Flood Impact Assessment
Proposed Alterations
22 Ocean Road, Palm Beach, 2108

Prepared For
Northern Beaches Council

Client
King Vest Pty Ltd

Project No.
ACE190861

Issue B November 2019

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Prepared By	Katrina Salloum	Civil Engineer	6 November 2019	Nil
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Prepared By	Katrina Salloum	Civil Engineer	25 November 2019	Nil
Reviewed By	Joe Bacha	Director	25 November 2019	Nil

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King Vest Pty Ltd	Nil

Disclaimer

The advice and information contained within this report relies on the quality of the records and other data provided by the Client and obtained from Council along with the time and budgetary constraints imposed.

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1 INTRODUCTION

Australian Consulting Engineers have been commissioned to undertake a Flood Impact Assessment for the Proposed Alterations at 22 Ocean Road, Palm Beach. The alterations outlined in this report involve a new couch lawn to the East of the site. The lawn is undergoing filling which has been designed in a way to reduce the flood risk at the property without causing flooding issues on the neighbouring properties or public areas.

This report will:

1. Determine the existing stormwater characteristics of the overland flowpath hydraulics and capacity;
2. Define the flood risk for the proposed development in accordance with the Northern Beaches Council DCP Flood Risk Management Policy;
3. Set earthworks levels for the proposed development in order to manage flooding in adjacent properties in accordance with Council's guidelines;
4. Discuss risk management in accordance with Council's Flood Risk Management Guidelines; and
5. Provide flood risk management procedures for the proposed development in accordance with Council's Flood Risk Management Guidelines;

This report has been prepared generally in accordance with Northern Beaches Council advice, Council's Flood Risk Management Policies and other reference documents, in particular the *Avalon to Palm Beach Floodplain Risk Management Study and Plan*, prepared by Manly Hydraulics Laboratory in June 2017.

2 SITE DETAILS

2.1 Location

The proposed development site is located within the municipality of Northern Beaches Council and is identified as Lot 71 on DP 6746. The site is located on the western side of Ocean Road, Palm Beach. The subject property has a total site area of approximately 1226m² by title and is bounded by residential allotments to the north, south and west, and an asphalt car park and Palm Beach to the east.

Figure 2-1 below shows the site's location outlined in red.

Figure 2-1– Approximate Location of Site

2.2 Proposed Development

The proposed development will see a new couch lawn to the east of the site along with a new hardwood deck. The new couch lawn levels are designed in order to reduce the flood risk on the property without causing adverse impacts on the neighbouring properties or public areas. Additionally, new driveway levels with a sliding gate are proposed.

Refer **Figure 2-2** for the site plan, and **Appendix B** for the architectural plans of the proposed development.

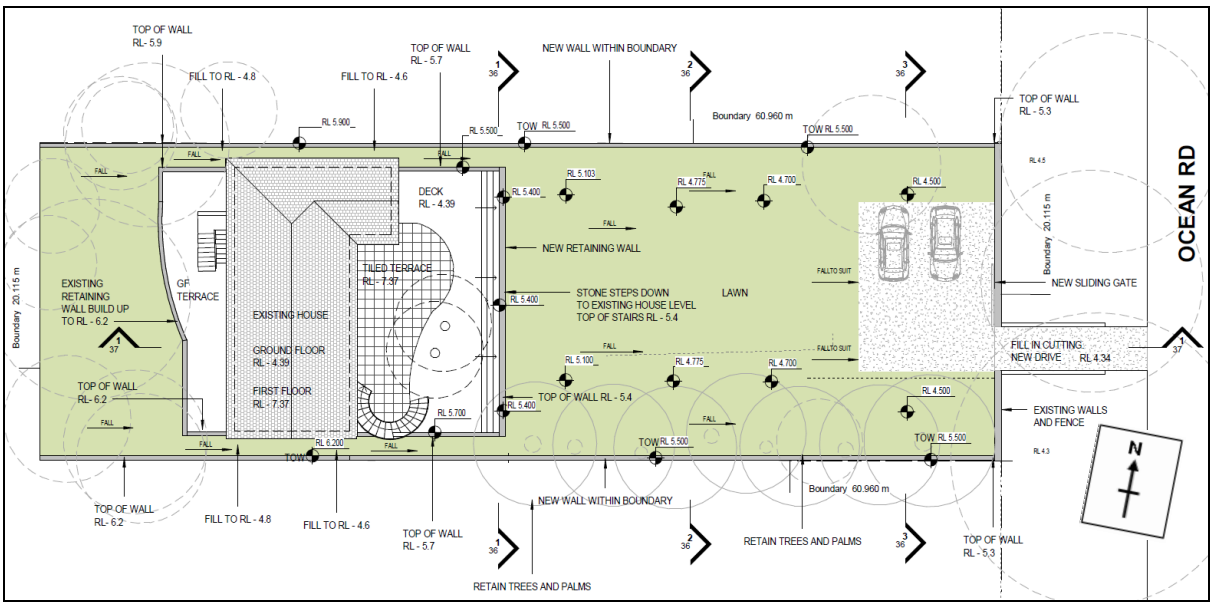


Figure 2-2 – Site Plan

2.3 Topography and Drainage

The site is located in the catchment of Palm Beach, within the location of a former minor tributary and interdunal lagoon immediately upstream of the beach. The site is partially mapped as high flood hazard by Council as a result of a small trapped low point on the site.

The topography of the upstream catchment is very steep developed bushland in the higher elevations, with fully urbanised area in the lower catchment.

The catchment area draining to the site is not clearly defined using topographic information due to the complex landforms, particularly in the steeper bushland areas. **Figure 2.3** below shows the approximate upstream catchment in blue, which illustrate the unclear drainage patterns to the subject site. The catchment drawn on **Figure 2.3** shows the local overland flowpath with an upstream catchment area of approximately 16 ha in size.

The complex drainage patterns for the site are the reason that this investigation has used the rainfall-on-the-grid modelling technique, discussed in **Section 3**, which combines hydrology and hydraulic modelling with a fully distributed rainfall input.

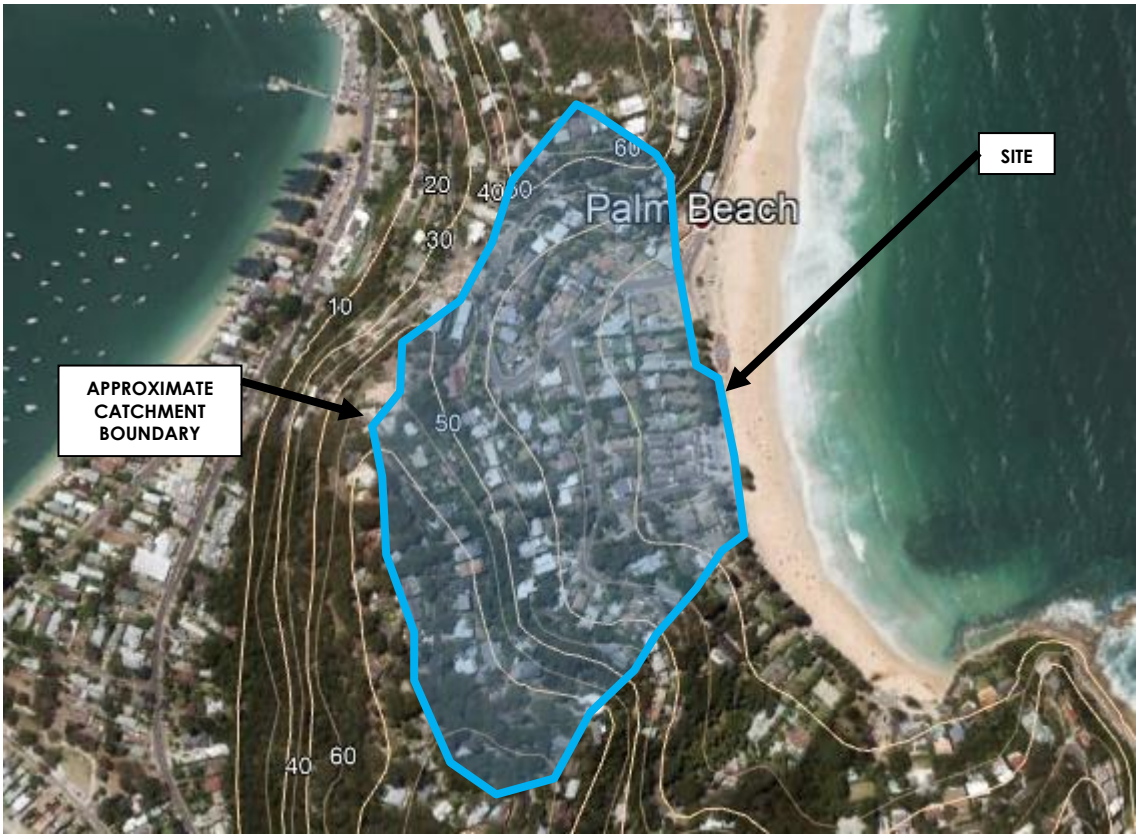


Figure 2.3 - Catchment Map

3 FLOOD IMPACTS

This investigation used the application of rainfall directly onto the grid of the two–dimensional hydraulic model within the TUFLOW flood modelling software (Build 2013-12-AA), using the SMS interface (Version 11.1). This methodology is known as the direct rainfall approach or 'rainfall on the grid'. This approach removes the need for a separate hydrological modelling package.

In traditional flood modelling, separate hydrological and hydraulic models are constructed. The hydrological model has inputs of rainfall, area losses and roughness within a lumped or partially distributed sub–catchment, calculating runoff hydrographs for modelled storm events. This hydrograph is then applied to the hydraulic model, which performs flow calculations based on hydraulic features to develop estimations of flood behaviour across the study area.

In the direct rainfall approach, the hydrological model is either partially or completely removed from the process. The hydrological routing is undertaken in the distributed two–dimensional model, rather than in a lumped hydrological package.

A coarse gridded hydrologic model was developed in order to check flow rates and determine the peak median storm event to use in the hydraulic modelling. This coarse hydrologic model was developed using the same TUFLOW package with the same data sets. This approach is required in order to use the rainfall-on-the-grid technique with the Australian Rainfall and Runoff 2016 methodology.

3.1.1 *Topographic data*

Topographic data for the model was obtained from Northern Beaches Council. This data was used in the development of the Careel Creek Catchment Flood Study, prepared by WMA Water in 2013, which is the technical background report used to prepare the *Avalon to Palm Beach Floodplain Risk Management Study and Plan*, prepared by Manly Hydraulics Laboratory in June 2017

Field survey of the site was included in the hydraulic modelling, in accordance with the requirements of Northern Beaches Council. This survey data has been imported into the TUFLOW model using the earthworks modelling software package 12D to develop a triangulated irregular network (TIN).

The data obtained from LPI, along with the survey TIN was sampled at 5.0 metre grid spacings for the hydrologic modelling and 0.5 metre grid spacings for the entire catchment for the hydraulic modelling. A representation of this data, showing contour and relief information is presented on **Figure 3.1**.

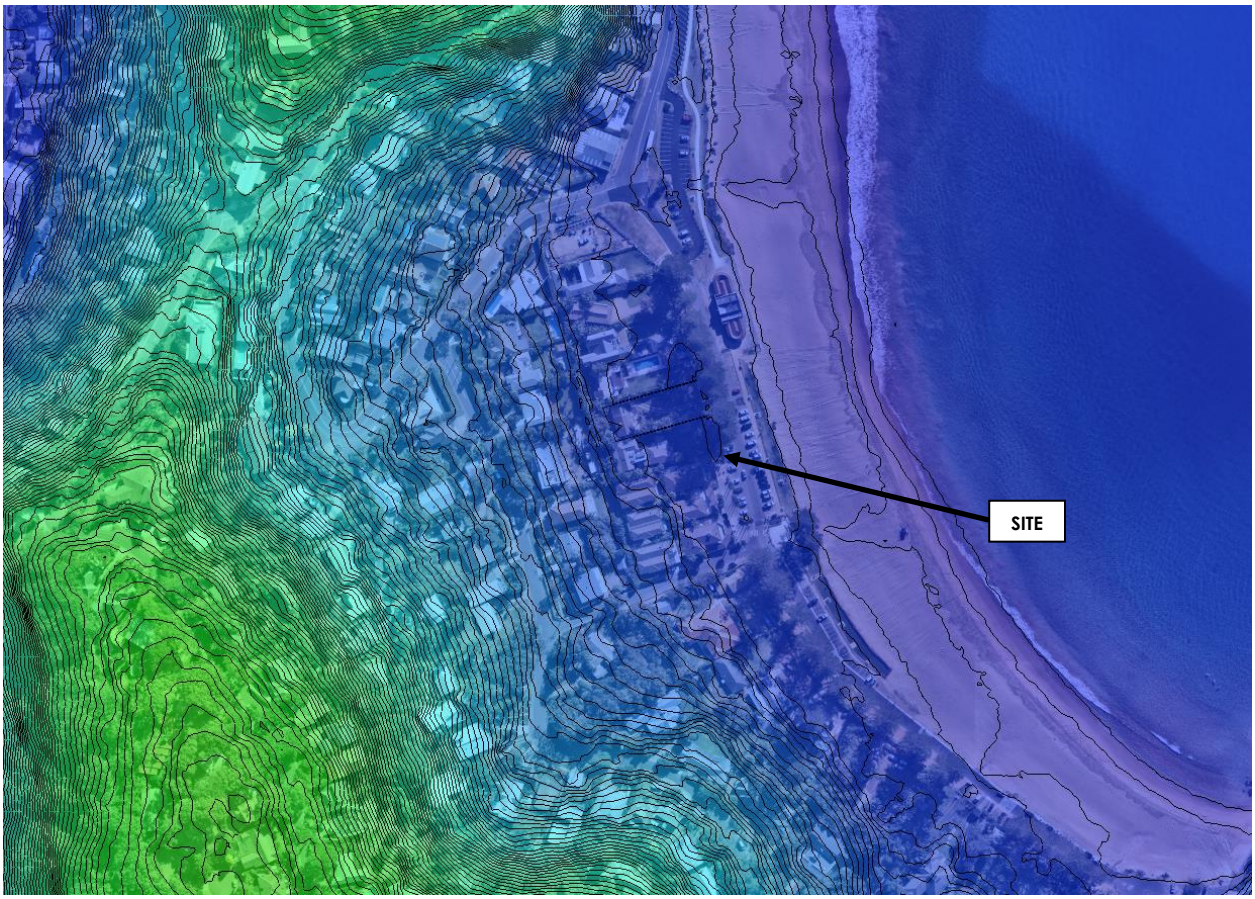


Figure 3.1 – Topographic Data

3.1.2 *Roughness*

Hydrologic or hydraulic modelling parameters published by Northern Beaches Council for use in this investigation. Manning's Roughness taken from the Careel Creek Catchment Flood Study and Plan prepared by WMA Water in 2013 Land use type is shown in **Figure 3.2**

The roughness parameters adopted for each mapped land use are:

- Beach/foreshore – 0.1
- High density vegetation – 0.1
- Medium density development – 0.15
- Roads/pavement – 0.03

Figure 3.2 – Land use mapping

3.1.3 *Losses*

The runoff Coefficient for each land use type were:

- Beach/foreshore – initial 0mm, continuing 2.5mm/hr
- High density vegetation – no losses
- Medium density development – initial 0mm, continuing 1.0mm/hr
- Roads/pavement – no losses

3.1.4 *Building Obstructions*

Buildings and other obstructions were modelled by mapping using aerial photography. Buildings identified within the model are shown in **Figure 3.3.**

Figure 3.3 – Building Obstructions

Buildings mapped were excluded from the grid.

3.1.5 *Blockage of Drainage Infrastructure*

The pit and pipe network was assumed to be fully blocked in the hydraulic modelling, with all modelled as flow travelling overland.

3.1.6 *Downstream Boundary Conditions*

The downstream boundary for the modelling was set at the Tasman Sea, at an elevation of 1.45mAHD, in accordance with the CSIRO document prepared in 2011 for Sydney Councils: *Modelling and Mapping of Coastal Inundation under Future Sea Level*.

3.1.7 *Catchment Flow*

Storm rainfall patterns for the 100y ARI were developed using the methodology outlined in Australian Rainfall and Runoff 2016. Storm durations ranging from 5 minutes to 1.5 hours were used in a coarse, 5.0 metre, gridded modelling to determine the peak median water level storm event, used in the existing and developed 0.5m gridded flood modelling.

The results of the modelling, with peak flood elevation at the low point within the site for the peak, lower and mean event are presented in **Figure 3.4**.

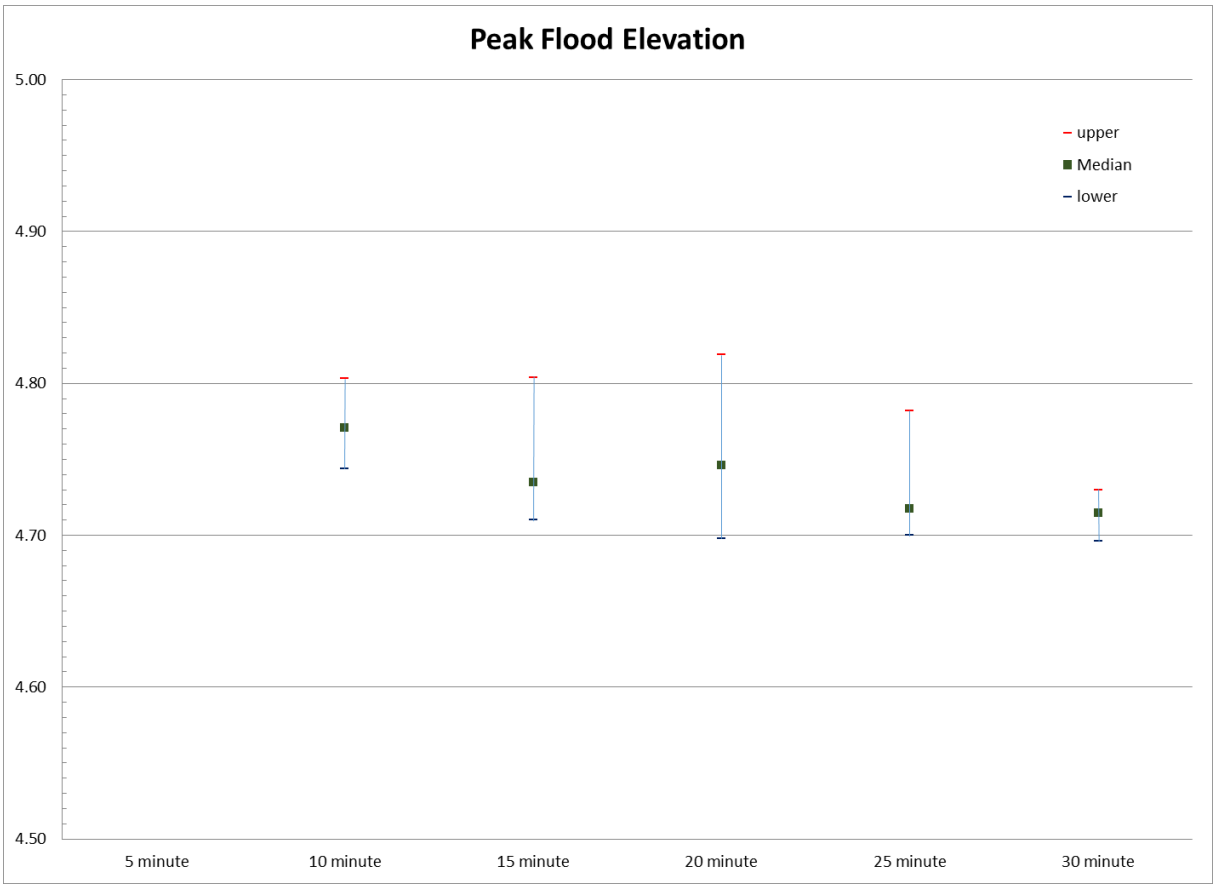


Figure 3.4 – Peak Flood Elevations at the site for ARR 2016 storm events

The results in **Figure 3.4** show peak ponded water level for each storm temporal pattern for the 10, 15, 20, 25 and 30 minute events, with the bold green square indicating the median event for each storm duration.

The peak elevation occurred during the 10-minute duration event for the 100y ARI event, with temporal pattern TP4357 (bold dark green). This event was used in the flood modelling with the 0.5m gridded model, which is presented in this report.

3.1.8 *Provisional Flood Hazard Categorisation*

Hazard categories were determined in accordance with Appendix L of the NSW Floodplain Development Manual, the graphical representation of this categorisation methodology is shown in **Figure 3.5**.

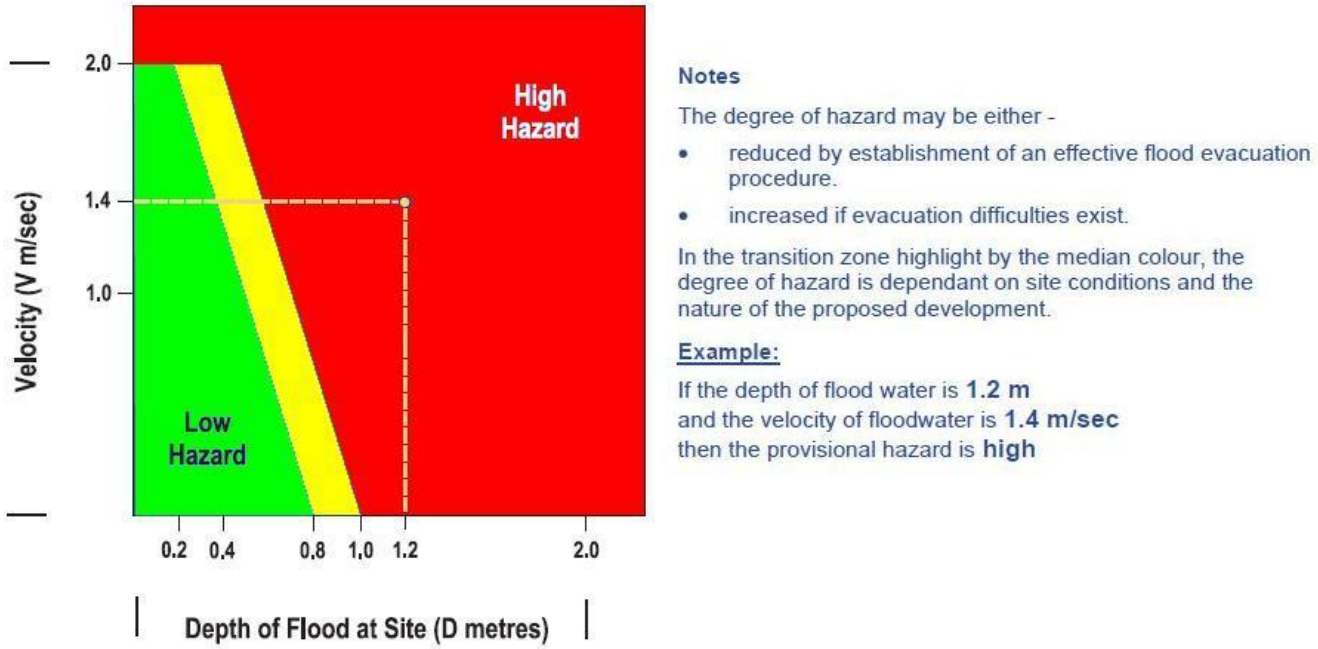


Figure 3.5 – Provisional Hydraulic Hazard Categories (Figure L2 from NSW Floodplain development manual (2005))

Flood hazard is mapped using this methodology by multiplying the flood depth by the velocity of the flow. Maps of provisional flood hazard categorisation at the site for the 100y ARI events are presented in **Sections 3.2** and **3.3** of this report. These maps were developed using the hazard mapping output from the TUFLOW modelling, presented using the QGIS geographic information system software package (Version 3.6.1).

3.2 Existing Scenario

Peak flood surface elevations and flow depths, along with flood hazard were calculated for the modelled storm event, the 100 year ARI event (10 minute TP 4357), for existing site conditions, with a 0.5m grid size. Peak flood extents and depths of overland flow paths have been mapped on the digital terrain model, using the QGIS geographic information system software package (Version 3.6.1),

Flood extents for the 100y ARI event have been mapped to a minimum depth of 0.15m shown on **Figure 3.6**(100y ARI). This nulling of shallow flows is in accordance with the recommended 0.15m nulling from the NSW Floodplain Development Manual. Flood surface elevations for the full extent shown in order to provide guidance on flood planning levels.

Flood velocity has been mapped and is presented on **Figure 3.7**.

Flood Hazard has been mapped in accordance with the requirements of Appendix L of the NSW Floodplain Development Manual, and are presented on **Figure 3.8** (100y ARI).

The results of the flood mapping of the existing scenario indicate that flooding at the site is the result of overland flow from the upstream catchment.

- 100 year ARI event
    - The existing site is almost entirely flooded in the 100-year event, with maximum depths of 1.0 –1.5m
    - Flood elevations are steep in the upper section of the site and relatively flat with levels between 4.7m and 4.8m AHD downstream of the house
    - The velocity of the flow on the northern and southern sides of the existing house is up to 1.75m/s
    - The majority of the building and surrounds are classified as low hazard, with a ponded low point area classified as medium and high hazard

Figure 3.6 – Existing Scenario 100 year ARI Flood Extent

Legend

- <= 0.15
- 0.15 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.75
- 0.75 - 1.0
- 1.0 - 1.5
- Lot

0 2.5 5 7.5 10 12.5 15 17.5 20 m

Details

Issue	Amendment	Date
A	Concept Design	14 Oct 19

Project

22 Ocean Road, Palm Beach

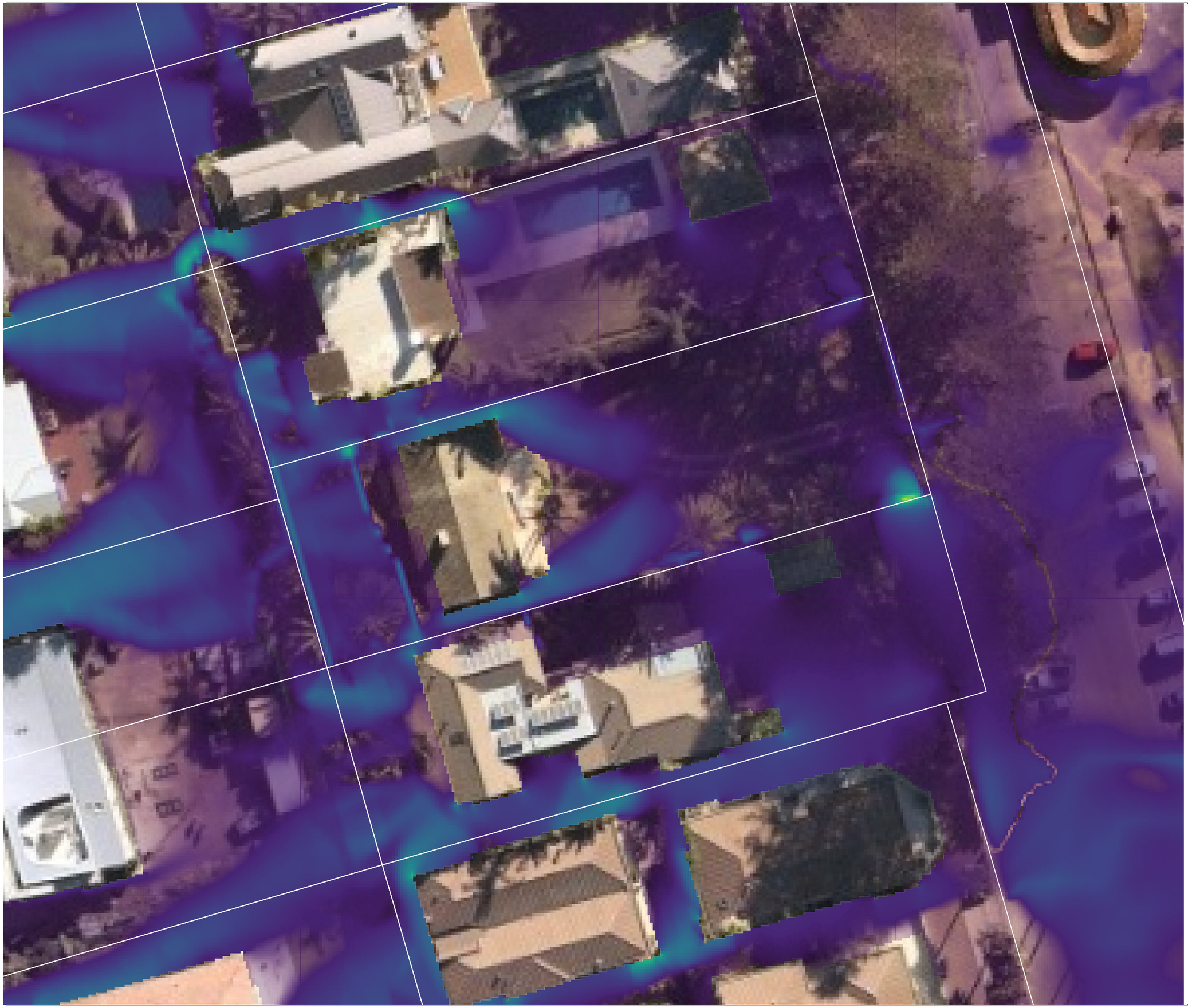
Drawing Title

FIGURE 3.6
100 YEAR ARI PEAK FLOOD DEPTH & ELEVATION EXISTING SCENARIO

Scale	1:2000 @ A3
Drawn	AAS
Checked	JB
Job No.	ACE190861
Drawing ID	FIG 3.6

ISSUE **A**

Figure 3.7 – Existing Scenario 100-year ARI Flood Velocity



Legend

- 0
- 0.25
- 0.5
- 0.75
- 1
- 1.25
- 1.5
- 1.75
- 2
- 2.25
- 2.5

0 2.5 5 7.5 10 12.5 15 17.5 20 m

Details

Issue	Amendment	Date
A	Concept Design	14 Oct 19

Project

22 Ocean Road, Palm Beach

Drawing Title

FIGURE 3.7
100 YEAR ARI PEAK FLOOD VELOCITY
EXISTING SCENARIO

Scale	1:2000 @ A3
Drawn	AAS
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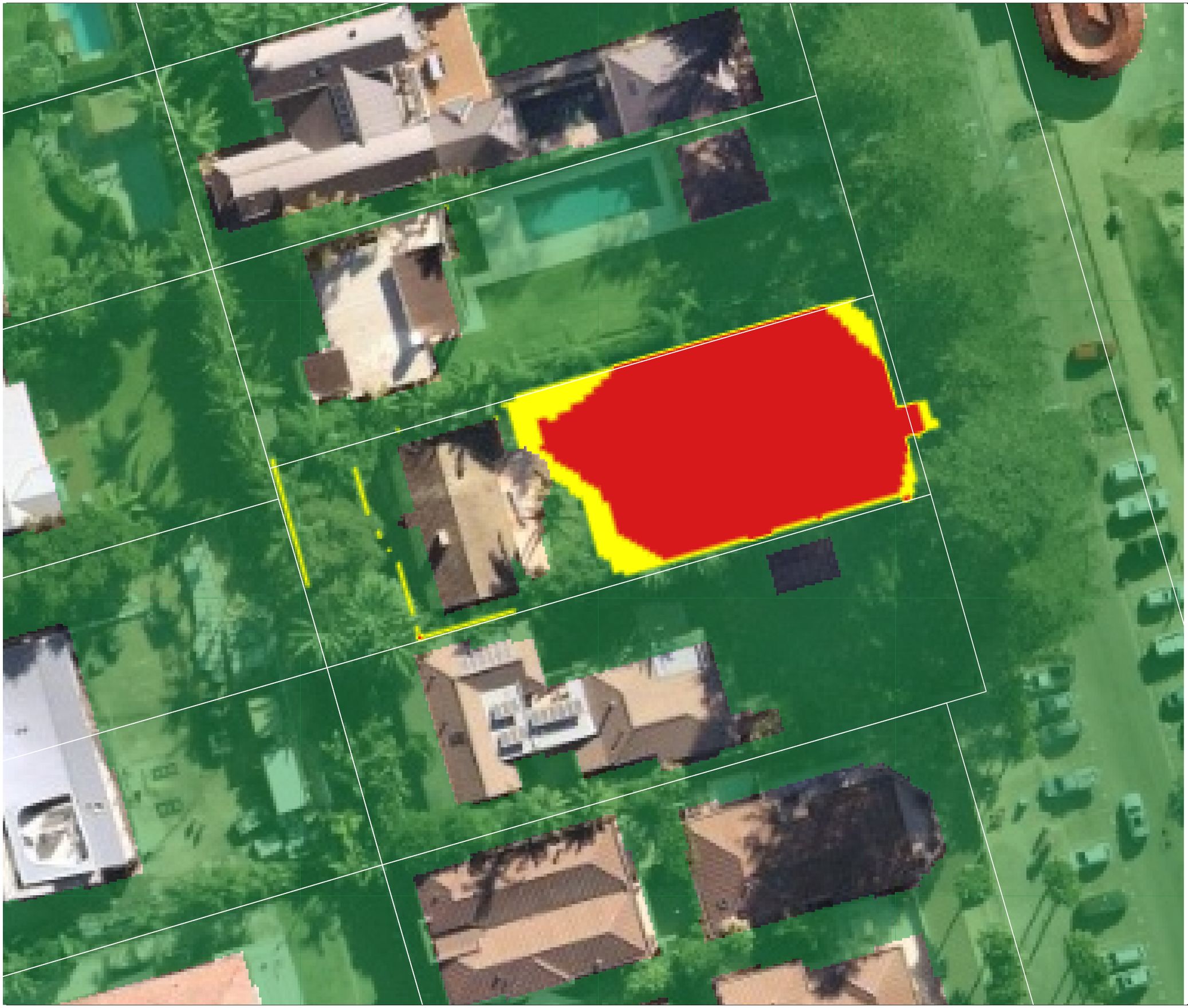
Job No.	ACE190861
Drawing ID	FIG 3.7

ISSUE **A**

Figure 3.8 – Existing Scenario 100 year ARI Flood Hazard Mapping



Legend

- Low Hazard
- Medium Hazard
- High Hazard

0 2.5 5 7.5 10 12.5 15 17.5 20 m

Details

Issue	Amendment	Date
A	Concept Design	14 Oct 19

Project

22 Ocean Road, Palm Beach

Drawing Title

FIGURE 3.8
100 YEAR ARI PEAK FLOOD HAZARD
EXISTING SCENARIO

Scale	1:2000 @ A3
Drawn	AAS
Checked	JB
Job No.	ACE190861
Drawing ID	FIG 3.8

ISSUE **A**

3.3 Developed Scenario

Peak flood surface elevations and flow depths, along with flood hazard were calculated for the modelled storm event, the 100y ARI event (10 minute TP 4357), for developed (proposed) site conditions, with a 0.5m grid size. Peak flood extents and depths of overland flow paths have been mapped on the digital terrain model, using the QGIS geographic information system software package (Version 3.6.1).

Flood extents for the 100y ARI event have been mapped to a minimum depth of 0.15m shown on **Figure 3.9** (100 year ARI). This nulling of shallow flows is in accordance with the recommended 0.15m nulling from the NSW Floodplain Development Manual. Flood surface elevations for the full extent shown in order to provide guidance on flood planning levels.

Flood velocity has been mapped and is presented on **Figure 3.10**.

The site has been modelled with flow paths located along the northern and southern boundary of the site next to the existing building boundary. The water approaching the subject site from upstream will find its path through these flowpaths then spread over in the proposed fronting courtyard to leave the site through the driveway. Retaining walls are provided along the northern and southern boundaries (with 500mm freeboard) to prevent minor, localised increases in flood levels in adjacent neighbouring properties (modelled with the proposed building layout with no mitigation measures). Additionally, retaining walls and stone steps near the proposed hardwood deck are provided with adequate freeboard (500mm) to protect the existing building from any water encroachment.

Flood Hazard has been mapped in accordance with the requirements of Appendix L of the NSW Floodplain Development Manual, and is presented on **Figure 3.11** (100 year ARI).

The results of the flood mapping of the existing scenario indicate that flooding at the site is the result of overland flow from the upstream catchment.

- 100 year ARI event
    - The site is almost entirely flooded in the 100 year event, with maximum depths of 0.5m
    - Flood elevations are steep in the upper section of the site and relatively flat with levels of between 4.7 and 4.8 m AHD downstream of the house, a gradient of <1%
    - The velocity of the flow on the northern and southern sides of the existing house is up to 1.75m/s
    - The site and surrounds are classified as low hazard

Figure 3.9 – Developed Scenario 100 year ARI Flood Extent

Legend

- <= 0.15
- 0.15 - 0.2
- 0.2 - 0.3
- 0.3 - 0.4
- 0.4 - 0.5
- 0.5 - 0.75
- 0.75 - 1.0
- 1.0 - 1.5
- Lot

0 2.5 5 7.5 10 12.5 15 17.5 20 m

Details

Issue	Amendment	Date
A	Concept Design	14 Oct 19

Project

22 Ocean Road, Palm Beach

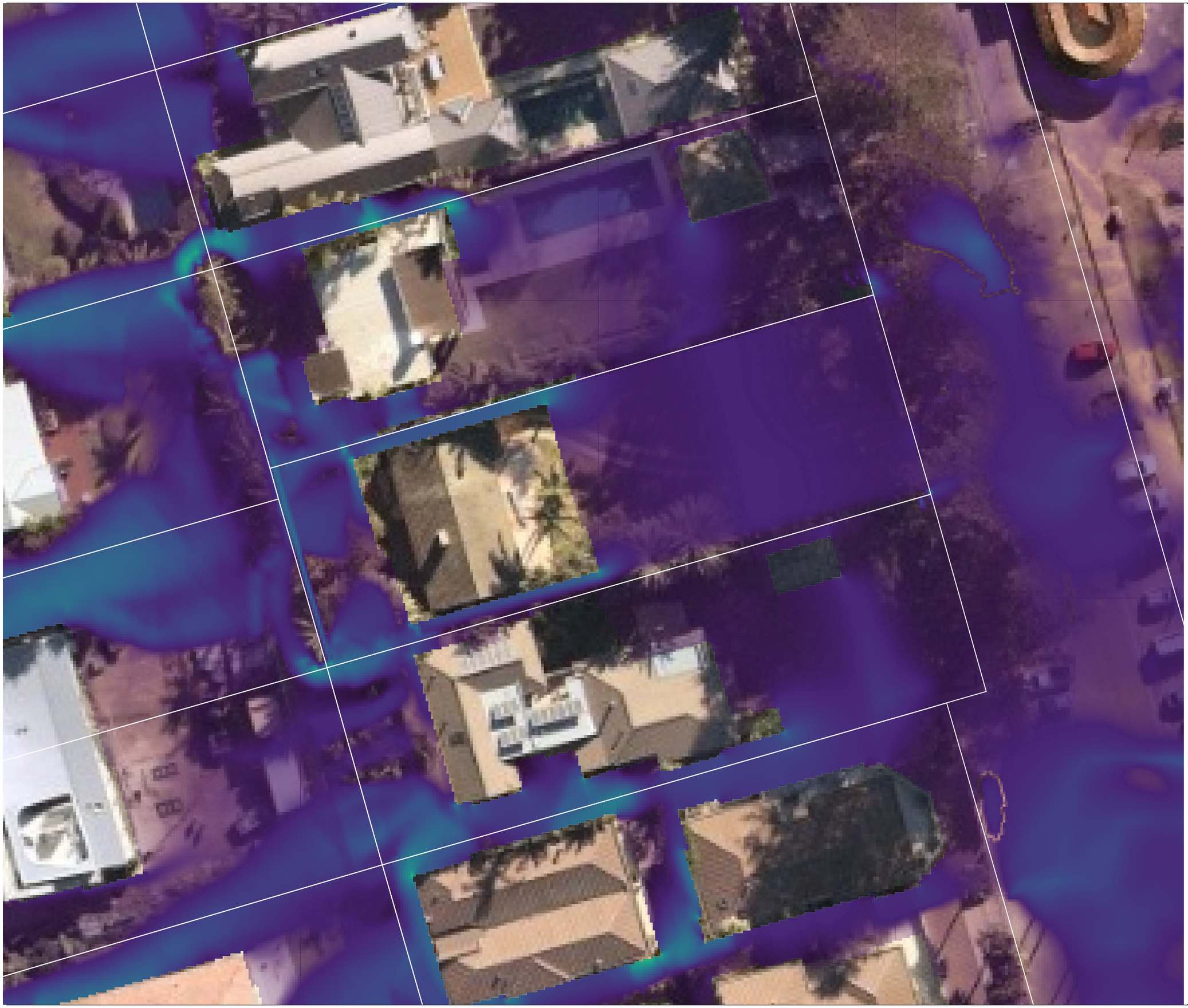
Drawing Title

FIGURE 3.9
100 YEAR ARI PEAK FLOOD DEPTH & ELEVATION DEVELOPED SCENARIO

Scale	1:200 @ A3
Drawn	AAS
Checked	JB
Job No.	ACE190861
Drawing ID	FIG 3.9

ISSUE **A**

Figure 3.10 – Developed Scenario 100 year ARI Flood Velocity



Legend

- 0
- 0.25
- 0.5
- 0.75
- 1
- 1.25
- 1.5
- 1.75
- 2
- 2.25
- 2.5

0 2.5 5 7.5 10 12.5 15 17.5 20 m

Details

Issue	Amendment	Date
A	Concept Design	14 Oct 19

Project

22 Ocean Road, Palm Beach

Drawing Title

FIGURE 3.10
100 YEAR ARI PEAK FLOOD VELOCITY
DEVELOPED SCENARIO

Scale	1:2000 @ A3
Drawn	AAS
Checked	JB
Job No.	ACE190861
Drawing ID	FIG 3.10

ISSUE **A**

Figure 3.11 – Developed Scenario 100 year ARI Flood Hazard Mapping

Legend

- Low Hazard
- Medium Hazard
- High Hazard

0 2.5 5 7.5 10 12.5 15 17.5 20 m

Details

Issue	Amendment	Date
A	Concept Design	14 Oct 19

Project

22 Ocean Road, Palm Beach

Drawing Title

FIGURE 3.11
100 YEAR ARI PEAK FLOOD HAZARD
DEVELOPED SCENARIO

Scale	1:2000 @ A3
Drawn	AAS
Checked	JB
Job No.	ACE190861
Drawing ID	FIG 3.11

ISSUE **A**

3.3.1 *Flood Difference Mapping*

Differences in flood surface elevations between existing and developed flood patterns has been prepared using the QGIS geographic information system software package (Version 3.6.1), shown on **Figure 3.12** (100 year ARI). Differences in flood elevation can be summarised as

- 100 year ARI event
    - All increases in flood elevation are retained within the site, with the maximum increase of 0.2m, within the overland flowpaths at the sides of the building
    - Decreases in flood elevation, up to 0.2m, are encountered at the upstream, western side of the lot

The earthworks proposed in the areas that were significantly flooded in the existing scenario present a decrease in flood risk on the site in the modelled arrangement. No increases in flood levels occur at any dwellings or at any locations that could potentially be used as safe harbour or evacuation routes.

It is important to note that other scenarios were modelled in purpose of draining upstream water to the street along with minimizing the flood risk of the subject site. One of the studied scenarios was proposing side channels along the northern and southern boundaries to drain water to the street through a stormwater system. The channels were designed to remain at natural surface along with boundary pits to drain the water to the existing stormwater network at Ocean Road to the South. The problem faced with this scenario is that the subject site natural surface is lower than Ocean road surface, the reason why the stormwater network system could not be connected to the existing network at Ocean Road by gravity.

Figure 3.12 – Flood Difference 100 year ARI

Details

Issue	Amendment	Date
A	Concept Design	14 Oct 19

Project

22 Ocean Road, Palm Beach

Drawing Title

FIGURE 3.12
100 YEAR ARI PEAK FLOOD DIFFERENCE - DEVELOPED/ EXISTING SCENARIO

Scale	1:200 @ A3
Drawn	AAS
Checked	JB
Job No.	ACE190861
Drawing ID	FIG 3.12

ISSUE **A**

4 CONCLUSION

This Flood Impact Assessment has been prepared to support the proposed alterations at 22 Ocean Road, Palm Beach.

- Flooding and flood impacts were addressed in accordance with Council's guidelines and discussions with Council.
- The proposed earthworks modifications to fill the existing trapped low point does not increase flooding outside the site and will reduce the flood risk within the site.

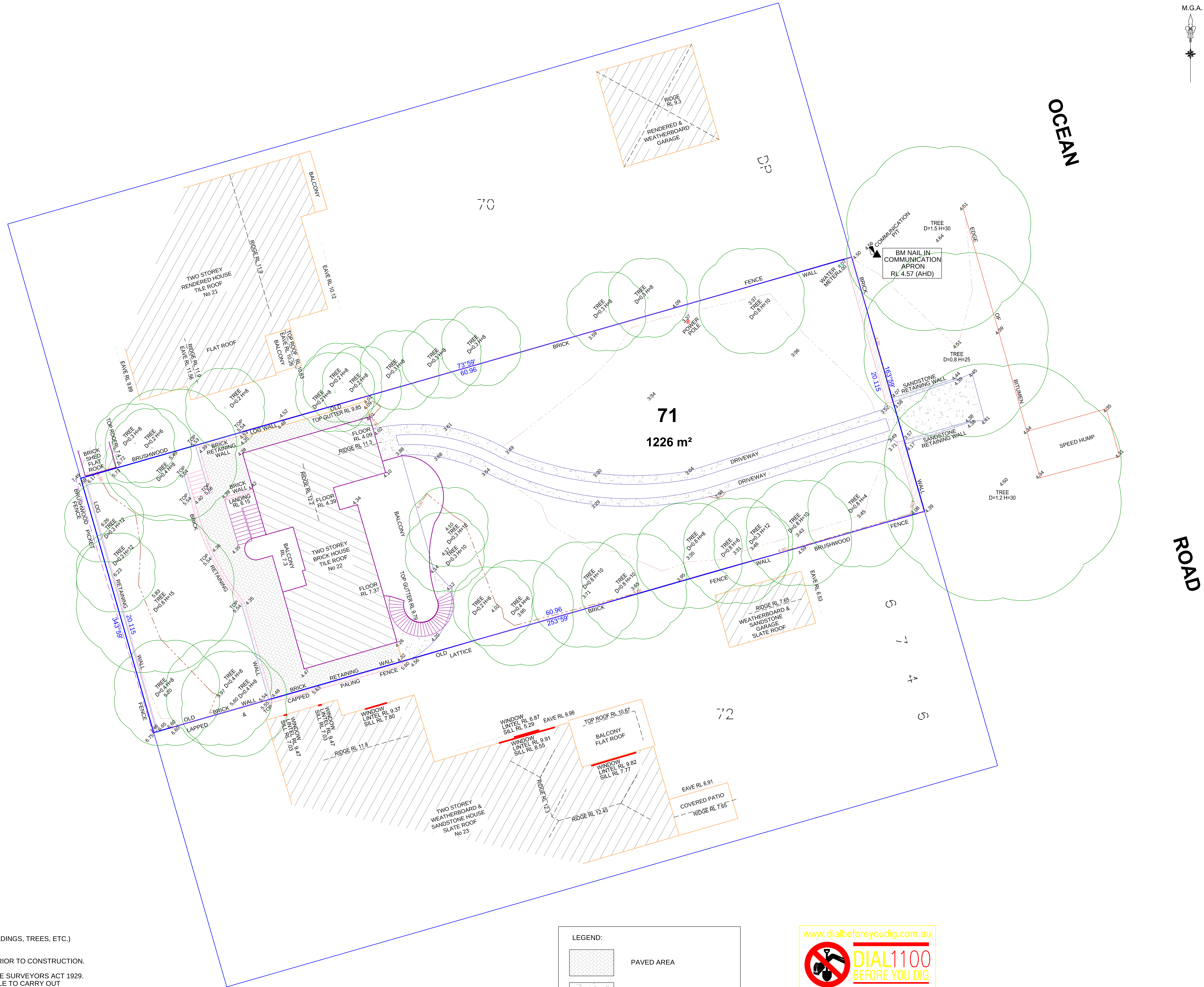
The report shows that the proposed development will achieve Northern Beaches Council's DCP requirement for flood control and flood risk management, and therefore recommends that the proposed development to proceed.

5 REFERENCES

1. Bureau of Meteorology Website http://www.bom.gov.au/
2. CSIRO (2011) *Modelling and Mapping of Coastal Inundation under Future Sea Level for Sydney Councils*.
3. Geosciences *Australia Australian Rainfall and Runoff 2016*
4. Manly Hydraulics Laboratory (June 2017) *Avalon to Palm Beach Floodplain Risk Management Study and Plan*
5. New South Wales Government – Floodplain Development Manual – The management of flood liable land, April 2005
6. Northern Beaches Council – Former Pittwater Development Control Plan 2014
7. WMA Water (2013) *Careel Creek Catchment Flood Study and Plan*

APPENDICES

Appendix A SURVEY PLAN



M.G.A.
OCEAN
ROAD
71
1226 m²
70
72
DP
5
7
4
6
TWO STOREY RENDERED HOUSE TILE ROOF No 21
TWO STOREY BRICK HOUSE TILE ROOF No 22
TWO STOREY WEATHERBOARD & SANDSTONE HOUSE SLATE ROOF No 23
RENDERED & WEATHERBOARD GARAGE
RIDGE RL 9.3
WEATHERBOARD & SANDSTONE GARAGE SLATE ROOF
RIDGE RL 7.85
EAVE RL 6.53
BM NAIL IN COMMUNICATION APRON RL 4.57 (AHD)
COMMUNICATION PIT
WATER METER
POWER POLE
DRIVEWAY
SANDSTONE RETAINING WALL
SPEED HUMP
BITUMEN
EDGE
OF
TREE D=1.5 H=30
TREE D=0.8 H=25
TREE D=1.2 H=30
60.96
73°59'
253°59'
20.115
163°59'
343°59'
BRICK RETAINING WALL
BRICK WALL
LANDING RL 6.13
FLOOR RL 4.09
FLOOR RL 4.39
FLOOR RL 7.37
RIDGE RL 11.3
RIDGE RL 12.2
BALCONY RL 7.3
BALCONY
TOP GUTTER RL 9.65
TOP GUTTER RL 9.79
COVERED PATIO
RIDGE RL 7.65
EAVE RL 6.91
BALCONY FLAT ROOF
TOP ROOF RL 10.67
EAVE RL 9.98
RIDGE RL 11.8
RIDGE RL 12.3
RIDGE RL 12.45
BRICK SHED FLAT ROOF

NOTE:

ANY STRUCTURES RELATED TO PHYSICAL FEATURES (BUILDINGS, TREES, ETC.) MUST BE CONFIRMED PRIOR TO FINAL DESIGN.

ALL SERVICES MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.

THIS DETAIL SURVEY IS NOT A 'SURVEY' AS DEFINED BY THE SURVEYORS ACT 1929. IF ANY CONSTRUCTION IS PLANNED IT WOULD BE ADVISABLE TO CARRY OUT FURTHER SURVEY WORK TO DETERMINE THE BOUNDARY DIMENSIONS.

AUSTRALIAN HEIGHT DATUM (AHD) HAS BEEN OBTAIN FROM GNSS OBSERVATIONS UTILISING SmartNet Aus. IF AHD HEIGHT IS CRITICAL ADDITIONAL SURVEY CONNECTIONS TO LOCAL CO-ORDINATED MARKS SHOULD BE MADE.

DISCLAIMER OF LIABILITIES TO ANY THIRD PARTIES : THIS PLAN IS MADE SOLELY FOR THE USE AND BENEFIT OF THE CLIENT NAMED ABOVE AND NO LIABILITY OR RESPONSIBILITY WHATSOEVER IS ACCEPTED TO ANY THIRD PARTY WHO MAY RELY ON THIS PLAN WHOLLY OR IN PART. ANY THIRD PARTIES ACTING OR RELYING OF THIS PLAN WHETHER WHOLLY OR IN PART ARE IN BREACH OF OUR COPYRIGHT AND DO SO AT THEIR OWN RISK.

LEGEND:

- PAVED AREA
- CONCRETE
- BUILDING
- SANDSTONE RETAINING WALL

NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE

DEVELOPERS & EXCAVATORS MAY BE HELD FINANCIALLY RESPONSIBLE BY THE ASSET OWNER SHOULD THEY DAMAGE UNDERGROUND NETWORKS.

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p: 88832622 f: 88832633 e: admin@cca.net.au

PLAN SHOWING DETAILS & LEVELS OVER LOT 71 IN DP6746 AT No 22 OCEAN ROAD, PALM BEACH		SHEET 1 OF 1 SHEETS	
DATUM: AHD	RATIO: 1 : 150 (A1)	REFERENCE	38117 / D-MGA
DATE: 4.12.2018	PRINCIPAL: VICTOR C COMINO		

Appendix B DEVELOPMENT LAYOUT PLANS

TOP OF WALL
RL- 5.9

FILL TO RL - 4.8

FILL TO RL - 4.6

TOP OF WALL
RL - 5.7

1
36

NEW WALL WITHIN BOUNDARY

2
36

3
36

TOP OF WALL
RL - 5.3

Boundary 60.960 m

RL 5.900

RL 5.500

TOW RL 5.500

TOW RL 5.500

FALL

FALL

FALL

RL 5.103

RL 5.400

DECK
RL - 4.39

FALL

RL 4.775

FALL

RL 4.700

RL 4.500

RL 4.5

NEW RETAINING WALL

TILED TERRACE
RL - 7.37

FALLTO SUIT

NEW SLIDING GATE

Boundary 20.115 m

EXISTING
RETAINING
WALL BUILD UP
TO RL - 6.2

1
37

GF
TERRACE

EXISTING HOUSE

GROUND FLOOR
RL - 4.39

FIRST FLOOR
RL - 7.37

RL 5.400

STONE STEPS DOWN
TO EXISTING HOUSE LEVEL
TOP OF STAIRS RL - 5.4

LAWN

FALL

RL 5.100

RL 4.775

FALLTO SUIT

RL 4.700

FILL IN CUTTING.
NEW DRIVE RL 4.34

1
37

TOP OF WALL
RL- 6.2

TOP OF WALL RL - 5.4

RL 4.500

RL 5.400

RL 5.700

FALL

EXISTING WALLS
AND FENCE

FALL

FALL

RL 6.200

TOW

TOW RL 5.500

TOW RL 5.500

RL 4.3

Boundary 60.960 m

NEW WALL WITHIN BOUNDARY

TOP OF WALL
RL- 6.2

FILL TO RL - 4.8

FILL TO RL - 4.6

TOP OF WALL
RL - 5.7

1
36

2
36

RETAIN TREES AND PALMS

3
36

TOP OF WALL
RL - 5.3

RETAIN TREES AND PALMS

1 SITE PLAN

1 : 200

Amendments

REV A - 22/11/19 - RAISE WALL HEIGHTS BY 200MM AS PER COUNCIL FEEDBACK

OCEAN RD

Project Address:
22 OCEAN RD
PALM BCH

Client:
COMINO

Project Status:
ALTERATIONS

Sheet Name:
SITE

Project number:
63

Scale:
1 : 200

Date:
NOV 22 2019

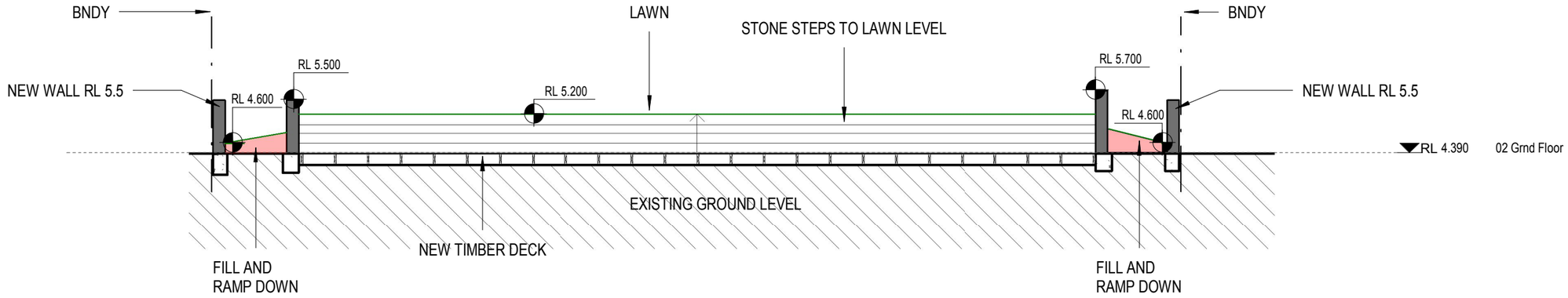
Sheet Number
00 **A**

DAVID KATON STUDIO PTY LTD
katon.david@gmail.com

4 TRACK BUILDING DESIGN

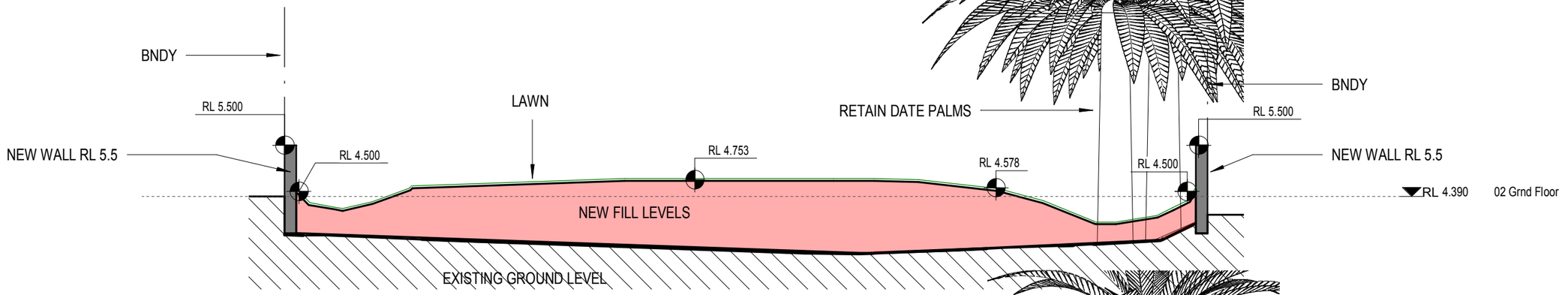
6 High View Rd
Pretty Beach
NSW 2257

P: 0422271398
E: info@4track.com.au



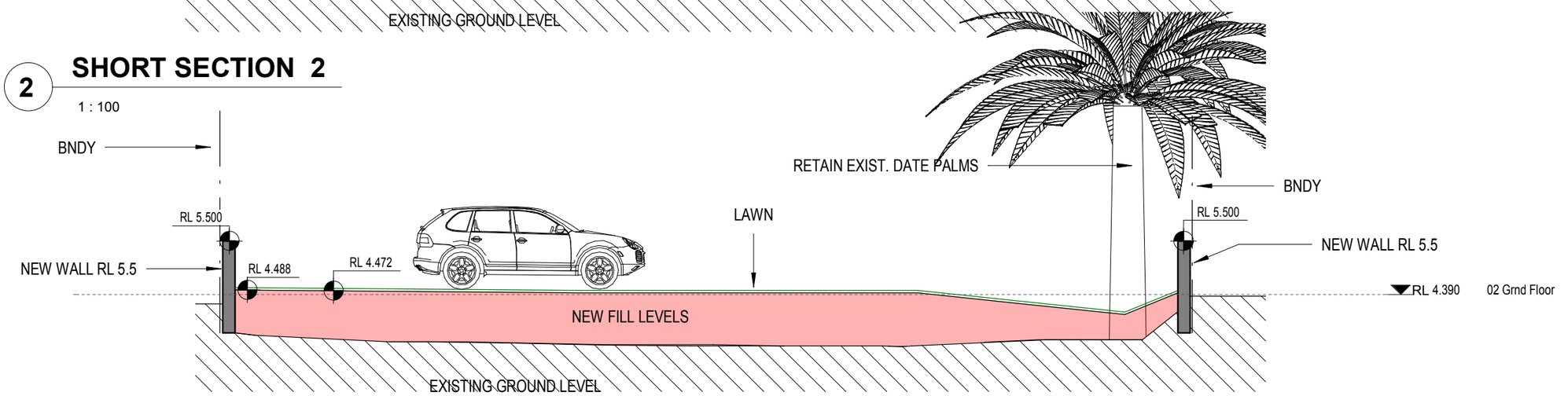
1 SHORT SECTION 1

1 : 100



2 SHORT SECTION 2

1 : 100



3 SHORT SECTION 3

1 : 100

Amendments

REV A - 22/11/19 - RAISE WALL HEIGHTS BY 200MM AS PER COUNCIL FEEDBACK

Project Address:
22 OCEAN RD
PALM BCH

Client:

COMINO

Project Status:

ALTERATIONS

Sheet Name:

YARD SHORT SEC.

Project number:

63

Scale:

1 : 100

Date:

NOV 22 2019

Sheet Number

36 **A**

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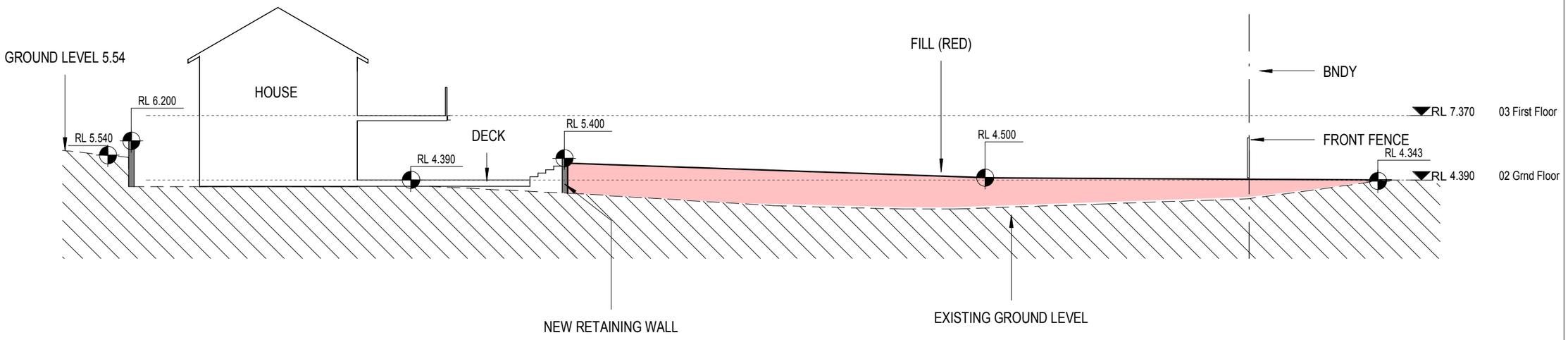

1 LONG SECTION FRONT YARD

1 : 200

Amendments

REV A - 22/11/19 - RAISE WALL HEIGHTS BY 200MM AS PER COUNCIL FEEDBACK

Project Address:
22 OCEAN RD
PALM BCH

Client:

COMINO

Project Status:

ALTERATIONS

Sheet Name:

YARD LONG SEC.

Project number:

63

Scale:

1 : 200

Date:

NOV 22 2019

Sheet Number

37 **A**

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