

Prepared for:

**ARTAS Architects**

**10 Kingston View Drive  
Kingston**

---

**FLOOD HAZARD REPORT**

**FE\_24065**

**20 September 2024**

---

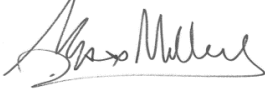




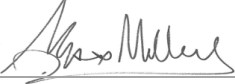
**flüssig**  
Engineers

**L4/ 116 BATHURST ST  
HOBART TASMANIA 7000  
ABN: 16 639 276 181**

## Document Information

Title	Client	Document Number	Project Manager
10 Kingston View Drive, Kingston Flood Hazard Report	<b>ARTAS Architects</b>	FE_24065	<b>Max W. Möller</b> <i>BEng, FIEAust, EngExec, CPEng, NER, APEC Engineer, IntPE (Aus.)</i> <i>Managing Director / Principal Hydraulic Engineer</i>

## Document Initial Revision

REVISION 00	Staff Name	Signature	Date
Prepared by	Max W. Moller <i>Principal Hydraulic Engineer</i>		02/09/2024
Prepared by	Ash Perera <i>Senior Hydraulic Engineer</i>		02/09/2024
Prepared by	Christine Keane <i>Senior Water Resources Analyst</i>		02/09/2024
GIS Mapping	Damon Heather <i>GIS Specialist</i>		09/09/2024
Reviewed by	John Holmes <i>Senior Engineer</i>		19/09/2024
Authorised by	Max W. Möller <i>Principal Hydraulic Engineer</i>		20/09/2024

## Document Revision History

Rev No.	Description	Reviewed by	Authorised by	Date
02	Change in building area	Max W. Moller	Max W. Moller	05/11/2024
01	Change in lot area- Section 1.1	Max W. Moller	Max W. Moller	27/09/2024

## © 2024 Flüssig Engineers Legal Disclaimer

This document is the exclusive intellectual property of Flüssig Engineers, a legal entity duly recognised under the laws governing the jurisdiction in which it operates. The rights, title, and interest in this document, both tangible and intangible, including any proprietary information are vested solely in Flüssig Engineers. The utilisation of this document is strictly subject to the terms and conditions for which it was created and intended for application exclusively in connection with the precise purposes for which it was originally commissioned and ordered.

Any unauthorised use, duplication, dissemination, distribution, modification, or any act that deviates from the scope of the designated engagement is prohibited and is not only in direct contravention of applicable intellectual property laws and contractual obligations but may also result in legal action being pursued by Flüssig Engineers. This prohibition extends to external peer review or any similar assessment, unless expressly authorised in writing by Flüssig Engineers.

Flüssig Engineers reserves the exclusive prerogative to grant or withhold approval for any usage, reproduction, or review of this document outside the parameters established by the Terms of Engagement. Such approval, if granted, shall be documented in written form and signed by an authorised representative of Flüssig Engineers

## Contents

---

<b>1.</b>	<b>Introduction</b> .....	<b>3</b>
1.1	Development .....	3
1.2	Objectives and Scope .....	3
1.3	Limitations .....	3
1.4	Relevant Planning Scheme Requirements.....	3
<b>2.</b>	<b>Model Build</b> .....	<b>4</b>
2.1	Overview of Catchment.....	4
2.2	Hydrology .....	4
2.3	Hydraulics.....	5
2.4	Development Runoff .....	7
<b>3.</b>	<b>Model Results</b> .....	<b>7</b>
3.1	Flood depth and extent. ....	7
3.2	Displacement of Overland Flow on Third Party Property.....	10
3.3	Development Effects on Stormwater Discharge .....	10
3.4	Model Summary.....	11
3.5	New Habitable Building.....	11
<b>4.</b>	<b>Flood Hazard</b> .....	<b>11</b>
4.1	Tolerable Risk.....	12
<b>5.</b>	<b>Conclusion</b> .....	<b>15</b>
<b>6.</b>	<b>Recommendations</b> .....	<b>15</b>
<b>7.</b>	<b>Limitations</b> .....	<b>16</b>
<b>8.</b>	<b>References</b> .....	<b>17</b>
<b>9.</b>	<b>Appendices</b> .....	<b>18</b>

## List of Tables

---

Table 1. KIPS 2015 Planning Scheme Requirements .....	3
Table 2. Parameters for RAFTS catchment .....	5
Table 3. Climate Change Increases .....	5
Table 4. Manning's Coefficients (ARR 2019).....	6
Table 5 Pre- and post-development results at the cross-sectional line within the lot .....	11
Table 6. Habitable Floor Construction Levels.....	11
Table 7. KIPS 2015 E15.7.4 .....	13
Table 8. KIPS 2015 E15.7.5 .....	14

## List of Figures

---

Figure 1. Contributing Catchment, 10 Kingston View Drive, Kingston .....	4
Figure 2. 1% AEP Box and Whisker Plot.....	5
Figure 3. 1m DEM (Hill shade) of Lot Area, 10 Kingston View Drive. ....	6
Figure 4. Pre-Development 1%+CC Flood Depths and extents .....	8
Figure 5. Post Development 1%+CC Flood Depth and extents .....	9
Figure 6. Pre and Post Development Net Discharge 1% AEP +CC, 10 Kingston View Drive .....	10

## Acronyms

---

AEP: Annual Exceedance Probability  
ARR: Australian Rainfall and Runoff  
CC: Climate Change  
KIPS: Kingborough Interim Planning Scheme  
DEM: Digital Elevation Model

## 1. Introduction

Flüssig Engineers has been engaged by **ARTAS Architects**, to undertake a site-specific flood hazard report for the proposed development at number 10 Kingston View Drive, Kingston in the **Kingborough Council** municipality. The purpose of this report is to determine the hydraulic characteristics on the existing and post-development scenarios and the flood hazard for the 1% AEP plus climate change (CC).

### 1.1 Development

The proposed development is a new training facility called “Tasmania JackJumpers High performance Centre” with 3638 m<sup>2</sup> of roof area and approximately 1970 m<sup>2</sup> paved/ concrete area. The development site has an area of 7,784 m<sup>2</sup> and is owned by the Kingborough Council.

This development triggers the inundation code as the development falls within Kingborough Council, flood prone area.

### 1.2 Objectives and Scope

This flood analysis has been written to meet the standards of the Kingborough Interim Planning Scheme 2015 (KIPS 2015), with the intent of understanding the development risk with respect to riverine flooding. The objectives of this study are:

- Provide an assessment of the site’s flood characteristics under the combined 1% AEP + CC scenario.
- Provide comparison of flooding for pre- and post-development against acceptable and performance criteria.
- Provide flood mitigation recommendations for the development, where appropriate.

### 1.3 Limitations

This study is limited to the objectives of the engagement by the client, the availability and reliability of data, and including the following:

- The flood model is limited to a 1% AEP + CC worst case temporal design storm.
- All parameters have been derived from best practice manuals and available relevant studies (if applicable) in the area.
- All provided data by the client or government bodies for the purpose of this study is deemed fit for purpose.
- The study is to determine the effects of the new development on flooding behaviour and should not be used as a full flood study into the area without further assessment.

### 1.4 Relevant Planning Scheme Requirements

**Table 1. KIPS 2015 Planning Scheme Requirements**

Planning Scheme Code	Objective
E15.7.4 Riverine Inundation Hazard Areas - A1	a) A new habitable building must have a floor level no lower than the 1% AEP (100 yr ARI) storm event plus 300 mm
E15.7.4 Riverine Inundation Hazard Areas - P1	A new habitable building must have a floor level that satisfies all of the following: a) risk to users of the site, adjoining or nearby land is acceptable; b) risk to adjoining or nearby property or public infrastructure is acceptable; c) risk to buildings and other works arising from riverine flooding is adequately mitigated through siting, structural or design methods; d) need for future remediation works is minimised;

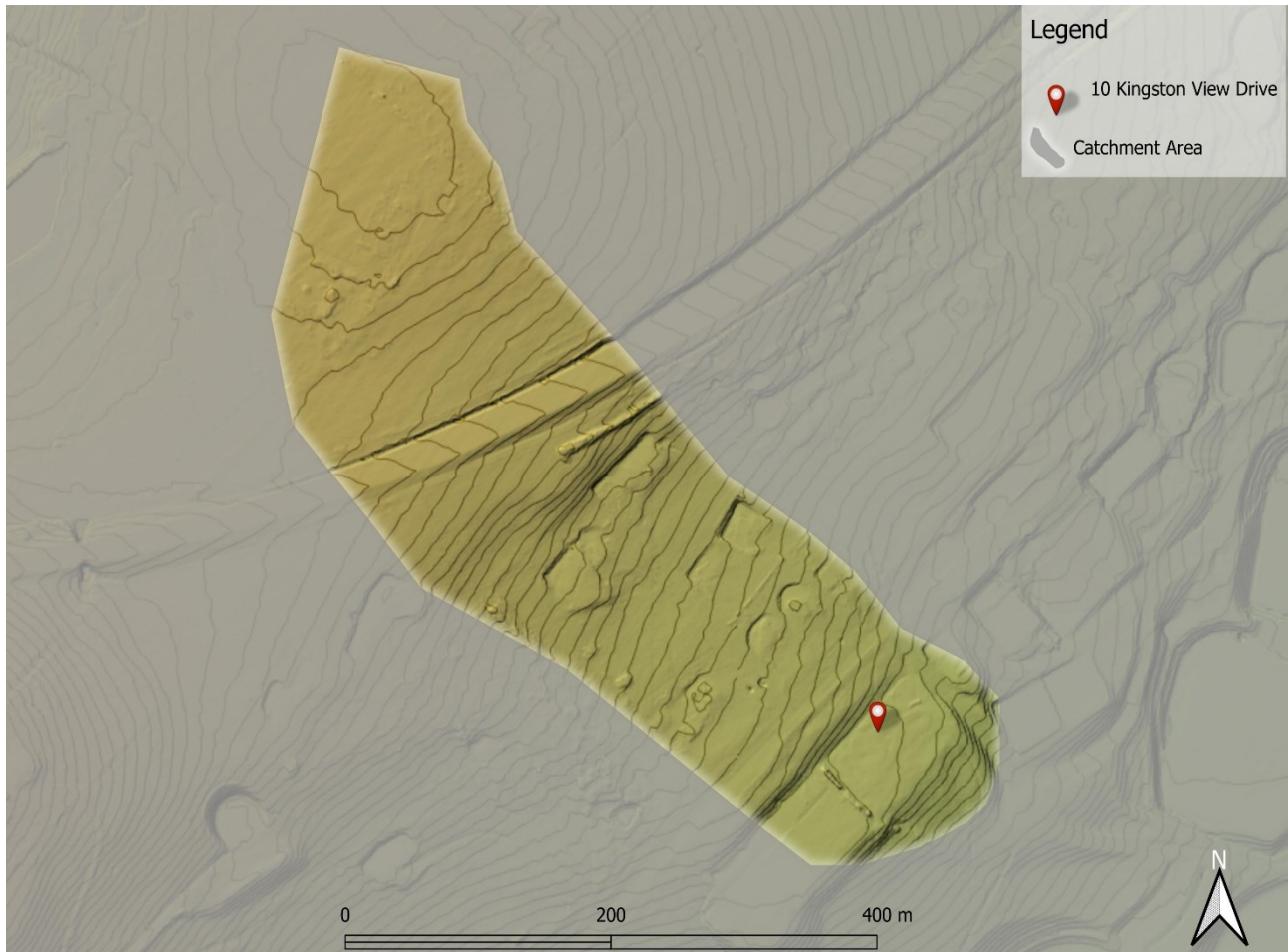
Planning Scheme Code	Objective
	e) provision of any developer contribution required pursuant to policy adopted by Council for riverine flooding protection works;
E15.7.5 Riverine, Coastal Investigation Area, Low, Medium, High Inundation Hazard Areas - P1	Landfill, or solid walls greater than 5 m in length and 0.5 m in height, must satisfy all of the following: <ul style="list-style-type: none"> <li>a) no adverse effect on flood flow over other property through displacement of overland flows;</li> <li>b) the rate of stormwater discharge from the property must not increase;</li> <li>c) stormwater quality must not be reduced from pre-development levels.</li> </ul>

## 2. Model Build

### 2.1 Overview of Catchment

The contributing catchment for 10 Kingston View Drive is approximately 13.5 ha. The majority of the land use is zoned Rural Living and Recreation, with the specific site being zoned Recreation.

Figure 1 below outlines the approximate contributing catchment for the 10 Kingston View Drive, Kingston development site.



**Figure 1. Contributing Catchment, 10 Kingston View Drive, Kingston**

### 2.2 Hydrology

The following Table 2 states the adopted hydrological parameters for the RAFTS catchment, derived from best practice documents.

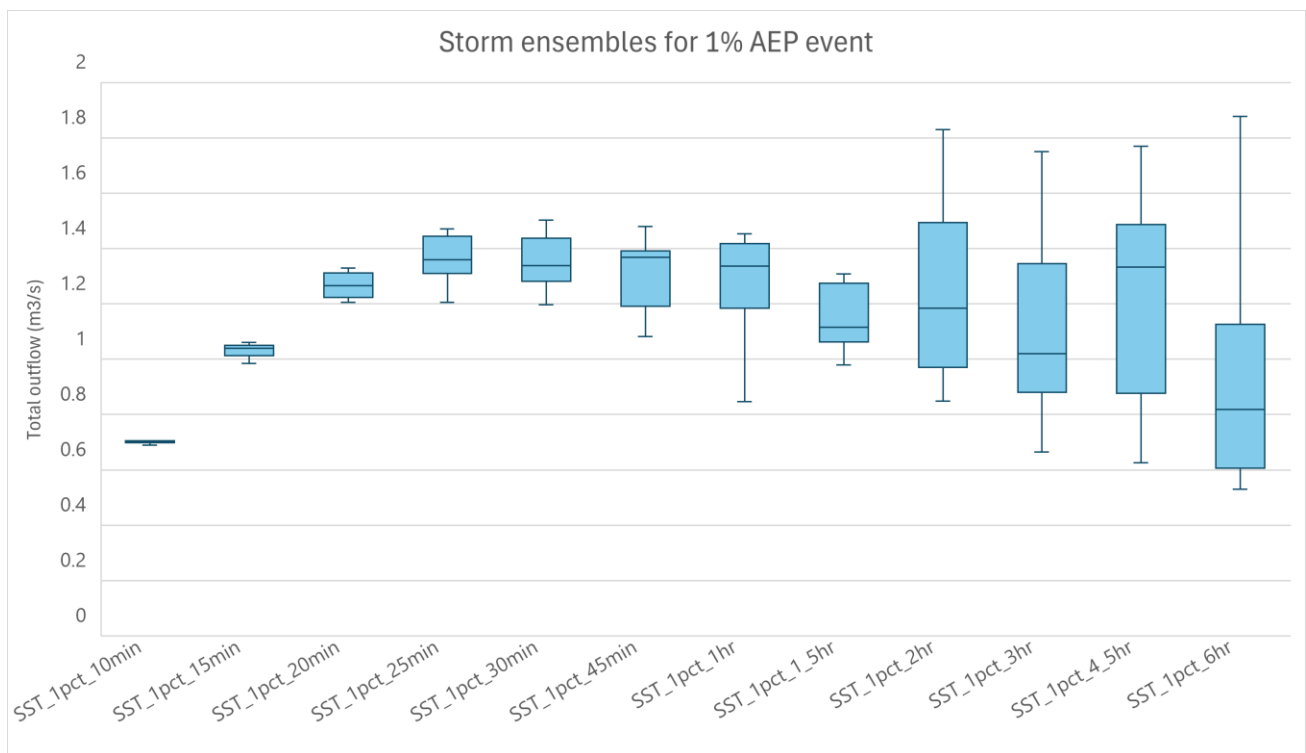
**Table 2. Parameters for RAFTS catchment**

Catchment Area (ha)	Initial Loss Perv/imp (mm)	Continuing Loss Perv/imp (mm/hr)	Manning's N pervious	Manning's N impervious	Non-linearity factor
13.5	28/1	3.4/0.0	0.045	0.02	-0.285

### 2.2.1 Design Rainfall Events

KIPS 2015 requires modelling of flood events of 1% AEP (100yr ARI) for the life of the development. Therefore, the design events assessed in this analysis are limited to the 1% AEP + CC design events. Due to the size and grade of the catchment the peak rainfall time was restricted to between 10 min – 6 hrs.

Figure 2 shows the box and whisker output for the 1% model run. The model shows that the 1% AEP 25-minute temporal pattern 5 was the worst-case storm. Therefore, this storm event was used within the hydraulic model.



**Figure 2. 1% AEP Box and Whisker Plot**

### 2.2.2 Climate Change

As per ARR 2019 Guidelines, for an increase in rainfall due to climate change at 2100, it is recommended the use of RCP 8.5. Table 3 shows the ARR 8.5 increase compared to the revised increase of 14.6%. The report by UTAS titled 'Climate Change Information for Decision Making' recommends the use of 22.5% as the climate change factor by 2100. Therefore, a climate change increase of 22.5% was adopted in the model.

**Table 3. Climate Change Increases**

Climate Zone	ARR 8.5 increase @ 2100	Climate Change Information for Decision Making
South-East Tasmania	16.3 %	22.5%

### 2.3 Hydraulics

A 1D-2D hydraulic model was created to determine the flood level through the target area.

### 2.3.1 Extents and topography

The area of concern is situated to the south of the catchment. The catchment originates at 10 Rowlands Court, Kingston, approximately 35 mAHd higher than the site location and the mainstream with an average gradient of approximately 5-6 %.

### 2.3.2 Calibration/Validation

This catchment has no stream gauge to calibrate the model against a real-world storm event. Similarly, there is little historical information available, and no past flood analysis undertaken to validate against the flows obtained in the model.

### 2.3.3 Survey

The 2D surface model was taken from a combination of Kingborough 2022- 1m DEM to create a 1m and cell size DEM. For the purposes of this report, 1m cells are enough to capture accurate flow paths. The DEM with hill shading can be seen below (Figure 3).



Figure 3. 1m DEM (Hill shade) of Lot Area, 10 Kingston View Drive.

### 2.3.4 Roughness (Manning’s n)

Table 4 shows Manning’s values used in the model. Values for this layer were derived from the ARR 2019 Guidelines.

Table 4. Manning's Coefficients (ARR 2019)

Land Use	Roads	Open Channel	Rural	Residential	Parks	Buildings	Piped Infrastructure
<b>Manning’s n</b>	0.018	0.035	0.04	0.045	0.05	0.3	0.013



### 2.3.5 Walls

All significant fences and retaining structures were included as 2D linear wall structures within the 2D model.

### 2.3.6 Buildings

Buildings were represented as mesh polygons with a high Manning's n value within the model. Buildings with unknown floor levels were set with a minimum 300 mm above ground. This method allows for flow through the building if the flood levels/pressure become great enough. The aim is to mimic flow through passageways such as doors, windows, hallways etc.

## 2.4 Development Runoff

Stormwater runoff from the development site has been assessed under pre- and post-development models to determine the potential impact the development at 10 Kingston View Drive, Kingston has on the immediate local flows. As per planning guidelines it is a requirement that this does not have a negative impact from pre to post development.

## 3. Model Results

---

The result of 1% AEP + CC were run through the pre-development and post-development model scenarios to compare the changes to flooding onsite and to surrounding properties.

### 3.1 Flood depth and extent.

It can be seen from the pre-development model runs (Figure 4), that some flooding occurs within the lot particularly along the north-western side which eventually discharging onto Twin Ovals Road. Figure 4 shows within the development lot at 10 Kingston View Drive, Kingston there is a maximum depth of 0.05 m at the cross-sectional result line on the north-eastern lot boundary. The maximum depth observed within the development site is under 0.12 m.

It is recommended that the retaining wall along the northern boundary of the proposed building be raised by a minimum of 0.3 metres above the backfill ground level. This adjustment will help divert overland flow away from the building and direct it towards the natural overland flow path.

Additionally, a 0.1 metre deep and 1.2 metre wide cut-off drain, as illustrated in Figure 5, is advised to further facilitate the redirection of surface water. This drain will enhance the effectiveness of the retaining wall in managing overland flow.

The maximum flood depth of 0.05 m remains unchanged at the cross-sectional results line in the post-development scenario. A maximum flood depth of 0.18 m within the development site is observed within the recommended cut-off drain.

The proposed training facility is free from inundation in the post-development scenario.



Figure 4. Pre-Development 1%+CC Flood Depths and extents



Figure 5. Post Development 1%+CC Flood Depth and extents

### 3.2 Displacement of Overland Flow on Third Party Property

Figure 5 shows the post-development flows that, when compared against pre-development, there appears to be a very minor increase in the extent of flooding on the Twin Ovals Road on the north-eastern lot boundary, however, this increase in depth and extent is only negligible, and this area is already affected by the overland flow in the pre-development scenario.

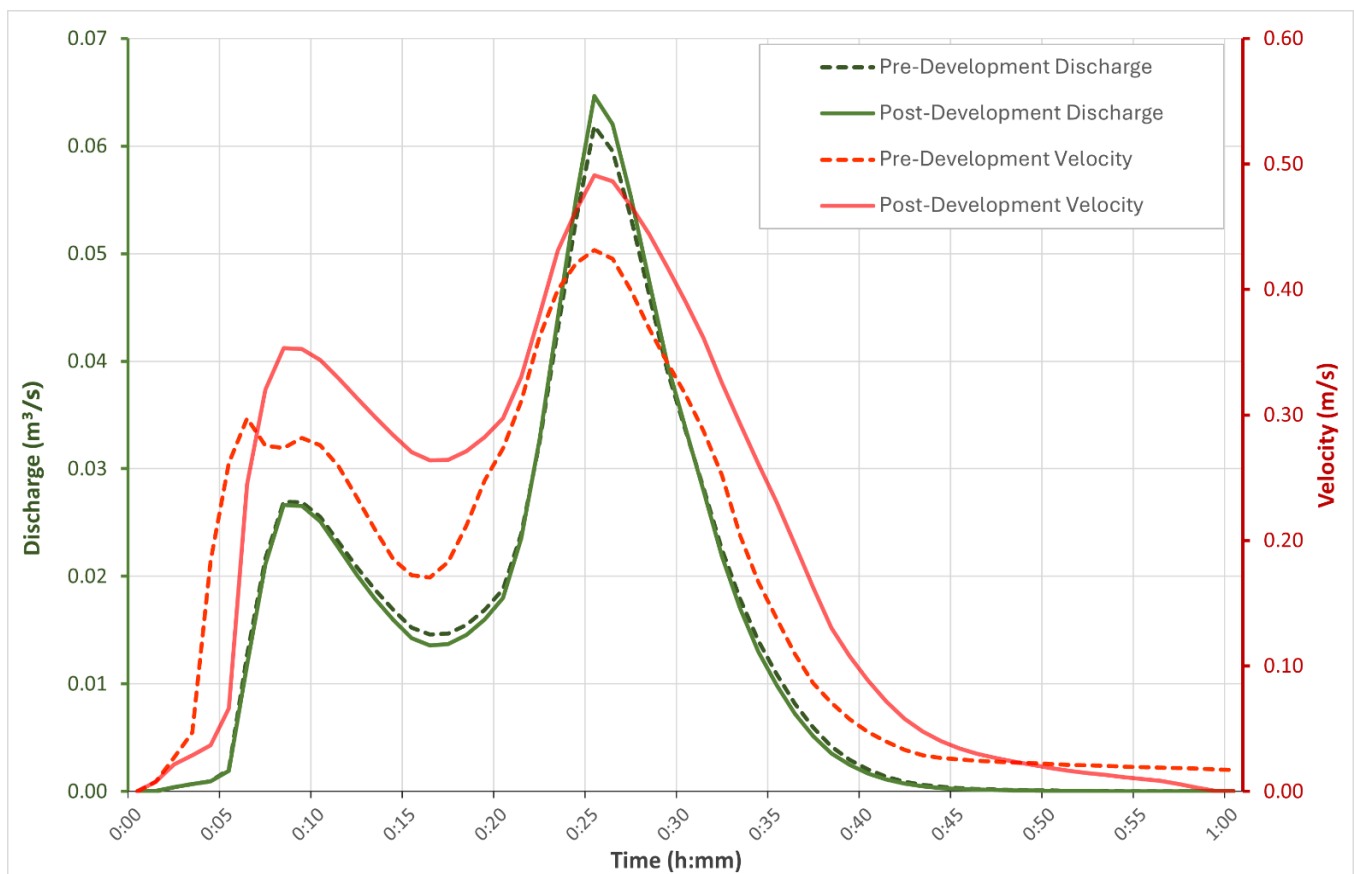
**It is therefore deemed that the post development scenario does not adversely affect flood hazard on surrounding properties.**

### 3.3 Development Effects on Stormwater Discharge

Figure 6 below shows the discharge hydrograph for the 10 Kingston View Drive at the marked cross-sectional line. The graph was captured in the model for both pre- and post-development runs and combined in a graph to demonstrate the change in net-discharge and velocity.

It demonstrates that there is a slight increase of 0.003 m<sup>3</sup>/s in net discharge from the predevelopment discharge of 0.062 m<sup>3</sup>/s to the post development discharge of 0.065 m<sup>3</sup>/s, and an increase of 0.06 m/s in the velocity from the pre-development of 0.431 m/s to the post-development velocity of 0.491 m/s. These changes having little effect on the development compared to the existing site conditions and are more likely due to model sensitivity.

**It is therefore deemed that the post-development scenario has no adverse effects on stormwater discharge.**



**Figure 6. Pre and Post Development Net Discharge 1% AEP +CC, 10 Kingston View Drive**

### 3.4 Model Summary

**Table 5 Pre- and post-development results at the cross-sectional line within the lot**

	Pre-development	Post-development	Net Change
Depth (m)	0.050	0.050	-
Velocity (m/s)	0.431	0.491	+ 0.060
Discharge (m <sup>3</sup> /s)	0.062	0.065	+ 0.003

### 3.5 New Habitable Building

To meet the performance criteria of the Building Regulations, the construction of a new habitable building is required to have a habitable floor level >300mm above the >1% AEP + CC flood level. (The floor level >1% AEP + CC flood level + 300 mm does not apply for non-habitable areas).

**Table 6. Habitable Floor Construction Levels**

10 Kingston View Drive	1% AEP +CC flood level (mAHD)	Minimum Floor Level required (mAHD)	Proposed Design Ground Floor Level (mAHD)
Tasmania JackJumpers High Performance Centre	-	-	111.00

As the proposed new training facility is not inundated as a result of the recommended mitigation measures, the proposed floor level of 111.00 mAHD can be maintained.

## 4. Flood Hazard

Appendix A shows the pre and post development hazard classification. In the pre-development scenario, the maximum velocity and depth at the cross-sectional result line on the southern lot boundary are 0.43 m/s and 0.05 m respectively. This places the hazard rating at **H1 – generally safe for people, vehicles and buildings** as adopted by the Australian Flood Resilience and Design Handbook.

The post-development scenario sees the depth at the eastern lot boundary changes and the velocity increasing slightly by 0.06 m/s.

In the post-development scenario, the overland flow path remains unchanged and discharges on to Twin Ovals Road. The maximum hazard classification in the post-development scenario is **H1** within the lot and surrounding areas.

As this study does not extend to the public access roads we cannot comment on the accessibility to the site, only within the site. Therefore, this report would advise that residents and visitors remain inside in the event of a flood unless instructed by emergency services. A summary of the hazard ratings is shown in Figure 7.

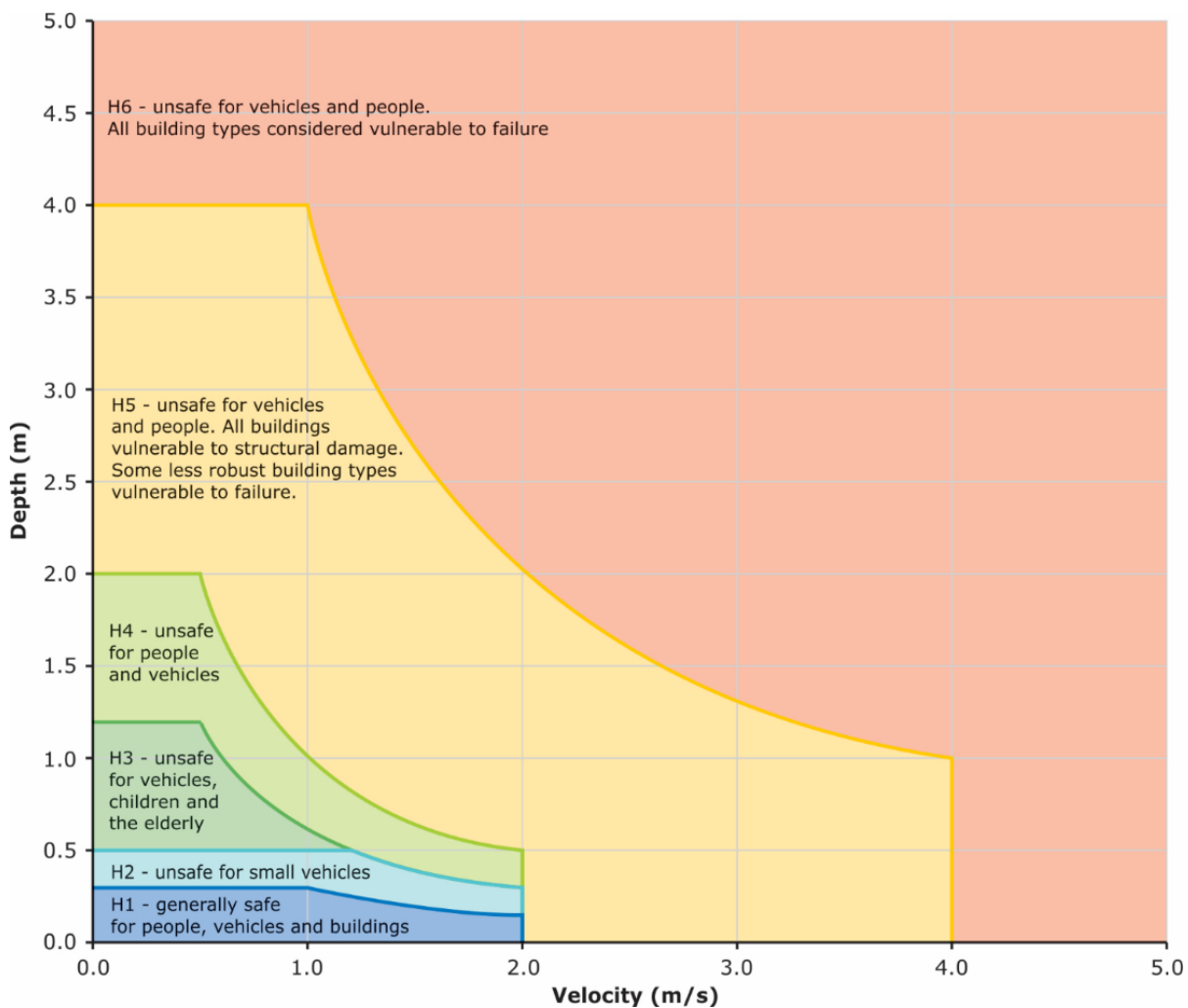


Figure 7. Hazard Categories Australian Disaster and Resilience Handbook

### 4.1 Tolerable Risk

Flood analysis into the lot at 10 Kingston View Drive, Kingston shows the proposed development is located within a shallow, low-risk overland flow path with a majority of the immediate surrounding area rated H1 hazard rating in the 1% AEP plus climate change event.

It is recommended that all structures undertake a hydrostatic/ hydrodynamic analysis to ensure suitability. Assuming appropriate structural considerations are applied, it is deemed that the structures proposed, intended to be a habitable class 9b building (sports facilities) with an asset life of 50 years (BCA2022), can achieve a tolerable risk to flooding over its asset life, assuming the recommendations of this report are adhered to.

Table 7. KIPS 2015 E15.7.4

E15.7.4 Riverine inundation hazard areas	
<b>Objective: To ensure that risk from riverine, watercourse or inland flooding is appropriately managed and takes into account the use of the buildings.</b>	
<b>Acceptable solution</b>	
<b>A1</b>	
A new habitable building must have a floor level no lower than the 1% AEP (100 yr ARI) storm event plus 300 mm.	Proposed new training facility is not subject to inundation.
<b>P1</b>	
A new habitable building must have a floor level that satisfies all of the following:	Response from flood report
(a) risk to users of the site, adjoining or nearby land is acceptable;	(a) No observable increase in flood depths and extents on neighbouring properties.
(b) risk to adjoining or nearby property or public infrastructure is acceptable;	(b) Some minor increase in flood extent on the Twin Ovals Road that is already affected by minor flooding in existing site conditions and does not contribute to any additional risk.
(c) risk to buildings and other works arising from riverine flooding is adequately mitigated through siting, structural or design methods;	(c) The recommended 0.1 m deep x 1.2 m wide cut off drain combined with raising the retaining wall 0.3 m from the backfill ground level adequately directs the overland flow away from the proposed building without affecting neighbouring lots.
(d) need for future remediation works is minimised;	(d) n/a
(e) provision of any developer contribution required pursuant to policy adopted by Council for riverine flooding protection works;	(e) n/a

**Table 8. KIPS 2015 E15.7.5**

E15.7.5 Riverine, Coastal Investigation Area, Low, Medium, High Inundation Hazard Areas			
<b>Objective: (a) To ensure that landfill and mitigation works do not unreasonably increase the risk from riverine, watercourse and inland flooding, and risk from coastal inundation.</b>			
Performance Criteria			
P1			
Landfill, or solid walls greater than 5 m in length and 0.5 m in height, must satisfy all of the following:		Response from Flood Report	
(a)	no adverse effect on flood flow over other property through displacement of overland flows.	(a)	No increase in flood risk from the development causing risk to flooding on third party property during 1% AEP + CC storm event.
(b)	the rate of stormwater discharge from the property must not increase.	(b)	Negligible increase of 0.003 m <sup>3</sup> /s in net discharge between the pre-development and post-development scenarios.
(c)	stormwater quality must not be reduced from pre-development levels.	(c)	The inclusion of the proposed development does not adversely affect the source of sedimentation into the flood waters including no increase in erosion potential.



## 5. Conclusion

---

The Flood Hazard Report for 10 Kingston View Drive, Kingston has reviewed the potential pre- vs post-development flood scenarios.

The following conclusions and outcomes were derived in this report:

1. A comparison of the post-development peak flows for the 1% AEP at 2100 were undertaken against the Kingborough Interim Planning Scheme 2015, E15.7.4 & E15.7.5.
2. No increase in peak flood depths for the 1% AEP +CC at the cross-sectional line is observed in the post-development scenario of 0.36 m compared to the pre-development model.
3. Peak discharge sees a negligible increase of 0.003 m<sup>3</sup>/s from pre- to post-development, riverine flood scenarios.
4. There is a slight increase in velocity of 0.06 m/s from pre- to post-development along the cross-sectional results line.
5. The pre-development model shows the hazard from flooding in the lot is H1 which remains unchanged in the post-development scenario.
6. The proposed building is not inundated and therefore, no hazard rating is observed within the building extents.

## 6. Recommendations

---

Flussig Engineers therefore recommend the following engineering design be adopted for proposed building to ensure the works meets the Inundation Prone Areas Code and the Building Regulations:

1. The retaining wall along the northern boundary of the proposed building to be raised by a minimum of 0.3 metres above the backfill ground level. Please refer 'ARTAS architects' Architectural documents.
2. A 0.1 m deep x 1.2 m wide cut-off drain is recommended to be constructed as shown in Figure 5.
3. The proposed footpath to be graded a minimum of 2% away from the building.
4. No additional solid structures be constructed around the property without further flood assessment.
5. All future proposed structures within the flood extent not shown within this report will require a separate report addressing their impacts.

Under the requirements of this Flood Hazard Report, the proposed development will meet current acceptable solutions and performance criteria under the Kingborough Interim Planning Scheme 2015.

## 7. Limitations

---

Flüssig Engineers were engaged by **ARTAS Architects**, for the purpose of a site-specific Flood Hazard Report for 10 Kingston View Drive, Kingston as per E15.7.4 & E15.7.5 of the Kingborough Interim Planning Scheme 2015. This study is deemed suitable for purpose at the time of undertaking the study. If the conditions of the development should change, the plan will need to be reviewed against all changes.

This report is to be used in full and may not be used in part to support any other objective other than what has been outlined within, unless specific written approval to do otherwise is granted by Flüssig Engineers.

Flüssig Engineers accepts no responsibility for the accuracy of third-party documents supplied for the purpose of this flood report.

## 8. References

---

- Australian Disaster Resilience Guideline 7-3: Technical flood risk management guideline: Flood hazard, 2014, Australian Institute for Disaster Resilience CC BY-NC
- Austroads 2013, Guide to Road Design Part 5: Drainage-General and Hydrology Considerations
- Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors), 2019, Australian Rainfall and Runoff: A Guide to Flood Estimation, Commonwealth of Australia
- Grose, M. R., Barnes-Keoghan, I., Corney, S. P., White, C. J., Holz, G. K., Bennett, J., & Bindoff, N. L. (2010). Climate Futures for Tasmania: General Climate Impacts Technical Report.
- T.A. Remenyi, N. Earl, P.T. Love, D.A. Rollins, R.M.B. Harris, 2020, Climate Change Information for Decision Making –Climate Futures Programme, Discipline of Geography & Spatial Sciences, University of Tasmania.
- Remenyi, T., Earl, N., Love, P., Rollins, D. and Harris, R. (n.d.). Climate Change Information for Decision Making. [online] Available at: <https://stca.tas.gov.au/wp-content/uploads/2023/03/Climate-Change-Information-for-Decision-Making-Kingborough.pdf>

## 9. Appendices

---

### Appendix A Flood Maps

# PRE 1% AEP + CC @2100



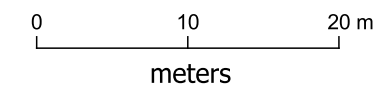
## Legend

- 10 Kingston View Drive
- 1.00m Contours
- Boundary Lines
- Existing internal driveway
- Existing Building Areas

## Pre 1% AEP + CC @2100

### Depth (m)

- <= 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.80
- 0.80 - 1.00
- 1.00 - 1.50
- > 1.50



**flüssig**  
Engineers

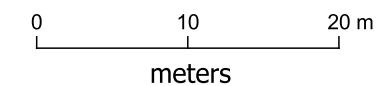
admin@flussig.com.au  
(03) 6288 7704  
www.flussig.com.au  
116 Bathurst St, Level 4  
Hobart, 7000, TASMANIA

# PRE 1% AEP + CC @2100



## Legend

- 10 Kingston View Drive
  - Boundary Lines
  - Existing internal driveway
  - Existing Building Areas
- Pre 1% AEP + CC @2100
- Velocity (m/s)
- <= 0.50
  - 0.50 - 1.00
  - 1.00 - 1.50
  - 1.50 - 2.00
  - > 2.00



**flüssig**  
Engineers

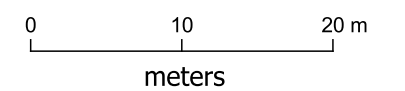
admin@flussig.com.au  
(03) 6288 7704  
www.flussig.com.au  
116 Bathurst St, Level 4  
Hobart, 7000, TASMANIA

# PRE 1% AEP + CC @2100



## Legend

- 10 Kingston View Drive
  - Boundary Lines
  - Existing internal driveway
  - Existing Building Areas
- Pre 1% AEP + CC @2100
- Hazard
- H1
  - H2
  - H3
  - H4
  - H5
  - H6



admin@flussig.com.au  
(03) 6288 7704  
www.flussig.com.au  
116 Bathurst St, Level 4  
Hobart, 7000, TASMANIA

# POST 1% AEP + CC @2100



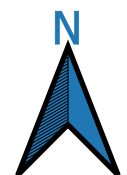
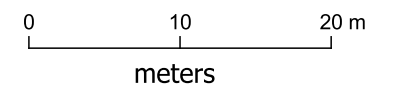
## Legend

- 10 Kingston View Drive
- 1.00m Contours
- Boundary Lines
- Existing internal driveway
- Existing Building Areas
- Proposed building
- Proposed carpark
- Proposed Footpat
- Proposed retaining wall
- 0.1m Deep Cutoff Drain

## Post 1% AEP + CC @2100

### Depth (m)

- <= 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.30
- 0.30 - 0.60
- 0.60 - 0.80
- 0.80 - 1.00
- 1.00 - 1.50
- > 1.50

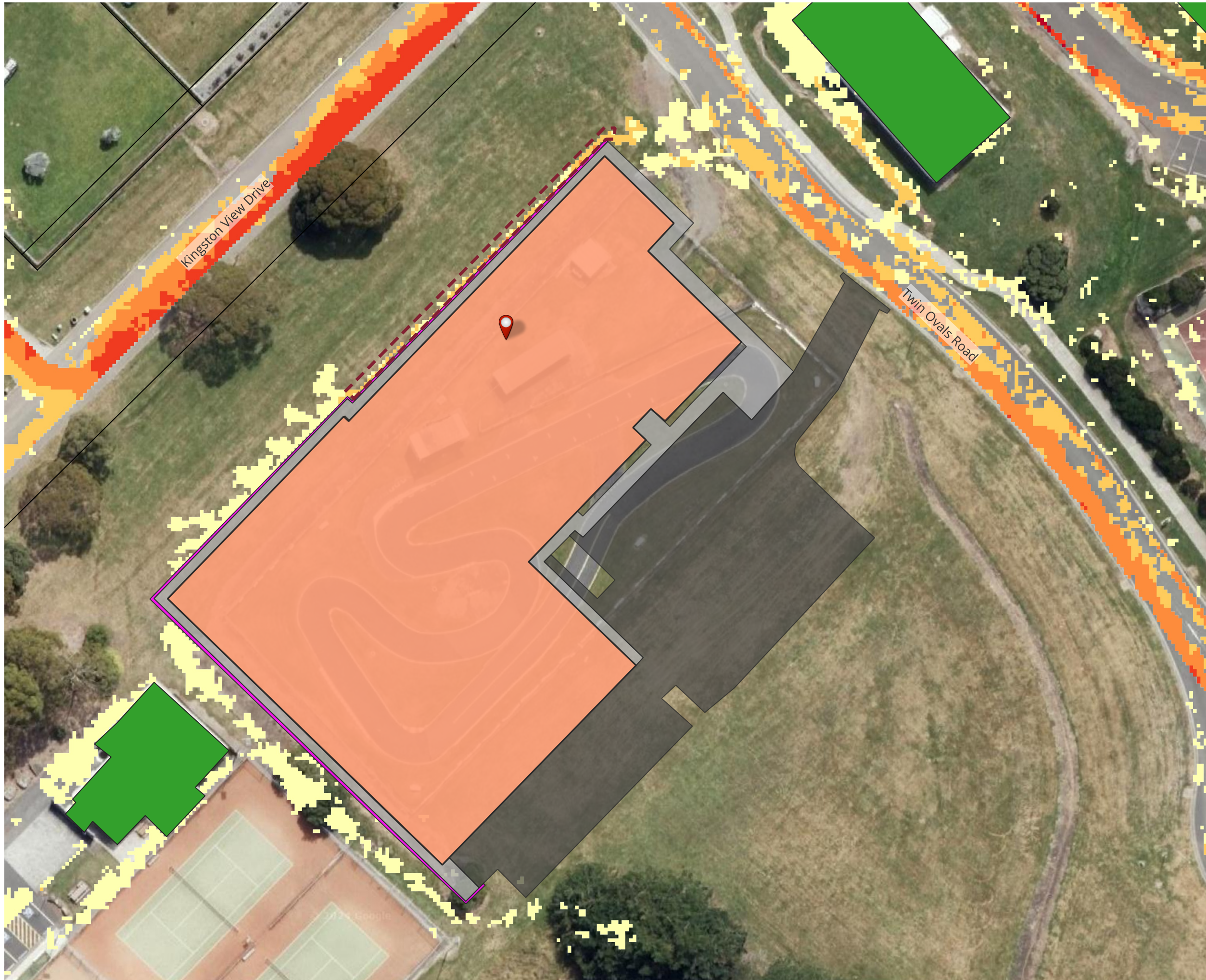


**flüssig**  
ENGINEERS

admin@flussig.com.au  
(03) 6288 7704  
www.flussig.com.au  
116 Bathurst St, Level 4  
Hobart, 7000, TASMANIA



# POST 1% AEP + CC @2100

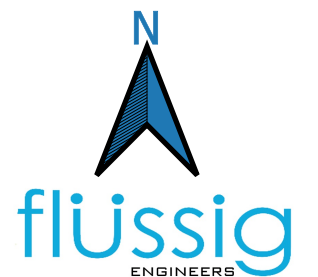
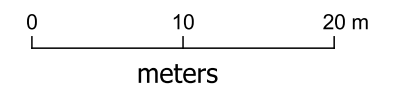


## Legend

- 10 Kingston View Drive
- Boundary Lines
- Existing internal driveway
- Existing Building Areas
- Proposed building
- Proposed carpark
- Proposed Footpat
- Proposed retaining wall
- 0.1m Deep Cutoff Drain

## Post 1% AEP + CC @2100

- Velocity (m/s)
- <= 0.50
  - 0.50 - 1.00
  - 1.00 - 1.50
  - 1.50 - 2.00
  - > 2.00



admin@flussig.com.au  
(03) 6288 7704  
www.flussig.com.au  
116 Bathurst St, Level 4  
Hobart, 7000, TASMANIA

# POST 1% AEP + CC @2100



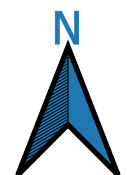
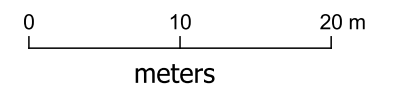
## Legend

- 10 Kingston View Drive
- Boundary Lines
- Existing internal driveway
- Existing Building Areas
- Proposed building
- Proposed carpark
- Proposed Footpat
- Proposed retaining wall
- 0.1m Deep Cutoff Drain

## Post 1% AEP + CC @2100

### Hazard

- H1
- H2
- H3
- H4
- H5
- H6



**flüssig**  
ENGINEERS

admin@flussig.com.au  
(03) 6288 7704  
www.flussig.com.au  
116 Bathurst St, Level 4  
Hobart, 7000, TASMANIA

**Contact Project Manager: Max Möller**



P: 03 6288 7704  
M: 0431 080 279  
E: [max@flussig.com.au](mailto:max@flussig.com.au)  
W: [www.flussig.com.au](http://www.flussig.com.au)  
A: Level 4, 116 Bathurst Street  
Hobart TAS 7000