City of Nedlands

AGENDA

Council Meeting Agenda Forum

8 March 2022

Notice of Meeting

To Mayor & Councillors

A Council Meeting Agenda Forum of the City of Nedlands is to be held on Tuesday 8 March 2022 in the Council Chamber at 71 Stirling Highway Nedlands commencing at 6pm.

Bill Parker
Chief Executive Officer
3 March 2022

Information

Council Meeting Agenda Forum are run in accordance with the City of Nedlands Governance Framework Policy. If you have any questions in relation to the agenda, procedural matters, addressing the Council or attending these meetings please contact the Executive Officer on 9273 3500 or council@nedlands.wa.gov.au

Public Question Time

Public Questions are dealt with at the Ordinary Council Meeting.

Deputations

Members of the public may make presentations or ask questions on items contained within the agenda. Presentations are limited to 5 minutes. Members of the public must complete the online registration form available on the City's website: Public Address Registration Form | City of Nedlands

Disclaimer

Members of the public who attend Council Meetings Agenda Forum should not act immediately on anything they hear at the meetings, without first seeking clarification of Council's position. For example, by reference to the confirmed Minutes of Council meeting. Members of the public are also advised to wait for written advice from the Council prior to taking action on any matter that they may have before Council.

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1. Declaration of Opening

The Presiding Member will declare the meeting open at 6.00 pm and will draw attention to the disclaimer on page 2.

2. Present and Apologies and Leave of Absence (Previously Approved)

Leave of Absence (Previously Approved)	Councillor R A Coghlan	Melvista Ward
Apologies	None as at distribution of this agenda.	

3. Public Question Time

Public questions will be dealt with at the Ordinary Council Meeting.

4. Deputations

Deputations by members of the public who have completed Public Address Registration Forms.

5. Requests for Leave of Absence

Any requests from Council Members for leave of absence will be dealt with at the Ordinary Council Meeting.

6. Petitions

Petitions will be dealt with at the Ordinary Council Meeting.

7. Disclosures of Financial Interest

The Presiding Member to remind Council Members and Staff of the requirements of Section 5.65 of the Local Government Act to disclose any interest during the meeting when the matter is discussed.

A declaration under this section requires that the nature of the interest must be disclosed. Consequently, a member who has made a declaration must not preside, participate in, or be present during any discussion or decision-making procedure relating to the matter the subject of the declaration.

However, other members may allow participation of the declarant if the member further discloses the extent of the interest. Any such declarant who wishes to participate in the meeting on the matter, shall leave the meeting, after making their declaration and request to participate, while other members consider and decide upon whether the interest is trivial or insignificant or is common to a significant number of electors or ratepayers.

8. Disclosures of Interests Affecting Impartiality

The Presiding Member to remind Council Members and Staff of the requirements of Council's Code of Conduct in accordance with Section 5.103 of the Local Government Act.

Council Members and staff are required, in addition to declaring any financial interests to declare any interest that may affect their impartiality in considering a matter. This declaration does not restrict any right to participate in or be present during the decision-making procedure.

The following pro forma declaration is provided to assist in making the disclosure.

"With regard to the matter in item x ….. I disclose that I have an association with the applicant (or person seeking a decision). This association is ….. (nature of the interest).

As a consequence, there may be a perception that my impartiality on the matter may be affected. I declare that I will consider this matter on its merits and vote accordingly."

The member or employee is encouraged to disclose the nature of the association.

9. Declarations by Members That They Have Not Given Due Consideration to Papers

This item will be dealt with at the Ordinary Council Meeting.

10. Confirmation of Minutes

This item will be dealt with at the Ordinary Council Meeting.

11. Announcements of the Presiding Member without discussion.

This item will be dealt with at the Ordinary Council Meeting.

12. Members Announcements without discussion.

This item will be dealt with at the Ordinary Council Meeting.

13. Matters for Which the Meeting May Be Closed

For the convenience of the public, the following Confidential items are identified to be discussed behind closed doors, as the last items of business at this meeting.

14. En Bloc Items

This item will be dealt with at the Ordinary Council Meeting.

15. Minutes of Council Committees and Administrative Liaison Working Groups

15.1 Minutes of the following Committee Meetings (in date order) are to be received:

This is an information item only to receive the minutes of the various meetings held by the Council appointed Committees (N.B. This should not be confused with Council resolving to accept the recommendations of a particular Committee. Committee recommendations that require Council's approval should be presented to Council for resolution via the relevant departmental reports).

This item will be dealt with at the Ordinary Council Meeting.

16. Divisional Reports - Planning & Development Report No's PD10.03.22 to PD15.03.22

16.1 PD10.03.22 Consideration of Development Application – Single House at 60A Strickland Street, Mount Claremont

Meeting & Date	Council - 22 March 2022
Applicant	Oswald Homes
Employee Disclosure under section 5.70 Local Government Act 1995	The author, reviewers and authoriser of this report declare they have no financial or impartiality interest with this matter. There is no financial or personal relationship between City staff and the proponents or their consultants.
Report Author	Roy Winslow – Manager Urban Planning
Director/CEO	Tony Free – Director Planning and Development
Attachments	1. Aerial Image and Zoning Map 2. Development Plans 3. Architectural Perspective Drawings 4. CONFIDENTIAL ATTACHMENT – Submission

Purpose

The purpose of this report is for Council to consider a development application for a single house at 60A Strickland Street, Mount Claremont.

Recommendation

In accordance with Clause 68(2)(b) of the Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015,* Council approves the development application received on 26 October 2021 in accordance with the plans date stamped 1 February 2022 for a Single House at 60A Strickland Street, Mount Claremont subject to the following conditions:

1. **The development shall at all times comply with the application and the approved plans, subject to any modifications required as a consequence of any condition(s) of this approval.**

2. **All stormwater from the development, which includes permeable and non-permeable areas shall be contained onsite.**

3. **Prior to occupation, landscaping shall be installed and maintained in accordance with the approved plans, including the planting of one (1) tree with a minimum planting area of 2m x 2m. All landscaping shall be maintained for the lifetime of the development thereafter, to the satisfaction of the City.**

4. **Prior to occupation, the screening and obscure glazing as shown on the approved plans shall be provided in accordance with the Residential Design Codes (Volume 1) by either:**

   a. **Fixed and obscured glass to a height of 1.6 metres above finished floor level;**
   b. **Fixed screening devices to a height of 1.6 meters above finished floor level that are at least 75% obscure and made of a durable material;**
   c. **A minimum sill height of 1.6 metres as above the finished floor level; or**
   d. **An alternative method of screening approved by the City.**

   The required screening shall be thereafter maintained to the satisfaction of the City of Nedlands.

5. **Prior to occupation of the development the external finish of the parapet walls is to be the same standard as the rest of the development in:**

   a. **Face brick;**
   b. **Painted render;**
   c. **Painted brickwork; or**
   d. **Other clean material as specified on the approved plans and maintained thereafter to the satisfaction of the City of Nedlands.**

6. **A Construction Management Plan shall be submitted and approved to the satisfaction of the City. The approved Construction Management Plan shall be observed at all times throughout the construction process to the satisfaction of the City. Adjoining landowners shall be notified in writing no less than 14 days prior to construction.**

7. **All building works to be carried out under this development approval are required to be contained within the boundaries of the subject lot.**

Voting Requirement

Simple Majority.

This report is of a quasi-judicial nature as it is a matter that directly affects a person's rights and interests. The judicial character arises from the obligation to abide by the principles of natural justice. Examples of Quasi-Judicial authority include town planning applications and other decisions that may be appealable to the State Administrative Tribunal.

The decision must be made in a manner that is impartial, free from bias, and in accordance with the principles of natural justice. The decision must be made in having regard to the facts of the matter under consideration, and in accordance with the relevant laws and policies as they apply to that matter.

Discretionary considerations and judgments in the decision must be confined to those permitted to be considered under the laws and polices applicable to the matter and given such weight in making the decision as the relevant laws and polices permit them to be given.

Background

Land Details

Metropolitan Region Scheme Zone	Urban
Local Planning Scheme Zone	Residential
R-Code	R20
Land area	506m^2
Land Use	Residential – Single House
Use Class	'P' Permitted Use

The site is located at 60A Strickland Street, Mount Claremont. The site is currently vacant. The original lot was recently subdivided into two lots with a side-by-side configuration. This application relates to the southern lot of the subdivision. The site is orientated east west and is bound by Strickland Street to the west and Clematis Lane to the east. The site slopes from west to east and has a fall of 1m. The lot is regular in shape, with a 10m frontage and a total area of 506m^2.

Discussion

Assessment of Statutory Provisions

If a proposal does not satisfy the deemed to-comply provisions of the R-Codes, Council is required to exercise a judgement of merit to determine the proposal against the design principles of the R-Codes. The R-Codes require the assessment to consider the relevant design principle only and to not apply the corresponding deemed-to-comply provisions. It is recommended that the application be approved by Council as it is considered to satisfy the design principles of the R-Codes. Further, it is considered unlikely that the development will have a significant adverse impact on the local amenity and character of the locality.

Local Planning Scheme No.3

Schedule 2, Clause 67(2) (Consideration of application by Local Government) – identifies those matters that are required to be given due regard to the extent relevant to the application. Where relevant, these matters are discussed in the following sections. Overall, the development is considered to meet these objectives, particularly in regard to height, scale, bulk and appearance, and the potential impact it will have on the local amenity.

State Planning Policy 7.3 - Residential Design Codes – Volume 1

State Planning Policy 7.3 Residential Design Codes Volume 1 (R-Codes) applies to all single and grouped dwelling developments. An approval under the R-Codes can be obtained in one of two ways. This is by either meeting the deemed-to-comply provisions or via a design principle assessment pathway.

The proposed development is seeking a design principle assessment pathway for parts of this proposal relating to lot boundary setbacks, solar access to the adjoining site, and the outbuilding (height). As required by the R-Codes, Council in assessing the proposal against the design principles, should not apply the corresponding deemed-to-comply provisions. All other areas meet the deemed-to-comply provisions.

Clause 5.1.3 – Lot boundary setbacks

On the upper floor, the guest wing to bedroom wall proposes a 1.7m setback to the northern lot boundary. The design principles for lot boundary setbacks consider the impact of building bulk on adjoining properties, providing adequate sun and ventilation and minimising overlooking. The proposed northern lot boundary setback is considered to meet the design principles as:

- The northern elevation is well articulated, via the use of varying setbacks ranging from 1.2m to 1.7m. The elevation incorporates design elements such as different colours and materials (rendered brick and a panel finish) and different roof forms (skillion and pitched roof) on the north which assist in breaking up the building bulk. It is considered that the setbacks proposed will not negatively impact the adjoining property in relation to bulk. Figure 1 below shows the northern elevation of the dwelling.
- Ventilation is maintained by the varying setbacks of 1.2m to 1.7m on the upper floor.
- The northern adjoining lot is not likely to be impacted by the solar access proposal as the shadow will fall to the south. Therefore, the northern setback does not impact overshadowing to the southern lot.
- All major openings to habitable rooms on the upper floor are provided with highlight windows to ensure visual privacy is maintained.

Figure 1: Northern elevation of dwelling showing varying materials and roof forms.

Clause 5.4.2 – Solar access for adjoining sites

The development proposes 35% shadow over the strata lot of 62 Strickland Street, Mount Claremont to the south. It is noted that the southern adjoining property is a strata lot with two lots, being 62 (front lot) and 62A (rear lot) on Strickland Street.

An east-west lot orientation is typically characteristic of the properties in Mount Claremont. Where a lot has been subdivided in a side-by-side configuration, the lot widths are usually 10m. Overshadowing is a key matter to these southern lots where a large proportion of overshadowing is presented by two-storey dwellings on the northern lots.

The design principles for solar access consider the effective solar access for the development and the impact of solar access for neighbouring properties by considering the outdoor living areas, major openings to habitable rooms and solar collectors on adjoining sites. The solar access meets the design principles as:

- The shadow from the proposal will fall over one major opening to a habitable room on the adjoining property. Based on a sectional overshadowing assessment, the habitable room will still be provided with access to light.
- Due to the subdivision form of the adjoining southern lot, overshadowing is calculated on the individual strata lot areas of the southern site, not the overall parent lot area.
- It is acknowledged that the single storey house would result in less shadow to the south. Altering the design to create a single storey house in order to attempt to meet the deemed to comply provision for overshadowing without compromising living space would likely result in a building that occupies a substantial portion of the site. Such a design would be closer to lot boundaries and occupy a larger portion of the site. It would have less corresponding open space and landscaping potential in comparison to a two-storey dwelling that allows a larger backyard, additional landscaping opportunities, greater setbacks and more open space. Whilst a two-storey dwelling creates greater overshadowing, it provides a better overall level of amenity.
- Consideration must be given for the constraints of the lots. The width and east-west orientation mean it would be unlikely for a two-storey house to achieve deemed-to-comply solar access without compromising an appropriately sized and liveable design.
- The R-Codes recommend 30m2 an outdoor living area provision for lots coded R20. The subject lot to the south is provided with 30m2 of outdoor living area which is not in the shadow of the proposed dwelling. Therefore, a sufficiently sized outdoor living area is protected from the overshadowing.
- There are no roof mounted solar collectors on the southern lot that would be impacted.
- The City has just received a development application for a new two-storey dwelling on the front lot of the strata to the south. The application is its early stages and the City is in the process of reviewing this application.
- The subject site to the north is currently vacant. Until such a time that the northern adjoining lot is developed, the subject site is provided with good solar access to habitable rooms, the primary living area and the outdoor living area which face north.

Clause 5.4.3 – Outbuildings

The garage is considered to be an outbuilding as it is detached from the dwelling. The garage proposes a 2.8m wall height. The design principles require outbuildings to not detract from the streetscape or the visual amenity of residents or neighbouring properties. The garage is considered to meet the design principles as:

- The garage meets the setback to Clematis Lane as recommended by the R-Codes.
- The location of the garage is appropriate as it allows the use of Clematis Lane instead of Strickland Street.
- The wall height of 2.8m is typical for a single storey wall and appropriate to accommodate sufficient clearances for parking a vehicle in the garage. The majority of this wall will also be screened by dividing fencing (typically 1.8m in height). As such, the wall height is unlikely to detract from the streetscape of Clematis Lane or the visual amenity of residents or neighbouring properties.

Consultation

The development application was advertised in accordance with the City's Local Planning Policy - Consultation of Planning Proposals to seven adjoining properties. The application was advertised for a period of 14 days from 30 November 2021 to 14 December 2021. At the close of the advertising period, one objection was received.

The following is a summary of the concerns/comments raised and the Administration's response and action taken in relation to each issue:

1. The development proposes a significant length of boundary walls to the south which result in overshadowing. The boundary wall also brings the development closer to the south, resulting in concerns with privacy and higher density living.

Amended plans were received on 1 February 2022 which reduced the length and height of the boundary walls to the south. The development achieves the deemed-to-comply provisions of the R-Codes in relation to boundary walls.

The development meets the deemed-to-comply provisions of the R-Codes in relation to visual privacy. On the ground floor, any major openings and the outdoor living area which are raised 0.5m above natural ground level will be screened to at least 1.6m above the finished floor level by the dividing fencing on the proposed retaining wall. On the upper floor, the major openings are provided with highlight windows facing south.

The development proposal is seeking a judgement of merit for the solar access to the southern lot. Please see above for the Design Principles assessment on solar access.

2. The development does not provide sufficient open space.

Amended plans were received on 1 February 2022 which increased open space. The development achieves the deemed-to-comply provisions of the R-Codes in relation to open space.

3. The development proposes significant overshadowing of the adjoining lot being the front strata lot to the south.

The development proposal is seeking a judgement of merit for the solar access to the adjoining southern site. Please see above for the Design Principles assessment on solar access.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Vision Our city will be an environmentally-sensitive, beautiful and inclusive place.

Values **Great Natural and Built Environment**

We protect our enhanced, engaging community spaces, heritage, the natural environment and our biodiversity through well-planned and managed development.

Priority Area Urban form - protecting our quality living environment

Budget/Financial Implications

Nil.

Legislative and Policy Implications

Council is requested to make a decision in accordance with clause 68(2) of the Deemed Provisions. Council may determine to approve the development without conditions (cl.68(2)(a)), approve with development with conditions (cl.68(2)(b)), or refuse the development (cl.68(2)(c)).

Decision Implications

If Council resolves to approve the proposal, development can proceed after receiving a Building Permit and necessary clearances.

In the event of a refusal, the applicant will have a right of review to the State Administrative Tribunal. The Tribunal will have regard to the R-Codes as a State Planning Policy. Similarly, should an applicant be aggrieved by one or more conditions of approval, this can be reviewed by the Tribunal.

Conclusion

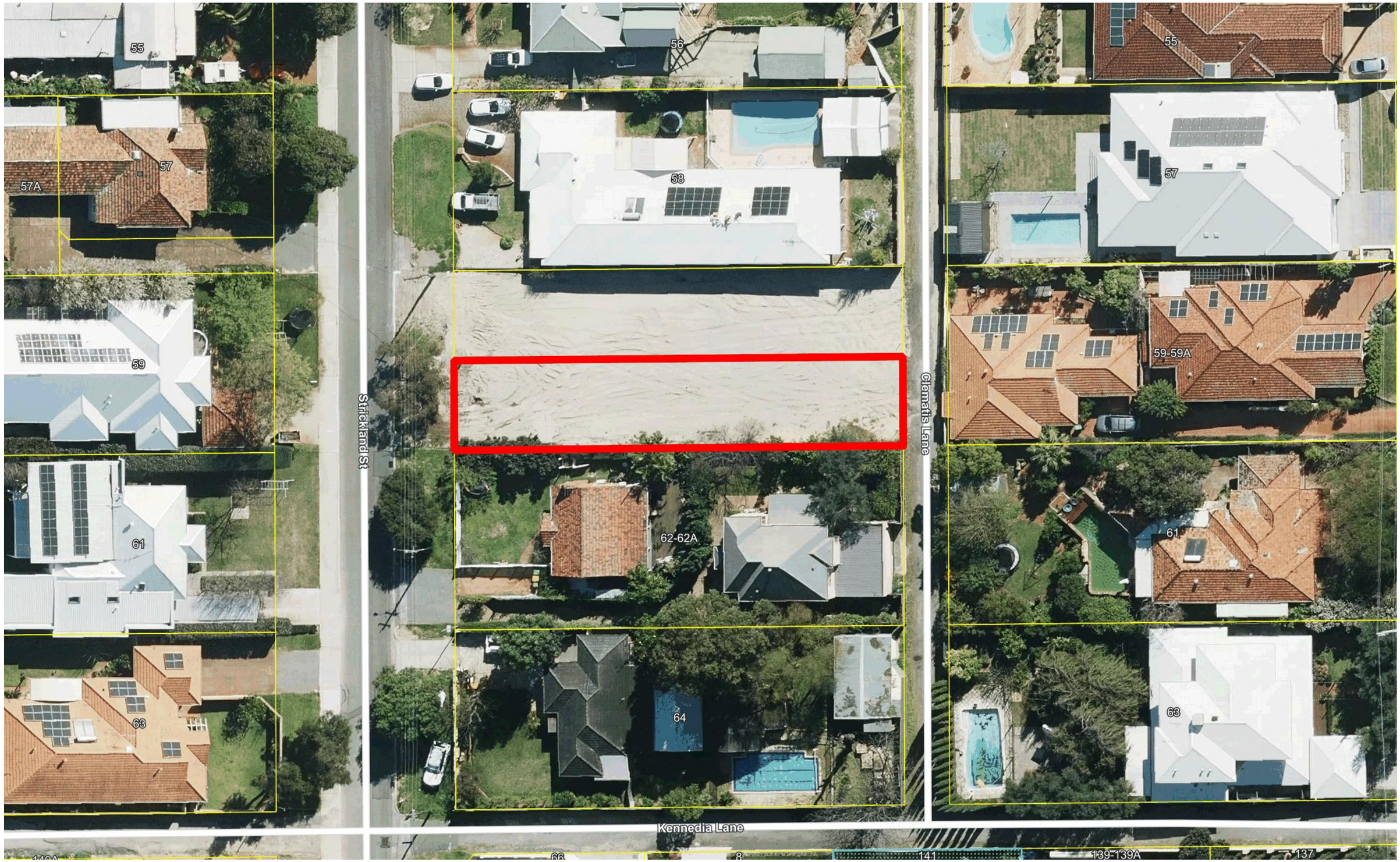
The application for a single house at 60A Strickland Street, Mount Claremont has been presented for Council consideration due to an objection being received. The proposal is considered to meet the key amenity related elements of R-Codes Volume 1 and as such is unlikely to have a significant adverse impact on the local amenity of the area. The proposal has been assessed and satisfies the design principles of the R-Codes and being consistent with the immediate locality and streetscape character.

The objection received relates primarily to overshadowing. An assessment against the design principles has identified that the proposal can be supported given the characteristics of the site and the affected property.

Accordingly, it is recommended that the application be approved by Council, subject to conditions of Administration's recommendation.

Further Information

N/A



City of Nedlands

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Aerial Image – 60a Strickland Street, Mount Claremont

4/02/2022

1:400

City of Nedlands

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Zoning Map – 60a Strickland Street, Mount Claremont

4/02/2022

1:750

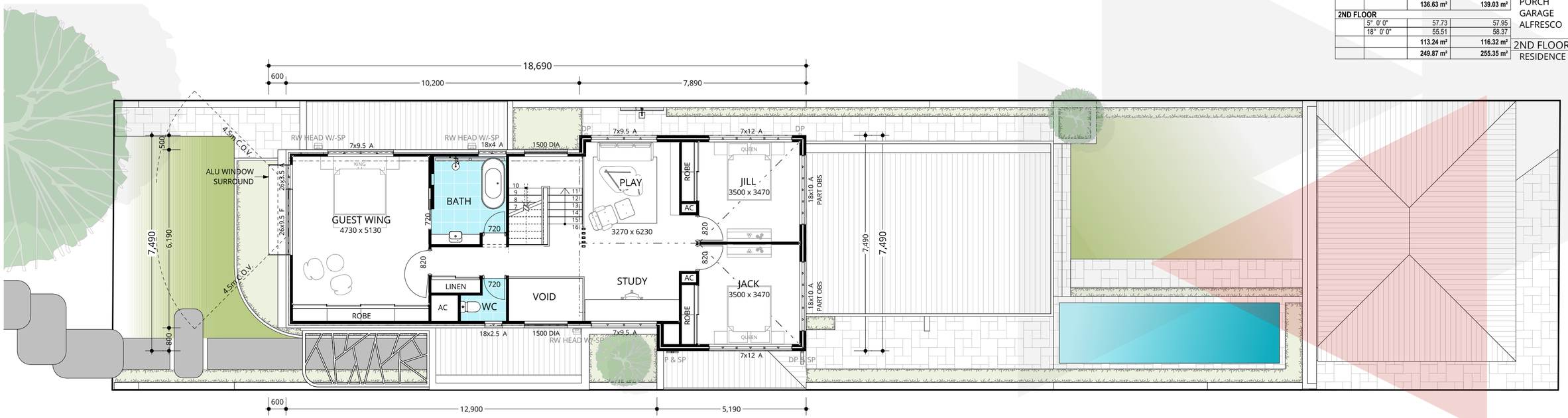
City of Nedlands
Amended Plans
Received
1 February 2022

PD10.03.22 Attachment 2

Roof Area Calculation - All Floors			
Floor	Pitch	Area (flat)	Area (pitched)
1ST FLOOR			
	2° 0' 0"	47.66	47.69
	5° 0' 0"	20.05	20.13
	10° 0' 0"	6.47	6.56
	15° 0' 0"	62.45	64.65
		136.63 m²	139.03 m²
2ND FLOOR			
	5° 0' 0"	57.73	57.95
	18° 0' 0"	55.51	58.37
		113.24 m²	116.32 m²
		249.87 m²	255.35 m²

60 Strickland Street

1ST FLOOR		
VERANDAH	6.50	15.00
RESIDENCE	160.44	69.02
PORCH	5.62	9.50
GARAGE	60.03	32.72
ALFRESCO	22.38	19.38
	254.97 m²	
2ND FLOOR		
RESIDENCE	120.02	51.16
	120.02 m²	
	374.99 m²	



Second Floor

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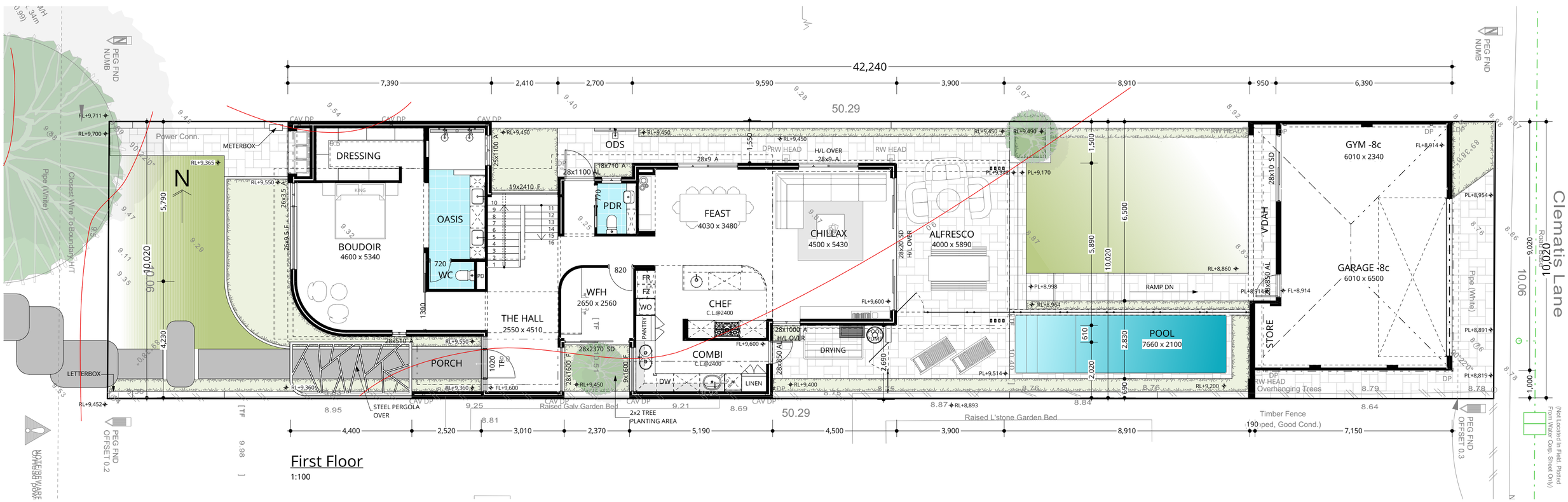

First Floor

1:100

1 OF 3

CLIENT NOTE
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PRELIMINARY DESIGN ONLY
DUE TO THE IMPLEMENTATION OF THE AMENDED RESIDENTIAL DESIGN CODES AND THE BUILDING CODES OF AUSTRALIA ENERGY EFFICIENCY PROVISIONS, THIS DESIGN MAY BE SUBJECT TO CHANGE UPON RECIEPT OF DETAILED SURVEY INFORMATION.
LOCAL GOVERNMENT APPROVAL
CLIENT ACKNOWLEDGES THAT NON COMPLIANT DESIGN DETAILS MAY DELAY LOCAL GOVERNMENT APPROVAL. JWH GROUP RESERVES THE RIGHT TO REVISE PROJECT PRICING IF LGA APPROVAL IS DELAYED BY CLIENT REQUESTED DESIGN DETAIL.

Proposed Strickland Street Residence

60 Strickland Street Mt Claremont
consultant : Jay W designer : Brad M Date : 1/02/2022
file : 301926 - strickland st - rev.3.pln

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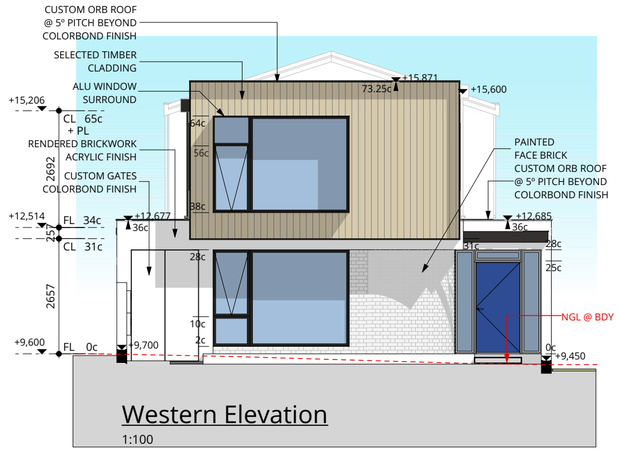
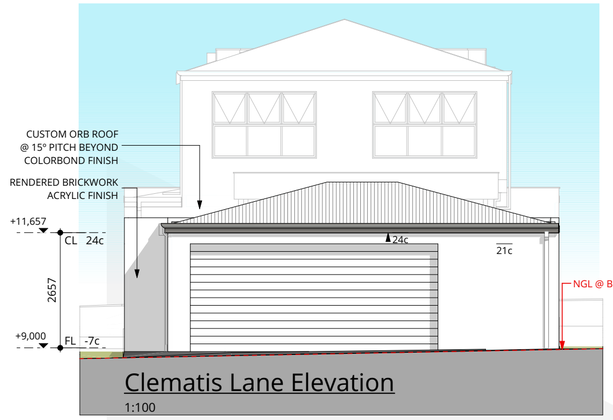
RESIDENTIAL ATTITUDES

Strickland Street Elevation
1:100



Western Elevation
1:100



Clematis Lane Elevation
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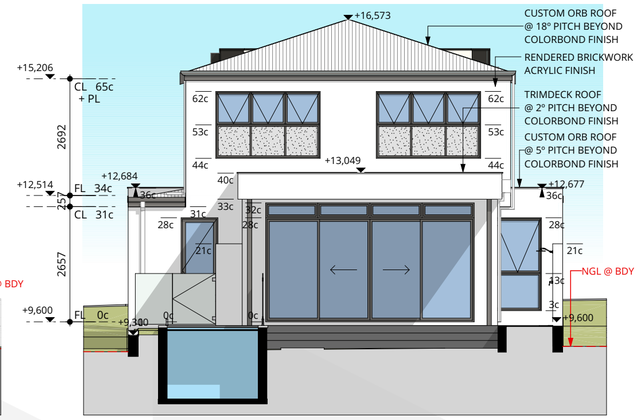

Eastern Elevation
1:100

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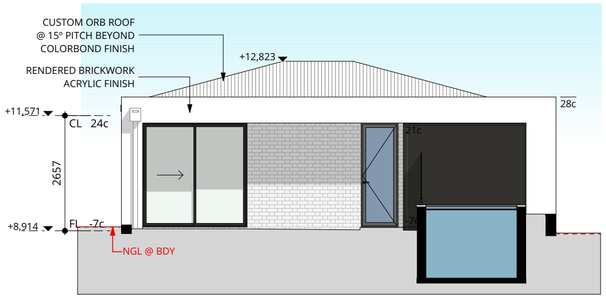
1 February 2022



Western Elevation - Garage
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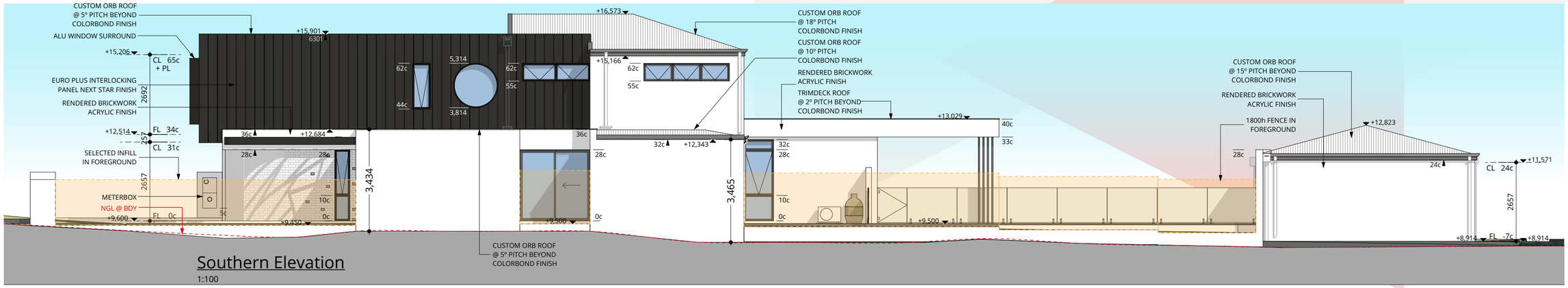

Southern Elevation
1:100

Northern Elevation
1:100

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Proposed Strickland Street Residence
60 Strickland Street Mt Claremont
consultant : Jay W designer : Brad M Date : 1/02/2022
file : 301926-strickland st-r4.3.pln

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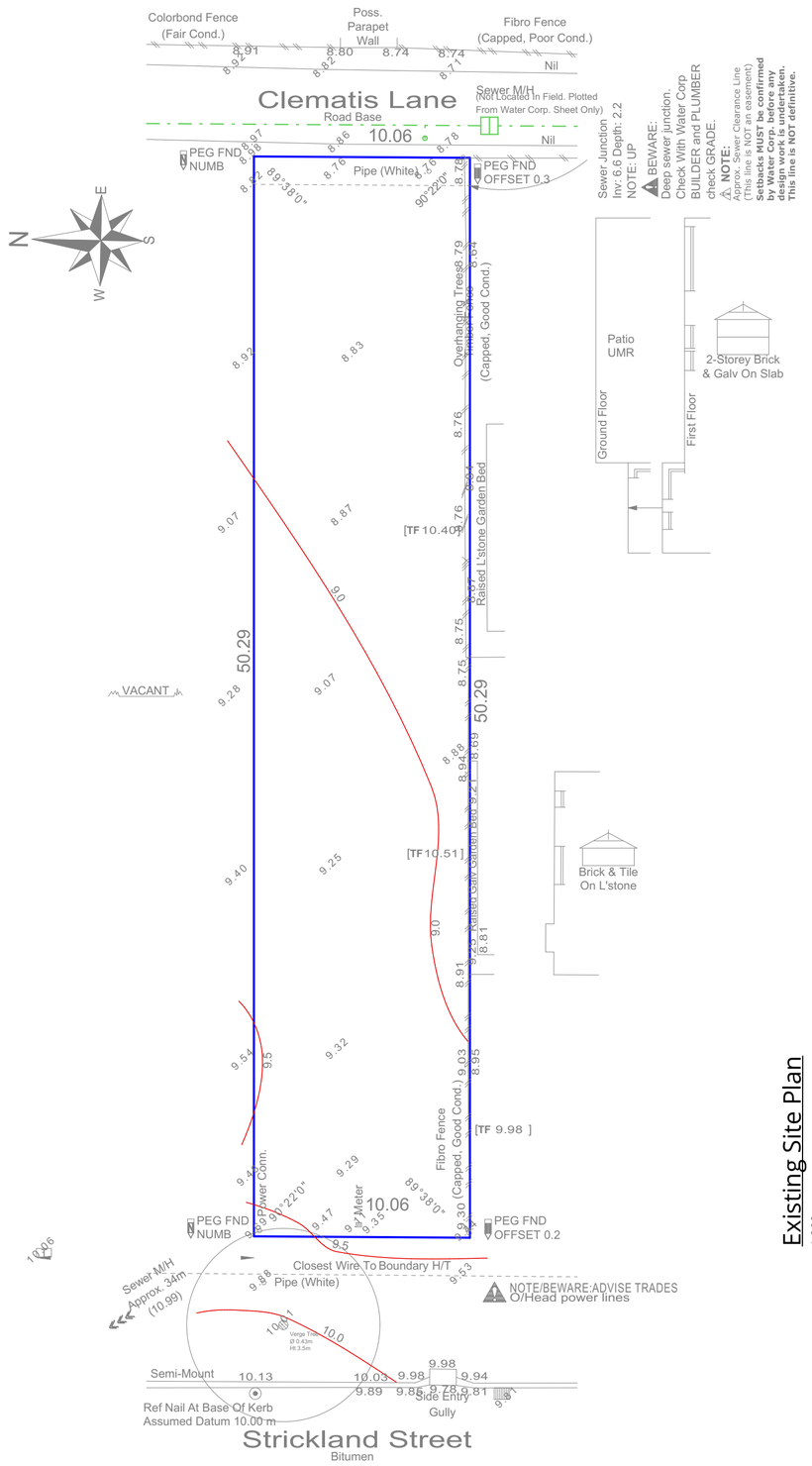
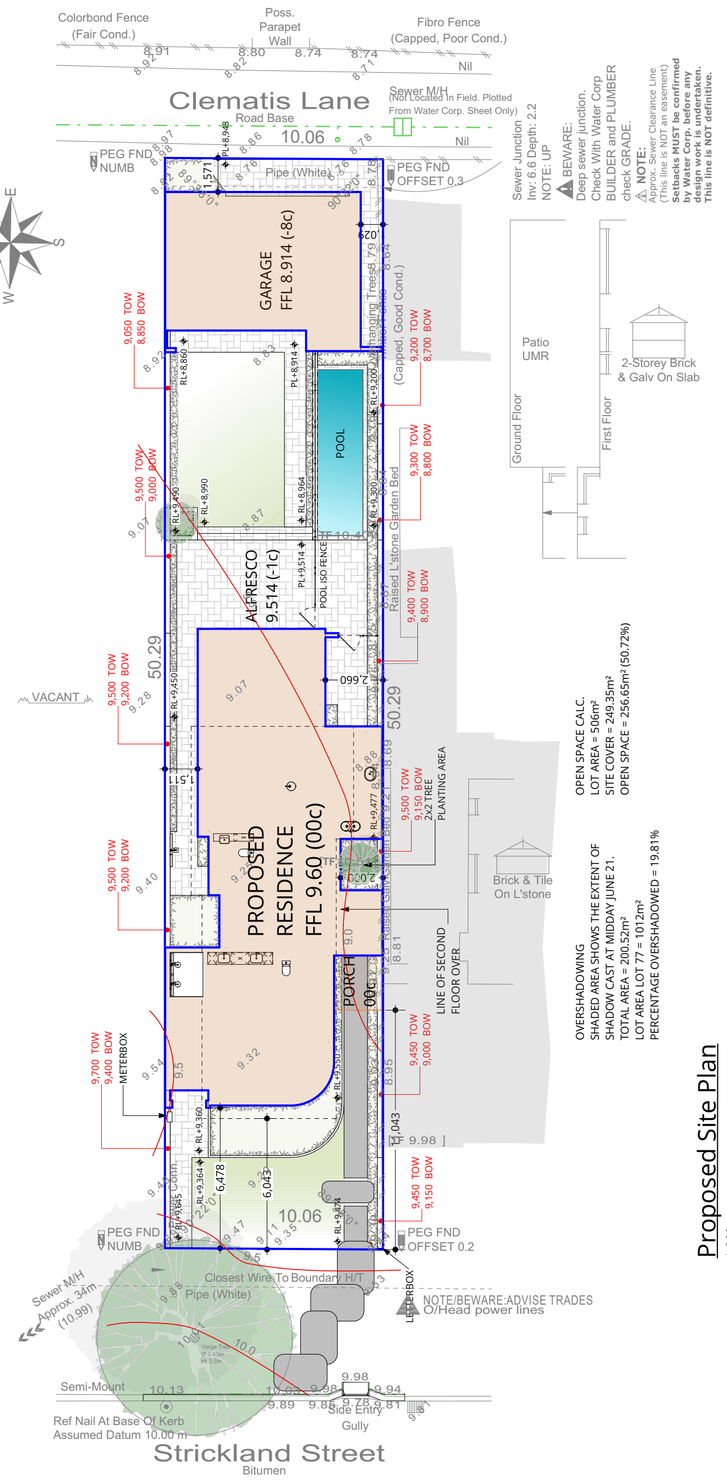
Received
1 February 2022



Existing Site Plan
1:200



OPEN SPACE CALC.
LOT AREA = 506m²
SITE COVER = 249.35m²
OPEN SPACE = 256.65m² (50.72%)

OVERSHADOWING
SHADED AREA SHOWS THE EXTENT OF SHADOW CAST AT MIDDAY JUNE 21.
TOTAL AREA = 200.52m²
LOT AREA LOT 77 = 1012m²
PERCENTAGE OVERSHADOWED = 19.81%

Proposed Site Plan
1:200

⚠WARNING: Plan not yet approved by titles office. Verify lot dimensions & angles with title.

Scale 1:200 (0 2 4 6 8)

⚠DISCLAIMER:
HIGH TENSION POWER LINES. CHECK TITLE FOR EASEMENTS AND WESTERN POWER FOR SET-BACKS.

COTTAGE SURVEYS
87-89 Guthrie Street
Osborne Park, WA 6017
PO Box 1611
Osborne Park
Business Centre WA 6917
P: (08) 9446 7361
E: perth@cottage.com.au
W: www.cottage.com.au

JOB #	506132	GPS	Lat: -31.969021 Long: 115.775561	ROADS	Bitumen	ELEC.	U/Ground / O/Head
				KERBS	Semi-Mount / Nil	COMMS.	Yes
ADDRESS	#60 Strickland Street	LOT	Lot 101 (DP 421638 - Unapproved)	FOOTPATH	Nil	WATER	Yes
SUBURB	Mt Claremont			SOIL	Sand	GAS	Check Alinta
LGA	CITY OF NEDLANDS	AREA	506m²	DRAINAGE	Good	SEWER	Yes
DRAWN	B. Smith	DATE	30 Jul 21 SSA No	VEGETATION	Light Grass Cover	COASTAL	No (Approximate Only Confirm With Shire)

LEGEND

	Power Dome
	Power Pole
T / P	Phone Pits
W	Water Conn.
TP 10.00	Top Pillar/Post
TW 10.00	Top Wall
TR 10.00	Top Retaining
TF 10.00	Top Fence

⚠DISCLAIMER:
Lot boundaries drawn on survey are based on landgate plan only. Survey does not include title search and as such may not show easements or other interests not shown on plan. Title should be checked to verify all lot details and for any easements or other interests which may affect building on the property.

⚠DISCLAIMER:
Survey does not include verification of cadastral boundaries. All features and levels shown are based on orientation to existing pegs and fences only which may not be on correct cadastral alignment. Any designs based or dependent on the location of existing features should have those features' location verified in relation to the true boundary.

⚠DISCLAIMER:
Survey shows visible features only and will not show locations of underground pipes or conduits for internal or mains services. Verification of the location of all internal and mains services should be confirmed prior to finalisation of any design work.

⚠DISCLAIMER:
Cottage & Engineering surveys accept no responsibility for any physical on site changes to the parcel or portion of the parcel of land shown on this survey including any adjoining neighbours levels and features that have occurred after the date on this survey. All Sewer details plotted from information supplied by Water Corporation.

CLIENT NOTE
PLEASE NOTE ITEMS SHOWN ON DESIGN SKETCH ARE REPRESENTATION ONLY. COSTING SCHEDULE & ADDENDA DOCUMENTS ARE TO SUPERSEDE DETAILS DEPICTED ON DESIGN SKETCH PLAN.
PRELIMINARY DESIGN ONLY
DUE TO THE IMPLEMENTATION OF THE AMENDED RESIDENTIAL DESIGN CODES AND THE BUILDING CODES OF AUSTRALIA ENERGY EFFICIENCY PROVISIONS, THIS DESIGN MAY BE SUBJECT TO CHANGE UPON RECIEPT OF DETAILED SURVEY INFORMATION.
LOCAL GOVERNMENT APPROVAL
CLIENT ACKNOWLEDGES THAT NON COMPLIANT DESIGN DETAILS MAY DELAY LOCAL GOVERNMENT APPROVAL. JWH GROUP RESERVES THE RIGHT TO REVISE PROJECT PRICING IF LGA APPROVAL IS DELAYED BY CLIENT REQUESTED DESIGN DETAIL.

Proposed Strickland Street Residence

60 Strickland Street Mt Claremont
consultant : Jay W designer : Brad M Date : 1/02/2022
file : 301926-strickland st-r4.3.pln

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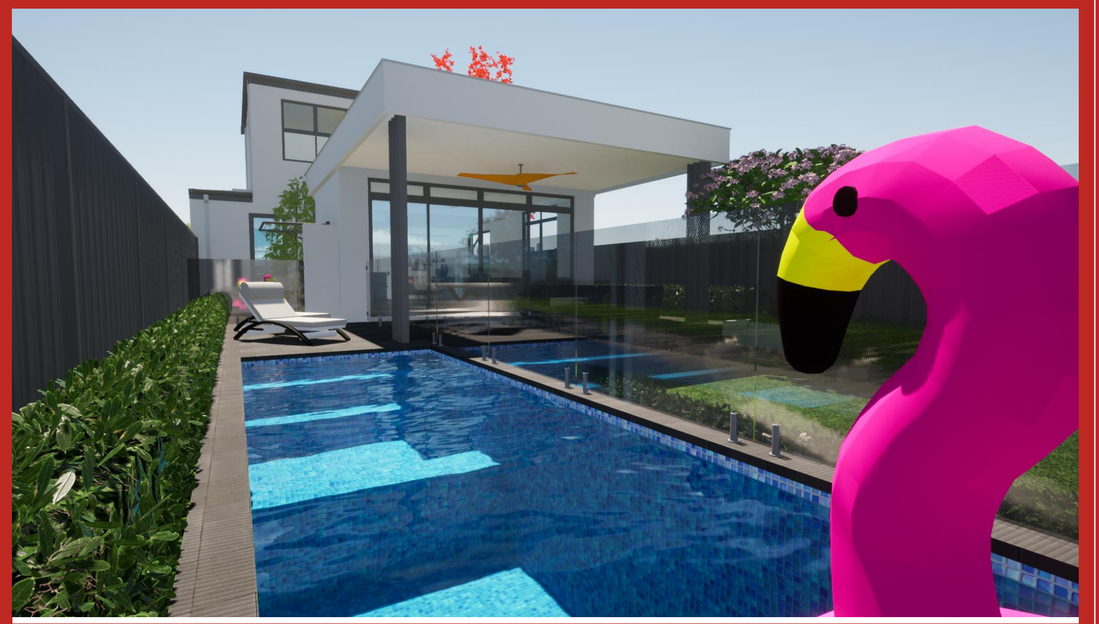
RESIDENTIAL ATTITUDES

Proposed Strickland Street Residence

60 Strickland Street Mt Claremont



Proposed Strickland Street Residence

60 Strickland Street Mt Claremont

16.2 PD11.03.22 Reconsideration of Development Application – 5 Grouped Dwellings at 18 Tyrell Street, Nedlands

Meeting & Date	Council - 22 March 2022
Applicant	Urbanista
Employee Disclosure under section 5.70 Local Government Act 1995	The author, reviewers and authoriser of this report declare they have no financial or impartiality interest with this matter. There is no financial or personal relationship between City staff involved in the preparation of this report and the proponents or their consultants.
Report Author	Roy Winslow – Manager Urban Planning
Director/CEO	Tony Free – Director Planning and Development
Attachments	1. Aerial Image and Zoning Map 2. Development Plans 3. CONFIDENTIAL ATTACHMENT - Submissions

Purpose

The purpose of this report is for Council to reconsider a development application for 5 grouped dwellings at 18 Tyrell Street, Nedlands that was previously refused by Council and subsequently amended following a State Administrative Tribunal (SAT) review.

Recommendation

In accordance with Clause 68(2)(b) of the Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015,* Council approves the development application received on 23 June 2021 in accordance with the plans date stamped 9 February 2022 for five grouped dwellings at 18 Tyrell Street, Nedlands subject to the following conditions:

1. **The development shall at all times comply with the application and the approved plans, subject to any modifications required as a consequence of any condition(s) of this approval.**

2. **All stormwater from the development, which includes permeable and nonpermeable areas shall be contained onsite.**

3. **Prior to occupation of the development the finish of the parapet walls is to be finished externally to the same standard as the rest of the development or in:**

   - **Face brick;**
   - **Painted render;**
   - **Painted brickwork; or**
   - **Other clean material as specified on the approved plans;**

   and maintained thereafter to the satisfaction of the City of Nedlands.

4. **Prior to occupation of the development, the balconies of Units 2, 3, 4 and 5 on the northern elevation, the kitchen windows of Unit 3 located on the south elevation, the master bedrooms of Units 2, 3 and 4 located on the south elevation, and the bedroom 3 window of Unit 5 on the south elevation, all as indicated in red on the approved plans, shall be screened in accordance with the Residential Design Codes by either;**

   a. **fixed obscured or translucent glass to a height of 1.60 metres above finished floor level; or**
   b. **Timber screens, external blinds, window hoods and shutters to a height of 1.6m above finished floor level that are at least 75% obscure;**
   c. **a minimum sill height of 1.60 metres as determined from the internal floor level; or**
   d. **an alternative method of screening approved by the City of Nedlands.**

   The required screening shall be thereafter maintained to the satisfaction of the City of Nedlands.

5. **Prior to occupation of the development, the approved landscaping plan is to be installed and maintained in accordance with that plan, or any modifications approved thereto, for the lifetime of the development thereafter, to the satisfaction of the City of Nedlands.**

6. **Prior to the issue of Building Permit, a Construction Management Plan shall be submitted and approved to the satisfaction of the City. The approved Construction Management Plan shall be observed at all times throughout the construction process to the satisfaction of the City. Adjoining landowners shall be notified in writing no less than 14 days prior to construction.**

7. **All fencing within the primary street setback area and facing Tyrell Street is to be visually permeable above 1.2m above natural ground level to the satisfaction of the City of Nedlands.**

8. **The development shall comply with the approved Waste Management Plan date received 23 June 2021 to the satisfaction of the City of Nedlands. Any modification to the approved waste management plan will require further approval by the City.**

9. **Prior to occupation, the development is to incorporate at least one energy efficiency initiative that exceeds the minimum practice, or all dwellings are to exceed the minimum NATHERS requirement by 0.5 stars to the satisfaction of the City of Nedlands.**

Voting Requirement

Simple Majority.

This report is of a quasi judicial nature as it is a matter that directly affects a person's rights and interests. The judicial character arises from the obligation to abide by the principles of natural justice. Examples of Quasi-Judicial authority include town planning applications and other decisions that may be appealable to the State Administrative Tribunal.

The decision must be made in a manner that is impartial, free from bias, and in accordance with the principles of natural justice. The decision must be made in having regard to the facts of the matter under consideration, and in accordance with the relevant laws and policies as they apply to that matter.

Discretionary considerations and judgments in the decision must be confined to those permitted to be considered under the laws and polices applicable to the matter and given such weight in making the decision as the relevant laws and polices permit them to be given.

Background

Land Details

Metropolitan Region Scheme Zone	Urban
Local Planning Scheme Zone	Residential
R-Code	R60
Land area	809m^2
Land Use	Existing – Single House Proposed – Grouped Dwellings
Use Class	'P' Permitted Use

The subject lot is located at 18 Tyrell Street, Nedlands and is 240m south of Stirling Highway. The site is located on the east side of Tyrell Street, two lots north of Edward Street.

The site has a lot area of 809m^2 and has an existing Single House. The site is relatively flat with a slight crossfall of around 0.7m from southwest (front) to northeast (rear).

The area is surrounded by existing single residential houses that are predominantly single storey. The properties in this area are coded R60 (Attachment 1).

History

The application was refused at the 23 November 2021 Council meeting for the following reasons:

1. The lot boundary setbacks are inconsistent with clause 5.1.3 of the Residential Design Codes and result in the appearance of excessive building bulk to adjoining properties, and do not provide adequate direct sun and ventilation to the building and open spaces on the site and neighbouring lots.
2. The lack of sufficient onsite visitor parking is inconsistent with clause 5.3.3 of the Residential Design Codes and is inadequate to cater for the projected needs of the development given the parking restrictions along Tyrell Street.
3. Building height be limited to two (2) storeys to fit into the existing streetscape.

4. Large windows facing east and west are required to have either permanent shading or reduced in size.
5. There is inadequate landscaping on site.

The applicant subsequently lodged an application for review to the SAT. After mediation, amended plans were submitted that included the following changes:

- The visitor parking bay at the front of the development has been removed and replaced with additional landscaping, including the planting of two pear trees.
- The strata plan is slightly reconfigured. Additional space resulting from the removal of the visitor parking bay has been distributed into the strata lots.
- The Unit 1 master bedroom ground floor setback is increased from 1.2m to 1.3m to the southern lot boundary.
- The lot boundary setback of the kitchen wall directly above the master bedroom is also increased from the boundary from 1.2m to 1.3m.
- The Unit 5 upper floor east-facing wall removes the external boxed landscape area which creates a recessed section that is setback greater from the lot boundary. In addition to the removal of the planter box, the height of the Unit 5 elevation is reduced by 0.2m to 7m.
- The wall belonging to the kitchen and bathroom of Unit 5 is now set back 1.8m from the lot boundary.

Application Details

The application seeks a reconsideration for development approval for five grouped dwellings. The dwelling fronting Tyrell Street and the dwelling at the rear are two storeys, with the middle dwellings constituting three storeys.

Discussion

Assessment of Statutory Provisions
If a proposal does not satisfy the deemed to-comply provisions of the R-Codes, Council is required to exercise a judgement of merit to determine the proposal against the design principles of the R-Codes. The R-Codes require the assessment to consider the relevant design principle only and to not apply the corresponding deemed-to-comply provisions. It is recommended that the application be approved by Council as it is considered to satisfy the design principles of the R-Codes. Further, it is considered unlikely that the development will have a significant adverse impact on the local amenity and character of the locality.

Local Planning Scheme No.3
Schedule 2, Clause 67(2) (Consideration of application by Local Government) – identifies those matters that are required to be given due regard to the extent relevant to the application. Where relevant, these matters are discussed in the following sections. Overall, the development is considered to meet these objectives, particularly in regard to height, scale, bulk and appearance, and the potential impact it will have on the local amenity.

Design Review Panel
The application was supported by the Design Review Panel. For full discussion refer to the previous Council report of November 2021 (Reference PD37.21).

State Planning Policy 7.3 - Residential Design Codes – Volume 1
State Planning Policy 7.3 Residential Design Codes Volume 1 (R-Codes) apply to all single and grouped dwelling developments. An approval under the R-Codes can be obtained in one of two ways. This is by either meeting the deemed-to-comply provisions or via a design principle assessment pathway.

The proposed development is seeking a design principle assessment pathway for parts of this proposal relating to lot boundary setbacks and visitor car parking. As required by the R-Codes, Council in assessing the proposal against the design principles, should not apply the corresponding deemed-to-comply provisions. All other areas meet the deemed-to-comply provisions.

Clause 5.1.3 – Lot Boundary Setback
Council's reasons for refusal included:

1. The lot boundary setbacks are inconsistent with clause 5.1.3 of the Residential Design Codes and result in the appearance of excessive building bulk to adjoining properties, and do not provide adequate direct sun and ventilation to the building and open spaces on the site and neighbouring lots.

The previous plans sought a design principles assessment for lot boundary setbacks to the east and the south. These amended plans now meet the deemed to comply setback provisions to the east. The plans also propose increasing the southern setback to the master bedrooms of Units 1 and 5 from 1.2m to 1.3m. However, these two sections still seek a design principles assessment. A condition of approval to screen specified windows has been included, with the applicant's consent, in order to meet the deemed to comply setbacks for all other walls.

The design principles for lot boundary setbacks consider the impact of building bulk on adjoining properties, providing adequate sun and ventilation and minimising overlooking. The proposed northern lot boundary setback is considered to meet the design principles for the following reasons:

- The southern wall is articulated to provide outdoor living areas and open space, with the walls of the middle three units being set back 3.1m from the boundary. This ensures the majority of the development will be set back so as to reduce the impact of bulk and scale to adjoining properties.
- Additional trees and landscaping are provided facing the southern boundary to obscure views to the building and soften the overall appearance as viewed from adjoining properties.
- The overall development meets the deemed-to-comply criteria for overshadowing.
- The ground floor setback has been increased from 1.2m to 1.3m compared to the previously refused set of plans.

It is worth noting that when the application was previously presented to Council, Unit 5 did not meet the deemed to comply provisions for the eastern lot boundary setbacks. The amended plans alter the setbacks and increase the sill height of the windows such that the eastern lot boundary setbacks now achieve deemed to comply.

Clause 5.3.3 Parking
Council's reason for refusal included:

2. The lack of sufficient onsite visitor parking is inconsistent with clause 5.3.3 of the Residential Design Codes and is inadequate to cater for the projected needs of the development given the parking restrictions along Tyrell Street

The development proposes no communal visitor bays, instead providing landscaping within the Tyrell Street streetscape. The design principles for parking include consideration of proximity to public transport, availability of street parking, and the type and size of the dwellings. The proposed parking arrangements are supported for the following reasons:

- The site is located less than 250m from a high frequency bus route serving multiple destinations located near the intersection of Stirling Highway and Tyrell Street. This allows ample opportunities for use of public transport.
- Each unit has room for two vehicles in the garage, whereas the proximity of the bus stop means the onsite parking criteria of the R-Codes stipulates only a single bay in necessary. The development has an excess of five parking bays total, as each unit has one bay beyond the deemed to comply.
- There is no permitted parking on the east side of Tyrell Street, and 2-hour parking restrictions on the west side. This enables sufficient on-street parking for short and long-term visitors.
- The visitor bay has been replaced with landscaping, including the provision of two trees. This additional landscaping is consistent with Council's recent decisions on "greening" the City.

Remaining Reasons for Refusal

Council's remaining reasons for refusal included:

3. Building height be limited to two (2) storeys to fit into the existing streetscape.
4. Large windows facing east and west are required to have either permanent shading or reduced in size.
5. There is inadequate landscaping on site.

As the applicant notes, there is no statutory requirement that building height be limited to two storeys, nor is there any provision in Volume 1 of the R-Codes for shading to east and west-facing windows or additional landscaping. Nonetheless, additional landscaping has been provided throughout the development.

Administration also notes that the development meets the height provisions set out in Council's Local Planning Policy – Residential Development. Further, had the application

consisted of multiple dwellings, it would have been assessed under Volume 2 of the R-Codes, which sets out 3 storeys (12m) as an acceptable outcome for building height.

Consultation

The application is seeking assessment under the design principles of the R-Codes for lot boundary setbacks and visitor car parking.

The development application was originally advertised in accordance with the City's Local Planning Policy - Consultation of Planning Proposals to five adjoining properties. The application was advertised for a period of 14 days from 28 August 2021 to 10 September 2021. At the close of the advertising period, a total of 14 submissions were received; 11 objections, one (1) submission of support (with comments), and two (2) requests to extend the advertising radius. Refer to the November 2021 Council Report for details.

Sustainability

The applicant proposes:

- solar panels on the roof of each home with a power share system run by the strata company;
- water efficient fixings and LED lighting throughout; and
- vegetation on the buildings.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Vision Our city will be an environmentally-sensitive, beautiful and inclusive place.

Values **Great Natural and Built Environment**
We protect our enhanced, engaging community spaces, heritage, the natural environment and our biodiversity through well-planned and managed development.

Priority Area Urban form - protecting our quality living environment

Budget/Financial Implications

It is noted that the SAT has the ability to award costs in certain circumstances, should the matter proceed to a full hearing.

Legislative and Policy Implications

Pursuant to section 31 of the *State Administrative Tribunal Act 2004 (WA),* Council is invited to reconsider its decision for 5 grouped dwellings at 18 Tyrell Street, Nedlands.
Council is requested to make a decision in accordance with clause 68(2) of the Deemed Provisions. Council may determine to approve the development without conditions (cl.68(2)(a)), approve with development with conditions (cl.68(2)(b)), or refuse the development (cl.68(2)(c)).

Decision Implications

If Council resolves to approve the proposal, development can proceed after receiving a Building Permit and necessary clearances.

In the event of a refusal, the applicant will have the option of proceeding to a full hearing at SAT, which is tentatively scheduled for later this year pending Council's decision.

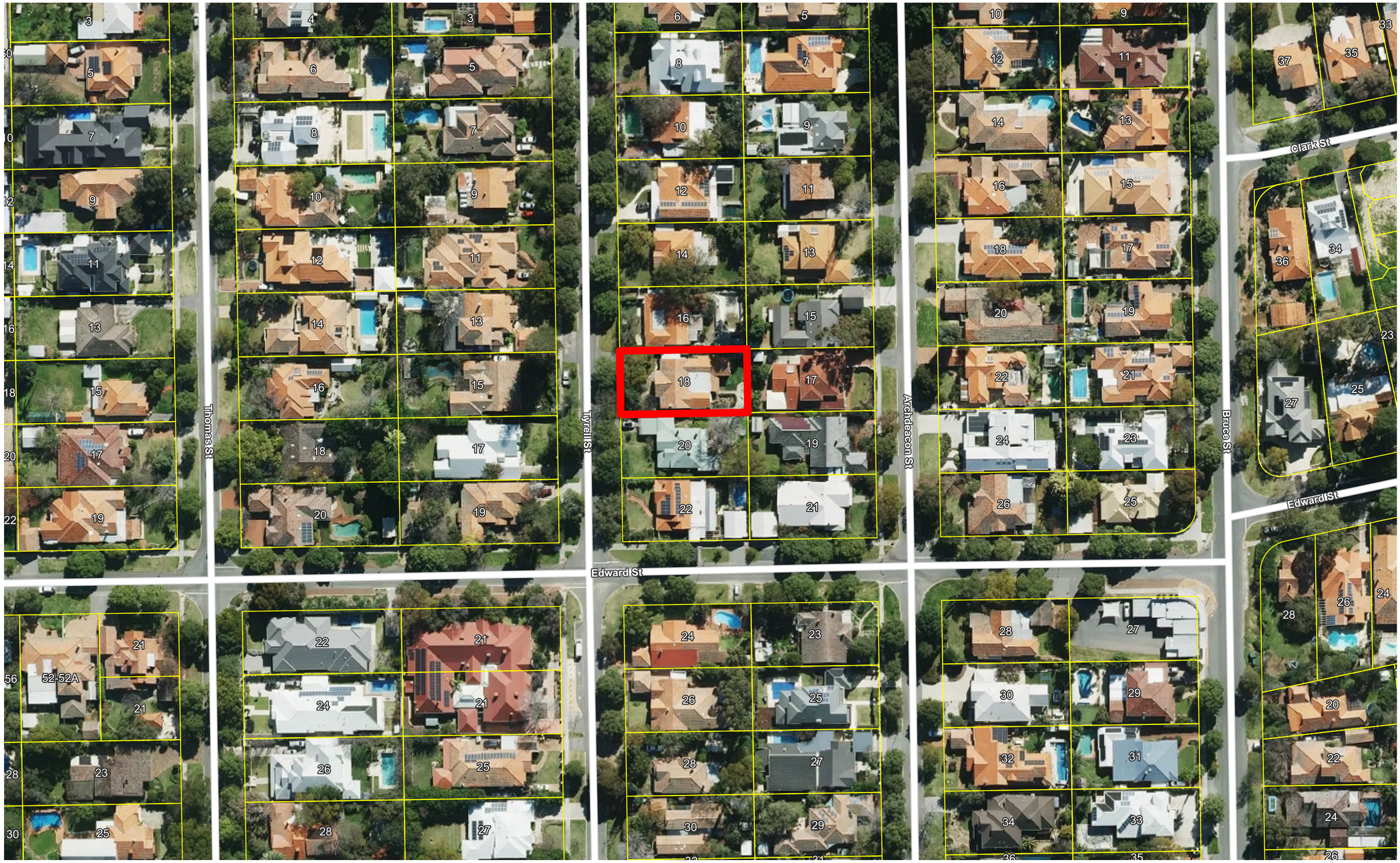
Conclusion

The application for a reconsideration for five grouped dwellings has been presented for Council consideration following SAT mediation and submission of amended plans. The proposal is considered to address the reasons for refusal raised by Council and as such is unlikely to have a significant adverse impact on the local amenity of the area. The proposal has been assessed and satisfies the design principles of the R-Codes and being consistent with the immediate locality and streetscape character.

Accordingly, it is recommended that the application be approved by Council, subject to conditions of Administration's recommendation.

Further Information

N/A



City of Nedlands

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19/10/2021

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City of Nedlands	The City of Nedlands accepts no responsibility for the accuracy of this image or the results of any actions taken when using this image		19/10/2021	
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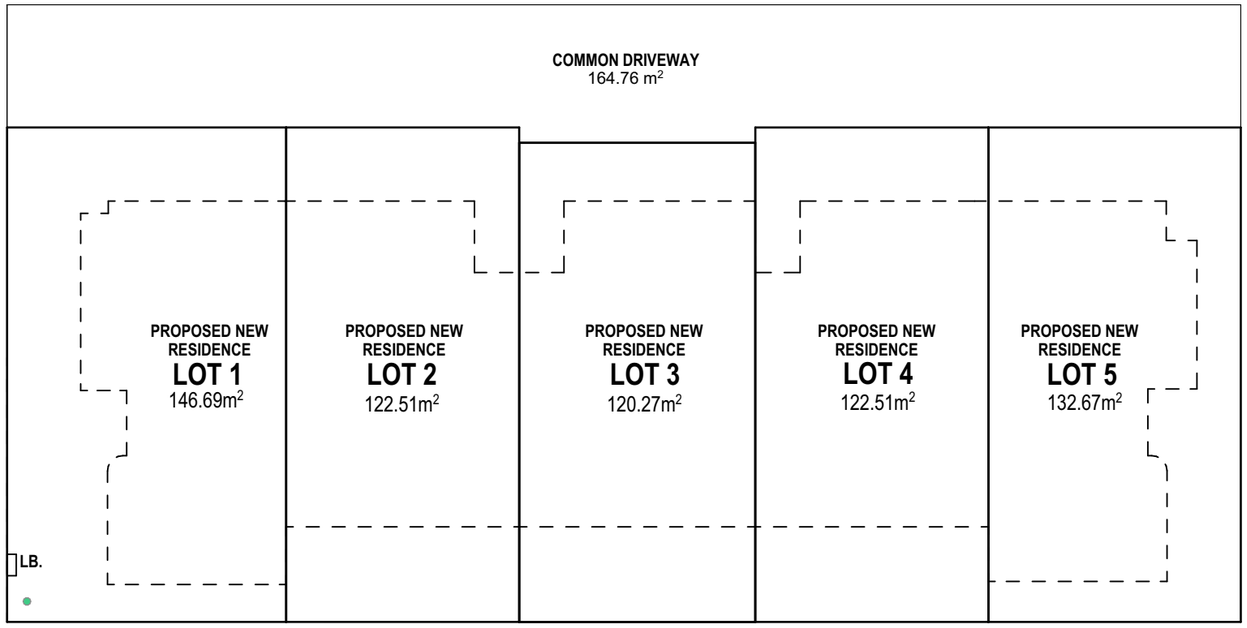
City of Nedlands
Amended Plans Received
9 February 2022



BIG SKY DEVELOPMENTS

© 2021

Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :

SITE
STRATA PLAN

PROJECT NAME :

LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.

A100.1

City of Nedlands
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N

LEGEND

- CLIVIA
- DIANELLA GODDESS
- SNOW PEAR
- CAPITAL PEAR
- MAGNOLIA
- FRANGIPANI TREE
- KANGAROO PAW
- KANGAROO PAW
- CREAM WASHED CONCRETE
- PERMABLE PAVING
- BRICK PAVING
- LETTERBOX

DEEP SOIL AREA: 56.20m²

PERTH LANDSCAPING & GARDENING

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Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

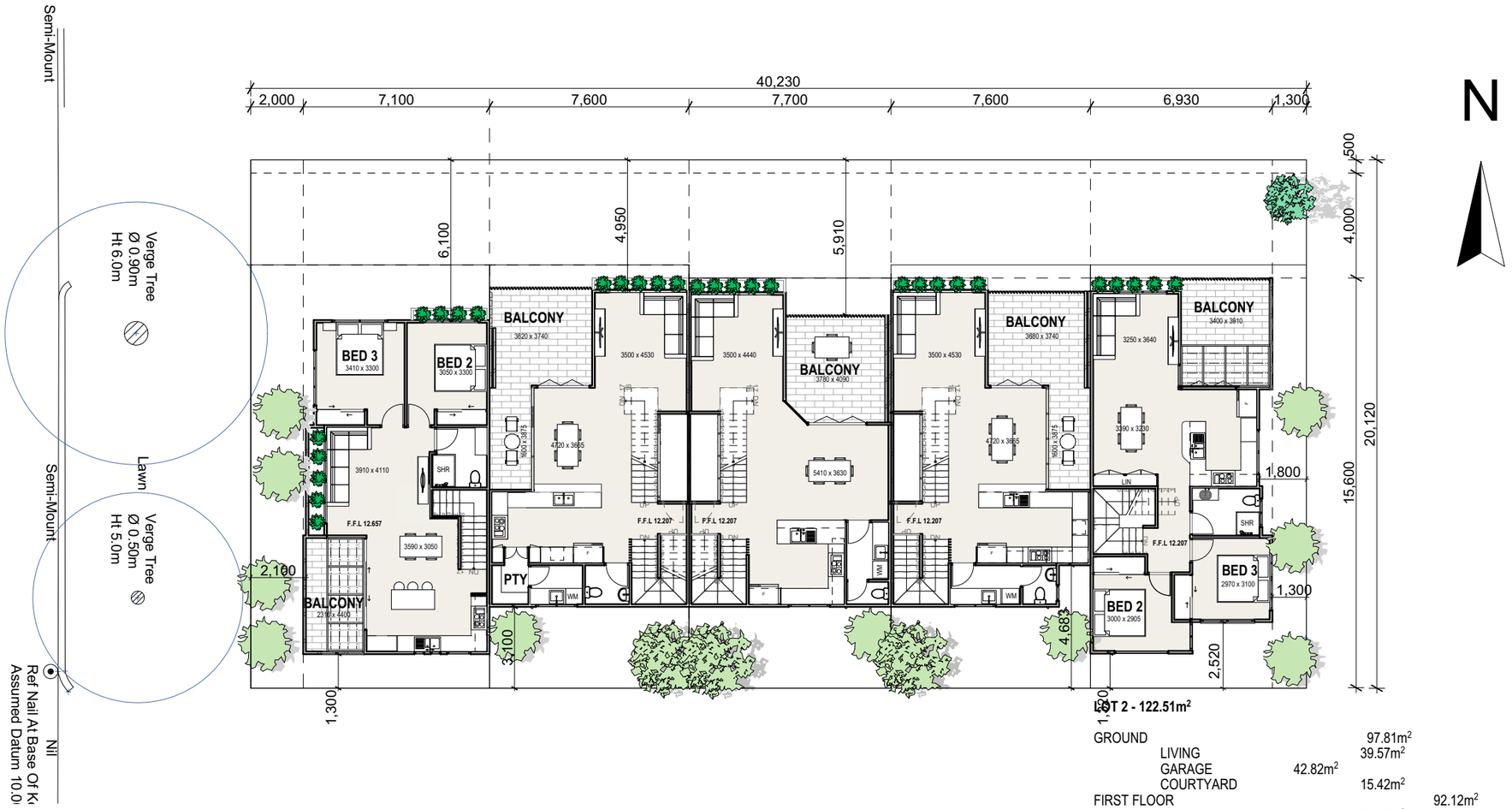
DRAWING TITLE :
SITE
SITE PLAN GL

PROJECT NAME :
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.
A100.2

City of Nedlands
Amended Plans Received
9 February 2022



LOT 1 - 146.69m²

GROUND			85.60m²
LIVING		35.00m²	
GARAGE	41.48m²		
COURTYARD		9.12m²	
FIRST FLOOR			86.16m²
LIVING		75.69m²	
ALFRESCO	10.47m²		
TOTAL			**171.76m²**

LOT 2 - 122.51m²

GROUND			97.81m²
LIVING		39.57m²	
GARAGE	42.82m²		
COURTYARD		15.42m²	
FIRST FLOOR			92.12m²
LIVING		71.15m²	
BALCONY	20.97m²		
SECOND FLOOR		74.53m²	
LIVING		74.53m²	
TOTAL			**264.46m²**

LOT 3 - 120.27m²

GROUND			95.99m²
LIVING		39.91m²	
GARAGE	43.54m²		
COURTYARD		12.54m²	
FIRST FLOOR			88.76m²
LIVING		72.69m²	
BALCONY	16.07m²		
SECOND FLOOR		74.54m²	
LIVING		74.54m²	
TOTAL			**259.29m²**

LOT 4 - 122.51m²

GROUND			97.93m²
LIVING		39.69m²	
GARAGE	42.82m²		
COURTYARD		15.42m²	
FIRST FLOOR			90.22m²
LIVING		69.25m²	
BALCONY	20.97m²		
SECOND FLOOR		74.34m²	
LIVING		74.34m²	
TOTAL			**262.49m²**

LOT 5 - 132.67m²

GROUND			82.70m²
LIVING		34.27m²	
GARAGE	41.23m²		
COURTYARD		7.20m²	
FIRST FLOOR			90.58m²
LIVING		76.03m²	
ALFRESCO	14.55m²		
TOTAL			**173.28m²**

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Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :

SITE
SITE PLAN 1FL

PROJECT NAME :

LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.

A100.3

City of Nedlands
Amended Plans Received
9 February 2022

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Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :

SITE
SITE PLAN 2FL

PROJECT NAME :

LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.

A100.4

City of Nedlands
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SUN SHADOW

OVERSHADOWING @ 12PM ON 21 JUNE

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Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :
PLANS
ROOF PLAN & OVERSHADOWING

PROJECT NAME :
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.
A101.1

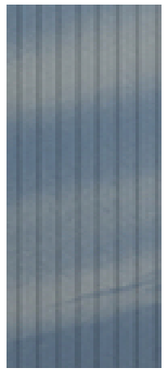
City of Nedlands
Amended Plans Received
9 February 2022

ELEVATION NORTH
SCALE 1:200

ELEVATION EAST
SCALE 1:200

ELEVATION TYRELL ST
SCALE 1:200

ELEVATION SOUTH
SCALE 1:200



OLIVE CLADDING

LOT 2 & 4 CLADDING

GARAGE CLADDDING

RED RECYCLED BRICK

WHITE BRICK

WHITE RENDER WALL

LOT 3 TIMBER

BALCONY'S

Areas indicated in red to be screened as per condition of approval

BIG SKY DEVELOPMENTS

© 2021

Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

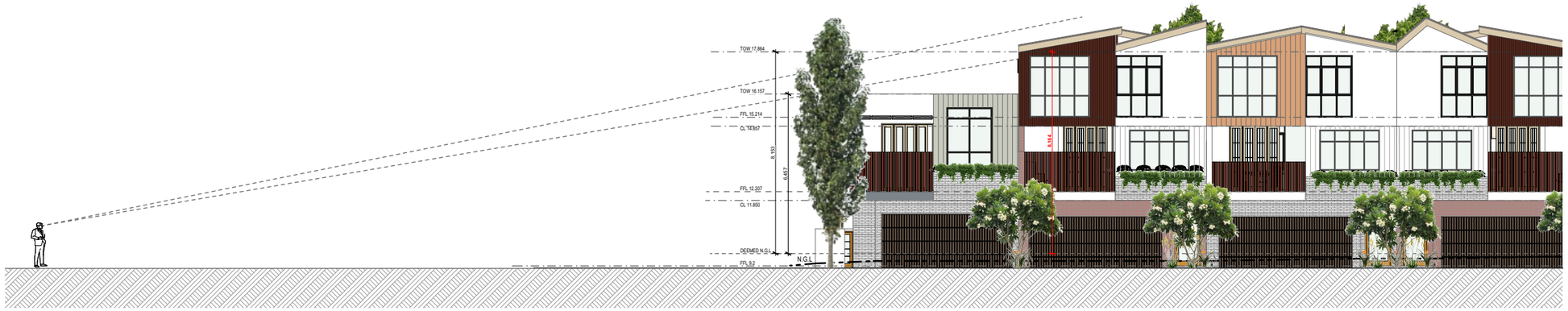
DRAWING TITLE :
ELEVATIONS
ELEVATIONS

PROJECT NAME :
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.
A200.2

City of Nedlands
Amended Plans Received
9 February 2022



ELEVATIONS HUMAN VIEW 1
1:200

REAR VIEW

BIG SKY DEVELOPMENTS

© 2021

Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

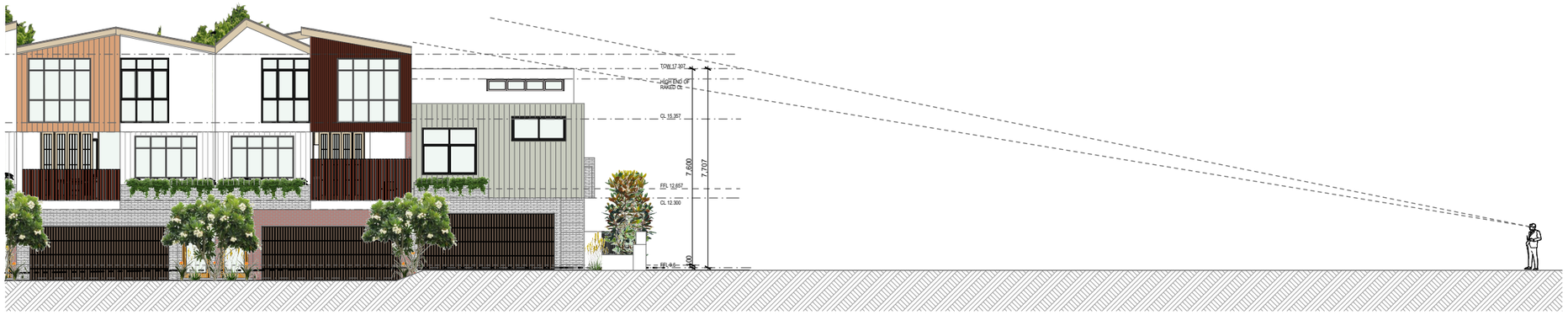
DRAWING TITLE :
ELEVATIONS
HUMAN PERSPECTIVE VIEW 1

PROJECT NAME :
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.
A200.3

City of Nedlands
Amended Plans Received
9 February 2022



ELEVATIONS HUMAN VIEW 2
1:200

STREET VIEW WITHOUT VERGE TREES

BIG SKY
DEVELOPMENTS

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Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :

ELEVATIONS
HUMAN PERSPECTIVE VIEW 2

PROJECT NAME :

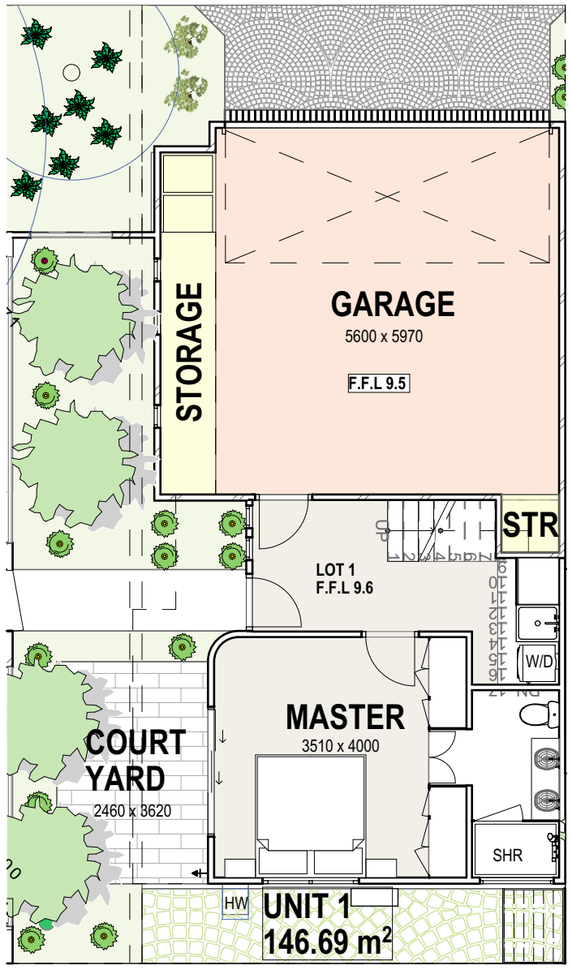
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.

A200.4

City of Nedlands
Amended Plans Received
9 February 2022



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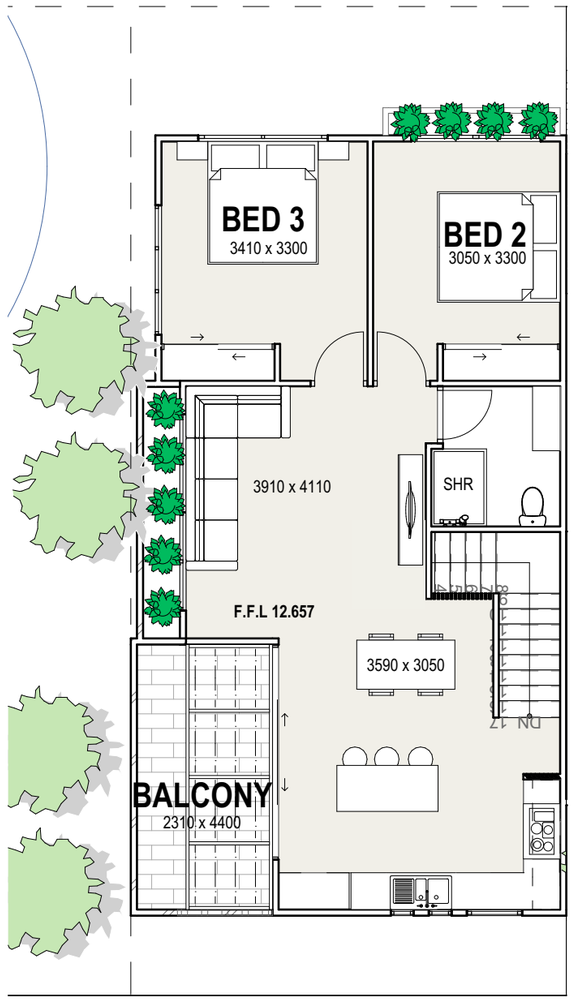


FIRST FLOOR
1:100

N

BIG SKY
DEVELOPMENTS

© 2021

Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :

UNITS
UNIT 1 FLOOR PLANS

PROJECT NAME :

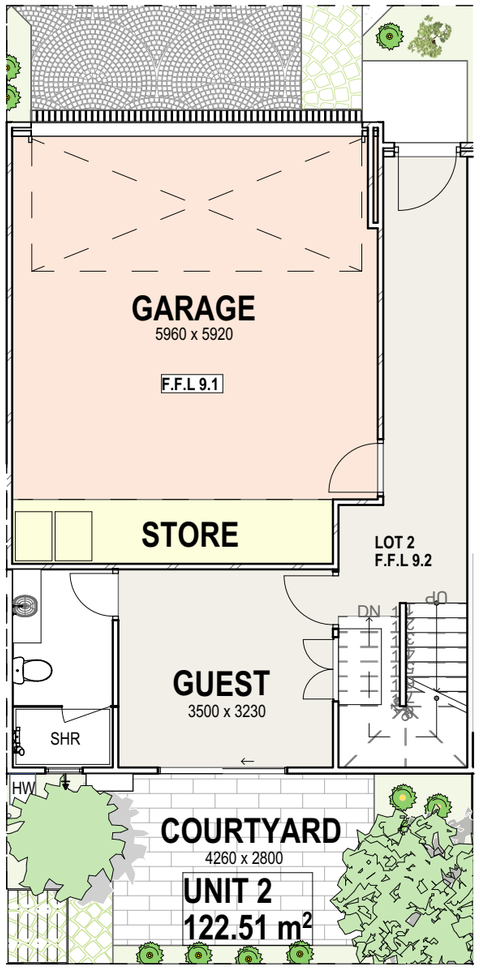
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.

A300.1

City of Nedlands
Amended Plans Received
9 February 2022



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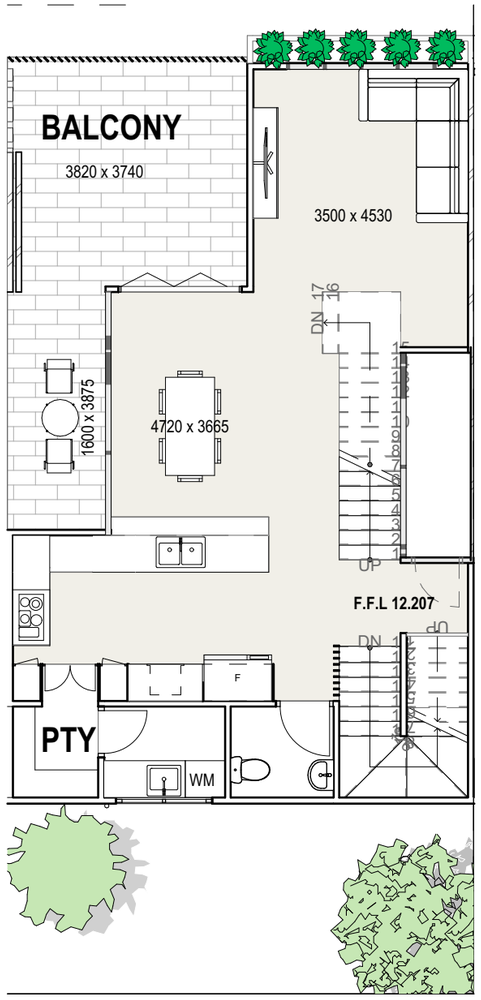

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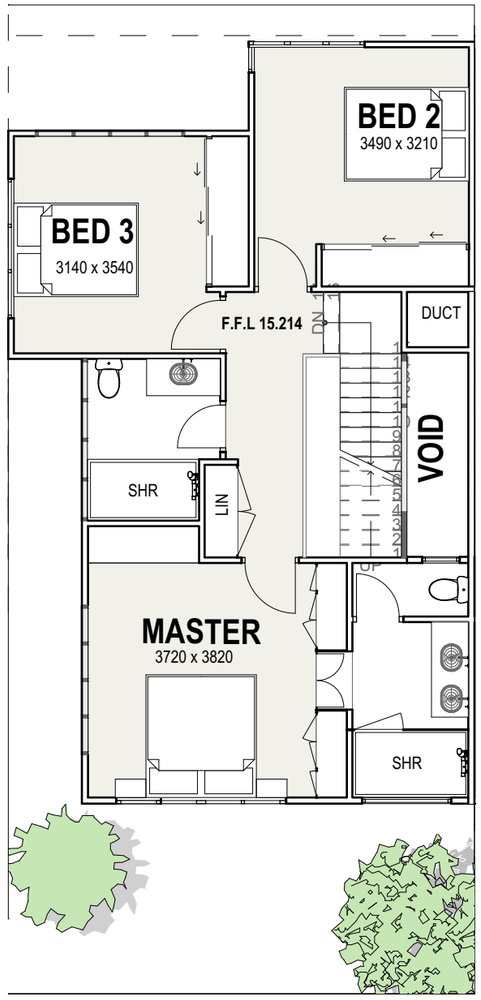

SECOND FLOOR
1:100

N

BIG SKY
DEVELOPMENTS

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Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :

UNITS
UNIT 2 FLOOR PLANS

PROJECT NAME :

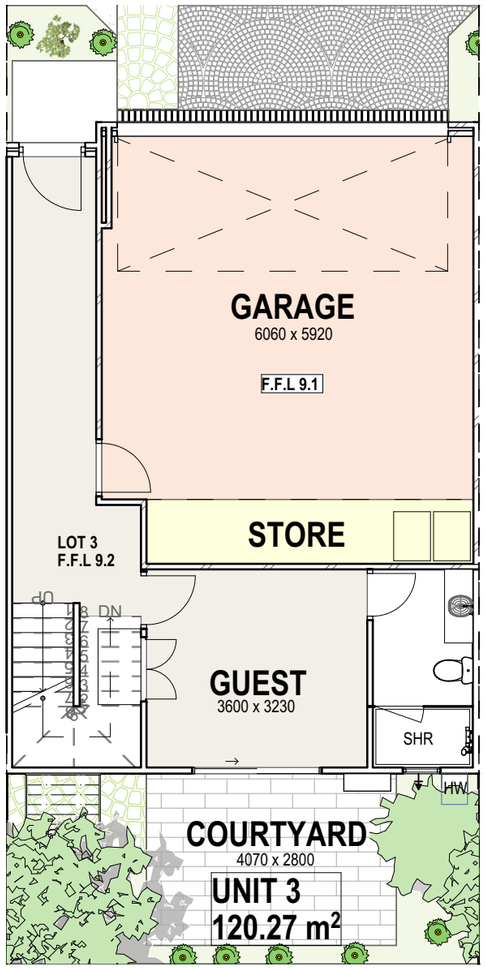
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.

A300.2

City of Nedlands
Amended Plans Received
9 February 2022



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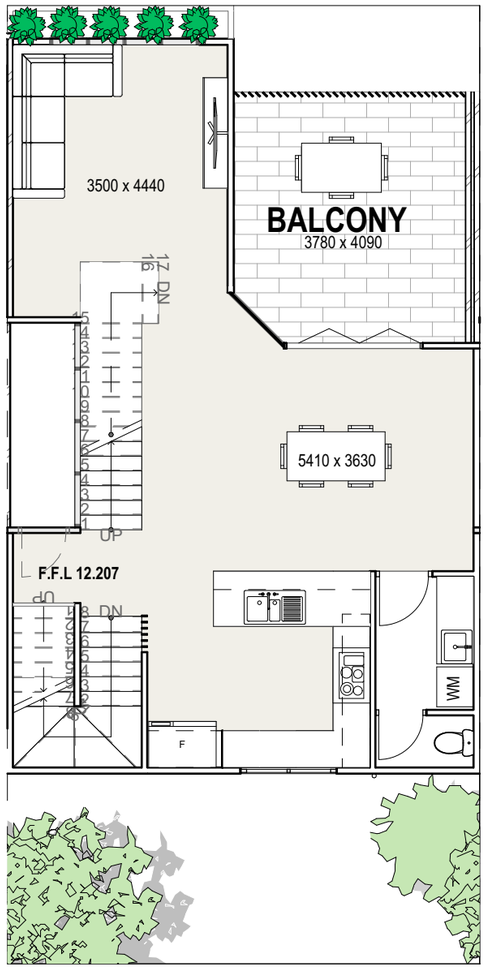

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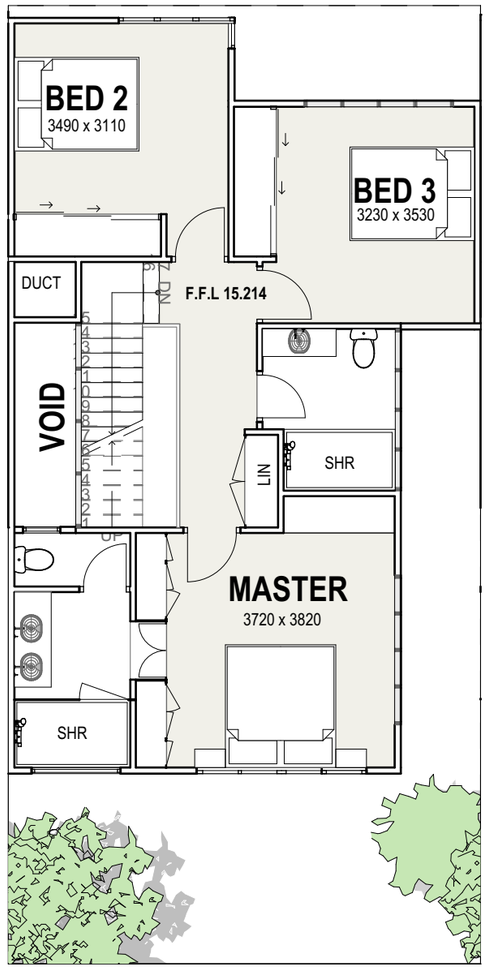

SECOND FLOOR
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BIG SKY
DEVELOPMENTS

© 2021

Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

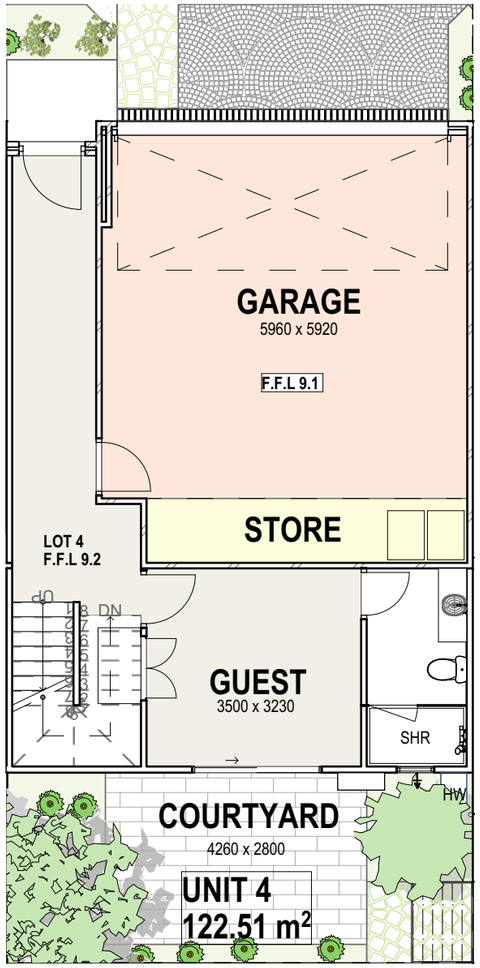
DRAWING TITLE :
UNITS
UNIT 3 FLOOR PLANS

PROJECT NAME :
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.
A300.3

City of Nedlands
Amended Plans Received
9 February 2022



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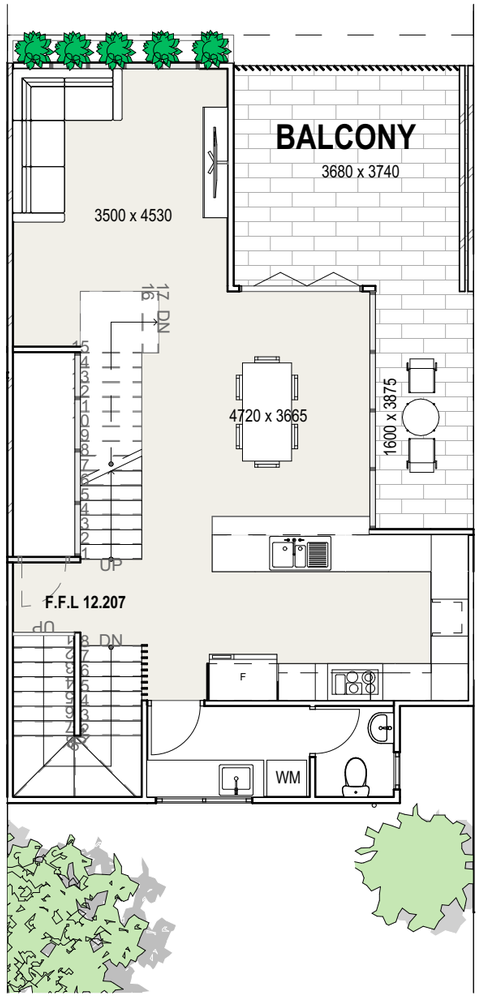

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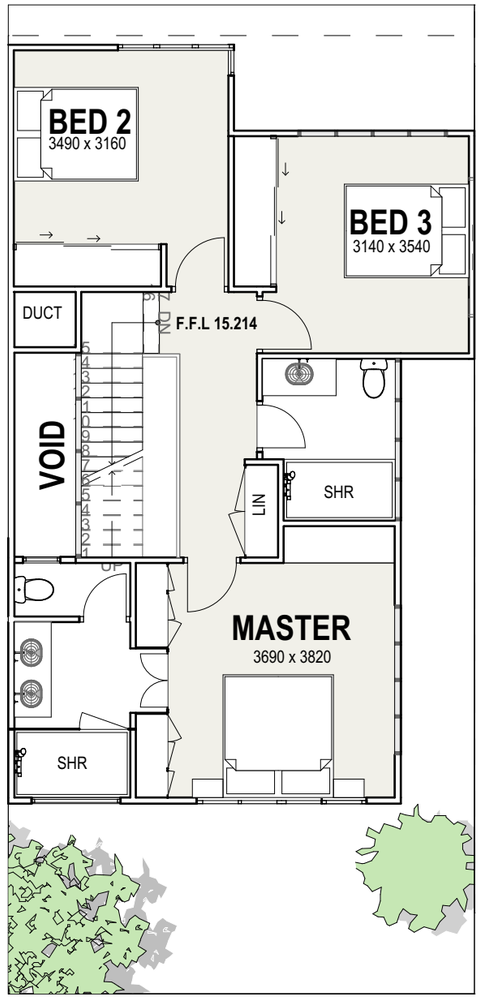

SECOND FLOOR
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BIG SKY DEVELOPMENTS

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Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :

UNITS
UNIT 4 FLOOR PLANS

PROJECT NAME :

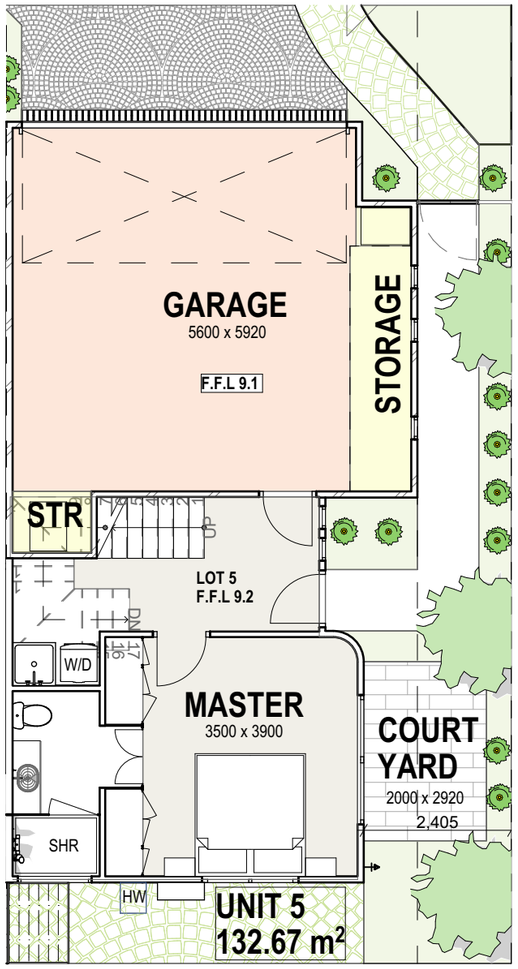
LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.

A300.4

City of Nedlands
Amended Plans Received
9 February 2022



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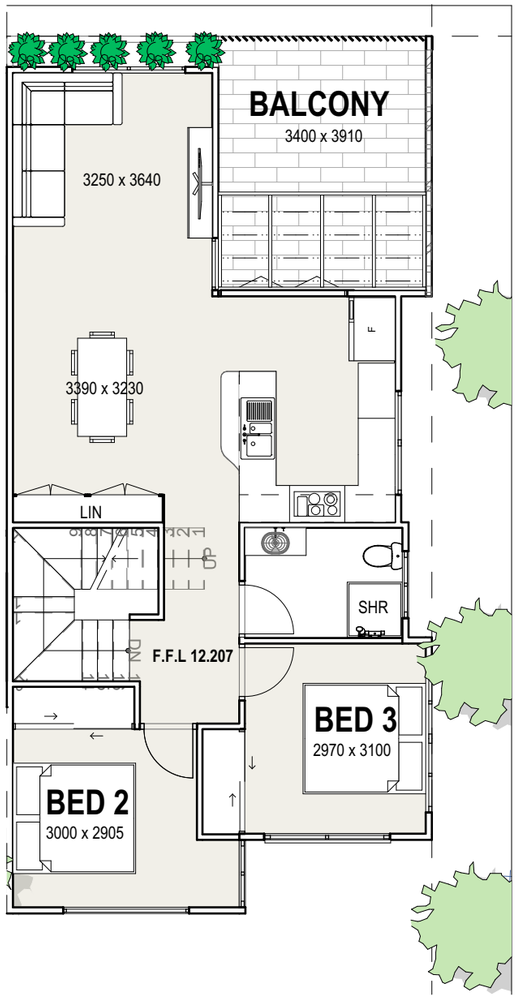

FIRST FLOOR
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N

BIG SKY
DEVELOPMENTS

© 2021

Drawn | Checked	BT |
Plot Date:	9/02/2022
Project NO.	#Project ID
Project Status	#Project Status
Client	#Client Full Name
Climate Zone	#Climate Zone
Wind Region	#Wind Region
Site:	#Site Full Address

DRAWING TITLE :

UNITS
UNIT 5 FLOOR PLANS

PROJECT NAME :

LOT 117 18 Tyrell St

REVISION NO.

DRAWING NO.

A300.5

16.3 PD12.03.33 Reconsideration of Development Application – Single House at 37C Kinninmont Avenue, Nedlands

Meeting & Date	Council - 22 March 2022
Applicant	Oswald Homes
Employee Disclosure under section 5.70 Local Government Act 1995	The author, reviewers and authoriser of this report declare they have no financial or impartiality interest with this matter. There is no financial or personal relationship between City staff and the proponents or their consultants.
Report Author	Roy Winslow – Manager Urban Planning
Director/CEO	Tony Free – Director Planning and Development
Attachments	1. Aerial Image and Zoning Map 2. Development Plans 3. Architectural Perspective Drawings 4. CONFIDENTIAL ATTACHMENT - Submissions

Purpose

The purpose of this report is for Council to reconsider a development application for a two-storey single house at 37C Kinninmont Avenue, Nedlands.
At the 23 November 2021 Ordinary Council Meeting (Refer item PD38.21), the application was refused by Council. Subsequent to Orders being set out by the State Administrative Tribunal (SAT) and amended development plans being received by the City, this application is presented to Council to reconsider the proposal and make a determination.

Recommendation

In accordance with Clause 68(2)(b) of the Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015,* Council approves the development application received on 15 July 2021 in accordance with the plans date stamped 8 February 2022 for a single house at 37C Kinninmont Avenue, Nedlands, subject to the following conditions:

1. **The development shall at all times comply with the application and the approved plans, subject to any modifications required as a consequence of any condition(s) of this approval.**

2. **All stormwater from the development, which includes permeable and non-permeable areas shall be contained onsite.**

3. **Prior to occupation, landscaping shall be installed and maintained in accordance with the approved plans, including the planting of one (1) tree with a minimum planting area of 2m x 2m. All landscaping shall be**

maintained for the lifetime of the development thereafter, to the satisfaction of the City.

4. **Prior to occupation, the screening as annotated on the approved plans shall be provided in accordance with the Residential Design Codes (Volume 1) by either:**

   a. **Fixed and obscured glass to a height of 1.6 metres above finished floor level;**
   b. **Fixed screening devices to a height of 1.6 meters above finished floor level that are at least 75% obscure and made of a durable material;**
   c. **A minimum sill height of 1.6 metres as above the finished floor level; or**
   d. **An alternative method of screening approved by the City.**

   The required screening shall be thereafter maintained to the satisfaction of the City of Nedlands.

5. **Prior to occupation of the development the external finish of the parapet walls is to be the same standard as the rest of the development in:**

   a. **Face brick;**
   b. **Painted render;**
   c. **Painted brickwork; or**
   d. **Other clean material as specified on the approved plans and maintained thereafter to the satisfaction of the City of Nedlands.**

6. **All building works to be carried out under this development approval are required to be contained within the boundaries of the subject lot.**

Voting Requirement

Simple Majority.

This report is of a quasi-judicial nature as it is a matter that directly affects a person's rights and interests. The judicial character arises from the obligation to abide by the principles of natural justice. Examples of Quasi-Judicial authority include town planning applications and other decisions that may be appealable to the SAT.

The decision must be made in a manner that is impartial, free from bias, and in accordance with the principles of natural justice. The decision must be made in having regard to the facts of the matter under consideration, and in accordane with the relevant laws and policies as they apply to that matter.

Discretionary considerations and judgments in the decision must be confined to those permitted to be considered under the laws and polices applicable to the matter and given such weight in making the decision as the relevant laws and polices permit them to be given.

Background

History

At the Ordinary Council Meeting on 23 November 2021, Council considered a proposed single house at 37C Kinninmont Avenue, Nedlands. Council resolved to refuse the application for the following reasons:

1. The proposed development does not meet the design principles of Clause 5.1.3 - Lot Boundary Setbacks of State Planning Policy 7.3 – Residential Design Codes (Volume 1) as the building is not setback from lot boundaries so as to reduce impacts of building bulk on adjoining properties.
2. The proposed development does not meet the design principles of Clause 5.2.2 - Garage Width of State Planning Policy 7.3 – Residential Design Codes (Volume 1) as the streetscape is dominated by the garage door and the visual connectivity between the dwelling and the streetscape is not maintained.

In December 2021, the applicant lodged an appeal with the SAT to review the decision. Subsequent to Orders being set out by SAT and amended development plans being received by the City in February 2022, this application is presented to Council to reconsider the proposal and make a determination.

Land Details

Metropolitan Region Scheme Zone	Urban
Local Planning Scheme Zone	Residential
R-Code	R60
Land area	337m^2
Land Use	Residential – Single House
Use Class	‘P’ Permitted Use

The subject lot is located 170m north of Stirling Highway. The site is currently vacant and is relatively flat.

The original lot at 37 Kinninmont Avenue, Nedlands was recently subdivided into three side-by-side lots. All lots have direct frontage to Kinninmont Avenue. This application relates to the southern lot of the subdivision.

The site is bound by the primary street – Kinninmont Avenue to the east and by residential properties to the north, west and south. All directly adjoining sites are also coded R60. The lot is regular in shape, with a frontage of 8.5m and a total area of 337m^2.

Discussion

Amended Plans
Pursuant to the Order set out by the Tribunal, the City has received amended plans which provide the following:

- A cross section of the southern elevation displaying an outline of the existing vegetation along the lot boundary between 37C and 39 Kinninmont Avenue, Nedlands.
- The vegetation is also shown on the southern boundary fence image, the upper floor plan and supporting renders.
- A revised front elevation to provide Colorbond cladding to the garage door and its surrounds.
- A revised upper floor façade incorporating recycled exposed red brick, which wraps around the master bedroom wall facing south.
- A modified arbour along the southern elevation which is made of steel frame portal columns, leading from the front of the dwelling to the entry door along the south side.
- Additional architectural perspective drawings to assist with the visual representation of the final built form.

Assessment of Statutory Provisions
If a proposal does not satisfy the deemed to-comply provisions of the R-Codes, Council is required to exercise a judgement of merit to determine the proposal against the design principles of the R-Codes. The R-Codes require the assessment to consider the relevant design principle only and to not apply the corresponding deemed-to-comply provisions. It is recommended that the application be approved by Council as it is considered to satisfy the design principles of the R-Codes. Further, it is considered unlikely that the development will have a significant adverse impact on the local amenity and character of the locality.

Local Planning Scheme No.3
Schedule 2, Clause 67(2) (Consideration of application by Local Government) – identifies those matters that are required to be given due regard to the extent relevant to the application. Where relevant, these matters are discussed in the following sections. Overall, the development is considered to meet these objectives, particularly in regard to height, scale, bulk and appearance, and the potential impact it will have on the local amenity.

State Planning Policy 7.3 - Residential Design Codes – Volume 1
State Planning Policy 7.3 Residential Design Codes Volume 1 (R-Codes) apply to all single and grouped dwelling developments. An approval under the R-Codes can be obtained in one of two ways. This is by either meeting the deemed-to-comply provisions or via a design principle assessment pathway.

The proposed development is seeking a design principle assessment pathway for parts of this proposal, relating to lot boundary setbacks, garage width and visual privacy. As required by the R-Codes, Council in assessing the proposal against the design principles, should not apply the corresponding deemed-to-comply provisions. All other areas meet the deemed-to-comply provisions.

Clause 5.1.3 – Lot boundary setbacks
The design principles for lot boundary setbacks consider the impact of building bulk on adjoining properties, providing adequate sun and ventilation and minimising overlooking. Council's reason for refusal included:

1. The proposed development does not meet the design principles of Clause 5.1.3 - Lot Boundary Setbacks of State Planning Policy 7.3 – Residential Design Codes (Volume 1) as the building is not setback from lot boundaries so as to reduce impacts of building bulk on adjoining properties.

Northern Upper Floor Setback

The wall from the office to the ensuite of the upper floor is setback 1.8m to the northern lot boundary. The proposed northern lot boundary setback is considered to meet the design principles as:

- The upper floor of the dwelling facing north incorporates four wall articulations between the balcony at the front and Bedroom 3 at the rear. The provided setbacks varying from 1.2m to 1.8m will allow the perception of building bulk to be broken up through the articulated walls.
- The northern elevation of the upper floor proposes highlight windows to Bedroom 2, Bedroom 3 and the office to protect the visual privacy of the future dwelling at 37B Kinninmont Avenue. The remainder of the windows facing north are minor openings. Therefore, the visual privacy provisions of the R-Codes are not applicable to these windows.
- The northern adjoining lot is currently vacant. In the design stage, the future dwelling of the northern lot can consider the layout, design and proposed setbacks of this application in their proposal.
- In the context of ventilation, the proposed development meets the provisions outlined in the R-Codes for open space. The proposed open space and setbacks ranging from 1.2m to 1.8m will allows airflow around the dwelling and neighbouring properties.
- In relation to the balcony, an assessment is provided against the design principles for visual privacy under Clause 5.4.1 below.

Southern elevation

The wall from the staircase to the balcony of the upper floor is set back 1.3m and the hallway is setback 2.4m from the southern lot boundary. The proposed southern lot boundary setbacks are considered to meet the design principles as:

- The upper floor of the dwelling facing south incorporates five wall articulations between the balcony at the front and Bedroom 3 at the rear. The provided setbacks, varying from 1.3m to 2.4m, will allow the perception of building bulk to be broken up through the articulated walls.

- The southern elevation incorporates various colours (renders) and materials (recycled exposed red brick) so as to provide visual interest and reduce the perception of building bulk. The southern elevation is shown in Figure 1 below.

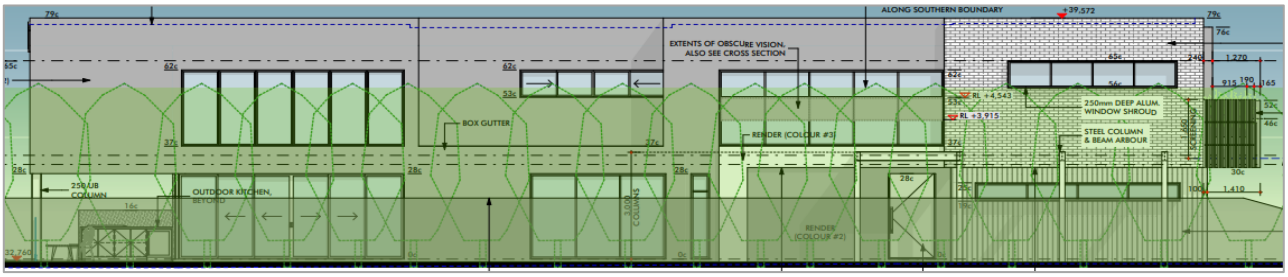


Figure 1: Southern elevation showing varying colours and materials

- Along the entire southern lot boundary, within the boundary of 39 Kinninmont Avenue, there is existing mature landscaping consisting of a dense treeline. The landscaping, which is approximately 5m in height, will provide vegetative screening of the proposed development. The landscaping is shown in Figure 1 above. As shown in the architectural perspective drawing of Figure 2 below, the ground floor will be screened by the landscaping, along with a majority of the upper floor.

Figure 2: Render of existing vegetation and view of proposed dwelling from neighbour's perspective from eye level.

- On the upper floor facing south, the master bedroom proposes highlight windows to protect visual privacy to the south. The windows to the stairs, hallway and void facing south are defined by the R-Codes as minor openings. Therefore, the visual privacy provisions of the R-Codes are not applicable to these windows.
- Notwithstanding, the applicant has proposed a band of obscure film on the window to the staircase facing south to limit the view from the staircase and landing. The obscure band is provided over and above the deemed-to-comply provisions of the R-Codes. The glazing is shown in Figure 1.

- The existing vegetation along the entire southern boundary provides a visual screen from the windows of the staircase, hallway and void facing south. As shown in Figure 3 below, the vegetation limits the line of sight and obscures views facing directly into the open space of the southern adjoining property. The line of sight is limited to a view of the sky.

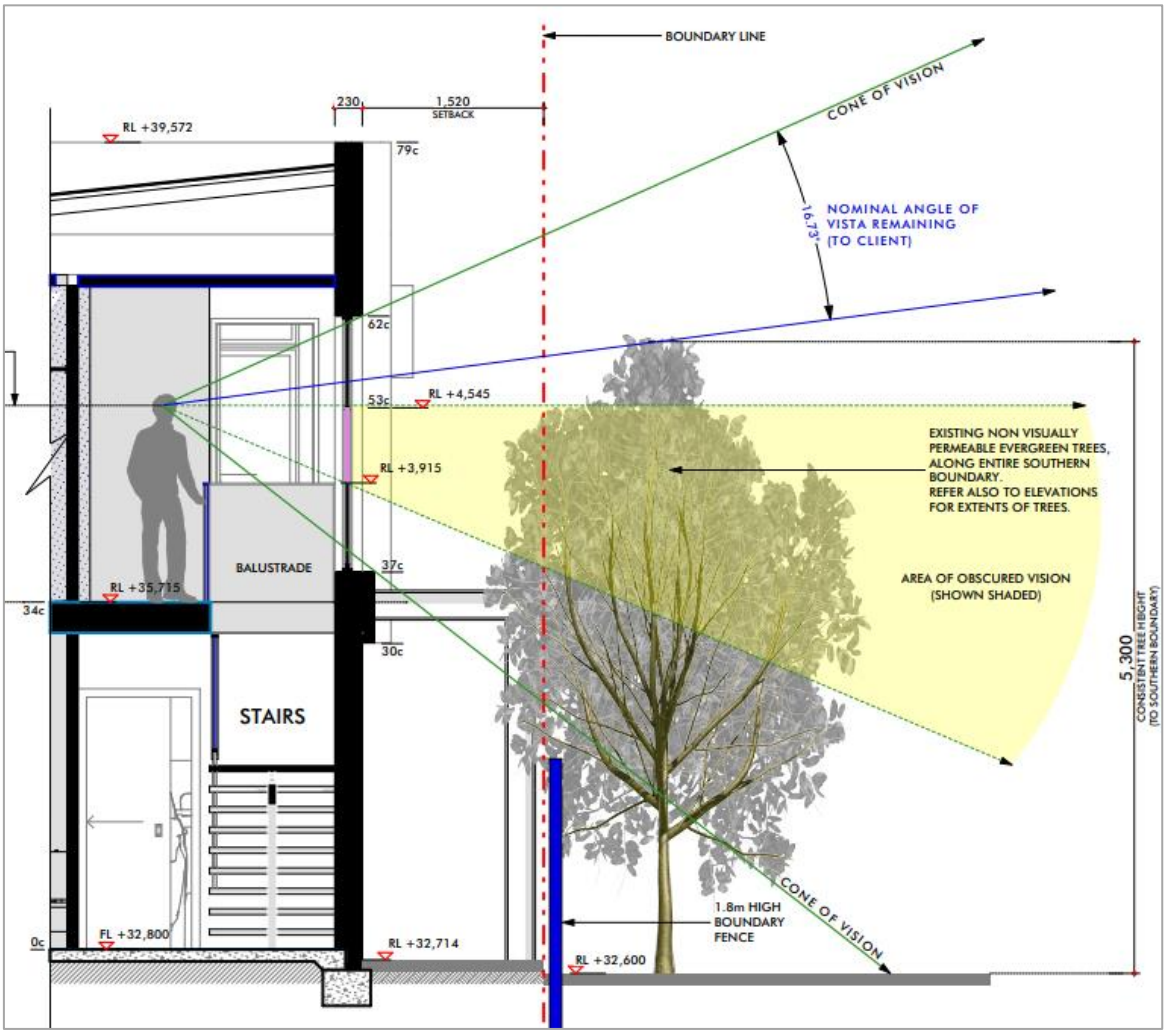


Figure 3: Cross-section showing line of sight facing south.

- The proposed development meets the deemed-to-comply provisions of Clause 5.4.2 – Solar Access for Adjoining Sites. Although the overshadowing from the development will fall over the open space of the southern lot, the application cannot be assessed against the design principles as the deemed-to-comply provisions have been met.
- The open space provision and setbacks ranging from 1.3m to 2.4m will allow access to natural sunlight and ventilation to the subject site and adjoining properties.
- In relation to the balcony, an assessment is provided against the design principles for visual privacy under Clause 5.4.1 below.

Clause 5.2.2 – Garage width

Council's second reason for refusal was:

2. The proposed development does not meet the design principles of Clause 5.2.2 - Garage Width of State Planning Policy 7.3 – Residential Design Codes (Volume 1) as the streetscape is dominated by the garage door and the visual connectivity between the dwelling and the streetscape is not maintained.

The subject site has an 8.5m wide frontage. The development proposes a garage width of 74% of the frontage (6.3m). The garage width has been assessed against the design principles which consider the visual connectivity between the dwelling and the streetscape to be maintained and the effect of the garage door on the streetscape being minimised so that the streetscape is not dominated by garage doors.

In order to reduce the visual impact of the garage door on the streetscape, the development proposes:

- The original plans proposed a sectional Colorbond garage door and brickwork to the garage surrounds. An updated front elevation of the garage proposes Colorbond cladding to the garage door and its surrounds to minimise the effect of the garage door on the streetscape (see Figure 4 below);
- An arbour along the southern elevation to lead pedestrians to the entry of the dwelling;
- Soft landscaping on both sides of the driveway;
- Reduced driveway width;
- A tree in the south-western corner of the front setback area; and
- An upper floor balcony above the garage which cantilevers over the garage door line to provide articulation and reduce the visual dominance of the garage door.

Figure 4: Architectural perspective drawing of the front façade displaying the cladding on the garage, landscaping of the driveway, tree in the front setback area and upper floor cantilever.

Clause 5.4.1 – Visual privacy

The front portion of the balcony (eastern elevation) facing Kinninmont Avenue is seeking an assessment against the design principles. The design principles for visual privacy consider the minimal overlooking of active habitable spaces and outdoor living areas of adjacent dwellings and maximum visual privacy to side and rear boundaries.

- No direct overlooking is proposed from the balcony, and the majority of oblique overlooking is confined to the street setback area. The balcony is provided with screening along the northern and southern elevations to provide visual privacy to the respective adjoining lots. The screening ensures there is no direct overlooking and that visual privacy is maintained behind the front setback area. This is shown in Figure 5 below.

- The indirect overlooking from the eastern elevation (front) of the balcony facing north and south falls primarily in the front setback areas of the adjoining lots. The indirect overlooking does not fall over an active habitable space or outdoor living area. As shown in Figure 5 below, the area of indirect overlooking is minimal with 0.2m^2 of overlooking to the north and 0.1m^2 of overlooking to the south behind the front setback area. It is noted that the indirect overlooking to the south will be screened by the existing vegetation. This is shown in the image below.

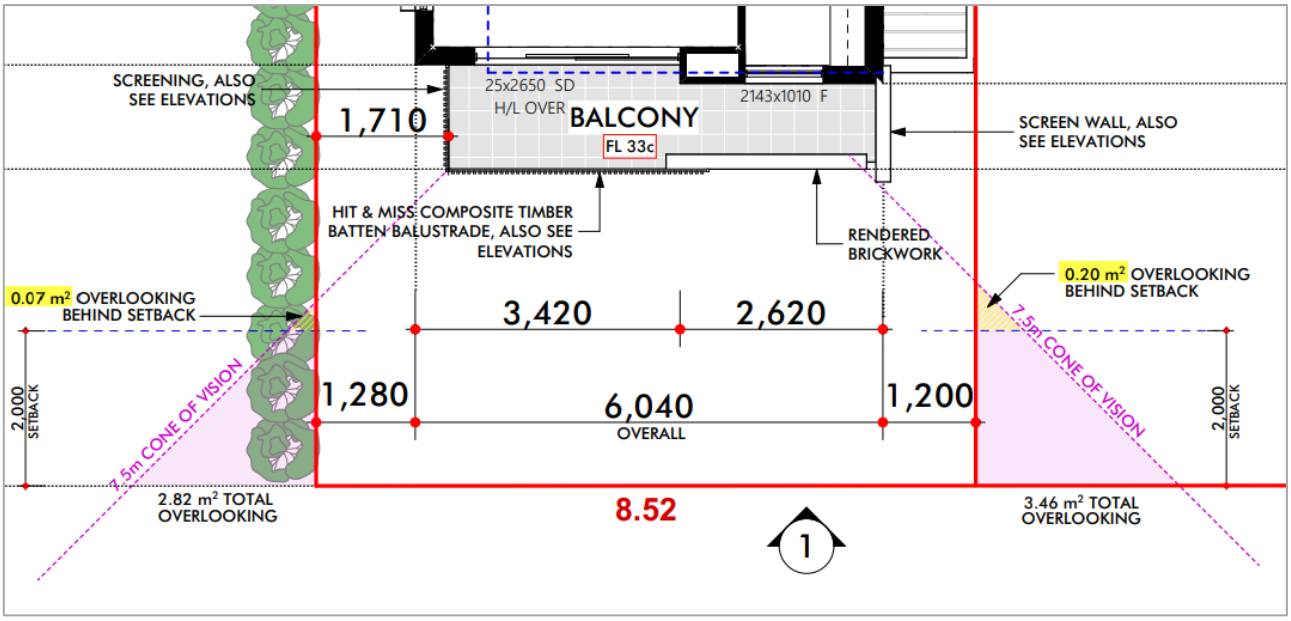


Figure 5: Area of indirect overlooking to adjoining properties and screening along the northern and southern elevations of the balcony.

- The indirect overlooking to the side adjoining properties is a result of the portion of the balcony on the front elevation of the balcony which faces Kinninmont Ave. This allows for passive surveillance of the street.

- The design of the building, the internal layouts and the screening provided ensure that all other upper floor major openings protect the visual privacy of the adjoining sites in accordance with the deemed-to-comply provisions of the R-Codes.

Consultation

The development application was originally advertised in accordance with the City's Local Planning Policy - Consultation of Planning Proposals to 20 adjoining properties. The application was advertised for a period of 14 days from 15 September 2021 to 29 September 2021. At the close of the advertising period, three objections were received.
Please refer to the original council report presented to Council on 23 November 2021 (Refer item PD38.21) for a summary of the comments from the consultation and the Administration's response and action taken in relation to each issue.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Vision Our city will be an environmentally-sensitive, beautiful and inclusive place.

Values **Great Natural and Built Environment**

We protect our enhanced, engaging community spaces, heritage, the natural environment and our biodiversity through well-planned and managed development.

Priority Area Urban form - protecting our quality living environment

Budget/Financial Implications

It is noted that the SAT has the ability to award costs in certain circumstances, should the matter proceed to a full hearing.

Legislative and Policy Implications

Pursuant to section 31 of the *State Administrative Tribunal Act 2004 (WA),* Council is invited to reconsider its decision for the single house at 37C Kinninmont Avenue, Nedlands.

Council is requested to make a decision in accordance with clause 68(2) of the Deemed Provisions. Council may determine to approve the development without conditions (cl.68(2)(a)), approve with development with conditions (cl.68(2)(b)), or refuse the development (cl.68(2)(c)).

Decision Implications

If Council resolves to approve the proposal, any tentative SAT hearing will likely be vacated and development can proceed after receiving a Building Permit and necessary clearances. In the event of a refusal, the applicant will have the right of review through a full hearing at which the Tribunal will be the final decision-maker.

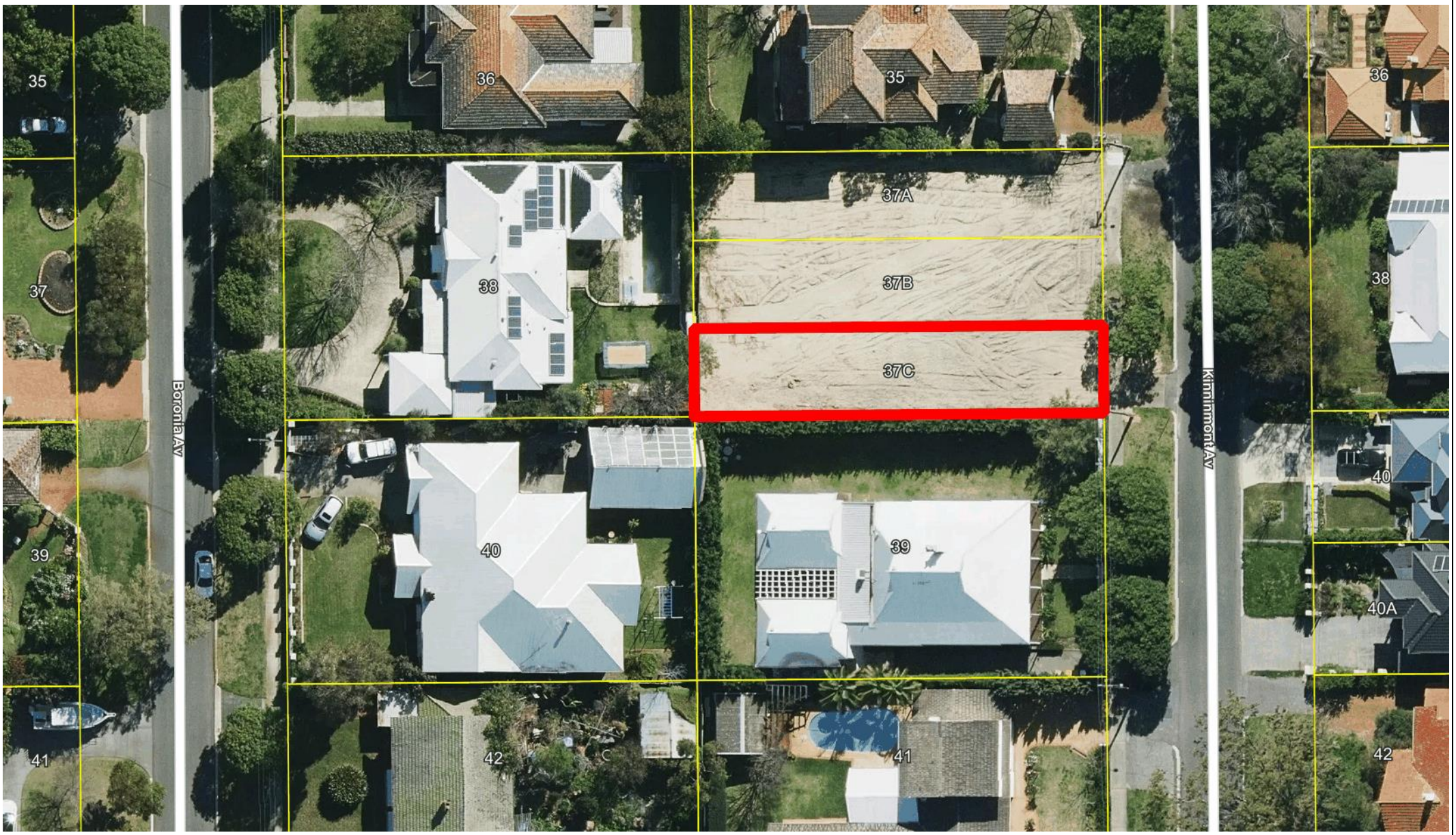
Conclusion

The application for a two-storey single house at 37C Kinninmont Avenue, Nedlands has been presented to Council for reconsideration under section 31 of the *State Administrative Tribunal Act 2004 (WA).* With the updated development plans and supporting information, the proposal is considered to meet the key amenity related elements of R-Codes Volume 1 and as such is unlikely to have a significant adverse impact on the local amenity of the area. The proposal has been assessed and satisfies the design principles of the R-Codes and being consistent with the immediate locality and streetscape character.

Accordingly, it is recommended that the application be approved by Council, subject to conditions of Administration's recommendation.

Further Information

Nil.



City of Nedlands

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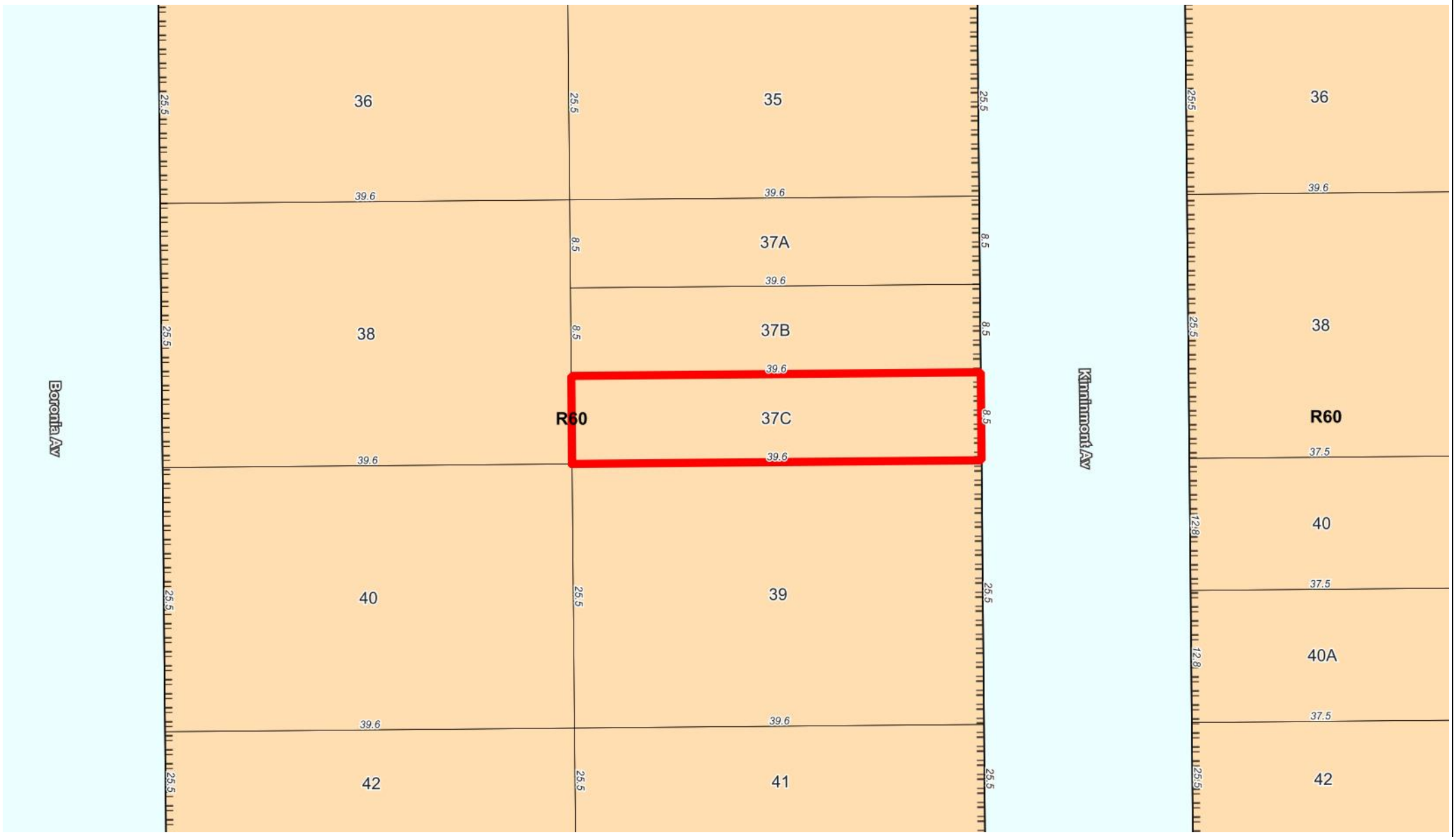
Aerial Image – 37C Kinninmont Avenue, Nedlands

8/02/2022

1:500



City of Nedlands	The City of Nedlands accepts no responsibility for the accuracy of this image or the results of any actions taken when using this image	Zoning Map – 37C Kinninmont Avenue, Nedlands	8/02/2022 1:500	

COTTAGE & ENGINEERING SURVEYS
Licensed Surveyors ©
87-89 Guthrie Street, Osborne Park, Western Australia
Telephone: (08) 9446 7361 Facsimile: (08) 9445 2998
Email : perth@cottage.com.au Website: www.cottage.com.au

J/N:	DATE:	SCALE:	DRAWN:
486103	18 Nov 20	1:200	B. Saliba

Builder : Property Development and Capital Pty Ltd (OLD AREA)
CLIENT :
LOT 274 #37 Kinninmont Avenue, Nedlands
Plan3492

LEGEND	
	SEC Dome
	Power Pole
T C	Phone Pits
W	Water Conn.
[TP10.00]	Top Pillar/Post
[TW10.00]	Top Wall
[TR10.00]	Top Retaining
[TF10.00]	Top Fence

City of Nedlands
Amended Plans
Received
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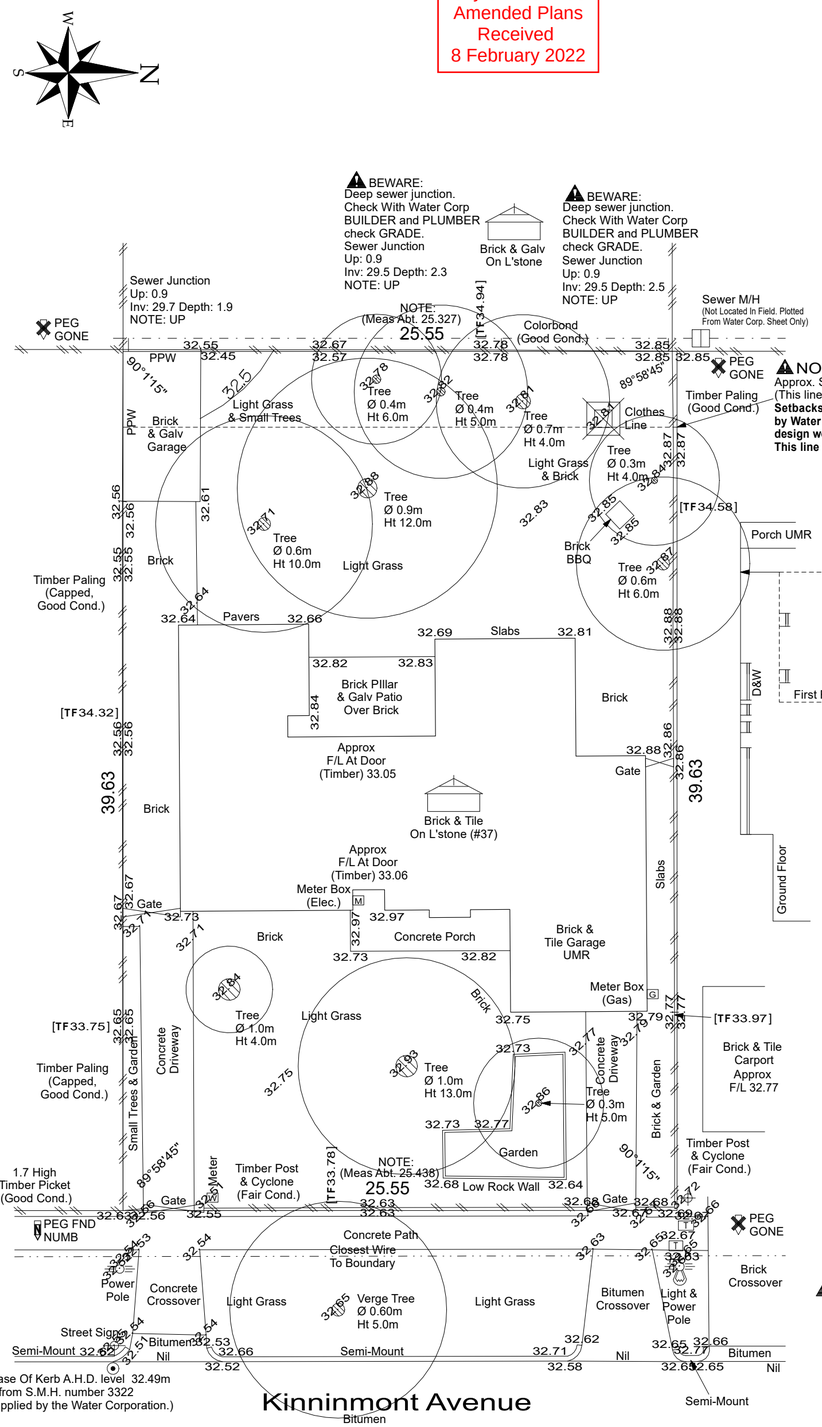
DISCLAIMER:
Lot boundaries drawn on survey are based on landgate plan only. Survey does not include title search and as such may not show easements or other interests not shown on plan. Title should be checked to verify all lot details and for any easements or other interests which may affect building on the property.

DISCLAIMER:
Survey does not include verification of cadastral boundaries. All features and levels shown are based on orientation to existing pegs and fences only which may not be on correct cadastral alignment. Any designs based or dependent on the location of existing features should have those features' location verified in relation to the true boundary.

DISCLAIMER:
Survey shows visible features only and will not show locations of underground pipes or conduits for internal or mains services. Verification of the location of all internal and mains services should be confirmed prior to finalisation of any design work.

DISCLAIMER:
Cottage & Engineering surveys accept no responsibility for any physical on site changes to the parcel or portion of the parcel of land shown on this survey including any adjoining neighbours levels and features that have occurred after the date on this survey. All Sewer details plotted from information supplied by Water Corporation.

DISCLAIMER:
Due to lack of survey marks/pegs, all building offset dimensions & features are approximate only and positioned from existing pegs/fences and walls which may not be on the correct alignment. Any design that involves additions to any structures shown or portion of structures remaining after any demolition has taken place requires boundaries to be repegged and exact offsets provided to your designer/architect before any plans are produced and before any work is started on site.



EXISTING SITE SURVEY
1:200

LOT MISCLOSE
0.000 m

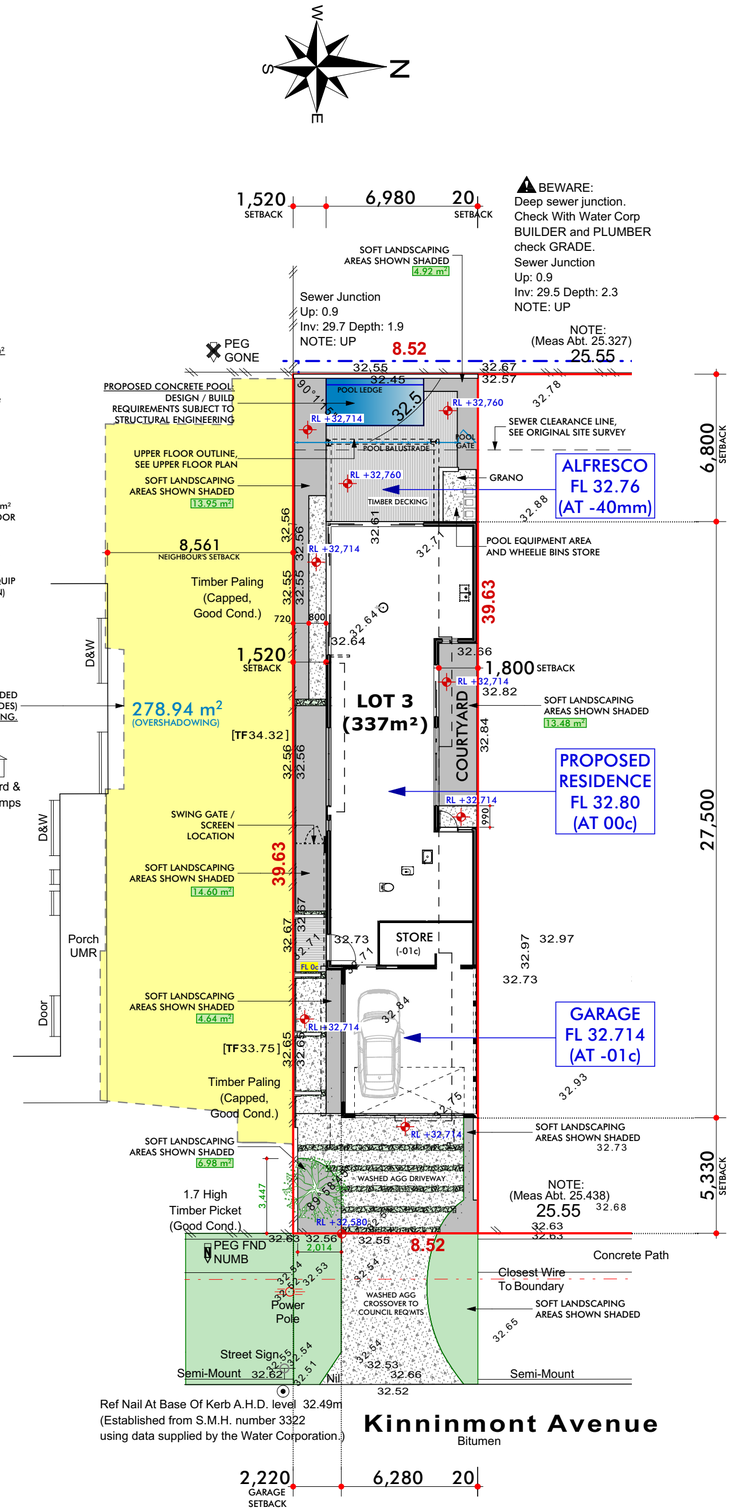
SOIL DESCRIPTION
Sand
Refer to Survey

Scale 1:200
0 2 4 6 8

SITE COVERAGE
SITE AREA = 337.00 m²
FLOOR AREA = 171.00 m²
SITE COVERAGE = 50.74 %

SITE COVERAGE CALC'S:
- R60 SITE ZONING
- FLOOR AREA:
GROUND + GARAGE (& STORE)
118.8 + 52.20m²
171.0m²

LANDSCAPING LEGEND:
- SOFT LANDSCAPING (MULCH) AREAS = 55.15m²
- LAWN / GRASS = 23.18m²
- POOL = 9.81m²
- TIMBER DECKING = 34.75m² (ALFRESCO / REAR OUTDOOR LIVING & PORCH)
- WASHED AGG = 89.51m² (CROSSOVER, DRIVEWAY, L'DRY LANDING, POOL EQUIP & WALKWAY OFF KITCHEN)



PROPOSED SITE PLAN
1:200

THE PURSER RESIDENCE
LOT 3 (PROPOSED) #37 KINNINMONT AVE NEDLANDS
Consultant : Marek Designer : Franco Date : 8/02/2022
File: W:\JOBS\MASTER\30000 - 39999\ (Franco\wd\)\39168 Purser\Working Drawings\Drawings\Purser V3.6 - PLANNING Rev 5.pln

OSWALD HOMES
EST 1972

2 OF 5

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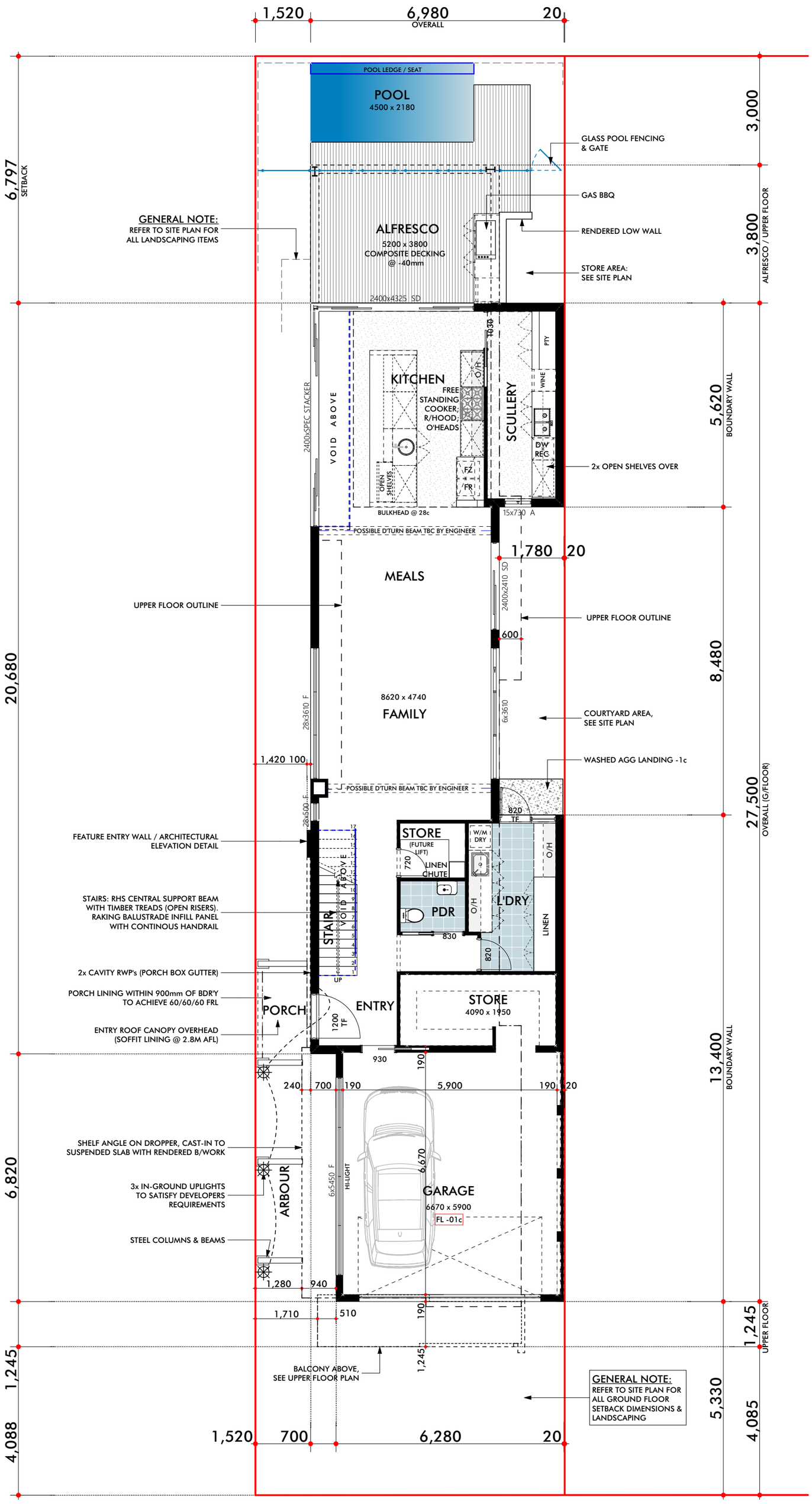
Roof Area Calculation - All Floors			
Floor	Pitch	Area (flat)	Area (pitched)
GROUND FLOOR			
	3° 0' 0"	25.96	25.99
		25.96 m²	25.99 m²
UPPER FLOOR			
	6° 0' 0"	168.85	169.78
		168.85 m²	169.78 m²
		194.81 m²	195.77 m²

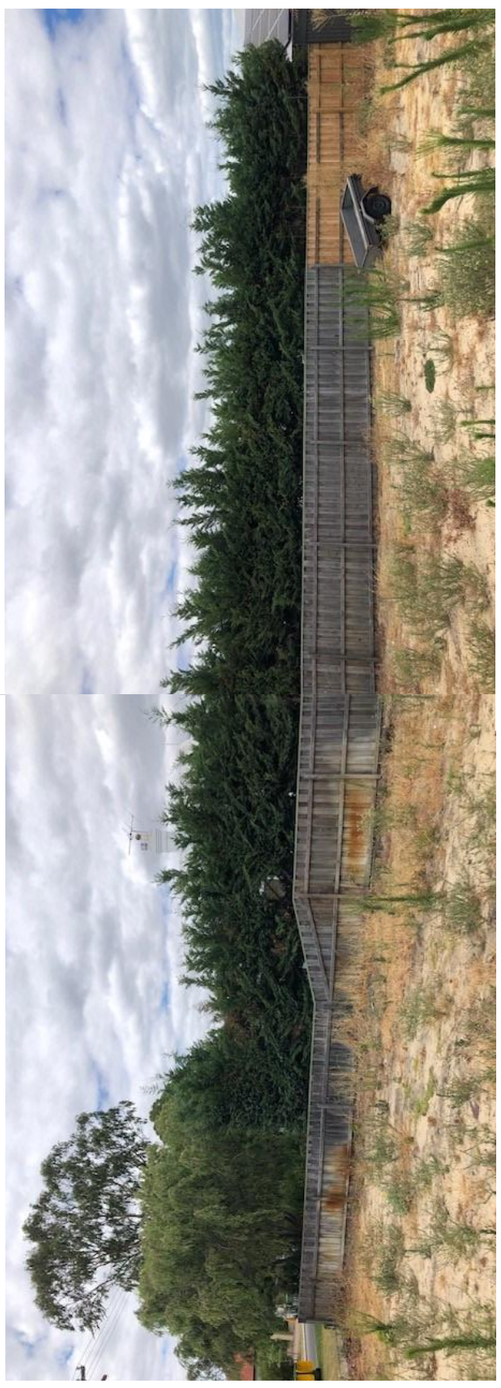
AREAS:

GROUND FLOOR	
PORCH	5.44
GROUND LIVING	118.81
GARAGE & STORE	52.20
ALFRESCO	19.76
	196.21 m²

UPPER FLOOR	
UPPER LIVING	166.23
BALCONY	6.81
	173.04 m²
	369.25 m²

City of Nedlands
Amended Plans
Received
8 February 2022





SOUTHERN BOUNDARY FENCE IMAGE
(DATE: JANUARY 2022)

GROUND FLOOR PLAN
1:100

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Consultant : Marek Designer : Franco Date : 8/02/2022
File : W:\JOBS MASTER\300000 - 399999 (Framework)\301618 Purser\Working Drawings\Design\Purser V3.6 - PLANNING Rev 5.pln

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		168.85 m²	169.78 m²
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AREAS:

GROUND FLOOR	
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UPPER FLOOR	
UPPER LIVING	166.23
BALCONY	6.81
	173.04 m²
	369.25 m²

OVERSHADOWING NOTE:
REFER TO SITE PLAN FOR EXTENT / OVERSHADOWING DIAGRAM

UPPER FLOOR PLAN
1:100

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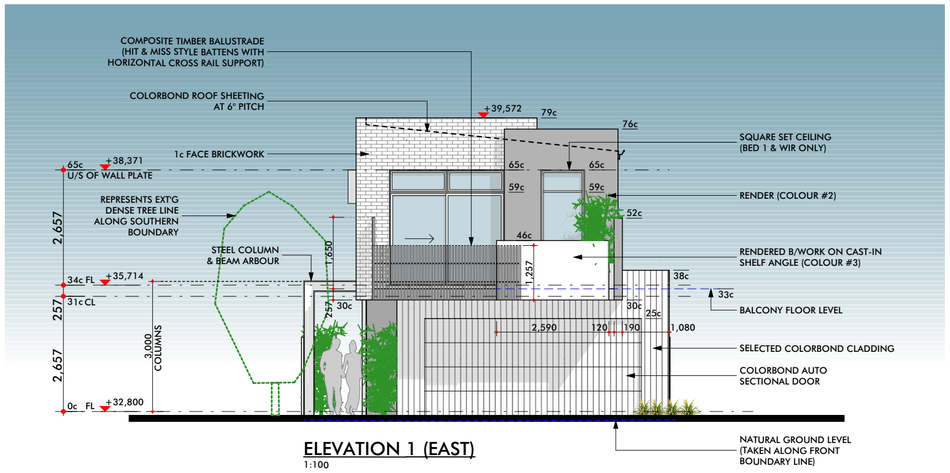
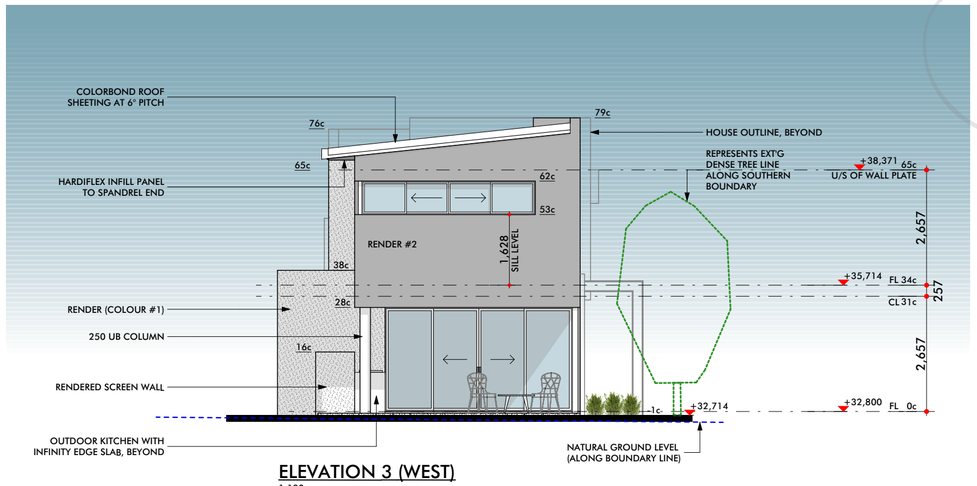
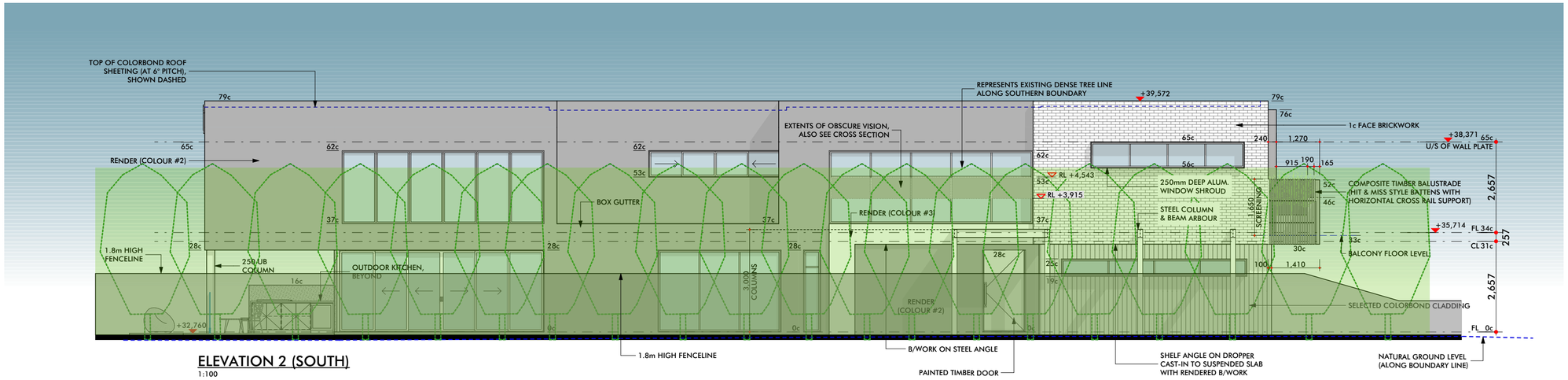


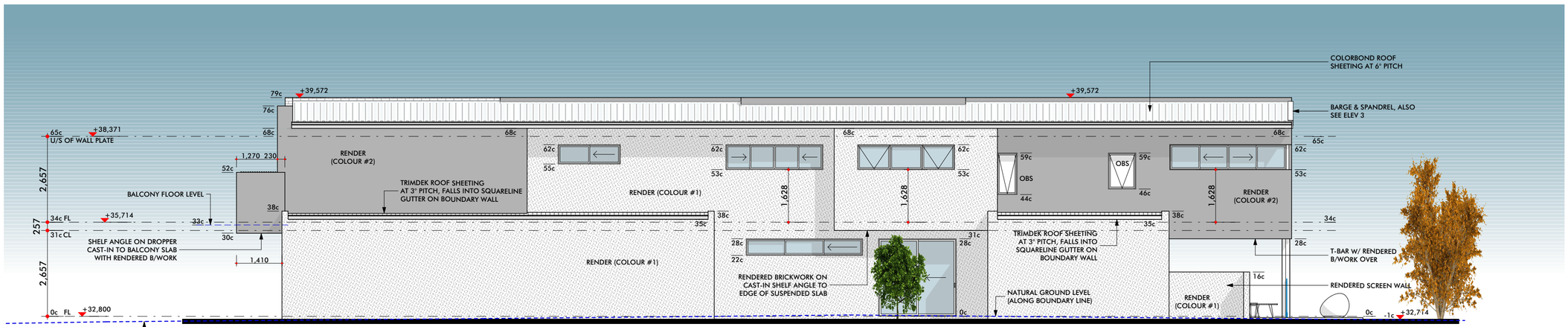
ELEVATION 1 (EAST)
1:100



ELEVATION 3 (WEST)
1:100



ELEVATION 2 (SOUTH)
1:100



ELEVATION 4 (NORTH)
1:100

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Consultant : Marek Designer : Franco Date : 8/02/2022

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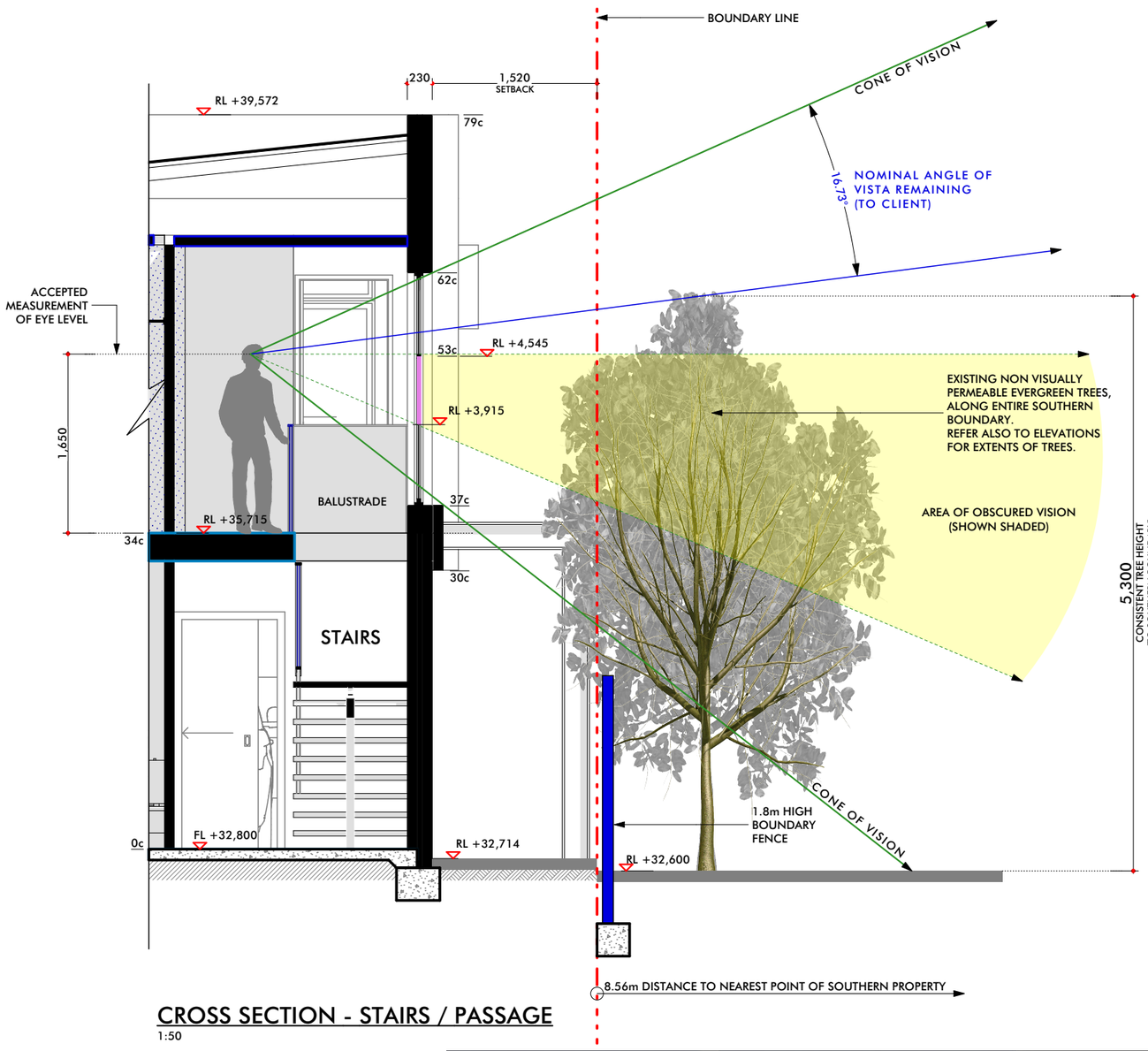
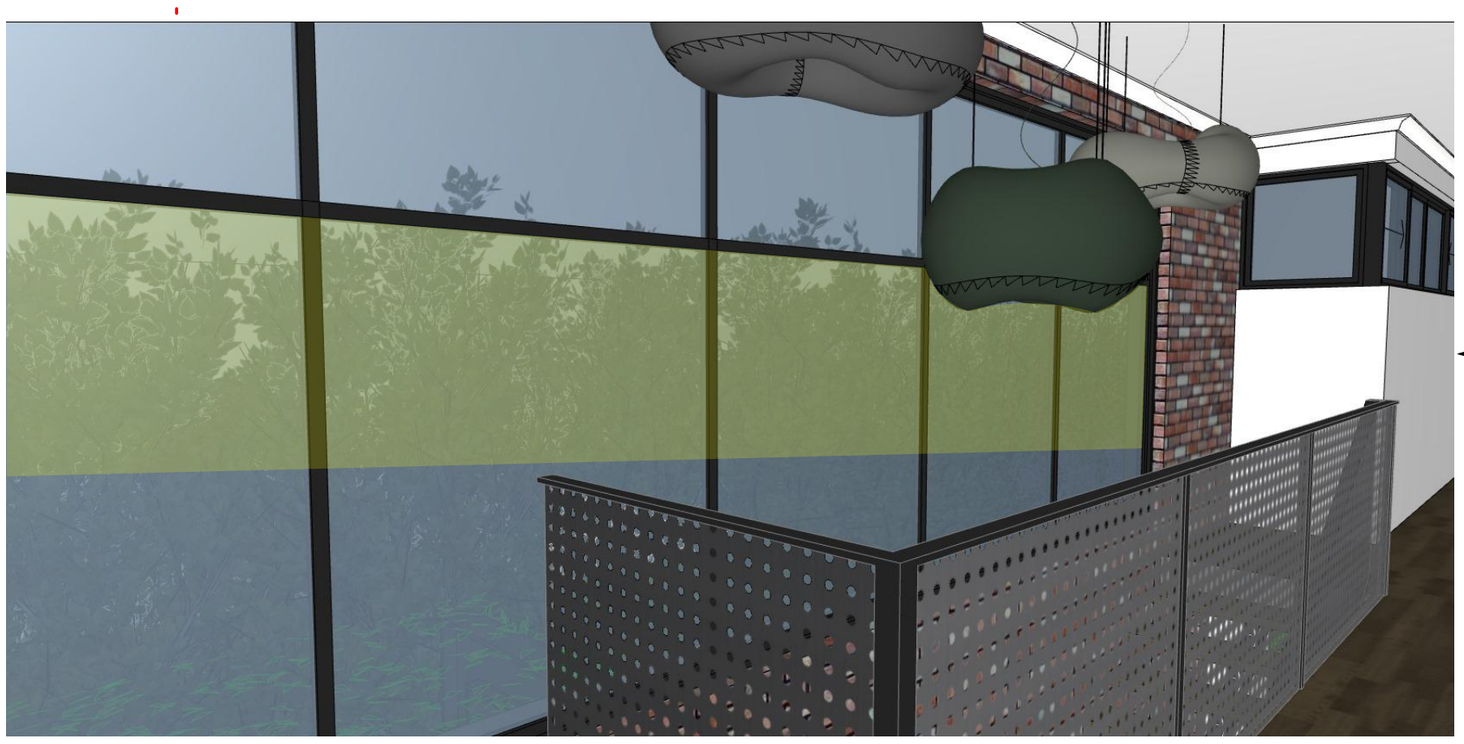


CROSS SECTION - STAIRS / PASSAGE
1:50

001 STAIR CROSS SECTION 3D VIEW



PERSPECTIVE VIEW OF EXISTING SOUTHERN NEIGHBOUR (FROM PASSAGE WAY OF UPPER FLOOR)

NEIGHBOUR'S PERSPECTIVE VIEW FROM EYE LEVEL, OF PROPOSED NEW RESIDENCE

NEIGHBOUR'S PERSPECTIVE VIEW FROM EYE LEVEL, OF PROPOSED NEW RESIDENCE

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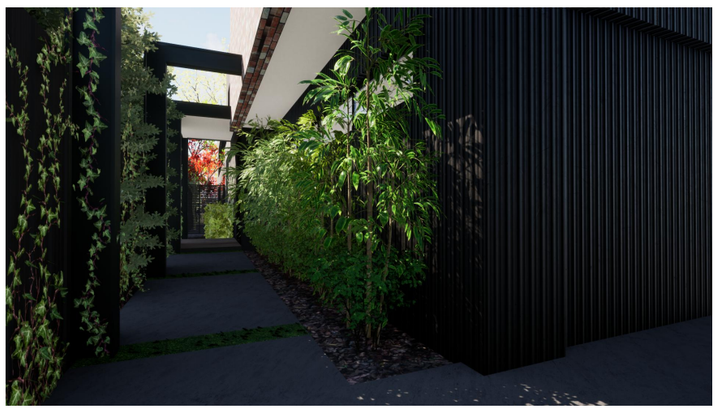

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16.4 PD13.03.22 Consideration of Development Application – Rear Addition to a Single House at 89 Stanley Street, Nedlands

Meeting & Date	Council - 22 March 2022
Applicant	Premier One Constructions
Employee Disclosure under section 5.70 Local Government Act 1995	The author, reviewers and authoriser of this report declare they have no financial or impartiality interest with this matter. There is no financial or personal relationship between City staff and the proponents or their consultants.
Report Author	Roy Winslow – Manager Urban Planning
Director/CEO	Tony Free – Director Planning and Development
Attachments	1. Aerial Image and Zoning Map 2. Development Plans 3. CONFIDENTIAL ATTACHMENT - Submission

Purpose

The purpose of this report is for Council to consider a development application for the addition of an above ground cellar to the rear of the existing single house at 89 Stanley Street, Nedlands.

Recommendation

In accordance with Clause 68(2)(b) of the Deemed Provisions of the *Planning and Development (Local Planning Schemes) Regulations 2015,* Council approves the development application received on 18 November 2021 in accordance with the plans date stamped 31 January 2022 for rear additions to a single house at 89 Stanley Street, Nedlands, subject to the following conditions:

1. **The development shall at all times comply with the application and the approved plans, subject to any modifications required as a consequence of any condition(s) of this approval.**

2. **All stormwater from the development, which includes permeable and non-permeable areas shall be contained onsite.**

3. **All building works to be carried out under this development approval are required to be contained within the boundaries of the subject lot.**

Voting Requirement

Simple Majority.

This report is of a quasi-judicial nature as it is a matter that directly affects a person's rights and interests. The judicial character arises from the obligation to abide by the principles of

natural justice. Examples of Quasi-Judicial authority include town planning applications and other decisions that may be appealable to the State Administrative Tribunal.

The decision must be made in a manner that is impartial, free from bias, and in accordance with the principles of natural justice. The decision must be made in having regard to the facts of the matter under consideration, and in accordance with the relevant laws and policies as they apply to that matter.

Discretionary considerations and judgments in the decision must be confined to those permitted to be considered under the laws and polices applicable to the matter and given such weight in making the decision as the relevant laws and polices permit them to be given.

Background

Land Details

Metropolitan Region Scheme Zone	Urban
Local Planning Scheme Zone	Residential
R-Code	R10
Land area	1012m^2
Land Use	Residential – Single House
Use Class	‘P’ Permitted Use

The site is located at 89 Stanley Street, Nedlands. The site is currently occupied by a two-storey single house.

This application proposes the addition of an above ground cellar which is connected to the rear of the dwelling. The cellar will be accessible via the existing covered alfresco. In order to facilitate the proposed cellar position, some of the existing planter boxes in the garden will be removed and the balustrade of the balcony above will be modified.

Discussion

Assessment of Statutory Provisions

If a proposal does not satisfy the deemed to-comply provisions of the R-Codes, Council is required to exercise a judgement of merit to determine the proposal against the design principles of the R-Codes. The R-Codes require the assessment to consider the relevant design principle only and to not apply the corresponding deemed-to-comply provisions. It is recommended that the application be approved by Council as it is considered to satisfy the design principles of the R-Codes. Further, it is considered unlikely that the development will have a significant adverse impact on the local amenity and character of the locality.

Local Planning Scheme No.3
Schedule 2, Clause 67(2) (Consideration of application by Local Government) – identifies those matters that are required to be given due regard to the extent relevant to the application. Where relevant, these matters are discussed in the following sections. Overall, the development is considered to meet these objectives, particularly in regard to height, scale, bulk and appearance, and the potential impact it will have on the local amenity.

State Planning Policy 7.3 - Residential Design Codes – Volume 1
State Planning Policy 7.3 Residential Design Codes Volume 1 (R-Codes) applies to all single and grouped dwelling developments. An approval under the R-Codes can be obtained in one of two ways. This is by either meeting the deemed-to-comply provisions or via a design principle assessment pathway.

The proposed development is seeking a design principle assessment pathway for parts of this proposal, relating to lot boundary setbacks. As required by the R-Codes, Council in assessing the proposal against the design principles, should not apply the corresponding deemed-to-comply provisions. All other areas meet the deemed-to-comply provisions.

Clause 5.1.3 – Lot boundary setbacks
The cellar proposes a 5m setback to the western lot boundary (rear). The addition meets the deemed-to-comply setback to the southern lot. The design principles for lot boundary setbacks consider the impact of building bulk on adjoining properties, providing adequate sun and ventilation and minimising overlooking. The proposed western (rear) lot boundary setback is considered to meet the design principles as:

- The cellar is proposed to be finished in similar materials to the external façade of the existing dwelling. The roof of the cellar in its design and form is also similar to the roof of the existing dwelling. It is considered the elevational treatment of the cellar is compatible to and consistent with the remainder of the dwelling. With the design of the cellar and the setback of 5m to the west, the cellar is not likely to negatively impact the adjoining properties in relation to bulk.
- Ventilation is maintained by the 5m setback to the western lot boundary and open space provided within the rear setback area.
- Overshadowing for the proposal meets the deemed-to-comply provisions.
- The cellar is not considered to be a “habitable room/space” as defined in the R-Codes. The proposed use of the cellar is for the storage of wine. As such, the cellar is considered to be a space of specialised nature occupied neither frequently nor for extended periods. Therefore, visual privacy is not applicable.

Consultation

The development application was advertised in accordance with the City’s Local Planning Policy - Consultation of Planning Proposals to five adjoining properties. The application was advertised for a period of 14 days from 30 November 2021 to 14 December 2021. At the close of the advertising period, one objection was received.

The following is a summary of the concerns/comments raised and the Administration’s response and action taken in relation to each issue:

1. The application does not meet the deemed-to-comply setbacks to the south prescribed under the R-Codes.

The cellar provides a 1.2m setback to the southern lot boundary which meets the deemed-to-comply setbacks prescribed by the R-Codes. The cellar is seeking a judgement of merit for the setback to the western lot boundary (rear). Please see the report above for the Design Principles assessment on lot boundary setbacks.

2. The cellar addition will contribute to building bulk and reduce the amenity for the adjoining property.
   Amended plans were received on 31 January 2022 to increase the setback to the western lot boundary to by 0.5m to 5m and decrease the height of the cellar by 0.5m to 5.5m. Please see the report above for the Design Principles assessment on lot boundary setbacks.

3. The cellar addition will result in additional overshadowing to the adjoining property.
   The development achieves the deemed-to-comply provisions of the R-Codes in relation to overshadowing.

4. The addition to the existing dwelling will increase the noise from the air-conditioning units and will impact the adjoining property when the air-conditioning is in use.

   The existing air conditioning units are not the subject of this current application. The applicant will be advised that noise levels (from the existing and proposed development) are to comply with the Environmental Protection (Noise) Regulations 1997 at all times.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Vision Our city will be an environmentally-sensitive, beautiful and inclusive place.

Values **Great Natural and Built Environment**

We protect our enhanced, engaging community spaces, heritage, the natural environment and our biodiversity through well-planned and managed development.

Priority Area Urban form - protecting our quality living environment

Budget/Financial Implications

Nil.

Legislative and Policy Implications

Council is requested to make a decision in accordance with clause 68(2) of the Deemed Provisions. Council may determine to approve the development without conditions (cl.68(2)(a)), approve with development with conditions (cl.68(2)(b)), or refuse the development (cl.68(2)(c)).

Decision Implications

If Council resolves to approve the proposal, development can proceed after receiving a Building Permit and necessary clearances.

In the event of a refusal, the applicant will have a right of review to the State Administrative Tribunal. The Tribunal will have regard to the R-Codes as a State Planning Policy. Similarly, should an applicant be aggrieved by one or more conditions of approval, this can be reviewed by the Tribunal.

Conclusion

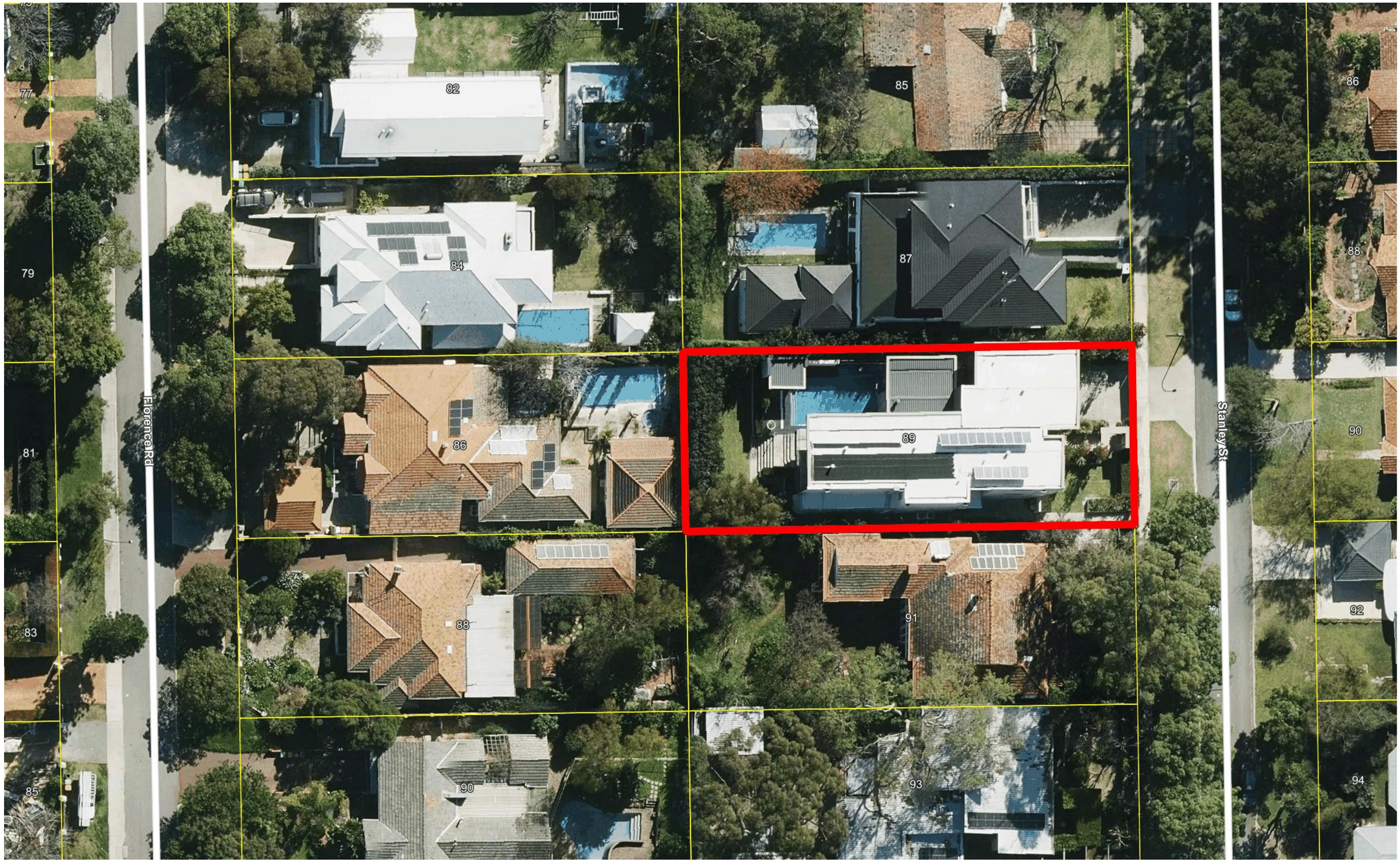
The application for an above ground cellar addition to the existing dwelling at 89 Stanley Street, Nedlands has been presented for Council consideration due to an objection being received. The proposal is considered to meet the key amenity related elements of R-Codes Volume 1 and as such is unlikely to have a significant adverse impact on the local amenity of the area. The proposal has been assessed and satisfies the design principles of the R-Codes and being consistent with the immediate locality and streetscape character. ‘

The objection relates primarily to setbacks and bulk. As assessment against the design principles has identified that the proposal can be supported.

Accordingly, it is recommended that the application be approved by Council, subject to conditions of Administration’s recommendation.

Further Information

N/A



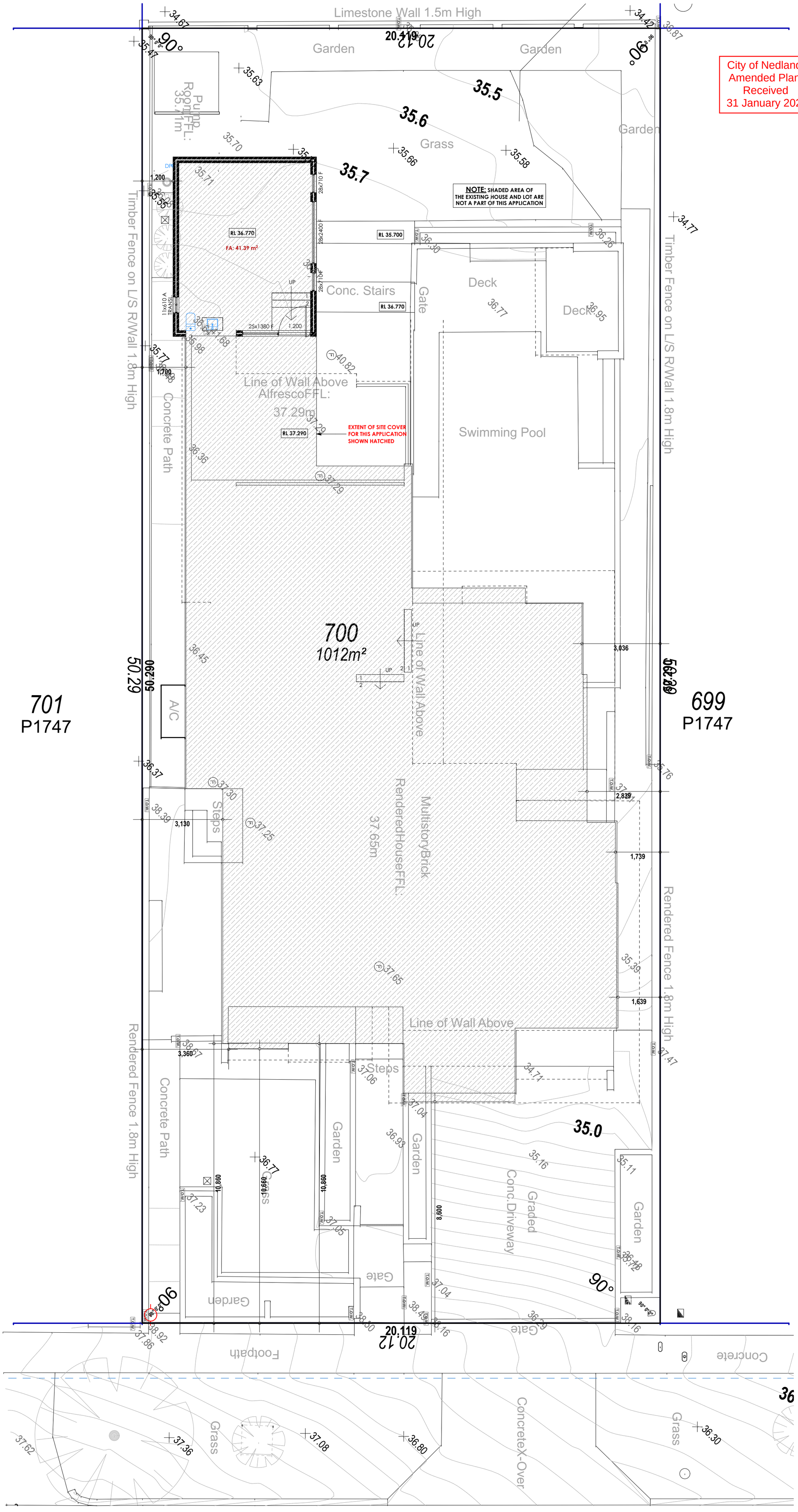
City of Nedlands	The City of Nedlands accepts no responsibility for the accuracy of this image or the results of any actions taken when using this image	Aerial Image – 89 Stanley Street, Nedlands	7/02/2022 1:400	N

City of Nedlands	The City of Nedlands accepts no responsibility for the accuracy of this image or the results of any actions taken when using this image	Zoning Map – 89 Stanley Street, Nedlands	7/02/2022 1:750	

PD13.03.22 Attachment 2

PROJECT STATUS		
PLANNING		
AMENDED		
DATE	REV	BY
12.11.21	PLN01	RS
29.11.21	PLN02_OVERSHADOWING	RS
31.01.22	PLN03	RS

City of Nedlands
Amended Plans
Received
31 January 2022



N

SITE COVERAGE

ZONED	R10
% ALLOWED	40%
SITE AREA	1,011.78m²
SITE COV. AREA	383.20m²

SITE COV. =37.9%

PREMIERONE Construction

PROPOSED CELLAR ADDITION
#89 (LOT 700) STANLEY STREET
NEDLANDS WA 6009

SITE PLAN

SCALE:		DATE:	DESIGNED BY:
1:100	@ A2	11.11.21	AR
DRAWN BY:	CHECKED BY:	DRAWING #:	OF:
RS	AR	02	13

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GROUND FLOOR AREAS		
	AREA (m2)	PERIM. (m)
EXISTING GROUND FLOOR TOTAL AREA	351.26	100
CELLAR (ADDITION)	41.39	26
	392.65 m²	

City of Nedlands
Amended Plans
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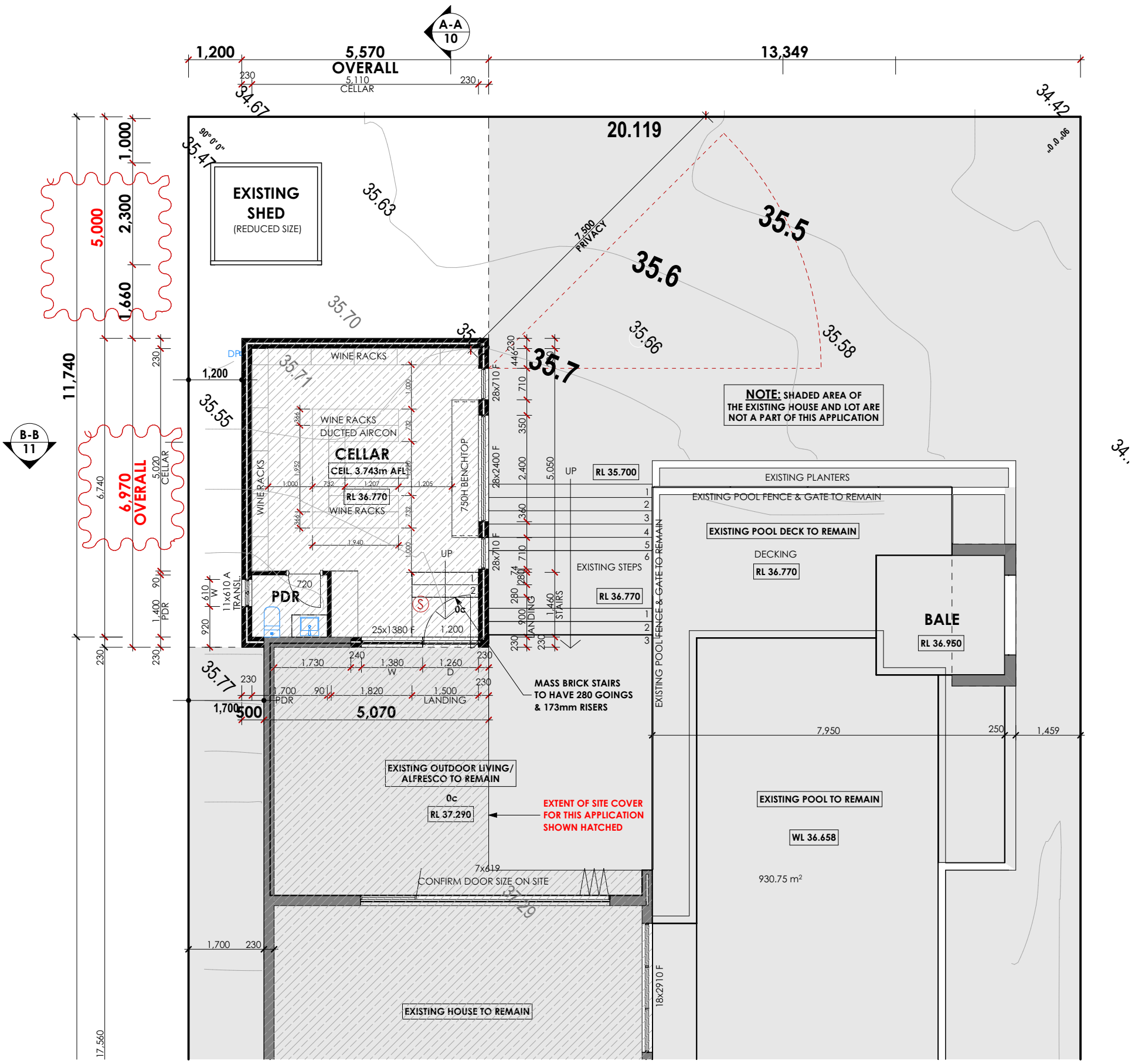
31 January 2022

PROJECT STATUS		
PLANNING		
AMENDED		
DATE	REV	BY
12.11.21	PLN01	RS
29.11.21	PLN02_OVERSHADOWING	RS
31.01.22	PLN03	RS



GROUND FLOOR CELLAR PLAN_PROPOSED

SCALE: 1:100

PremierOne Construction

PROPOSED CELLAR ADDITION
#89 (LOT 700) STANLEY STREET
NEDLANDS WA 6009

CELLAR FLOOR PLAN_PROPOSED

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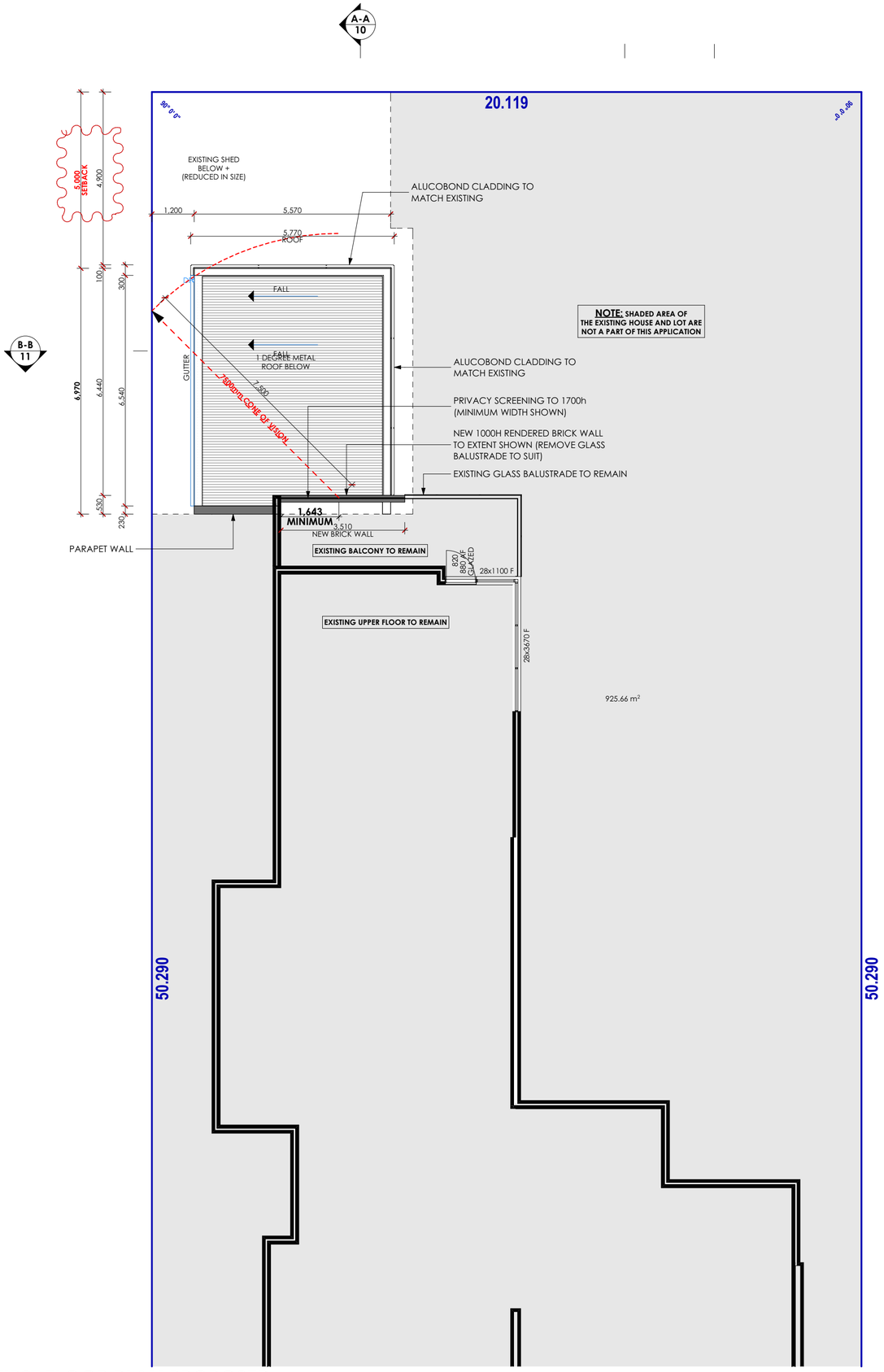
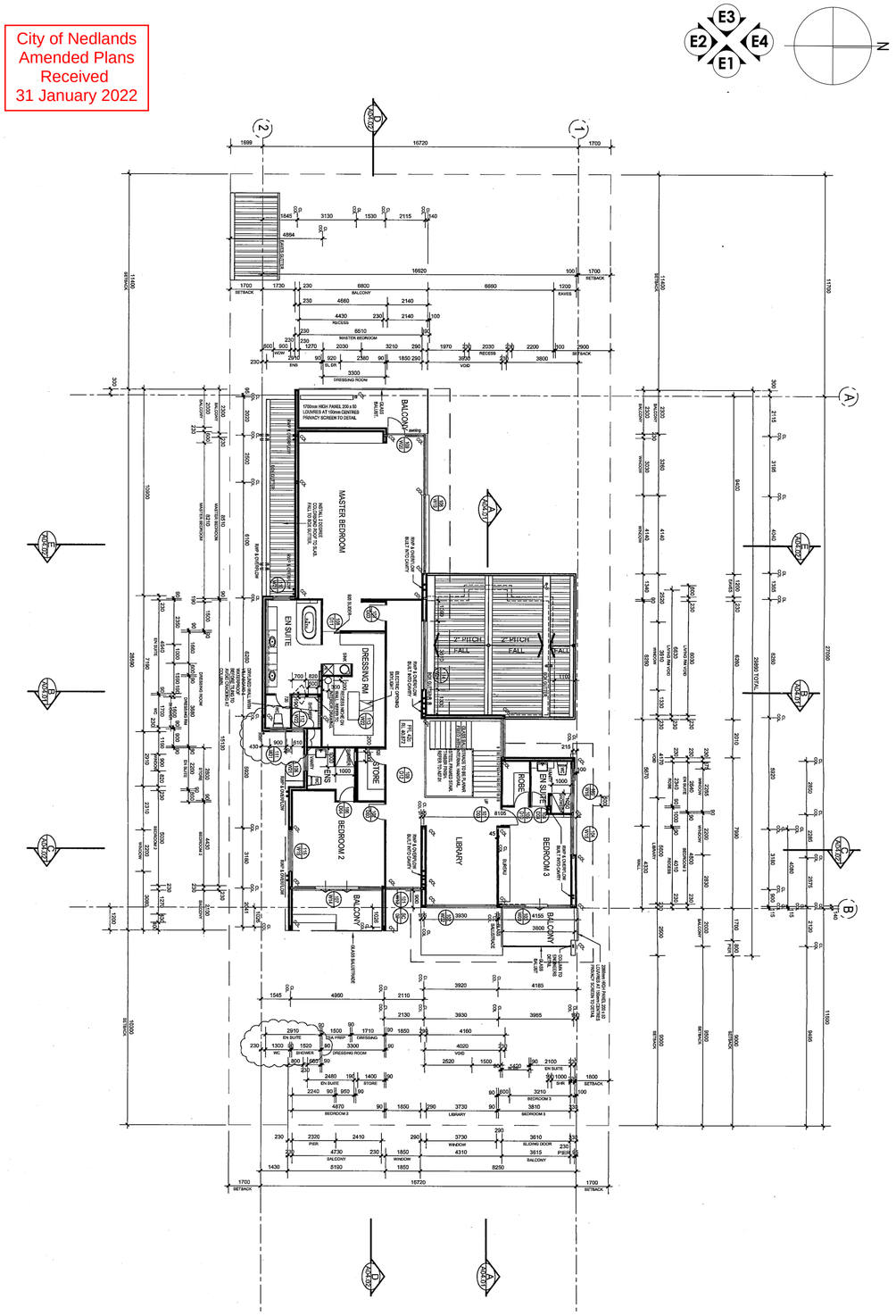
29.11.21	PLN02_OVERSHADOWING	RS
31.01.22	PLN03	RS

City of Nedlands
Amended Plans
Received
31 January 2022



FIRST FLOOR PLAN PROPOSED

SCALE: 1:100



EXISTING FIRST FLOOR PLAN (NOT TO SCALE)

PREMIERONE Construction

PROPOSED CELLAR ADDITION
#89 (LOT 700) STANLEY STREET
NEDLANDS WA 6009

FIRST FLOOR PLAN_PROPOSED

SCALE:		DATE:	DESIGNED BY:
1:100, 1:1 @ A2		11.11.21	AR
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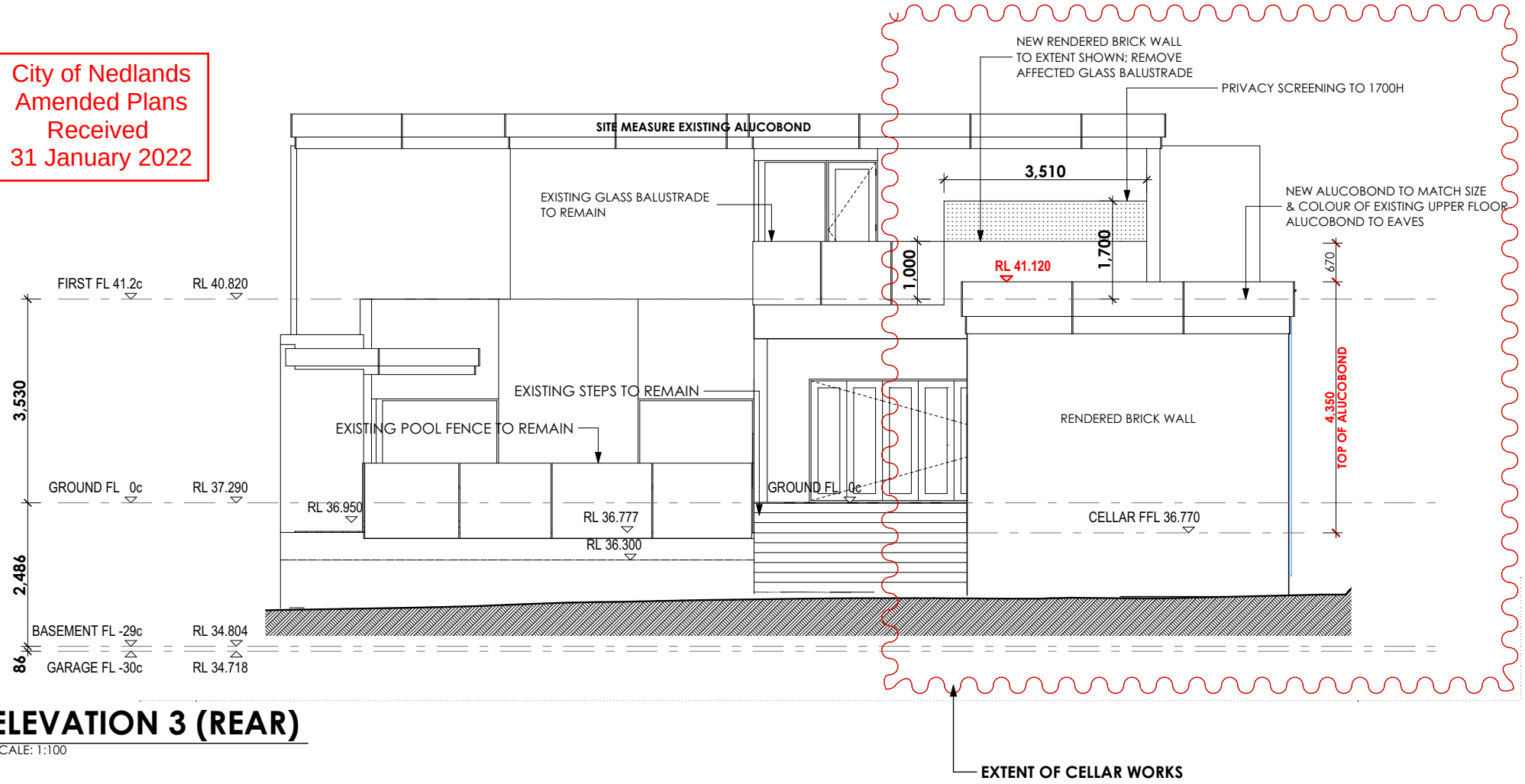
31.01.22	PLN03	RS

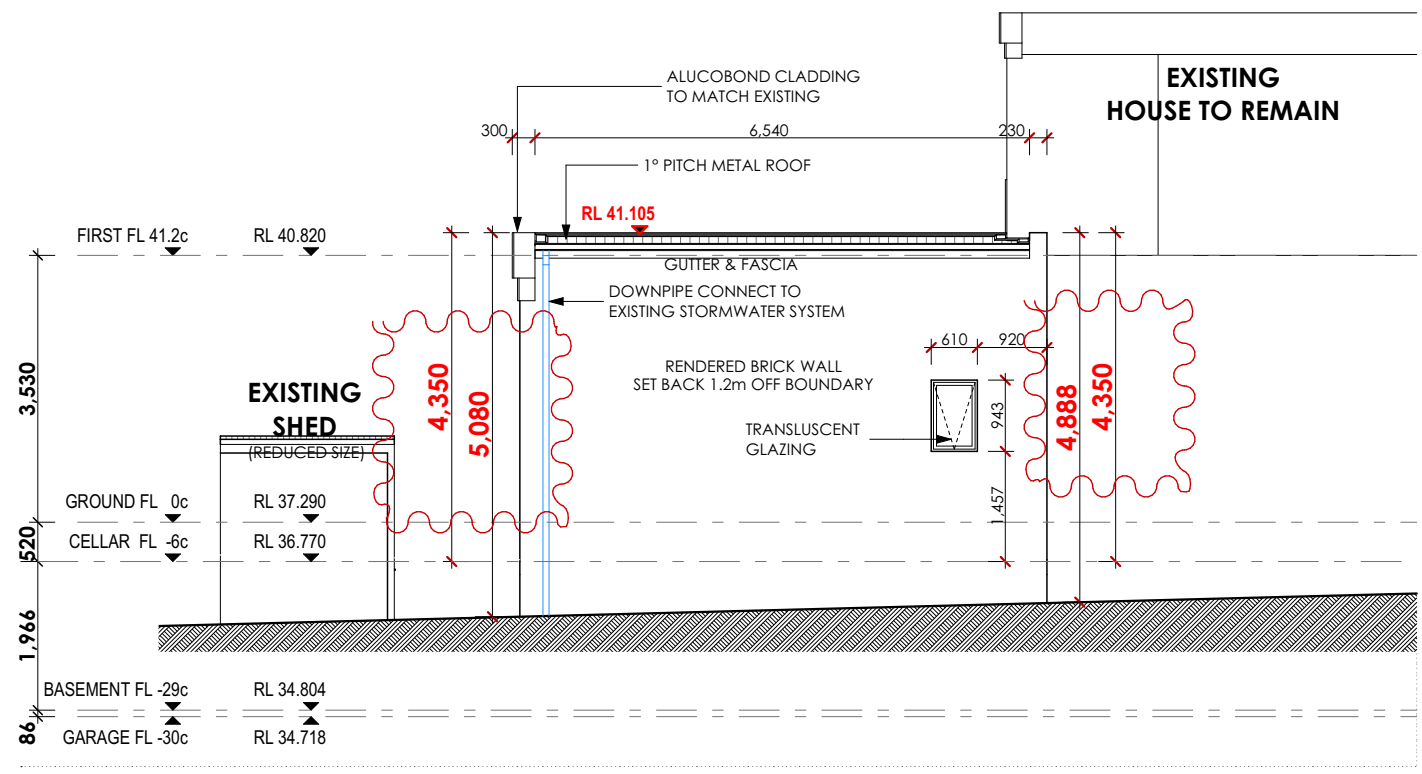
EXISTING FRONT ELEVATION 1 TO REMAIN

City of Nedlands
Amended Plans
Received
31 January 2022



ELEVATION 3 (REAR)

SCALE: 1:100



ELEVATION 2 (LEFT SIDE)

SCALE: 1:100

PREMIERONE Construction

PROPOSED CELLAR ADDITION
#89 (LOT 700) STANLEY STREET
NEDLANDS WA 6009

ELEVATIONS 1

SCALE:		DATE:	DESIGNED BY:
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AMENDED		
DATE	REV	BY
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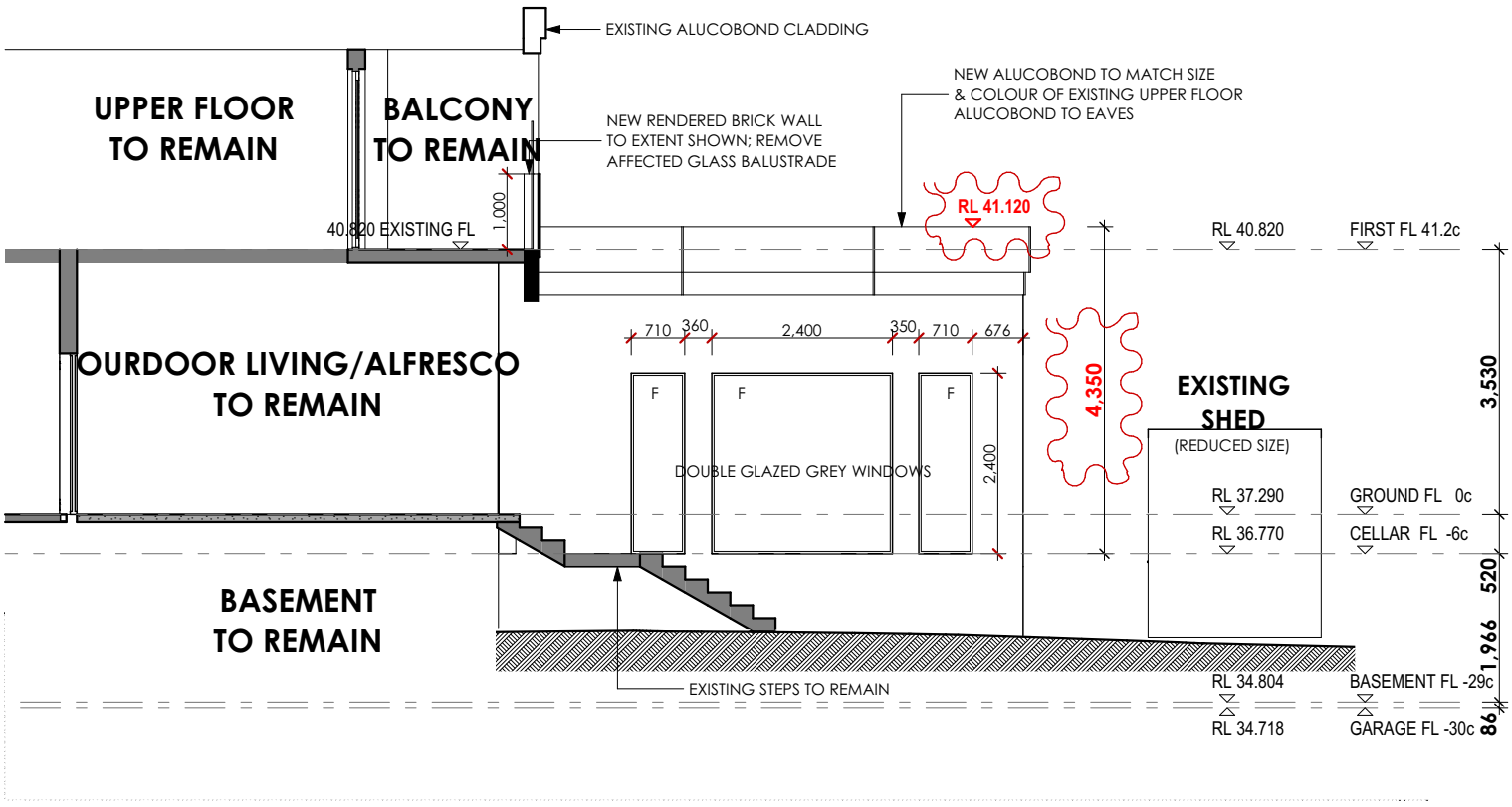
29.11.21	PLN02_OVERSHADOWING	RS
31.01.22	PLN03	RS



ELEVATION 4 (SHOWING CELLAR ONLY)

SCALE: 1:100

PROPOSED LOCATION OF CELLAR

PremierOne Construction

PROPOSED CELLAR ADDITION
#89 (LOT 700) STANLEY STREET
NEDLANDS WA 6009

ELEVATIONS 2

SCALE:		DATE:	DESIGNED BY:
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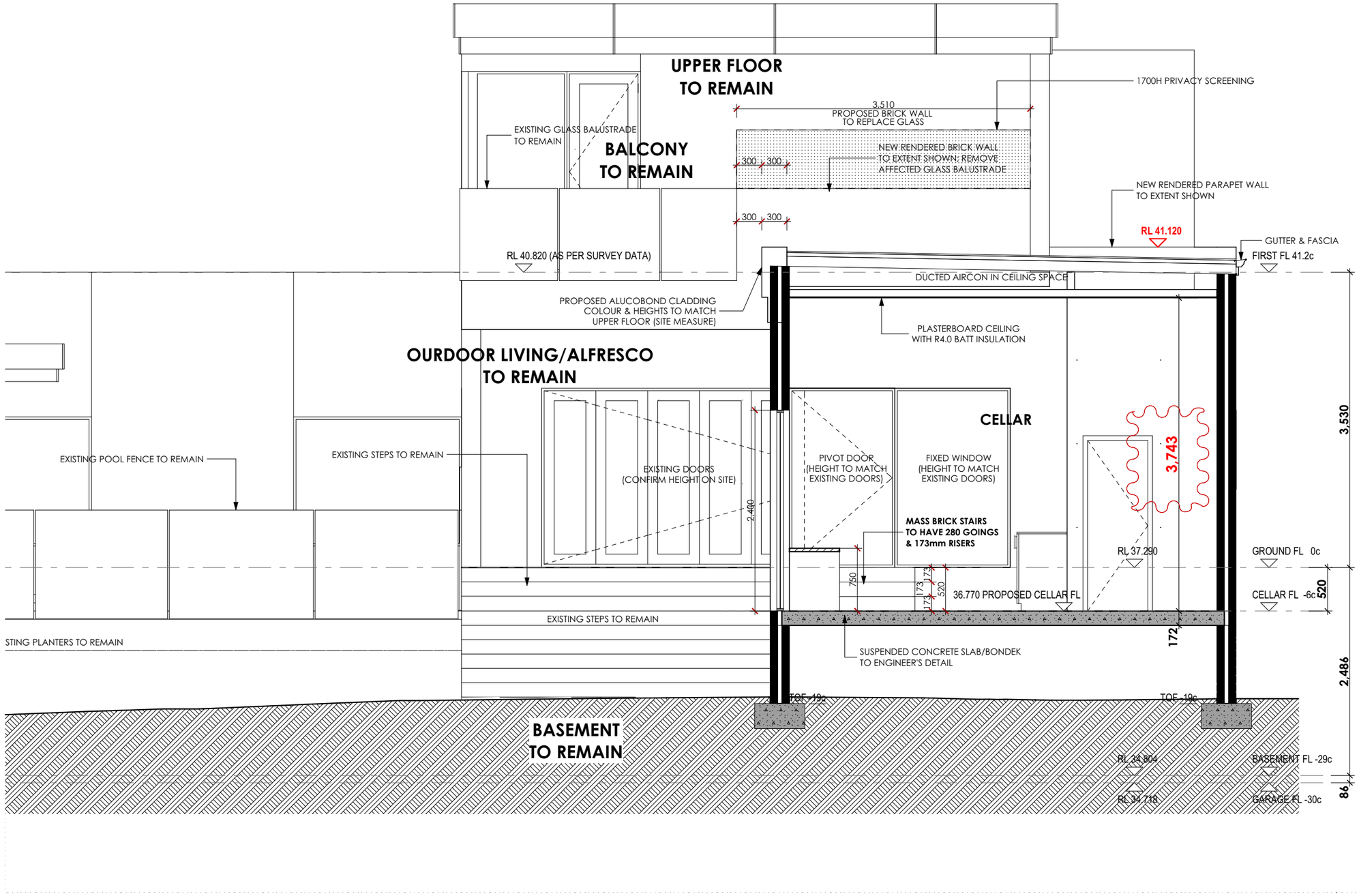
29.11.21	PLN02_OVERSHADOWING	RS
31.01.22	PLN03	RS

City of Nedlands
Amended Plans
Received
31 January 2022



SECTION B

SCALE: 1:50

PREMIERONE Construction

PROPOSED CELLAR ADDITION
#89 (LOT 700) STANLEY STREET
NEDLANDS WA 6009

SECTIONS 2

SCALE:		DATE:	DESIGNED BY:
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RS	AR	11	13

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31 January 2022

PROJECT STATUS		
PLANNING		
AMENDED		
DATE	REV	BY
12.11.21	PLN01	RS
29.11.21	PLN02_OVERSHADOWING	RS
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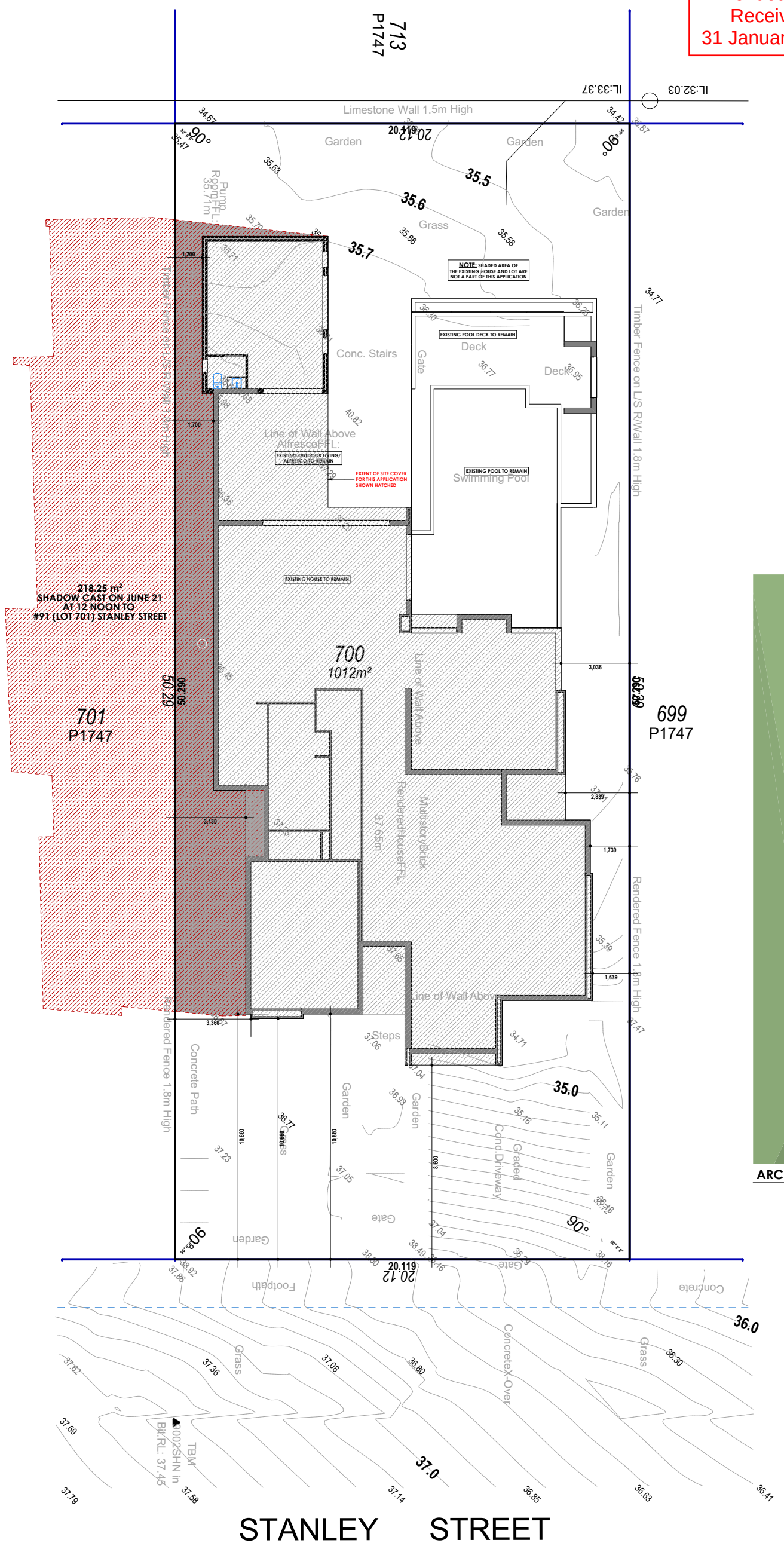

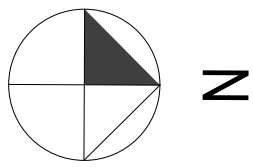

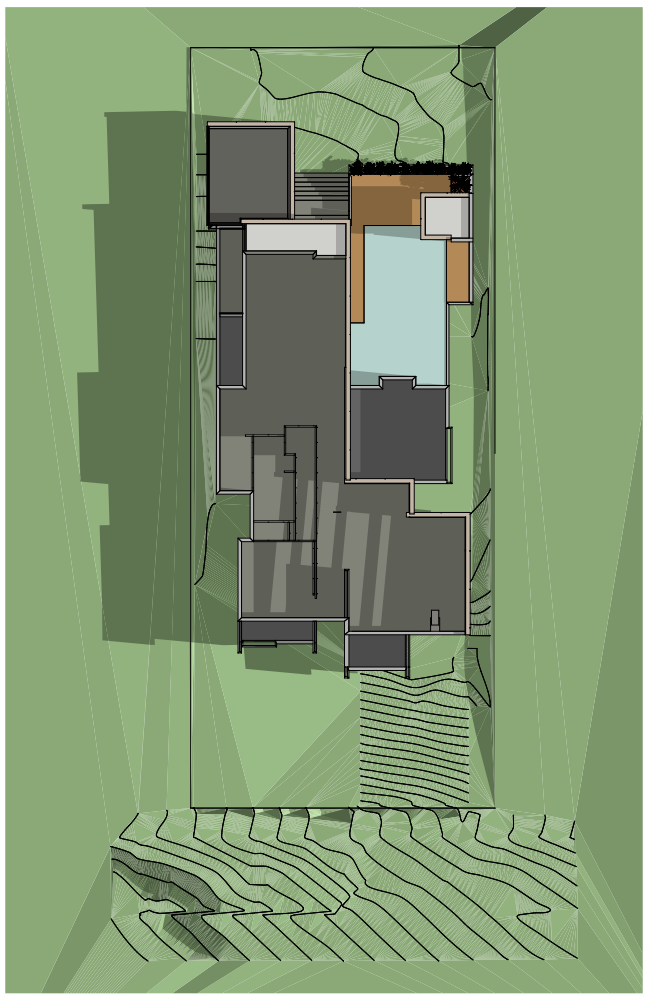

ARCHICAD-GENERATED SHADOW

OVERSHADOWING CALCULATIONS:

#91 (LOT 701) LOT AREA = 1011.70m²
MAXIMUM SHADOW CAST ALLOWED (25%) = 252.93m²
ACTUAL SHADOW CAST ON JUNE 21 AT 12 NOON = **218.85m² (21.63%)**

PREMIERONE Construction

PROPOSED CELLAR ADDITION
#89 (LOT 700) STANLEY STREET
NEDLANDS WA 6009

OVERSHADOWING DIAGRAM

SCALE: 1:100 @ A3		DATE: 11.11.21	DESIGNED BY: AR
DRAWN BY: RS	CHECKED BY: AR	DRAWING #: 13	OF: 13

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16.5 PD14.03.22 Consideration of Community Benefits and Infrastructure Contribution Models

Meeting & Date	Council - 22 March 2022
Applicant	City of Nedlands
Employee Disclosure under section 5.70 Local Government Act 1995	Nil.
Report Author	Roy Winslow – Manager Urban Planning
Director/CEO	Tony Free – Director Planning & Development
Attachments	1. Overview of Community Benefits and Infrastructure Funding Models

Purpose

The purpose of this report is for Council to consider the research and analysis of five community benefit and infrastructure contribution models and select the most appropriate model/s for the Nedlands context. This report has been prepared in response to Council's 27 October 2020 Notice of Motion relating to infrastructure contributions.

Recommendation

Council:

1. **endorses the Mayor writing to the Hon. Rita Saffioti MLA Minister for Transport; Planning; Ports, requesting the adoption of standardised development levies, into the Western Australian planning framework, for significant development similar to those required under section 7.12 of the New South Wales *Environmental Planning and Assessment Act 1979;***

2. **selects the Cash-in-lieu of land for Public Open Space developer contribution model; and**

3. **supports the development of a Public Open Space Strategy and associated Local Planning Policy.**

Voting Requirement

Simple Majority.

Background

Previous Council resolution

At the 27 October 2020 Ordinary Council Meeting, Council resolved to commence the preparation of an Infrastructure Contributions Framework, and allocated funds to allow for this work. This report has been prepared in response to Council's resolution.

Independent research

Council was provided background research into the merits of five infrastructure funding models in May 2021. To determine which model was the most suitable, the City engaged an external consultant to undertake the complex analysis and provide recommendations in an independent report.

Officers first recommendation is for Council to commence advocating at the State level for a development levy that would apply to all significant development, similar to that of the New South Wales section 7.12 – Fixed Development Consent Levies.

Officers also recommend that Council prepare a Public Open Space strategy and Local Planning Policy (LPP) for the purpose of obtaining infrastructure contributions for cash-in-lieu of land for Public Open Space for subdivision involving three lots or more.

Discussion

The Scheme and increase in population / change in demographics

Since the gazettal of the City of Nedlands Local Planning Scheme No. 3 (the Scheme) on 16 April 2019, the City of Nedlands (City) has experienced a rise in the number and scale of development applications proposing increased residential density within its four urban growth areas. The State Government's Perth and Peel @ 3.5 million establishes a target of 4,400 additional new dwellings for the City of Nedlands by 2050. Over time, the City's population will increase and demographics will change, placing strain on existing infrastructure and generating demand for new or upgraded community infrastructure.

Despite facilitating significant additional dwellings, the Scheme does not contain infrastructure contribution provisions. There are a number of long-standing contribution models contemplated under the Western Australian planning framework. However, in undertaking its research, officers became aware of funding models being employed both interstate and within Western Australia.

The following five funding models were analysed:

1. Developer Contribution Plans;
2. Development Incentives for Community Benefit;
3. Cash-in-lieu of land for Public Open Space;
4. Specified Area Rates; and
5. Development Levies.

Attachment 1 summarises the research and consultant analysis of each funding mechanism and ranks each in terms of suitability, efficiency and impact. A more detailed summary of each model is provided below.

Model 1 - Development Contribution Plan (DCP)

Development Contribution Plans (DCPs) are more suited to funding the delivery of new infrastructure in outer metropolitan areas, rather than established infill areas where significant dwelling yield is achieved in a short period of time. Therefore, within the City of Nedlands, it can be difficult to determine how much additional or upgraded infrastructure is required to meet the needs of new developments versus the existing community.

To establish a DCP, the City will need to comprehensively assess the current condition of its assets and their ability to meet the community's needs. The City can only collect contributions to deliver infrastructure needed to cater for new dwelling growth within the 10-year operating life of the DCP. Based on the projected dwelling yield in the City, very little could be wholly funded via a traditional DCP, leaving a potential funding liability for the City for many projects. Further, the cost of implementing and maintaining a DCP is large relative to the expected revenue. For these reasons, Model 1 is not recommended, as there are more appropriate models for the Nedlands context.

Model 2 - Development Incentives for Community Benefit

A formal community benefit framework must be informed by a site and context analysis, with incentives to be linked to design excellence and community benefit (i.e. a public good that a proposal delivers). A community benefit framework could be implemented using a Local Planning Policy that applies either to a specific area or City wide, or a Local Development Plan or Precinct Structure Plan. Scheme provisions may also be necessary to provide certainty. Comprehensive community engagement must be carried out to determine what is considered a tangible community benefit, to ensure discretion is applied appropriately. Although community benefit provisions may be suitable for specific areas of the City, it is not recommended to apply to all the City's urban growth areas.

Model 3 - Cash-in-lieu of land for Public Open Space

This approach has the potential to yield the greatest reward with the least effort and expense by the City when compared to other infrastructure and community benefit funding arrangements.

In accordance with the Western Australian Planning Commission's Development Control Policy 2.3 – Public Open Space in Residential Areas, where more than five residential lots are created through subdivision, 10% of the gross subdivisible area of land is generally required to be given up as a reserve for recreation. However, it is often preferable to provide cash-in-lieu of land for Public Open Space (POS) where a 10% land area contribution is too small for practical use, there is already sufficient POS in the locality, or where POS is planned in another location. Any expenditure of POS cash-in-lieu funds must be directly related to the use or development of land for POS purposes.

Further understanding of the amount, type and distribution of existing POS and its capacity to accommodate population growth is required, to identify any POS shortfalls and the amount attributable to dwelling and population growth. Preparation of a POS strategy may demonstrate a genuine need for new and/or improved POS. An LPP would be needed to supplement the strategy and guide conditions on development approvals.

Should Council endorse the City's recommendation to establish a cash-in-lieu of land for POS framework, the City will commence work on a POS Strategy. The POS Strategy will generally aim to deliver the following outcomes:

- Identify the current POS provision across the City, and provide a clear decision-making process to assess the need for POS and to address gaps within the community.
- Identify and respond to changing industry trends, challenges, population growth and associated impacts.
- Recognise and communicate the benefits of POS for community health outcomes.
- Establish a POS framework to manage sustainable provision of amenity and facilities while providing equitable access to a range of functions.

In light of the above, Model 3 is deemed appropriate and optimal for the City of Nedlands.

Model 4 - Specified Area Rates

The City can impose a Specified Area Rate (SAR) on land to levy costs to deliver a work, service, or facility, where it is accessible or beneficial to ratepayers within that area (i.e. underground power). The costs to implement a SAR are low, however, must be adopted annually and are therefore susceptible to reduction or removal through budget deliberations, creating uncertainty and insecurity for that income stream. Accordingly, this model is not recommended.

Model 5 - Section 7.12 Fixed Development Consent Levies (NSW Model)

New South Wales introduced section 7.12 Fixed Development Consent Levies in 2005, to offer a simplified and less administratively costly alternative to traditional developer contribution plans. This flat levy is used more frequently in infill areas where it is difficult to establish nexus between the development and the infrastructure need and where growth is difficult to predict.

There are several benefits to a levy applied at a specific rate. The levy is based on the total cost of development, meaning its application is relative to the development size. The levy applies uniformly to specific types of development meaning there is no avenue for appeal and the collected funds can be spent on previously identified infrastructure projects. These projects do not need to directly relate to the development which allows the local government to fund a wider range of infrastructure than what a traditional DCP would typically fund.

The current levy applied to development is up to 1% of the total development cost. It is expected, however, that the 'Amending Regulation' to the *Environmental Planning and Assessment Amendment (Infrastructure Contributions) Regulation 2021* which is proposed

to go before the New South Wales parliament in July 2022, will change the basis on which the levy is charged to:

- $15,000 per additional dwelling for single and grouped houses;
- $15,000 per additional dwelling for all other forms of accommodation;
- $50 per square meter of additional gross floor area of commercial uses;
- $35 per square meter of additional gross floor area of retail uses; and
- $35 per square meter of additional gross additional floor area for industrial uses.

There is currently no legislative mechanism available in Western Australia to establish this type of contribution plan. If Council is willing to advocate to the State Government for the introduction of such a levy, it is recommended that the City work in partnership with other inner-city local governments to secure a suitable and mutually beneficial outcome for all stakeholders.

Recommended Funding Models

The City recommends that Council adopts Model 3 - Cash-in-lieu of land for Public Open Space and advocates alongside other local governments for Model 5 - Fixed Development Consent Levies (NSW model) to be adopted into the Western Australian Planning framework.

Consultation

A POS strategy and associated Local Planning Policy would be publicly advertised (in draft format) for a minimum period of 21 days, if endorsed by Council in the future. Any development levy would need to be implemented at the State level, negating the need for local consultation.

Strategic Implications

Both recommendations align with the following values from the City's Strategic Community Plan 2018-2028.

Values

Great Natural and Built Environment
We protect our enhanced, engaging community spaces, heritage, the natural environment and our biodiversity through well-planned and managed development.

Great Communities
We enjoy places, events and facilities that bring people together. We are inclusive and connected, caring and support volunteers. We are strong for culture, arts, sport and recreation. We have protected amenity, respect our history and have strong community leadership.

Priority Area Renewal of Community Infrastructure
Providing for sport and recreation
Working with neighbouring Councils to achieve the best outcomes for the western suburbs as a whole

The City of Nedlands Strategic Community Plan 2018-2028 identifies the estimated dwelling growth anticipated in the municipality and that infrastructure investment will be required to support the City's existing and growing community, including POS and a high standard of urban design in growth areas. Obtaining cash-in-lieu of land for POS achieves this strategic objective.

Budget/Financial Implications

Preparation and adoption of the POS Strategy would be in accordance with allocations in the City's 2022/2023 operating budget. The Strategy outcomes, including the development of localised POS plans, will have financial implications.

Legislative and Policy Implications

The POS Strategy and any associated Local planning Policy is required to be prepared in accordance with the relevant requirements for State and Local Planning Policies/Strategies. Section 153 of the *Planning and Development Act 2005* facilitates POS contributions for subdivisions when three lots or more are created.

Decision Implications

If Council does not endorse this report's recommendation, Council will likely fund any shortfall when building, upgrading or maintaining facilities and POS infrastructure.

Conclusion

The community will benefit from infrastructure contributions, resulting in enhanced areas of Public Open Space and facilities within the City of Nedlands. Adopting this approach (Model 3) has the potential to yield the greatest reward with the least resources by the City, when compared to other infrastructure and community benefit funding arrangements.

Advocating alongside inner-city local governments for the adoption of a Section 7.12 style development levy may assist in securing a suitable and mutually beneficial outcome for all stakeholders.

Further Information

Nil.

Table 6 – Options Analysis

Funding Mechanisms	Assessment					
	Impact	Ease	Affordability	Immediacy	Alignment	Comment/Recommendations
1. Development Contribution Plan	✓				✓	a. Do not pursue a Development Contribution Plan at present, unless: i. A future Precinct Structure Plan or other document(s) identify infrastructure needs of a reasonable quantum within a defined area, such as that shown in Appendix 1; or ii. The City can demonstrate that future development will generate the need for a specific infrastructure type, such as laneway upgrades.
2. Development Incentives for Community Benefit			✓	✓		b. Do not pursue a Development Incentives for Community Benefits framework: unless i. The City has rigorously examined and established a clear position on community benefits in the City of Nedlands (in response to our questions in Figure 7); and ii. The City is willing to grant development concessions/incentives in exchange for delivery of community benefits; and iii. The City is comfortable for another decision-maker to exercise their discretion regarding the award of development concessions/incentives and the provision of community benefits; and iv. The City is confident the outcome will yield a net community benefit.
3. Cash-in-lieu for POS contributions	✓	✓	✓	✓	✓	c. Prepare a POS strategy to ascertain new and upgraded public open space assets needed to cater for projected population growth. d. Ensure the POS strategy includes an evidence-based assessment of the amount, type and distribution of POS relative to future growth areas. e. If the strategy confirms that additional POS is needed to accommodate future population growth, then prepare an implementation policy and commence collecting POS cash-in-lieu funds for this purpose.
4. Specified Area Rate	✓					f. Do not pursue a specified area rate at this time, unless the City identifies one or more works, services or facilities that ratepayers within a defined area: i. Have benefited or will benefit from; or ii. Have access to or will have access to; or

Funding Mechanisms	Assessment					
	Impact	Ease	Affordability	Immediacy	Alignment	Comment/Recommendations
						iii. Have contributed or will contribute to the need for
5. Section 7.12 Type Fixed Development Consent Levy		✓	✓	✓	✓	g. Engage with WESROC and ICCWG local governments to establish a joint advocacy position for the state government's introduction of Fixed Development Consent Levies, similar to the NSW section 7.12 arrangement.

16.6 PD15.03.22 Indoor Wood Fire Heaters

Meeting & Date	Council – 22 March 2022
Applicant	City of Nedlands
Employee Disclosure under section 5.70 Local Government Act 1995	Nil
Report Author	Jessica Bruce A/Manager Health & Compliance
Director/CEO	Tony Free Director Planning and Development
Attachment	1. Perth Wood Heater Replacement Programs

Purpose

The purpose of this report is for Council to consider the investigations and recommendations following the Council resolution of 27 July 2021 requested the Chief Executive Officer to commence an advisory period aimed at banning the use of indoor wood fire heating in the City of Nedlands before April of 2024

Recommendation

That Council:

1. endorses the Mayor writing to the Hon Reece Whitby MLA the Minister for Environment; Climate Action requesting that the State Government establishes and funds an indoor wood heater replacement program; and

2. acknowledges the education initiatives to be undertaken by the City.

Voting Requirement

Simple Majority.

Background

The Council resolution of 27 July 2021 was for the Chief Executive Officer to commence an advisory period aimed at banning the use of indoor wood fire heating in the City of Nedlands before April of 2024. The basis of the resolution was that wood smoke has negative impacts on community health.

It is acknowledged that wood smoke affects the quality of both indoor and outdoor air. According to WA Department of Health, wood smoke could contribute to short and long-term health issues such as irritation of the eyes, throat and nose, difficulty breathing, and decreased lung function.

Discussion

The State's Department of Water and Environmental Regulation (DWER) is responsible for the control and enforcement of the State legislation in place for solid fuel heaters and firewood. They are regulated through the administration of the *Environmental Protection (Solid Fuel Heater and Firewood) Regulations 2018* (the Regulations), made under the *Environmental Protection Act 1986* (the Act), which regulates the manufacture, sale or distribution for sale of solid fuel burning equipment, or solid fuel, of a prescribed class or description.

In addition, DWER has developed and implemented the BurnWise program aiming to promote the efficient operation of domestic wood heaters to minimise smoke emissions (or particle pollution). This is achieved via providing a series of brochures and other materials to the community, with BurnWise wood smoke management guide to support local government to manage domestic wood smoke.

At a local level, the City of Nedlands has the *City of Nedlands Health Local Law 2017,* which regulates smoke emissions to the extent that the escape of smoke from premises is not to cause a nuisance.

City's Current Approach

The City encourages wood heater users to operate their heaters in an efficient manner by providing relevant information developed by DWER.

BurnWise information and brochures about wood heaters and health, the operation of domestic wood heaters, and backyard burning is publicly available to the community upon request or via DWER's BurnWise program webpage.

As a comparison, other local governments including the Cities of Wanneroo, Swan, Subiaco, Fremantle, and Towns of Cottesloe, Claremont, Mosman Park address wood smoke concerns similarly to the City. Most local governments provide residents with BurnWise program material, information on backyard burning/wood/smoke, and the complaints response process.

Approaches by Other States and Territories

It is found that other states and territories do not have legislation that prohibits the operation of domestic wood heaters. Instead, approaches taken have been consistent across Australia including providing informative materials to educate members of the community and regulating wood heaters and smoke through the administration of state legislation.

Potential of Banning Indoor Wood Heaters

The State government agency DWER is responsible for the control and enforcement of the State legislation in place for solid fuel heaters and firewood.

The Regulations, administered by DWER are in place to establish mandatory efficiency and emission standards for wood heaters sold in WA, and mandatory quality standards for

firewood offered for sale. The Western Australia Government does not prohibit the use of wood heaters within the state, rather it aims to ensure that air emissions from heaters and firewood are minimised. This approach is consistent with other Australian states.

Officers have undertaken investigations into the City establishing a local law on the banning of indoor wood heaters under the *Local Government Act 1995* (LG Act) prohibiting the use of wood heaters. The advice received is that such a law is likely to be disallowed by the Joint Standing Committee on Delegated Legislation (Committee) for the following reasons:

The proposed local law would be in substantive terms inconsistent with the Regulations.

- A ban on the use of wood fire heaters under a local law would not satisfy the standard of reasonableness or test of proportionality, as it is a matter more appropriately dealt with by legislation enacted by parliament than under delegated legislation.
- The proposed local law would be beyond the scope of the City's legislative power as the regulation of activities on private land would be in a manner not contemplated by the LG Act.
- The proposed local law attempts to deal with matters concerning private land beyond those provided for in Schedule 3.1 or 3.2 and therefore would be beyond the scope of the City's legislative power under section 3.5 of the LG Act.

Any proposed ban of wood heaters would need to be introduced by DWER, as the appropriate State government authority, through legislative change.

Alternative Options Available

The alternative approaches explored by officers involved firstly an education program for the community and secondly an advocacy program aimed at the State Government introducing changes.

Education

The City encourages wood heater users to operate their heaters in an efficient manner by providing relevant information developed by DWER. This includes:

- Make DWER's BurnWise program information and flyers available on City's website.
- Raise awareness of efficient use of wood heaters through the promotion of BurnWise program from late summer through to end of winter including:
    - making information and flyers readily available, aiming to have awareness messages reaching as many residents as possible, for example at City administration building, libraries, Point Resolution Childcare Centre, on City's social media platforms, and through City's newsletters.
    - have BurnWise leaflets on the responsible and efficient use of wood heaters available to City residents and visitors at City events.

Advocacy

The Australian Capital Territory and Victoria have an economic incentive program currently in place to encourage the replacement of existing solid fuel heaters.

In Western Australian the Wood Heater Replacement Program (2006 and 2007) was managed by the then Department of Environmental Conservation in collaboration with home heating retailers, offered an economic incentive to encourage people using wood heaters to convert to an alternative heating source. The program was created as an action from the Perth Air Quality Management Plan 2000-2030 ensuring clean air is achieved and maintained through the Perth metropolitan area. The program offered 378 (2006) and 577 (2007) rebates of which 15 and 17 rebates respectively were within the City of Nedlands.

It is recommended that the Mayor write to the Hon Reece Whitby MLA the Minister for Environment and Climate Action requesting that a similar program be re-established in Western Australia.

Consultation

The Administration consulted with the following during the advisory period:

- Department of Water Environmental Regulation
- Western Australian Local Government Association
- Northern Territory Environmental Protection Authority
- Environmental Protection Authority South Australia
- Queensland Government
- Brisbane City Council
- New South Wales Environmental Protection Authority
- New South Wales Government
- Australian Capital Territory Government
- Solar Victoria
- Environmental Protection Authority Victoria
- Environmental Protection Authority Tasmania

There has been no community engagement relating to prohibiting indoor wood fire heaters.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Vision Our city will be an environmentally-sensitive, beautiful and inclusive place.

Values **Healthy and Safe**
Our City has clean, safe neighbourhoods where public health is protected and promoted.

Priority Area

- Urban form - protecting our quality living environment

Budget/Financial Implications

No financial implications have been identified associated with the recommendations.

Legislative and Policy Implications

Matters relating to wood heaters and firewood are currently governed under the *Environmental Protection (Solid Fuel Heater and Firewood) Regulations 2018* (Regulations) which is administered by the Department of Water and Environmental Regulation.

Decision Implications

Should recommendations be endorsed, Administration assist the Mayor writing to Hon Reece Whitby MLA the Minister for Environment; Climate Action requesting that the State Government establishes and funds an indoor wood heater replacement program. Administration would continue implementing the education initiatives.

Should recommendations be voted against, only the implementation of education initiatives will be continued as part of the City's ongoing community engagement activities.

Conclusion

The Administration advises that matters associated with wood heaters, wood smoke and firewood are regulated under the current legal framework. At the state level, DWER regulates the manufacture, sale and distribution of solid fuel heaters and firewood through the administration of the *Environmental Protection (Solid Fuel Heater and Firewood) Regulations 2018.* Smoke emissions are regulated at the local level via the administration of the *City of Nedlands Health Local Law 2017*. Current laws at both state and local levels do not prohibit the use of wood heaters.

As a local law to prohibit the use of indoor wood heaters is likely to be disallowed, two alternative options have been explored by the Administration. First, raising the community awareness of the efficient use of wood heaters by making DWER's BurnWise information available to the community at City's buildings and websites etc. Second, advocate to the State Government with the aim to requesting a wood heater replacement program with economic incentives be established in WA, similar to the State's initiative that took place in 2006 and 2007.

As a result of the investigation above the Administration recommends that Council endorse the Mayor writing to Hon Reece Whitby MLA the Minister for Environment; Climate Action requesting that the State Government establishes and funds an indoor wood heater replacement program, and acknowledges the education initiatives to be undertaken by the City.

Further Information

Nil.

Department of Environment and Conservation
Our environment, our future

ENVIRONOTE No 5

Halt the Haze - Wood Heater Replacement Program 2006

AN INITIATIVE OF THE PERTH AIR QUALITY MANAGEMENT PLAN

Wood smoke from domestic heating contributes to reduced air quality and winter haze events in Perth. The most recent survey data shows there are 52 600 homes using firewood as the main or occasional heating source in Perth[1]. They burn about 87 000 tonnes of firewood per year and emit about 970 tonnes of fine particles into the atmosphere. These fine particles contribute to a number of health risks particularly heart and respiratory illness.

The Department of Environment and Conservation (DEC) recognises that wood smoke emissions can be reduced through social and economic intervention. The Perth Home Heating (2004) Survey indicated that the majority of wood heaters are at the end of their recommended working lives and are declining in their operating efficiency[2]. Improved wood heater operation, fewer wood heaters in the Perth airshed and low emission wood heaters can all contribute to improved winter air quality. DEC and local governments are continuing to pursue interventions which will lead to reduced wood smoke.

Introduction

DEC's Wood Heater Replacement Program for 2006 offered an economic incentive to encourage people using wood heaters or fireplaces as the main source of heating in their homes to convert to an alternative heating source.

The program was developed as part of the Perth Air Quality Management Plan (AQMP), a 30-year-plan released in December 2000 to ensure that clean air is achieved and maintained throughout the Perth metropolitan area[3].

A $600 rebate was made available to eligible Perth residents for the removal of a wood heater or disablement of a fireplace and installation of a ducted or flued gas heater. The program, offering a total of 400 rebates, was exceptionally popular.

The program began in July 2006. It was advertised in community newspapers and attracted media coverage on television and radio and in State and local newspapers.

This document summarises the major findings of the Wood Heater Replacement Program 2006.

Results

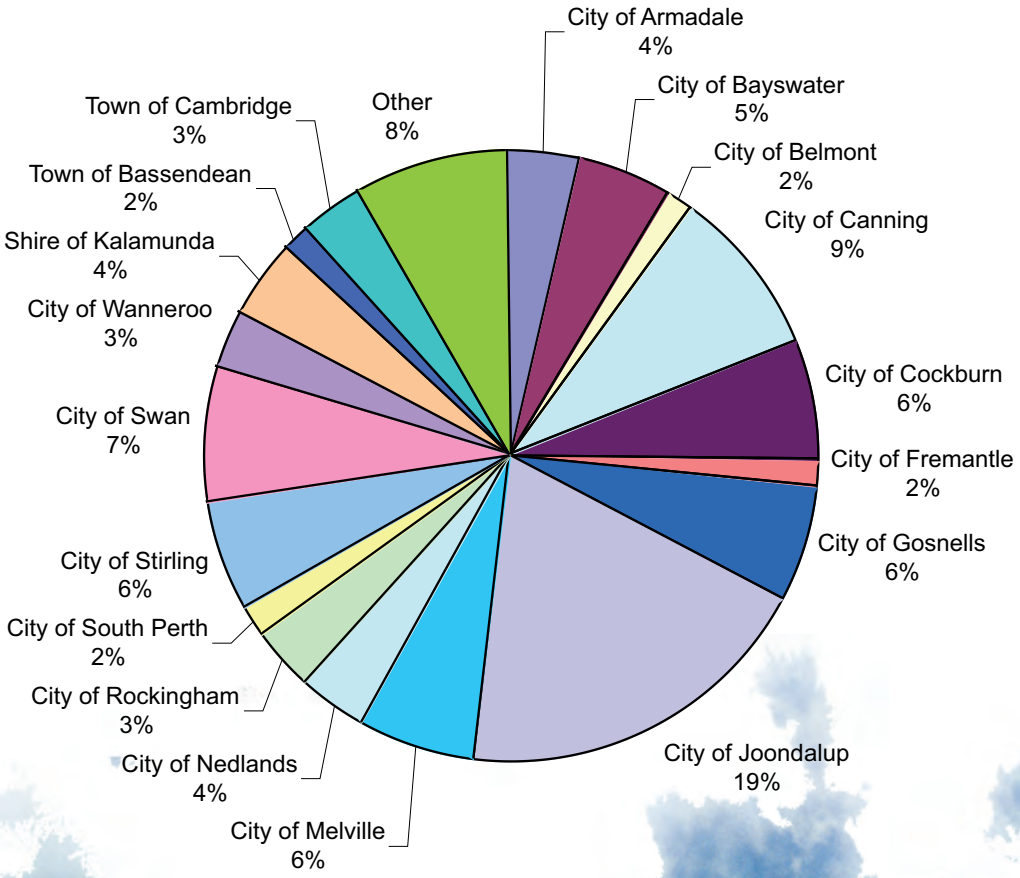
The program initially offered 300 individual rebates which were quickly fully subscribed. A further 100 rebates were offered in an extension of the program and were also taken up rapidly. Once the rebates were fully subscribed, additional applicants were placed on a notification list for similar future programs.

Thirty households on the notification list were offered a rebate as a result of earlier applicants not wishing to continue with the program. The program officially closed on 15 September and anyone who pulled out after this date was not replaced by a person on the notification list. A total of 378 rebates were allocated in 2006.

Overall 46 applicants pulled out of the program. Reasons given for this included the purchase and installation costs were too expensive; they had problems getting an installer; decided on another form of heating such as reverse-cycle or unflued gas heating; or they realised they were ineligible. The program was most popular in the City of Joondalup (74 rebates). Other council areas where the rebate was very popular included the cities of Canning (35 rebates), Swan (28 rebates), Cockburn (24 rebates), Melville (24 rebates) and Gosnells (24 rebates). Figure 1 below shows the percentage of rebates each council secured. Council areas where fewer than five rebates were allocated were combined in the 'other' category.

To ensure all wood heaters were removed from the Perth airshed, they were collected from participant's houses by a steel merchant. The heaters were then crushed, becoming scrap metal ready for recycling (see pictures).

Figure 1: Depicts the spread of program participants over the Perth Metropolitan Area.



The wood heaters from the program were crushed and recycled.

Results continued...

Flued gas heating was the most popular choice for people participating in the program. However, there was no significant difference between the average cost of purchase and installing of either flued or ducted gas heating systems. The average total cost of purchase and installation of any gas heater prior to receiving a rebate was $3085.85 (see Table 1). The prices paid for flued and ducted gas heating ranged from $1100 to $7298, however most participants paid between $2000 and $4000 for their replacement heater (see Figure 2.)

On average the financial rebate offered represented 20 per cent of the replacement heater purchase cost (range: 8 - 55 per cent).

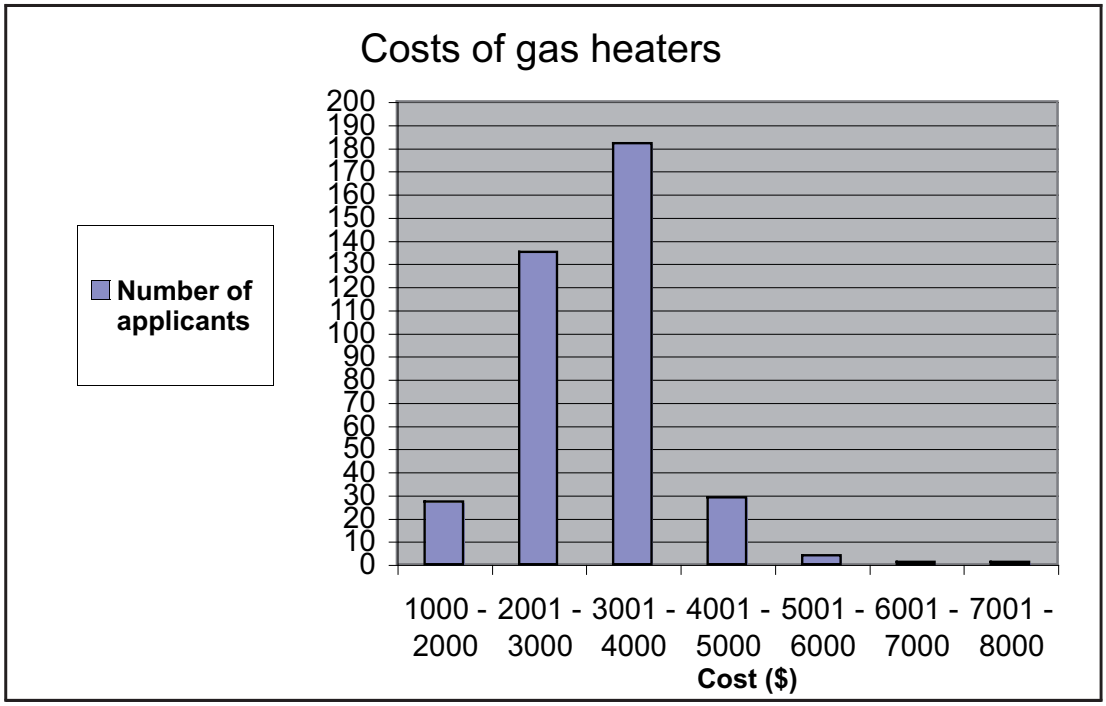
Wood heaters removed from homes in the Perth metropolitan area during the Wood Heater Replacement Program 2006.

Table 1: Shows the average prices applicants paid for flued/ducted heating and the installation.

	Flued gas heating	Ducted gas heating
Average price	$3000	$3798
Average Cost Installation	$597.60	*
Range (both)	$1100 - 7298	
Average price (both)	$3085.85	

*note: ducted gas heaters always included installation in the total price.

Figure 2: Price ranges for both flued/ducted heating paid by applicants.



Conclusions

The 2006 Wood Heater Replacement Program removed 378 wood heaters/fireplaces from the Perth metropolitan area by providing a significant financial contribution to the purchase and installation of alternative heating in the form of flued or ducted gas. This program builds on previous work undertaken by DEC to reduce domestic wood smoke emissions to manage winter haze. The 2004 pilot wood heater replacement program removed approximately 280 wood heaters. This brings the total for the two programs to approximately 650 wood heaters removed from the Perth airshed.

The incentive offered in these programs made the changeover from wood to gas heating more affordable for applicants, accelerating the replacement process.

The end product: scrap metal ready to be recycled.

The targeted reduction of wood heaters, particularly older non-compliant models, plays an important role in managing and improving Perth's air quality. The 2006 Wood Heater Replacement Program not only removed wood heaters, but provided a valuable tool to increase public awareness of wood smoke, the potential associated health effects and the role the community can play in reducing wood heater emissions. This program supports the implementation of the broader haze management plan.

DEC encourages the community to consider alternative methods of home heating and remove older non-compliant models of wood heaters from their homes.

Feedback and future programs

DEC received important and valuable feedback from program participants, stakeholders and community members that will be used for planning future programs.

If you would like to be placed on a list to receive information on similar programs or would like to give us feedback on the program, please email: haze@dec.wa.gov.au.

More information

More information on wood heaters, smoke and particle haze is available online at airquality.environment.wa.gov.au. Click on the 'Halt the Haze' link on the right hand side of the page.

[1] Australian Bureau of Statistics, 2005, *Environmental Issues: People's Views and Practises*, Cat. No. 4602.0; Australian Bureau of Statistics, Canberra.

[2] DoE, 2006; *Perth Home Heating Survey 2004 Technical Report*; Department of Environment, Perth.

[3] DEP, 2002; *Implementing the Perth Air Quality Management Plan – Supporting Document*, Department of Environmental Protection, Perth.

2007079-0607-250

PD15.03.22 Attachment 1

ACT NOW FOR THE FUTURE
Government of Western Australia
Department of Environment and Conservation
Our environment, our future

ENVIRONOTE No 6

Halt the Haze – Wood Heater Replacement Program 2007

AN INITIATIVE OF THE PERTH AIR QUALITY MANAGEMENT PLAN

Introduction

Wood smoke from domestic heating contributes to reduced air quality and haze events in winter months in Perth. Based on the most recent survey data (ABS 2005) there are 52,600 homes using firewood for heating in Perth[1]. They burn about 87,000 tonnes of firewood a year and emit about 970 tonnes of fine particles into the atmosphere.

These fine particles contribute to health risks including aggravation of minor illnesses leading to extra visits to the doctor and days off work, increased hospital admissions and a small number of lung cancers and premature deaths each year. The present cost of these health impacts, attributable to residential wood smoke, is estimated to be about $18 million a year[2].

The program

The Wood Heater Replacement Program for 2007, run by the Department of Environment and Conservation (DEC) in collaboration with home heating retailers, Alinta and Wesfarmers Kleenheat Gas, offered an economic incentive to encourage people using wood heaters or fireplaces as the main source of heating in their homes to convert to an alternative heating source. The program was created as one of a number of actions to combat smoke and haze under the Perth Air Quality Management Plan, a 30-year plan released in December 2000 to ensure that clean air is achieved and maintained throughout the Perth metropolitan area[3].

A $500 rebate was available to eligible residents in the Perth metropolitan area, for the removal of a wood heater or disablement of a fireplace and installation of a ducted or flued gas heater. An additional $100 Kleenheat Gas voucher was offered to eligible applicants who purchased gas heaters using LPG. The program, offering a total of 800 rebates, started on 23 May 2007 and ran for three months, officially ending on 31 August 2007.

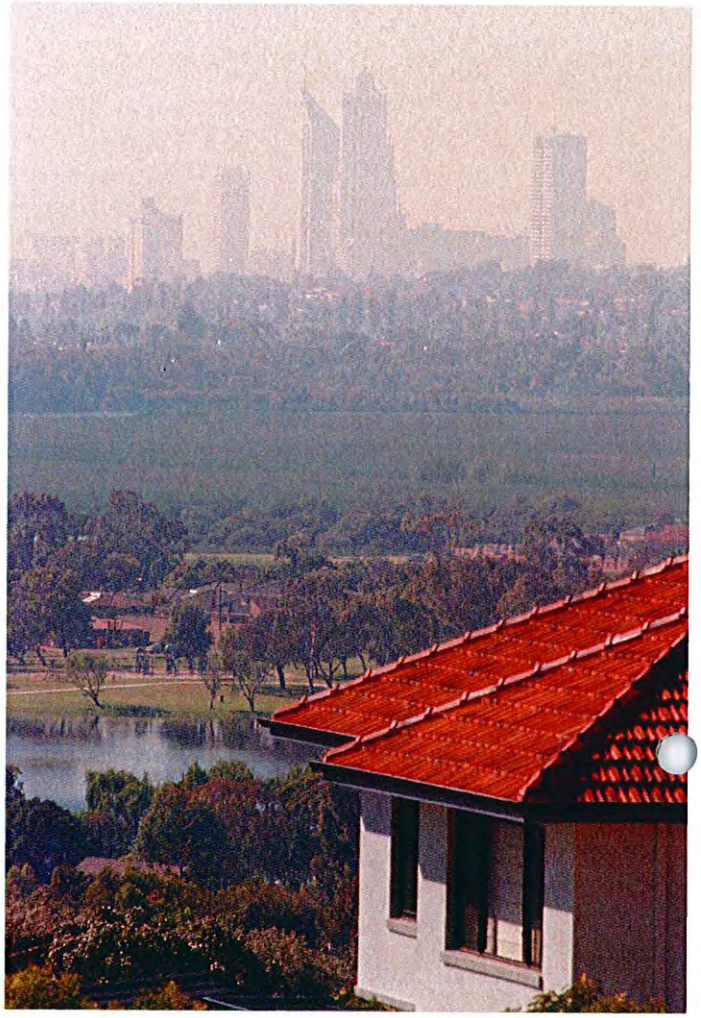
PAM90600

Results

The program was 72 per cent subscribed, with 577 rebates allocated. A total of 23 applicants purchased an LPG gas heater and received the additional $100 Kleenheat Gas voucher.

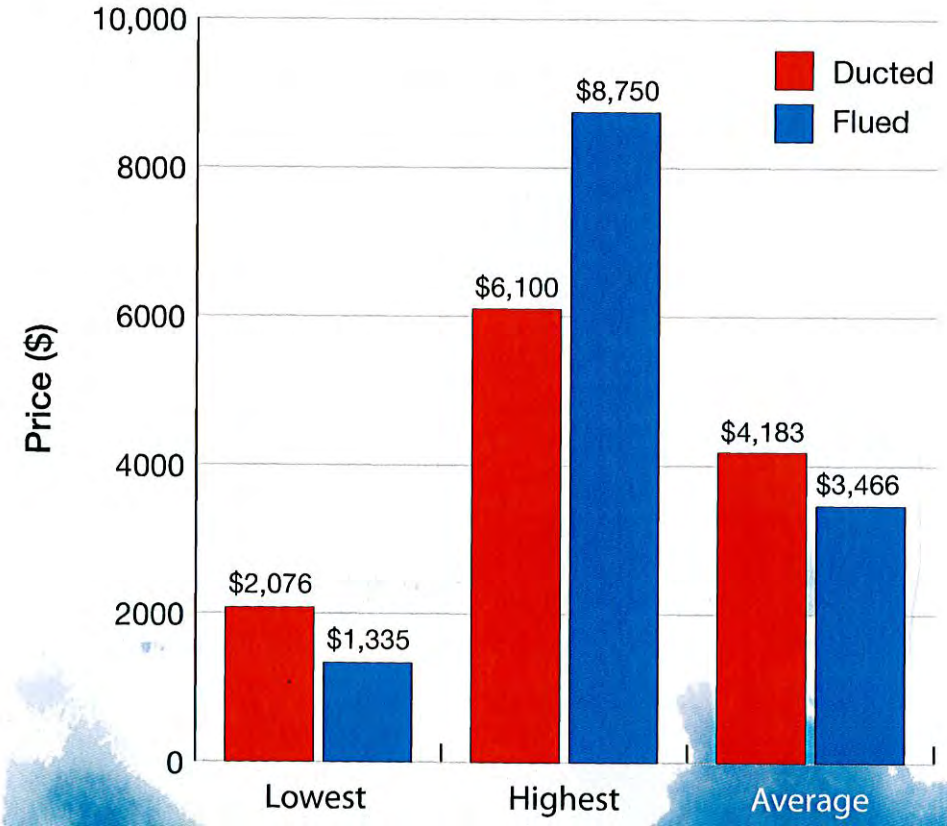
The 2007 program was administered by DEC, assisted by retailers of flued and ducted gas heating in the Perth metropolitan area. Overall, 21 companies and 46 shop fronts participated in the program. The retailers were recruited through an expression of interest from DEC and were responsible for providing potential applicants with information on the program, ensuring applicants met all the eligibility criteria, passing application information on to DEC and ensuring the old wood heaters were removed and disposed of. Applicants were only eligible for a rebate if they purchased a flued/ducted gas heater from one of these participating stores. Sales were reported at 40 of the stores.

The majority of Wood Heater Replacement Program applicants chose to replace their wood heater with a flued gas heater rather than a ducted system. Five hundred and thirty one applicants (92 per cent) purchased a flued heater and 51 applicants (8 per cent) purchased a ducted system. There was relatively little difference in these figures from the 2006 program where 12 per cent of applicants (out of 378) chose ducted heating. Details of costs paid for gas heaters in the program are shown in Figure 1.



A typical haze event in Perth

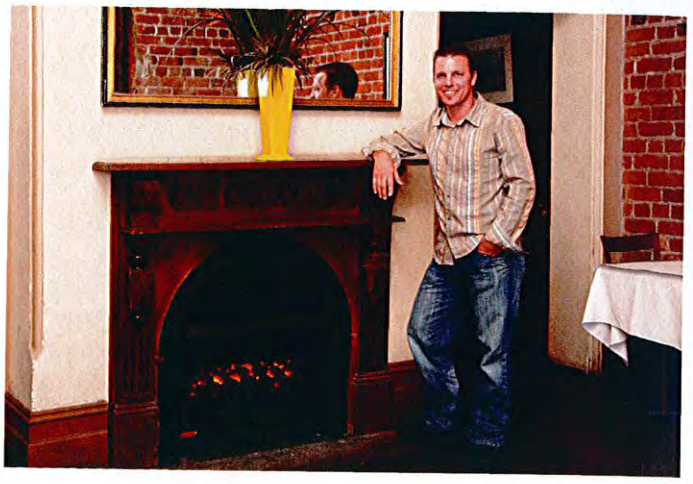
Figure 1: Costs of flued and ducted gas heaters



The program offered 800 rebates. Over the three months of the program, 577 rebates were allocated and 34 applicants pulled out of the program. Reasons given for this included purchase and installation costs being too high, problems getting an installer, the applicant decided on another form of heating such as reverse-cycle or unflued gas heating, or they realised they were ineligible.

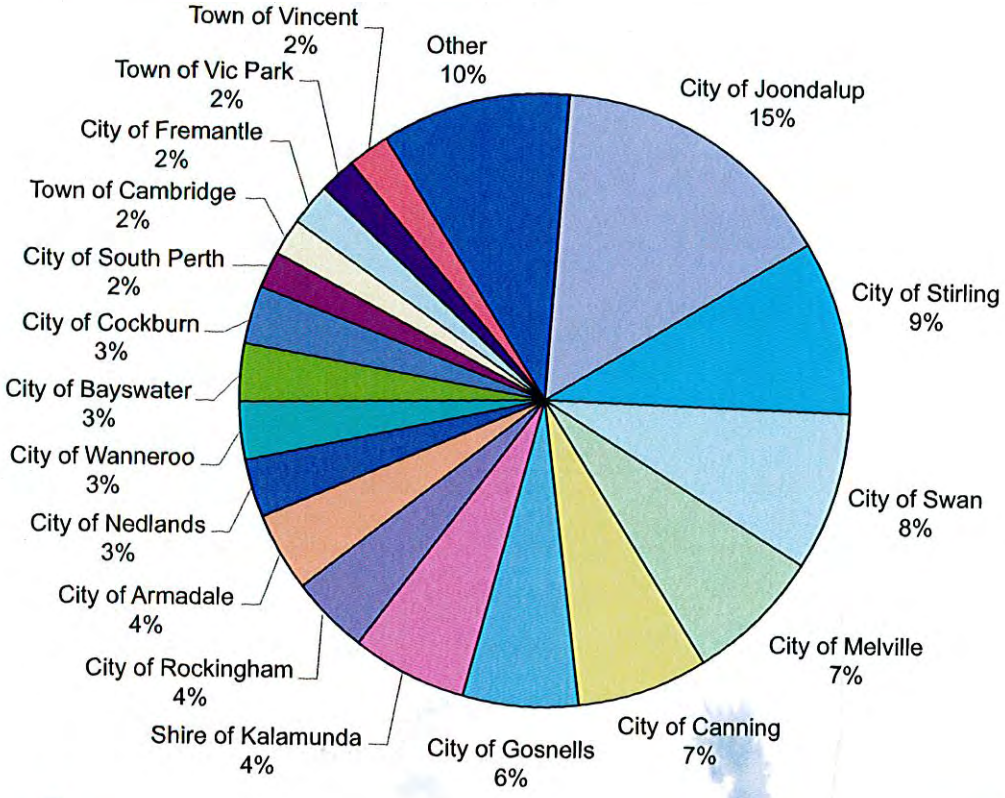
The program was most popular in the City of Joondalup (91 rebates). Other council areas where the rebate was popular included the cities of Stirling (54 rebates), Swan (48 rebates), Melville (43 rebates) and Canning (38 rebates). Figure 2 shows the percentage of rebates for each council. Council areas where fewer than five rebates were allocated were combined in the 'other' category. The spread of applicant locations was similar to the 2006 replacement program. The 2006 program was also most popular in Joondalup, Stirling, Swan, Melville and Canning.

To ensure all wood heaters were removed from use in the Perth airshed, skip bins were supplied to retailers and the old wood heaters were then transported to a steel merchant where they were crushed and recycled.



Oxford Hotel Manager John Liso with the one of the hotel's new gas heaters. The Oxford Hotel received a $500 rebate for replacing their open fireplaces with flued gas.

Figure 2: Spread of applicants across local councils



Summary

The main intent of the program was to encourage those people currently using wood heaters as their main source of heating to convert to an alternative, cleaner heating source. The incentive offered in the program was intended to make the changeover from wood to gas heating more affordable for applicants, accelerating the replacement process.

The targeted reduction of wood heaters, particularly older non-compliant models, plays an important role in managing and improving Perth's air quality. The 2007 Wood Heater Replacement Program not only removed wood heaters, but provided a valuable tool to increase public awareness of wood smoke, the potential health effects and the role the community can play in reducing wood heater emissions.

Since 2004, three wood heater replacement programs have resulted in the removal of approximately 1,235 wood heaters in the Perth region. These programs form a key part of DEC's overall haze management plan. DEC encourages community members to consider alternative methods of home heating and remove older non-compliant models of wood heaters from their homes.

A flued gas heater

Future programs

The uptake of rebates in the 2007 program was noticeably slower than in 2006. This, and the lower number of rebates applied for, suggests that since 2004, this kind of program may have reached a high proportion of wood heater owners who are contemplating changing their heating system. Future programs will be designed taking this trend into account.

References

[1] Australian Bureau of Statistics, 2005, *Environmental Issues: People's Views and Practises*, Cat. No. 4602.0; Australian Bureau of Statistics, Canberra.

[2] Department of Environment and Conservation, 2007, Wood heater policy options paper, Consultation document, Perth.

[3] DEP, 2002. Implementing the Perth Air Quality Management Plan. Department of Environmental Protection, Perth.

2008150-0708-250

17. Divisional Reports - Technical Services Report No's TS02.03.22 to TS03.03.22

17.1 TS02.03.22 Montario Quarter - Stage 2 Road Naming Approval

Meeting & Date	Council – 22 March 2022
Applicant	MNG Survey
Employee Disclosure under section 5.70 Local Government Act 1995	Nil.
Report Author	Steve Crossman – Asset Coordinator
Director	Andrew Melville – Acting Director Technical Services
Attachments	1. Proposed Road Name Table 2. Landgate Preliminary Approval 3. Road Name Plan 4. Extract of Landgate's Policies and Standards for Geographical Naming in Western Australia

Purpose

MNG Survey (MNG), on behalf of Landcorp are seeking the endorsement of Council to name three (3) new roads in the Montario Quarter development in Shenton Park.

Endorsement by Council will allow MNG to apply formally to Geographic Names Landgate (GNL) to accept the proposed road names.

Recommendation

That Council approve the proposed road names as listed below:

1. preferred names:

a. Wellness Court,
b. Coalesce Lane; and
c. Forge Mews; and

2. back up Names:

a. Innovation; and
b. Legacy.

Voting Requirement

Simple Majority.

Background

The Shenton Park Rehabilitation Hospital ceased operation on 4 October 2014 when its vital services and functions were relocated to the new Fiona Stanley Hospital. Landcorp, as the land and development agency for the Western Australia Government, is redeveloping the Shenton Park Rehabilitation Hospital site into a residential development as part of the Government's asset divestment program. This development is known as Montario Quarter.

On 27 March 2018, Council approved the first tranche of names for stage one (1) of the development including a supplementary list. This list of names was then sent to the GNL for approval. GNL approved the following names and they have subsequently been used:

- Sadka Lane,
- Muecke Way,
- Dawes View,
- Guttman Approach,
- Seymore Avenue, and
- Goatcher Vista

On the 28 August 2018, Landcorp applied to the City for the second tranche of road names. Council approved the following names:

- Orton Road;
- Salk Road; and
- Sabin Road.

The Salk and Sabin names are now no longer acceptable to Landgate.

Discussion

On the 11 January 2022, MNG contacted the City with the latest tranche of names for Stage 2 of the Montario Quarter development. Each name suggested has had pre-approval from Landgate's Geographical Names Committee. MNG has supplied justification for each as follows.

Preferred Names:

- Wellness Court - Connected to the site's former use as the Shenton Park Rehabilitation Hospital of which wellness was the forefront of the sites use, through the many medical innovations, nurses and individuals.

- Coalesce Lane - Calls individuals to reflect on the sites' history and present context that shapes Montario Quarter, located on the site of the former Shenton Park Rehabilitation Hospital, and the shared aspirations for the future.

  Meaning 'to grow together' or 'to unite distinct elements into a whole'. The sites former use and reprisal as a growing residential estate brings people together, through public open space, interactive heritage elements including Public Artworks such as the Wellness Machine and interpretative trails.

  Note, that over the next decade Montario Quarter will grow with more than 1,100 dwellings and change in response to the way people use the precinct.

- Forge Mews - In reference to unbreakable bonds, connections shared, union, rebuilding and renewed strength. This name seeks to embody concepts of connection to place and people.

  Montario Quarter, located on the site of the former Shenton Park Rehabilitation Hospital is built on the connections to the past through heritage elements, connection to nature with the Woodland Precinct and ongoing rehabilitation.

  The site is noted to be of Aboriginal significance with an ethnographic site (DPLH Site ID #3763) being identified as Other Heritage Place, with Traditional Owners noting it was associated with a camp, bringing people together.

  The former Hospital also brought people together and, forged new relationships including between nurses and patients.

Back-up Names

It must be noted that the back up names do not have a road suffix at this time.

- Innovation - Named after the pioneering medical achievements of Sir George Bedbrook in the field of paraplegia including the founding of the Department of Paraplegia.

- Legacy - Contribution to the legacy of the achievements at the former Shenton Park Rehabilitation Hospital including the legacy of Sir George Bedbrook, Dr Phyllis Goatcher and Dr Marie Sadka.

Consultation

Landcorp have advised the City that the State Heritage Office and their contracted heritage consultants, Palassis Architects, were consulted in the process of developing proposed road names for the Montario Quarter. A Conservation Management Plan and an Interpretation Plan were developed for the site in 2017.

Policy 15 of the Conservation Management Plan states:

"Interpretation about the social significance of SPRH should be included in the Interpretation Plan and implemented by Landcorp within the public realm as part of the overall site redevelopment."

Landcorp have advised that the Interpretation Plan goes into some detail about significant people and associations and naming themes. This Plan identifies that, site, the alignment if these names need to, where possible, reflect the previous physical locations of buildings on the site.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Vision Our City will be an environmentally-sensitive, beautiful and inclusive place.

Values

Great Communities
We enjoy places, events and facilities that bring people together. We are inclusive and connected, caring and support volunteers. We are strong for culture, arts, sport and recreation. We have protected amenity, respect our history and have strong community leadership.

Reflects Identities
We value our precinct character and charm. Our neighbourhoods are family-friendly with a strong sense of place.

Easy to Get Around
We strive for our City to be easy to get around by preferred mode of travel, whether by car, public transport, cycle or foot.

Budget/Financial Implications

There are no budget or financial implications in Council adopting this recommendation.

Legislative and Policy Implications

Under the provisions in the Land Administration Act 1997, the Minister for Lands has the authority for officially naming roads in Western Australia. Through delegated authority, Geographic Names Landgate, acts on the Minister's behalf to undertake administrative responsibilities, including the development of policies and procedures required for the formal approval of road names.

Policy dictates that the selection of new road names within new subdivisions is usually the developer/landowner's role. Endorsement from the relevant Local Government(s) is necessary prior to the developer/landowner making a submission to the GNL for approval.

An extract of Langate's Policies and Standards for Geographical Naming in Western Australia can be viewed in Attachment 2.

Decision Implications

By endorsing the recommendation, MNG can finalise the application for new road names with GNL

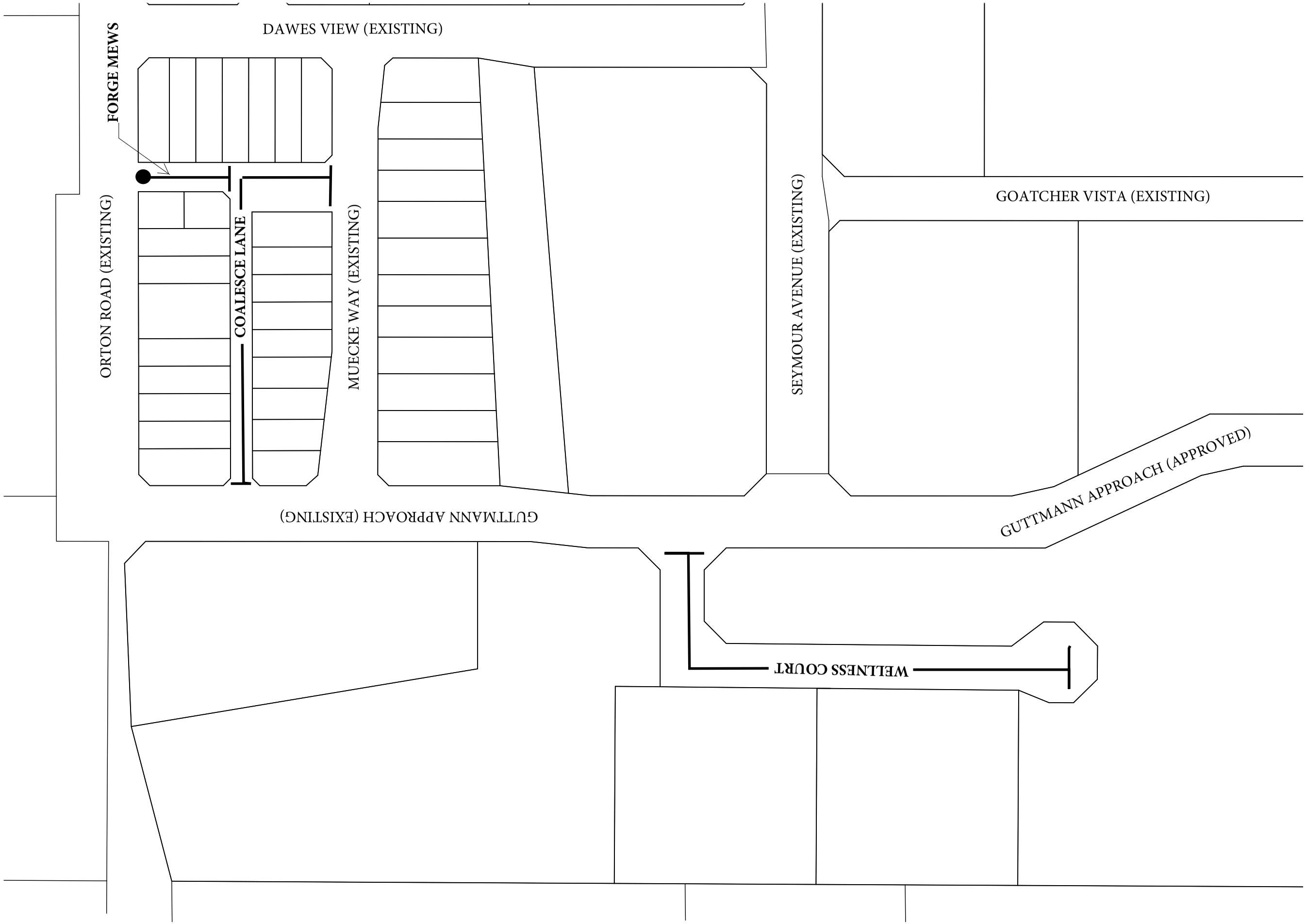
Conclusion

Administration recommends Council approve the requested names list for the Stage 2 roads as applied for.

Further Information

N/A.

TS02.03.22 Attachment 1



Natasha Pallister

From: Therese Hadland <Therese.Hadland@landgate.wa.gov.au>
Sent: Tuesday, 11 January 2022 8:37 AM
To: Natasha Pallister
Subject: [MNG EXT] RE: 2021 Job 2787 Suitability of proposed names. re; precheck road Names for Montario Quarter, Shenton Park

Hi Natasha,

Hope you had an enjoyable Christmas and New Year break.

A check of the three names found them to be suitable.

Please remember to first test the names through our Request a Road Name form 😊

Kind Regards,

Therèse Hadland | Senior Geospatial Officer – Names and Addressing
My Working Days are Monday, Tuesday, Thursday & Friday
Location Data Maintenance
Landgate
1 Midland Square, Midland WA 6056
t +61 (08) 9273 7275
e geographicnames@landgate.wa.gov.au
w landgate.wa.gov.au
Landgate

All general enquiries T. 9273 7200 geographicnames@landgate.wa.gov.au address@landgate.wa.gov.au Customer Feedback Submit Feedback

Landgate respectfully acknowledges the traditional owners of country throughout Western Australia and we pay our respects to their Elders past, present and emerging.

We acknowledge Noongar people as the original custodians of the land on which our Midland office sits.

From: Natasha Pallister <natasha.pallister@mngsurvey.com.au>
Sent: Monday, 10 January 2022 1:51 PM
To: Therese Hadland <Therese.Hadland@landgate.wa.gov.au>
Subject: RE: 2021 Job 2787 Suitability of proposed names. re; precheck road Names for Montario Quarter, Shenton Park

Hi Therese,

Further to the emails below regarding road names for Montario Quarter in Shenton Park can you please check the following names and provide preliminary assessment if suitable?

- Wellness Court
- Coalesce Lane
- Forge Mews

Please find attached the relevant documentation to support this application:

- Marked up plan showing extents
- Proposed Road Name Table with back up names to check if required.

If you have any queries, please don't hesitate to contact me.

Kind Regards,

Natasha Pallister
Project Assistant

MNG Ref: 98792
Attached File/s:

MNG. TEAMWORK. INNOVATION. KNOWLEDGE.
Perth | Melbourne | Kimberley | South West

McMullen Nolan Group Pty Ltd
e: natasha.pallister@mngsurvey.com.au
d: 08 6436 1586
a: L1, 2 Sabre Crescent, Jandakot WA 6164
p: PO Box 3526, Success WA 6964
t: 08 6436 1599 w: www.mngsurvey.com.au

From: Therese Hadland <Therese.Hadland@landgate.wa.gov.au>
Sent: Thursday, 16 December 2021 10:33 AM
To: Natasha Pallister <natasha.pallister@mngsurvey.com.au>
Subject: [MNG EXT] RE: 2021 Job 2787 Suitability of proposed names. re; precheck road Names for Montario Quarter, Shenton Park

Hi Natasha,

That's fine. I can open a new job number when you have some new names that require checking.

Kind Regards,

Therèse Hadland | Senior Geospatial Officer – Names and Addressing
My Working Days are Monday, Tuesday, Thursday & Friday
Location Data Maintenance
Landgate
1 Midland Square, Midland WA 6056
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w landgate.wa.gov.au
Landgate

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Landgate respectfully acknowledges the traditional owners of country throughout Western Australia and we pay our respects to their Elders past, present and emerging.

We acknowledge Noongar people as the original custodians of the land on which our Midland office sits.

Montario Quarter Road Name List

Proposed Name	Proposed Suffix	Background/origin/meaning/justification
Wellness	Court	Connected to the sites former use as the Shenton Park Rehabilitation Hospital of which wellness was the forefront of the sites use, through the many medical innovations, nurses and individuals.
Coalesce	Lane	Calls individuals to reflect on the sites' history and present context that shapes Montario Quarter, located on the site of the former Shenton Park Rehabilitation Hospital, and the shared aspirations for the future. Meaning 'to grow together' or 'to unite distinct elements into a whole'. The sites former use and reprisal as a growing residential estate brings people together, through public open space, interactive heritage elements including Public Artworks such as the Wellness Machine and interpretative trails. Note, that over the next decade Montario Quarter will grow with more than 1,100 dwellings, and change in response to the way people use the precinct.
Forge	Mews	In reference to unbreakable bonds, connections shared, union, rebuilding and renewed strength. This name seeks to embody concepts of connection to place and people. Montario Quarter, located on the site of the former Shenton Park Rehabilitation Hospital is built on the connections to the past through heritage elements, connection to nature with the Woodland Precinct and ongoing rehabilitation. The site is noted to be of Aboriginal significance with an ethnographic site (DPLH Site ID #3763) being identified as Other Heritage Place, with Traditional Owners noting it was associated with a camp, bringing people together. The former Hospital also brought people together, and forged new relationships including between nurses and patients.

Back up Names		Background/origin/meaning/justification
Innovation		Named after the pioneering medical achievements of Sir George Bedbrook in the field of paraplegia including the founding of the Department of Paraplegia.
Legacy		Contribution to the legacy of the achievements at the former Shenton Park Rehabilitation Hospital including the legacy of Sir George Bedbrook, Dr Phyllis Goatcher and Dr Marie Sadka.

Section 2: Roads

Introduction

For the purposes of these policies, a road is considered to be any public or private land- based thoroughfare or course navigable by vehicle or foot that can be used for assigning addresses or allowing access between points or to a feature. Examples of roads include alleyways, roads, streets, highways, fire tracks, bike paths and walking tracks.

Using this section of the policy

Within Western Australia road naming is standardised to facilitate the application of correct address information and to ensure that a consistent approach is undertaken to benefit emergency service responders, transport and service delivery. If established policies for road naming were not applied, the provisions of emergency service responders, utilities and postal deliveries would be compromised.

In Western Australia the following shall be applied:

• all roads shall be named, including private roads which are open to public access or for the delivery of services. This includes but is not limited to: – major state roads, highways, motorways and freeways

– roads within complexes such as universities, hospitals and retirement villages

– roads within conservation reserves, state forests, water reserves and any other government administered land

– pedestrian-only roads such as paths, trails, malls or steps

• all road naming proposals shall be submitted to Landgate for approval.

Any proposal to name, rename or extend a road shall clearly indicate the full extent of the road to which the name will apply. The extent of a road is considered to be its start and end points. This includes bends, divided carriageway sections and curves which are included between these two points.

A road name shall not be applied in a way that is ambiguous or could cause confusion for road users. The road name should be applied to a single, unobscured and unobstructed roadway that leads from point A to point B, in a clear and logical manner.

Roads are not suitable for dual naming and approval will not be given to such proposals.

Who can officially name roads?

Under the provisions in the *Land Administration Act 1997,* the Minister for Lands (the Minister) has the authority for officially naming and unnaming roads in Western Australia. Through delegated authority, Landgate acts on the Minister's behalf to undertake the administrative responsibilities, including the development of policies and procedures, required for the formal approval of road names.

Which roads can be named?

All roads, whether they are public or private, shall be named and formally approved by Landgate.

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Therefore, any land course navigable by vehicle or foot and of interest to local governments, public groups, emergency service response and public service providers must be officially named according to the policies and procedures outlined in this document.

Note: driveways that give access to five or fewer address sites do not need to be named if the properties are adequately addressed on the main road that provides access. Driveways on private land or common property should not be named, unless it can be shown there is a risk to public safety or the name is causing confusion in the delivery of goods and services.

Public roads

A public road is any road that is opened, dedicated or declared to be a public road, whether under the *Land Administration Act 1977, Part 2 – General administration, Division 3 - General* or any other Act.

As a prerequisite to lodgement, all survey documents creating, extending or showing abuttals to roads must show the correct approved road names. If no approved name exists, the new road names must be formally approved by Landgate before the survey can be lodged. To help expedite this process, the developer or their agent should be prompt in lodging a concept plan and a proposal for road names with the relevant local government. Local governments shall then propose the names to Landgate for approval.

Private roads and rights-of-way

A private road is any road that is not a public road which is open to public access or for use by other services. Private roads and rights-of-way must be clearly identified and uniquely named to facilitate the application of standardised addressing to all land parcels in Western Australia.

The delivery of emergency and other services to residents and businesses are often impeded when private road names are not officially recorded. To minimise confusion, standardise address allocations and support emergency service responders, all road naming policies and addressing standards must be applied.

Private roads include but are not limited to:

- some roads or driveways to battle-axe blocks
- roads indicated on community subdivision plans
- roads in various cluster developments
- roads on private property, for example, roads in caravan parks
- other forms of 'rights of way'.

Naming a road on private land does not mean that Landgate, the secretariat, the GNC or the Minister is accepting responsibility for that road other than of ensuring its name meets the required naming policies for Western Australia.

Reserved road names

Local governments may no longer request that eligible road names be reserved for future use within their boundaries. Prior existing reserved road names will automatically lapse five years from original approval, with the Reserve Register to contain no local government requested names from 1 January 2022.

Local governments are encouraged to maintain their own reserve register, using the Landgate on-line form to check for suitability.

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Road naming policies

Local governments and other authorities are to ensure that all naming submissions conform to the policies outlined in Section 1, as well as all the policies outlined in this Section.

2.1 Australian/New Zealand Standard AS/NZS 4819:2011 Rural and urban addressing

Except where provisions are already made in these policies, the naming of any road must conform to the provisions of *AS/NZS 4819:2011 Rural and urban addressing*. The Standard outlines how to derive datum points and how address numbers are assigned.

2.1.1 Road extents

Any proposal to name or rename a road needs to clearly indicate the extent to which the name will apply. The extent of a road is considered to be its start and end points, and the course (including bends, divided carriageway sections and curves) of the road between these two points.

Contiguous navigable roads

A named road shall include only one navigable section. If a road design has become obstructed, due to construction of other roads or features, and is separated to become two unconnected navigable sections of road then these road extents must be assigned separate unique road names. This is particularly important when emergency service responders cannot navigate the entire course of the road from one end to the other.

Common separations may include unbridged streams, pedestrian segments, railings etc. The above does not apply when the separate sections are either of the following:

• two sides of the same road separated by a median strip; or

• part of a classified highway that is split by a section that is assigned a local name where it passes through a town or city.

2.1.2 Laneways and short roads

The increase in urban density in new developments and urban redevelopment has resulted in many narrow short lanes and rights-of-way requiring names. Laneways shall be named if a name is required for addressing purposes or has been created as a public road by survey.

The naming of such roads is supported with a preference for use of the road type LANE and short names consisting of no more than six letters. The leg of a battle-axe lot shall not be considered a laneway.

Roads which are regarded as short, for example a small cul-de-sac or private road with five or less address sites, that are not proposed to be lengthened or will not have additional address sites needed in the future, may not need a separate name. Any address numbers required may be assigned on to the road on which it connects.

2.1.3 Naming malls and pedestrian access ways

Malls and pedestrian access ways shall be named according to the current road naming policies and standards. The names shall be recorded as private road names and may be used for the allocation of street addresses if required.

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If a mall or public access way is created as an official reserve and a name is required for the actual reserved area, then the name shall be recorded separately as a road name and as a topographic feature name (reserve).

2.2 Components of a road name

All road name submissions must conform to the policies as outlined in Section 1.

2.2.1 Name element requirements

Every road name should consist of a single name element followed by a road type, for example Smith Road, Jones Street etc. not Black Swan Drive, John Smith Avenue.

A single length of road shall have only one name.

Road names without a type shall not be used, for example Broadway, Causeway, The Avenue, The Boulevard, The Esplanade, The Mews, The Strand etc.

2.2.2 Road types

All road names shall include a road type.

The road type must be selected from the list as shown in Australian/New Zealand Standards AS/NZS 4819:2011 Rural and urban addressing – Appendix A, Road Types – Australia. A copy of this road types list has been provided in this document in Appendix 2A: Road types suitable for use in Australia.

The road type shall be chosen to convey the function and characteristics of the road as described in the 'description' field of the road type list. Road types may be chosen with the final configuration in mind, for example a road that is first constructed as a cul-de-sac may be given an open-ended street type if it can be confirmed that the road structure will be modified and eventually become a through road.

Road types shall not be used to distinguish different roads of the same or similar sounding names, for example Reed Street, Reed Crescent and Reed Way. Such roads shall be considered as duplicates and are not acceptable.

This also applies to similar sounding names such as Read Street, Rede Crescent and Reid Way.

Other road types suitable for use in Western Australia

In addition to the road types listed in Appendix 2A, there are exceptions where the use of an alternate road prefix or suffix may be requested.

The word 'Jalan' is used as a prefix on roads situated on the Cocos (Keeling) Islands and Christmas Island. The word 'Jalan' is a Malay word for road or street, for example, Jalan Guru and Jalan Perak.

Aboriginal words used to describe paths or tracks may also be used. For example, the word 'Banan' is used exclusively within the Kimberley area as a road type, for example Berewereng Banan and Templetonia Banan.

2.2.3 Unacceptable names

The official naming parameters as detailed in Section 1: Policies and Standards must be applied for all road naming submissions.

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As outlined in Section 1: Policy 3.1, names starting with 'the definite article 'THE' shall not be approved for use as a road name, for example The Boardwalk, The Esplanade, The Strand are no longer acceptable road names.

The use of road types as part of a road name shall not be used for example Swan View Road, Southern Crest Road, Beachview Drive, Lakeview Avenue, View Street or Boulevard Way.

As outlined in Section 1: Policy 1.3.4, the use of prefixes and suffixes is not supported. The only exception that may be considered by Landgate is when the name is derived from a local feature of historical significance such as 'Lake Clifton Drive' or 'Mount Meharry Way'.

Destination-to-destination names, for example Harvey-Quindanning Road, are not acceptable, see Section 1: Policy 1.3.4. Where previous naming actions have allowed the use of a hyphen as part of the name, there shall be no space between the names and the hyphen, for example Quairading-York Road is acceptable, Quairading – York Road is not.

The use of numerals in a road name may cause confusion between the name of the road and an address number. Therefore it is not acceptable for a road name to include numbers/numerics, either in full alphabetised or numeric format for example neither Eight, Eighth, 8 or 8th, see Section 1: Policy 1.3.12

2.3 Name duplication

All road name submissions must conform to all the mandatory policies outlined in Section 1: Policy 1.6.

2.3.1 Existing duplicated or similar sounding names

Road names submitted for approval shall not be, regardless of road type:

- homonymous, for example similar in spelling to an existing road name
- similar in sound to an existing road name
- in the same locality as an existing road name
- in an adjoining locality
- in the same Australia Post postcode delivery area
- less than 10km from the existing duplication in the metropolitan area
- less than 50km from an existing duplication in rural areas.

These exclusions shall also apply to similar sounding or written names, and to those within similar sounding localities even if they are more than 10km away, for example Forrestfield / Forrestdale, Woodbridge / Woodridge, Fremantle / East Fremantle etc.

Road name duplication should be avoided in adjoining local governments.

2.4 Naming amendments

Road names are intended to be enduring. The renaming of any road is discouraged unless there are good reasons for a change of name.

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Reasons that may be considered in support of a name change are:

• redesign of a road layout

• changed traffic flow

• mail delivery problems

• the misspelling of a name in the original application

• name duplication issues

• property street addressing issues.

Renaming shall be necessary when a road is made into a cul-de-sac, resulting in two or more separated sections of road. Such separations can cause difficulties for emergency service responders and the delivery of other services to the area. The renaming of a portion of separated road may also be used to solve address numbering problems.

Where a change to the name of a road is proposed, the new name selected shall conform to all the necessary naming policies and standards.

For regional roads the change of name must have broad community support, and for local roads, there must be majority support from the affected land owners and residents.

The requirements of emergency service responders for clear, unambiguous road naming shall also be a consideration.

Proposals normally require the support of local government, but the Minister is the final authority in all such matters.

Submissions for road name changes deemed to be non-essential or unnecessary shall incur a service charge.

2.5 Naming roundabouts and rotaries

Roundabouts and rotaries are circular intersections in which traffic travels clockwise around a central island. They are constructed to control traffic, to minimise delay by being able to accommodate large volumes of traffic movements, and to provide adequate sight distances. The

primary difference between the two is that rotaries have a significantly larger diameter than roundabouts.

All entrances and exits to roundabouts and rotaries must be clearly named and labelled with adequate signage.

2.5.1 Roundabouts

Roundabouts are circular intersections with specific design and traffic control features. These features include yield control of all entering traffic, channelised approaches, and geometric curvature and features to induce desirable vehicle speeds. They may also include more extensive pedestrian and bicycle features.

Roundabouts shall not have names or address ranges.

2.5.2 Rotaries

Rotaries are characterised by a large diameter (a minimum of 40m). Unlike most roundabouts, lane changes may be required within a rotary for some movements.

Rotaries may be named however all such naming requests shall adhere to the following:

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• the naming of state road rotaries shall be undertaken through consultation with MRWA

• local government is to be consulted for the naming of rotaries which are under their control

• rotary names shall be unique and not duplicated anywhere within Western Australia

• rotary names should be short and preferably of local Aboriginal origin

• rotary names shall not be named the same as any of their intersecting roads.

Rotaries shall not have address ranges.

2.6 State roads

Main Roads Western Australia (MRWA) is responsible for the management of all freeways, highways and main roads in Western Australia, which are collectively referred to as state roads. Management includes all ramps and rotaries associated with state roads. A list of state roads is available on the MRWA website (www.mainroads.wa.gov.au).

The naming of major state roads shall conform to these naming policies and standards and shall be referred to the Minister for approval. The process for the selection of names shall include consultation with relevant state and local government agencies and should include consultation with the wider community.

The Minister for Transport has determined that, for all new major roads funded by the state government, MRWA shall consult with government before any action is initiated to identify a suitable name. Advice will then be provided on whether the government is to choose a name, or if MRWA should undertake community consultation or some other action to identify a suitable name or shortlist of names, for consideration by government. MRWA must advise Landgate of the government's chosen or endorsed name.

The official naming parameters as detailed in Section 1: Policies and Standards must be applied for all such naming actions.

2.7 Government managed land

All roads administered by other government agencies and authorities other than local governments, must adhere to all of the relevant Landgate naming policies.

Commonwealth, state, territory or local government authorities or agencies responsible for the management of roads or tracks on land administered by them, shall liaise with Landgate to develop practices and processes for their naming.

Because of the varied nature of roads that fall under the jurisdiction of different state government departments and authorities, Landgate prefers to establish individual naming policies and practices for each department or authority as required.

If a unique set of naming policies and practices has not been established for a relevant government department or authority, then the general Landgate policies shall apply.

2.8 Private, residential and commercial developments

The intention of this subsection is to outline the process for naming or renaming roads created as part of a private, residential or commercial subdivision.

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It should be noted that whilst the selection of new road names within new subdivisions is usually the developer/landowner's role, endorsement from the relevant local government(s) is necessary prior to any submissions being made to Landgate.

The developer and the local government(s) should work collaboratively to develop compliant road names for the subdivision.

2.8.1 Roads on private property

Private roads include (but are not limited to) any formed roads and tracks within a commercial logging site, caravan park, retirement village or closed-gate community. If the intention is for these private roads to be used for property street addressing, way finding purposes or for general public access, they must be named in accordance to these policies.

All private roads should be named and submitted for approval, especially if the road gives access to one or more properties that cannot be assigned an alternative unambiguous urban or rural address.

The irregular and ungoverned naming of roads within complexes can lead to confusion and interruption to the efficient delivery of emergency and other essential services. The official approval of road names within such complexes ensures that the details are accessible to the wider community and are included on the majority of relevant organisational and public mapping products.

2.8.2 Compliance

All roads within private, residential or commercial subdivision must be named in accordance with Section 1: General policies and standards.

When plans of subdivision are lodged for registration with Landgate, an audit of the road names will be undertaken. If it can be shown that the road names on a lodged plan have not been officially

approved, this will result in delays affecting the approval of lodged surveys and consequently the issuing of certificates of title.

Owners of private land and complexes should liaise with the relevant local government when developing roads on the site. Owners must ensure that road names conform to the Policies and Standards for Geographical naming in Western Australia.

2.9 Tourist drives / routes

To assist the promotion of Western Australia's diverse range of landscapes, scenery and other 'special places' to overseas and eastern states visitors, state tourist and local scenic drives may be determined and named.

2.9.1 State tourist drives

A state tourist drive shall be a quality route which is considered to be of state-wide significance. It should portray and link some of the state's unique natural features or exceptional scenic areas. It must provide a meaningful route for tourists to experience something 'special' and enhance a visitor's tour of the state.

It shall be a requirement that the standard of routes recognised as state tourist drives be kept at a high level. If this criterion is not adhered to, then the value of such routes will be undermined and the value of such an initiative will be diminished.

A route simply linking features such as national parks, state forests, lookouts or other built or natural features is not sufficient to justify a designation as a state tourist drive. They can be used to enhance such a route, but cannot be the sole purpose for it. Similarly, a route that links together a township's normal features and facilities would also not constitute justification for a state Tourist Drive.

2.9.2 Local scenic drives

If a route which does not meet the assessment criteria for a state tourist drive has been recognised as having a reasonable tourism value, then it may be recognised as a local scenic drive.

If the route does not have any tourism merit and may have a negative or misleading impact on tourists and visitors to an area, then no approval for such a route shall be given.

2.9.3 General assessment criteria

Tourism value shall be assessed by the following:

• the tourist drive/route must have significant tourism interest and shall offer an array of significant scenic or natural features which should be of greater interest than the general topography or sights as seen on a regular through route

• the theme and name of the route must reflect its unique characteristics and not conflict with its natural or physical surroundings or any other official feature, road or route within the state or nationally

• routes with generic names like 'Marine Tourist Drive', 'Heritage Tourist Drive' or 'Wildflower Tourist Drive' shall not be approved as they are not unique to a specific location within the state

• the tourist drive/route should not rely on attractions which are strictly seasonal or are not a permanent feature of the route, such as wildflowers

• the proposed tourist drive/route shall be endorsed by the relevant local government(s), local Visitor Centre(s), WA Tourism Commission and a majority of the local community and businesses

• be as safe as possible for motorists who may be unfamiliar with the local area

• only include sealed maintained roads and avoid any hazardous alignments or grades, or single lane roads which may not be suitable for the volume of tourist traffic that may be attracted to the route

• not follow main arterial roads such as major local government roads and national or state highways except where necessary for short distances (no more than 5kms) to maintain the continuity of the tourist drive/route

• not be located in built up areas or town centres

• avoid intersections or sections of road which may at times be relatively congested with heavy haulage or other non-tourist traffic

• be capable of leading motorists back to the main through route from which they deviated with adequate signage to assist them with continuing their journey.

Tourist information on the general area, including brochures, maps and guides should be made available from tourist centres and other outlets along the route. The route will also need to be marked on maps in roadside information bays wherever they exist.

2.9.4 Submission process to recognise tourist route

Applications for a route to be recognised as a state tourist drive shall be submitted to Landgate.

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The application must:

• be supported with a formal resolution from the relevant local government(s)

• indicate that the proposed route is supported by the WA Tourism Commission, Regional Travel Association, local visitor centre, as well as the local community and businesses

• identify the jurisdiction(s) responsible for the erection and ongoing maintenance of direction and other related signs along the route, including the cost of removing the signs if the route fails to meet the criteria for a state tourist drive at some point in the future

• clearly describe the route on a large scale map

• describe the unique natural features or scenic attributes which exist along the route;

• list all significant natural and built attractions along the route with a brief description of each

• include a one or two word name for the route which will be suffixed with the words 'Tourist Drive'

• include a description of how the state tourist drive will be promoted and what marketing collateral will be produced.

2.9.5 Review of current state tourist drives and routes

State tourist drives/routes will be subject to review on a regular basis to ensure that the quality of the route has not diminished or been compromised over time. If a state tourist drive/route loses that special quality it had when first assessed and recognised then the route shall be deleted.

2.9.6 Identification of state scenic drives, tourist drives and routes

Local government is responsible for the establishment and maintenance of such drives and routes including the cost of road signage and its maintenance. The signage of state tourist drives is governed by Australian Standard AS1742. Part 6: Manual of uniform traffic control devices – Tourist and service signs.

Local governments will be required to obtain approval from Main Roads WA (MRWA) for the erection of any route signs which occur on highways and roads under its control.

Supplementary or any other associated Tourist Attraction and Tourist Service signs will be subject to the established approval and funding guidelines available from MRWA and respective local governments.

Road name submission process

Landgate accepts applications for new names relating to roads, localities, administrative boundaries and topographic features. Such applications should be directed to the relevant local government for their endorsement and submission to Landgate.

General information on the process for submitting naming applications is shown at Appendix 1A.

In addition, each road name proposal shall include the following information:

• the reason for the proposal or name change

• origin of each road name and its source

• a location by local government, locality and estate name if known

• identification on a map clearly indicating extent and precise start and end points

• photographs or sketches

• any other supporting information such as historic articles, reference materials, publications etc

• where applicable, evidence of landowner, family or community support

• if the name is Aboriginal in origin, evidence of support from relevant Aboriginal Community

• if the application is for a renaming, evidence of consultation from the affected residents and property owners is required.

Please refer to Landgate's *help guide* on Landgate's website for assistance specific to road naming submissions.

Incomplete applications will not be progressed until all the necessary information has been provided.

17.2 TS03.03.22 Foreshore Management Steering Committee – Establishment and Appointment of Members

Meeting & Date	Council – 22 March 2022
Applicant	City of Nedlands
Employee Disclosure under section 5.70 Local Government Act 1995	Nil.
Report Author	Daniel Kennedy-Stiff, Manager City Programs and Projects
Director/CEO	Andrew Melville, Acting Director Technical Services
Attachments	Nil.

Purpose

The purpose of this report is for Council to adopt the Terms of Reference for the Foreshore Management Committee and confirm the appointment of its members.

Recommendation

Council:

1. **adopts the Terms of Reference for the Foreshore Management Steering Committee as per the below;**

2. **appoints the Mayor and four Councillors (one Councillor from each ward) as Committee Members:**

   Councillor (insert name) - Coastal Ward
   Councillor (insert name)- Hollywood Ward
   Councillor (insert name) - Dalkeith Ward
   Councillor (insert name) - Melvista Ward

3. **appoints one representative from the Department of Biodiversity, Conservation and Attractions (DBCA) as a member**

4. **appoints the Deputy Mayor and four Councillors (one Councillor from each ward) as Deputy Members of the Committee:**

   Councillor (insert name) - Coastal Ward
   Councillor (insert name)- Hollywood Ward
   Councillor (insert name) - Dalkeith Ward
   Councillor (insert name) - Melvista Ward:

Terms of Reference

Purpose

This Committee is established by Council in accordance with section 5.8 of the Local Government Act 1995 to oversee the City of Nedlands Foreshore Management Planning Project.

Scope

1. **Evaluate the Request for Quote (RFQ) responses received by the City for the provision of Foreshore Management planning services and select a preferred consultant.**

2. **Provide guidance to the Consultant on the community consultation plan and process.**

3. **Approve the community consultation plan.**

4. **Provide guidance to the Consultant on the Concept designs, Program of Works and Community Consultation results.**

5. **Provide guidance and input into the draft Foreshore Management Plan; and**

6. **Consider the draft Foreshore Management Plan and make a recommendation to Council on the adoption of the Foreshore Management Plan.**

Membership

1. **The membership of the committee shall comprise the Mayor and one Councillor from each ward with the Councillors being determined by nomination and if necessary, a ballot conducted at a Council Meeting and up to one non-Councillor Member, being a representative from the Department of Biodiversity, Conservation and Attractions (DBCA) as voting members.**

2. **Council will appoint one Councillor from each ward as deputy members of the committee.**

3. **If a vacancy on the committee occurs for whatever reason, then Council shall appoint a replacement in accordance with the same arrangements as for the original appointment.**

4. **Deputy members are only required to attend and vote if the primary member is absent, an apology or on leave or has resigned.**

5. **The term of the presiding member and committee members will expire immediately prior to the next ordinary Council election.**

6. **The presiding member shall be determined by election amongst the members of the committee at the first meeting of the Committee.**

7. **Should the elected presiding member not be present during a meeting of the committee then a temporary presiding member shall be elected in accordance with 7 above.**

Staff

The Project Management Team, including the City's Project Managers and the appointed Consultant team will work closely with the Committee throughout the Project.

Meetings

1. **This Committee operates under the Council's Standing Orders Local Law.**

2. **The committee shall have flexibility in relation to when it needs to meet, but as a minimum shall meet monthly. It is the responsibility of the presiding member to call the meetings of the committee.**

Reporting

The Committee shall report quarterly to the Council summarising its activities during the previous financial year.

Voting Requirement

Absolute Majority

Background

At the Ordinary Council Meeting on 17 December 2019 Councillor Bennett put forward a Notice of Motion (NoM) regarding the Riverwall and foreshore management. Cr Bennett recognised that the area is a high profile and important gateway to Nedlands from Perth. Additionally, he highlighted concerns that the revetment wall design does not reflect an understanding of coastal ecology, coastal engineering or the relevant physical forces that need to be considered. Aesthetic concerns were also raised.

Further, there was opportunity to involve local experts who could assist in developing best practice, holistic solutions, to enhance existing environmental values, with the aim of improving river access, community recreational benefits, and foreshore activation.

Concern was also raised that the proposed uneven limestone boulders within the continuous revetment wall would be a hazard for slips and falls into the river with limited access to get out.

Following their consideration of the notice of Motion, Council resolved to delay acceptance of the tendered contracts associated with the Nedlands Foreshore Riverwall Restoration to explore other community benefit and nature-based options. Additionally, Council requested that the Administration, in collaboration with other technical experts, hold a workshop to explores alternative option to revetment solutions.

Consequently, a Foreshore Workshop was organized and held on 10 September 2021 and was attended by the Mayor, Councillors, Administration staff, members from the University of Western Australia and representatives from Department of Biodiversity, Conservation and Attractions (DBCA).

The workshop sought input from Councillors and other key stakeholders on matters regarding foreshore management along the full length of the Nedlands Foreshore. The input and guidance for the workshop has been incorporated into the Project planning and Request for Quote documentation.

The guiding aims and objectives of the FMP, which are consistent with the Swan Canning River Protection Strategy, have been categorized into socio economic, commercial and sustainability benefits realization objectives, which have been developed, and weighted by relevance, are shown below:

Tier 1:

1. Be consistent with the Swan Canning River Protection Strategy, its vision of ‘A healthy river for all, to be enjoyed and shared, now and in the future’, its responses, strategies and actions.

2. Create a highly accessible and integrated public open space

   By improving access, connectivity and legibility for all users to the foreshore environment.
   Review current transport provisions and investigate multi modal transport options. Identify transport considerations aimed at reducing car use and conflict between nodes of transport.

3. Create a sustainability benchmark

   Develop a strategy to manage the operation, maintenance, renewal and upgrade of infrastructure assets to meet key stakeholders and community needs in a sustainable, cost effective and holistic manner.

   Support environmental values to enhance native flora, fauna and marine species – particularly dolphins

Promote an environment that responds to the requirements of climate change and water sensitive urban design practice and provides biodiversity

Recommend management / maintenance strategies for the next ten years.

4. Establish key areas for sport activities, passive recreation and nature spaces.

   Provide safe and diverse recreation choices at the foreshore.

   Increase activation and appeal of existing spaces.

   Provide unique environment for fitness and leisure activities with passive and relaxation opportunities.

Tier 2:

5. Celebrate Aboriginal culture and the wider history and heritage as a strong element of the foreshore's identity

   Create opportunities in partnership with the local community to celebrate and educate visitors on the historic use of the foreshore by the Noongar Aboriginal peoples.

   Create opportunities in partnership with the local community and heritage.

6. Create Partnership Opportunities

   Within the local area by attracting commercial opportunities to key nodal areas.

7. Create Education and Training Opportunities

Leverage the location and provide innovative education opportunities through the provision of way finding and other public infrastructure.

Leverage the location on the river and relationships with government and community groups for the provision of innovative training and educational water related programmes.

By improving access, connectivity and legibility for all users to the foreshore environment.

Tier 3:

8. Enhance Nedlands as a residential location of choice

By attracting tourists and residents from regional and national and international markets.

Discussion

Due to the strategic importance of a Foreshore Management Plan, Administration is seeking to establish a Foreshore Management Plan Steering Committee to provide guidance and input into the process of developing a comprehensive Foreshore Management Plan.

This project will be conducted in partnership with DBCA, who will assume several roles in the project:

1. Project co-funder: DBCA has committed $30,000 to assist in the development of a Foreshore Management Plan.

2. Statutory approval authority.

3. Specialist advisor and Subject Matter Expert on the Swan/Canning River and Foreshore.

The proposed project timeline is shown below:

Activity	**Indicative timeline**
Appoint FMP Steering Committee	22 March 2022
RFQ Award	late March 2022
Start up meeting	late March 2022
Community Consultation Plan approved by Steering Committee	June 2022
Key stakeholder and Community consultation commences	July 2022
Draft Foreshore Management Plan (including Works Program, funding analysis and Concept drawings) presented to Council	December 2022
Foreshore Management Plan approved by Council	February 2023

Consultation

Consultation with Councillors and other key stakeholders was initiated through the Foreshore Workshop on 10 September 2021, held at the University of Western Australia.

The strategic guiding principles of the Foreshore workshop are shown above in the Discussion section of this report.

A community consultation plan will be developed as part of this project, and consultation with the Community, the Steering Committee and key stakeholders will be undertaken throughout the project.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Vision

Our city will be an environmentally-sensitive, beautiful and inclusive place.

Values

Healthy and Safe
Our City has clean, safe neighborhoods where public health is protected and promoted.

Great Natural and Built Environment
We protect our enhanced, engaging community spaces, heritage, the natural environment and our biodiversity through well-planned and managed development.

Great Governance and Civic Leadership
We value our Council's quality decision-making, effective and innovative leadership, transparency, accountability, equity, integrity and wise stewardship of the community's assets and resources. We have an involved community and collaborate with others, valuing respectful debate and deliberation.

Great Communities
We enjoy places, events and facilities that bring people together. We are inclusive and connected, caring and support volunteers. We are strong for culture, arts, sport and recreation. We have protected amenity, respect our history and have strong community leadership.

Reflects Identities
We value our precinct character and charm. Our neighborhoods are family-friendly with a strong sense of place.

Easy to Get Around
We strive for our City to be easy to get around by preferred mode of travel, whether by car, public transport, cycle or foot.

Priority Area

- Urban form - protecting our quality living environment
- Renewal of community infrastructure such as roads, footpaths, community and sports facilities

Budget/Financial Implications

There is $76,084 of Municipal funds currently allocated to this project, and DBCA have made a commitment of a further $30,000. It is expected that further funds of the approx. $50,000 will need to be allocated next Financial Year to finalise the project. Additional funding will be proposed as part of the City's 2022/23 Budget process.

Legislative and Policy Implications

Section 5.8 of the Local Government Act 1995 allows Council to establish Committees to assist the Council to exercise the power and discharge the duties of the Local Government. The Foreshore Management Plan will need to be complaint with the Swan and Canning Rivers Management Act 2006. Partnering with DBCA and the engaging of an expert consultant mitigates the risks associated with legislative non-compliance.

Decision Implications

If Council endorse the recommended Terms of Reference for the establishment of this Committee, the Project will be able to proceed with Councillor input and guidance throughout the project.

If Council does not endorse recommended Terms of Reference for the establishment of this Committee, the Project will have limited Councillor involvement. This will significantly increase the risk of changes to the Plan, or the Plan not being endorse when presented to Council.

Without an endorsed Foreshore Management Plan, the Administration will not have Strategic guidance on how to effectively plan and manage works along the Foreshore, which will result in a poor outcome for this key area of the City.

A Foreshore Management Plan that has been endorsed by Council will enable the City to apply for state and federal grant funding opportunities that will assist to deliver future capital works.

Conclusion

The Foreshore Management Plan project presents a unique opportunity for the City of Nedlands to undertake community consultation that will inform the City as to how our residents want to use the Foreshore over the coming decades, and then to develop a long-term strategic plan to manage and improve the Foreshore.

The establishment of the Foreshore Management Plan Steering Committee will ensure Council has the opportunity to provide strategic guidance to the project and is involved in the development process.

Further Information

N/A

17.3 TS04.03.22 City of Nedlands Drainage Infrastructure Study

Meeting & Date	Council Meeting – 22 March 2022
Applicant	City of Nedlands
Employee Disclosure under section 5.70 Local Government Act 1995	Nil.
Report Author	Finn Macleod, Manager Assets
Director/CEO	Andrew Melville, Acting Director Technical Services
Attachments	1. Draft City of Nedlands Drainage Infrastructure Upgrade Study 2. Proposed additional 2021-22 Drainage Projects 3. Flooding of City Buildings and Assets 4. City of Nedlands Stormwater Council Policy 5. City of Nedlands Crossover Specification

Purpose

The purpose of this report is to present the draft City of Nedlands Drainage Infrastructure Upgrade Study. The report also recommends a series of projects for inclusion within the 2021/22 capital works program.

Recommendation

That Council:

1. receives the Drainage Infrastructure Upgrade Study;

2. directs the Chief Executive Officer to include the Drainage Infrastructure Upgrade Study recommendations into the long term financial plan;

3. endorses the following capital works projects for 2021 – 22:

a. Taylor Road Basin
b. Waroonga Road Basin
c. 30 Bulimba Road, Nedlands
d. 55 Adderley Street, Mount Claremont
e. 57 Adderley Street, Mount Claremont
f. 54 Jenkins Road, Nedlands
g. 3A Bulimba Road, Nedlands
h. 12 Edwards Green, Floreat
i. 105 Broadway, Nedlands
j. 1A Doonan Road, Nedlands

4. directs the Chief Executive Officer to review the City's Stormwater Policy; and

5. directs the Chief Executive Officer to Review the City's Crossover Specification.

Voting Requirement

Simple Majority.

Background

On 9 July 2021, a storm event impacted the western suburbs of Perth, causing flooding to a number of private properties within the City of Nedlands. The storm event has been classified as a 1 in 180 year storm.

Following the storm event, Council considered the matter at the August Ordinary Council Meeting where it was resolved that:

Council in acknowledging recent winter storm events:

1. requests the CEO to prepare a City-wide report of damage, including but not limited to;

    - Flooding from water draining from public land into private land with lots identifies,
    - Flooding and storm damage to City buildings and assets,
    - River, ocean and wetland inundation of shorelines and assets,
    - Call out assistance received from State Emergency Services,
    - A program of works for the remedial draining infrastructure required (if any) and
    - A cost projection for any remedial work and impact on Budget in out years.

2. instructs the CEO to commission a drainage study to:

    a. Review the available local weather data of the storm event that occurred on 9 July 21;
    b. Assess the capacity of the drainage network in all affected areas; and
    c. Provide recommendations on any upgrade works that are required.

3. approves by absolute majority the transfer of $200,000 from the Service Reserve to the City Wide Drainage account for the drainage study; and

4. instructs the CEO to present a report to Council with the findings of this study, inclusive of recommendations, works cost estimates and a program of works to be considered within the Forward Capital Works Plan.

As a result of this decision, the City engaged GHD to undertake a drainage assessment which involved consultation with affected residents, data collection and modelling.

Photos, videos, resident recollection and anecdotal evidence from the community, and City staff, was used to calibrate and validate the model. The model was used to understand the

cause of flooding in each location and then test potential works to improve drainage capacity and mitigate the risk of future flooding events.

The report and modelling are nearing completion, with minor addendums to be provided in areas in which additional modelling has been requested.

Discussion

The recommendations contained within the study can be categorised as follows:

1. Upgrades to infrastructure
2. Improvements to policy and specifications

Upgrades to infrastructure
The proposed works in the report have been designed to prevent private property flooding and convey all stormwater within the road or drainage infrastructure for a 1% Annual Exceedance Probability (AEP) event. This is in line with the Department of Water's *Stormwater Management Manual for Western Australia 2014*.

The modelling has shown that there are many locations within the City that are at risk of flooding again in future storm events if further works on the City's drainage infrastructure are not undertaken.

During the investigation, multiple solutions were investigated for all locations, with the most cost-effective solutions recommended by GHD. The investigation has resulted in 41 recommended projects, worth a total estimated cost of $2.45 million at a confidence of ± 50%. The low confidence in the estimate reflects the use of unit rates as opposed to specific estimates for each project.

Due to the volume and complexity of several of the recommended projects, staff are investigating a multi-year capital works program to implement the proposed upgrades, prioritised by the City's ability to deliver the works, risk of future flooding, impact of future flooding and further investigative and design works that may be required prior to construction.

Staff have proposed a list of works which are expected to be relatively simple to deliver within the remainder of this financial year while further work on developing a staged capital works program to implement all upgrades is undertaken. Details of these projects can be seen in Attachment 2

It is expected that some residents may oppose the suggested works, as in many locations residents' crossovers do not meet the City's Crossover Specification and will require replacement to meet standards. In other locations, both crossover replacement and increases to the level of the verge has been recommended. While this may be unpopular with residents, it is far more cost effective than other alternatives such as large underground systems or lowering road levels. It is proposed that the City fund verge raising and crossover replacements using like for like materials where available. Crossovers which do not comply should be replaced even when the resident opposes the replacement and wishes to accept

the risk of flooding as a crossover not to specification may impact flooding of properties surrounding the property with a non-compliant crossover.

The recommended projects for 2021-22 financial year that have been provided by staff reflects the largest impact that staff believe can be made in the short term. Deliverability of many projects is constrained by further survey, design and investigative works required along with the availability of resources to deliver projects in the time remaining this financial year.

Improvements to the policy and specifications
The report also highlights changes to Council policy and specifications as a recommendation. It is important that stormwater generated from private property does not exit and place additional burden on the drainage network for which it has not been designed. The GHD report has highlighted recommendations in relation to the City's planning and drainage policies that will be reviewed by City staff and presented to Council for further consideration.

Consultation

Within the City of Nedlands, there were 55 properties that were reported as being affected by flooding caused by the 9 July 2021 storm event. All affected property owners and occupiers were invited to a 1 on 1 consultation with the appointed consultant. 37 of the 55 residents requested to speak to the consultant, all of whom have now met or spoken with the consultant.

Importantly, the information gathered, inclusive of verbal, video and photographic materials have informed the model's design and subsequent recommendations.

Consultation on proposed projects will occur during the project delivery process.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Our city will be an environmentally-sensitive, beautiful and inclusive place.

Values

Great Natural and Built Environment
We protect our enhanced, engaging community spaces, heritage, the natural environment and our biodiversity through well-planned and managed development.

High standard of services
We have local services delivered to a high standard that take the needs of our diverse community into account.

Easy to Get Around

We strive for our City to be easy to get around by preferred mode of travel, whether by car, public transport, cycle or foot.

Priority Area

- Urban form - protecting our quality living environment
- Renewal of community infrastructure such as roads, footpaths, community and sports facilities
- Encouraging sustainable building
- Working with neighbouring Councils to achieve the best outcomes for the western suburbs as a whole

Budget/Financial Implications

Council approved $250,000 within the Mid-Year Budget Review to implement works from the Drainage Infrastructure Upgrade Study and river wall repairs. Following further investigation, the river wall repairs can be completed within the existing budget allowing $250,000 to be allocated to funding the recommended drainage projects in 2021/22. Projects listed will be completed in line with the assigned priority. Due to the uncertainty of current estimates, it is possible that not all approved projects are completed in 2021/22. Projects which are not completed will be planned for a future year.

The estimate undertaken by the consultant to complete all works totals $2.45 million, however, staff expect it is likely that the total cost will exceed this significantly. Many of the projects will incur additional expenses that may include site specific surveys, additional modelling and design prior to construction, while costs including service location and relocation, project management and traffic management have not been included. It is estimated that the total cost of all projects combined could increase to more than $5 million.

As the majority of these works are new infrastructure, or infrastructure upgrades, there will be an ongoing cost of maintenance and renewal of these assets. It is expected annual maintenance costs to clean and maintain the new infrastructure will be in the order of $5,800 per annum with ongoing renewal costs of approximately $50,000 per year.

Given the quantum of the recommended works and associated costs, the City will incorporate the recommended works into the long-term financial plan. This plan covers a 10 year time horizon.

Legislative and Policy Implications

The following legislative and policy implications relate to this item:

- City of Nedlands Stormwater Council Policy
- Local Government Act 1995 (s3.51, Schedule 3.2 and 9.1)
- State planning policy 2.9 - Water Resources

Decision Implications

If Council endorse the recommendation, the City will begin works as quickly as possible, with future works incorporated into the long-term financial plan. Additionally, the City will prepare discussion papers for presentation at a future Concept Forum with regard to the City's Stormwater Policy and Crossover Specification.

If Council did not endorse the recommendation, the delivery of required drainage infrastructure will be delayed.

Conclusion

The Drainage Infrastructure Upgrade Study has shown that there are many areas of the City's drainage network which do not meet current best practice.

It is recommended that Council receive the Drainage Infrastructure Upgrade Study, request that the CEO develop a Capital Works Program incorporating the Report's recommendations, and endorse the listed capital works projects for the 2021-22 financial year.

These actions will enable the City to commence work on improving drainage infrastructure to reduce the risk of future storm events adversely impacting private property.

Further Information

N/A

TS04.03.22 Attachment 1

Drainage Infrastructure Upgrade Study

City of Nedlands

22 February 2022

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The Power of Commitment

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Executive summary

This report is subject to, and must be read in conjunction with, the limitations set out in section 1.2 and the assumptions and qualifications contained throughout the Report. On the 9th July 2021, a 1 in 180-year 45-minute storm caused extensive damage to private properties located throughout the City of Nedlands. This event has brought a renewed attention on some ongoing drainage problems and identified some new, previously unknown, problems. A total of 55 properties were selected for investigation by GHD.

Following resident interviews and flood modelling, the causes of flooding experienced at the 55 properties during the 9th July 2021 storm was assessed, together with the existing level of performance of the drainage system under a range of design storms. GHD recommend that works are undertaken to protect residential and commercial properties from flooding in the 1 in 100-year event, where practicable. In most cases, this will involve works that safely collect and convey floodwaters via the road network, using upgrades to kerbs, crossovers, verges, and other surface treatments. Where roads don't have capacity for this level of service, subsurface drainage will be upgraded to provide this capacity, using structures such as pits, pipes, soakwells, and subsurface infiltration devices. Further detailed design, service locating, and detailed flood modelling is required to confirm the recommended solution is both practical and achievable for the 100-year storm. In highly constrained locations, a lower level of service may be necessary.

The works have been estimated to cost a total of $2.45m. It has been assumed that these works cannot be funded and constructed at once, and therefore the projects have been prioritised using a risk-based methodology that accounts for the likelihood and severity of flood impacts.

In addition to the works, it is recommended that the City consider adopting the following planning and design policies or standards:

- Lots are to retain the 1% AEP storm on-site.
- Roads are to be trafficable in the 20% AEP storm.
- Roads and drainage, in combination, are to safely collect and convey the 1% AEP storm to a suitable outlet or basin.
- Basins are to detain and dispose of the 1% AEP storm via infiltration or other means, without overtopping.

GHD also recommendations completion of a drainage asset management plan that details a target level of service for both flood risk and water quality, a target level of service for asset condition and failure rates, a maintenance plan for the repair and upkeep of assets ensuring safety, functionality and operational capacity, and financial evaluations and forecasts.

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Appendix B	Flood mapping, causes, and solutions for flood affected properties
Appendix C	Cost Estimate
Appendix D	Councillor presentation
Appendix E	Digital deliverables

Attachments

No table of contents entries found.

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1. Introduction

1.1 Purpose of this report

The purpose of this project is to recommend drainage upgrades to mitigate flooding at a selection of locations within the City of Nedlands.

1.2 Scope and limitations

This report: has been prepared by GHD for City of Nedlands and may only be used and relied on by City of Nedlands for the purpose agreed between GHD and City of Nedlands as set out in section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than City of Nedlands arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described throughout this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by City of Nedlands and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

GHD has prepared the preliminary cost estimate set out in section 5.2.2 of this report ("Cost Estimate") using information reasonably available to the GHD employee(s) who prepared this report; and based on assumptions and judgments made by GHD of quantities, rates, inflation, and the involvement of the City of Nedlands in delivering the work (which hasn't been priced).

The Cost Estimate has been prepared for the purpose of planning construction activities and must not be used for any other purpose.

The Cost Estimate is a preliminary estimate only. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. Unless as otherwise specified in this report, no detailed quotation has been obtained for actions identified in this report. GHD does not represent, warrant or guarantee that the [works/project] can or will be undertaken at a cost which is the same or less than the Cost Estimate.

Where estimates of potential costs are provided with an indicated level of confidence, notwithstanding the conservatism of the level of confidence selected as the planning level, there remains a chance that the cost will be greater than the planning estimate, and any funding would not be adequate. The confidence level considered to be most appropriate for planning purposes will vary depending on the conservatism of the user and the nature of the project. The user should therefore select appropriate confidence levels to suit their particular risk profile.

1.3 Background and methodology

The City of Nedlands (CoN) engaged GHD to undertake a Stormwater Infrastructure Upgrade study for the Nedlands Local Government Area (LGA). The CoN stormwater system uses a combination of pits, pipes, and road reserves to collect and convey stormwater to basins, the Swan River, and other receiving systems. The stormwater system is not currently meeting performance standards and requires upgrade and renewal.

This study investigates the cause of historical flooding events, and in particular the 9th July 2021 storm. During this storm, many residents reported various degrees of flooding, with the more complex or uncertain locations included in this scope for investigation (Appendix A). Based on the causes identified by GHD, the study recommends new

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and upgraded drainage infrastructure to achieve various degrees of flood protection. High level cost estimates and project prioritisation has also been prepared to assist the City of Nedlands schedule and budget the proposed works.

The outcomes of this study are intended to inform drainage improvement decisions and a high-level drainage strategy for CoN, which is to be developed as part of a separate detailed design assessment.

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2. Data collection, review, and processing

The following data was obtained and reviewed.

2.1 Topography

The City of Nedlands supplied a topographic data set originally published by the Department of Water and Environmental Regulation (LiDAR Elevation Dataset, Swan Coastal Plain, 2008). The data was collected in 2007 and supplied as a 1m resolution grid. Due to the age, quality, and resolution of the data, several limitations were discovered that impact hydraulic modelling. An overview of the topography is provided in Appendix A

Referring to Figure 1, a cross section taken through a typical road illustrates that the Lidar surface fails to observe roadside kerbing and the fact that the road has a two-way crossfall in this location. To improve the data, surfaces identified as roads were lowered by 113 mm to account for standard mountable kerb heights. Whilst this was an improvement, it couldn't resolve the crossfall issue, and it couldn't represent variable kerb and crossover heights. In select locations where the crossfall and kerb heights were critical to understanding flood behaviour, site specific manual edits were made to road geometry to reflect site observations.

In areas of high vegetation density, including some basins, the ground level is poorly represented by the Lidar data. Manual adjustments were made to lower ground levels in basins where field observations justified a deeper ground surface. Changes to surface levels since the 2007 survey were also unaccounted for, but generally not found to be problematic. Survey data was used to represent road geometry at the Jenkins Avenue safe active street zone.

Fences and walls can alter flood behaviour. There is wide variation in the materials and hydraulic conductivity of these structures. Where deemed necessary, walls and solid fences observed from inspection or Google Street View were input into the model to improve the model performance.

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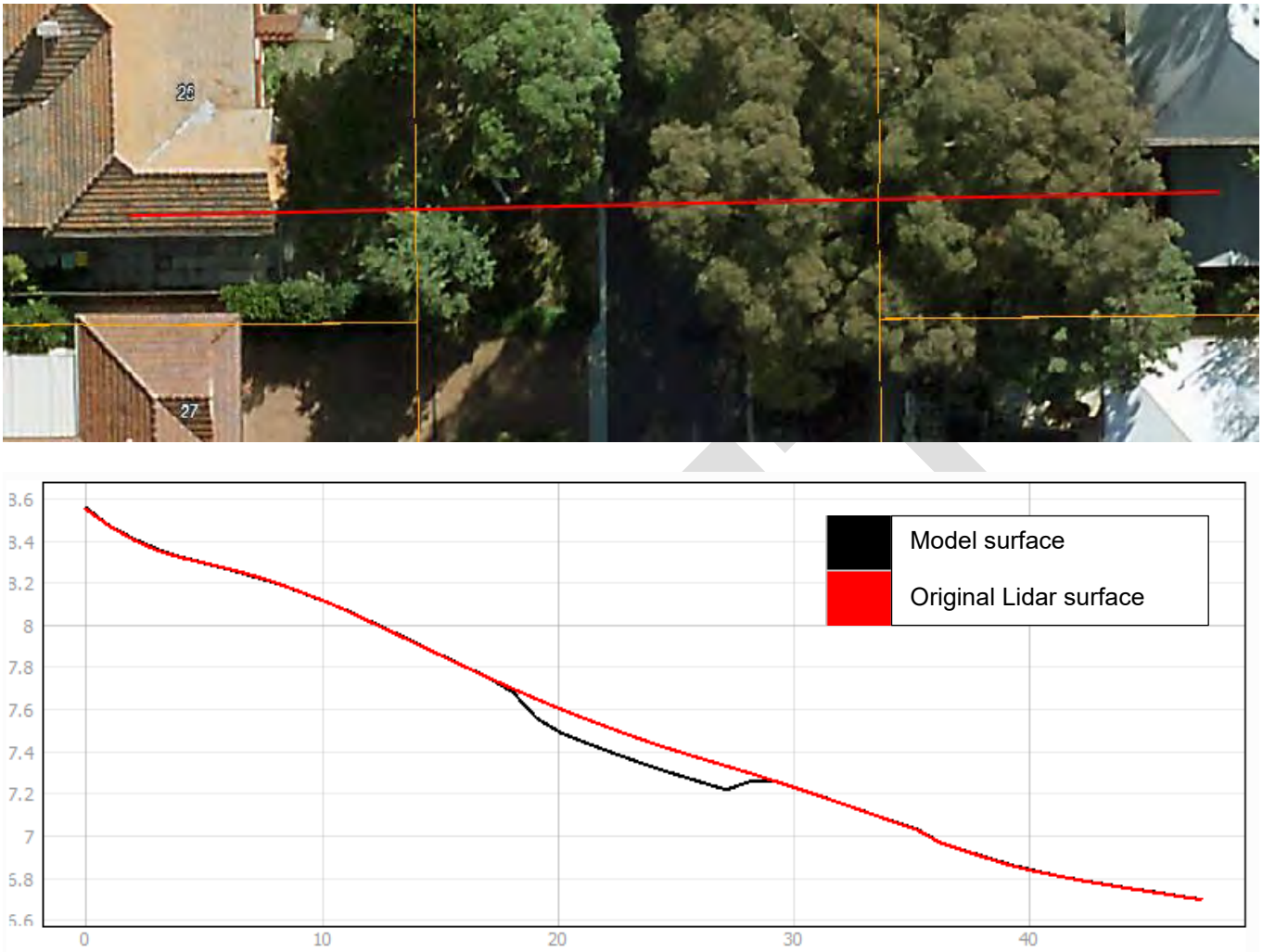

Figure 1 Typical road cross section

2.2 Aerial imagery

3-Band 60mm digital orthophotography acquired on 1st and 20th May 2021 (Aerometrex, 2021) was used to classify surface hydraulic roughness and identify impervious surfaces (Appendix A).

2.3 Planning and cadastre

Cadastral data was obtained from Landgate (Cadastre Address (LGATE-002), 2021) to identify the address of all land parcel boundaries within the study area.

2.4 Buildings and structures

Building outlies were obtained from Microsoft's deep neural network segmentation and polygonization of satellite imagery (Microsoft, 2020). This data was used to identify impervious areas.

2.5 Drainage structures

The City of Nedlands supplied pit and pipe data in GIS format, containing 2663 pipes and 4642 pits. The data contains information on the pit type, inlet types, depths, and diameters, and the pipe diameters and invert levels. Where level attribute data was missing, it was estimated based on ground levels, and/ or the levels of adjoining structures.

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Pit inlets were configured with a depth versus inlet flow rate relationship. Soakwells were configured with an infiltration rate equivalent to 5×10^{-5} m/s. Where a single continuous pipe bypassed closely to a pit but was not snapped to the pit, it was assumed that the pit and pipe were hydraulically connected. In this situation, the single pipe segment was split into two segments and joined to the pit.

GHD has not independently verified or checked the quality and completeness off the data, however there were some inconsistencies that suggests there is some missing or incomplete data, such as sealed manholes without any connecting pipes, pipes without connecting pits, and pits that were observed via Google Street View but not contained in the data.

Pit and pipe data obtained from the City of Subiaco was used to supplement City of Nedlands data at adjoining catchments.

2.6 Historical flooding and resident meetings

2.6.1 9th July storm

On the 9th of July, the City of Nedlands experienced a 1 in 180-year storm event, where 44.4mm of rain fell over 45 mins. Table 1 documents the 9th of July storm in comparison to other recent extreme rainfall events.

Table 1 Nedlands extreme rainfall events

Date	Rainfall (mm)	Duration	Probability
9 July 2021	44.4 (Floreat) 46.8 (Kings Park)	45-mins	1 in 180-years
15 Jan 2018	119.4	18-hours	>1 in 100-years
9-10 Feb 2017	85.9	6-hours	1 in 50-years
22 March 2010	27.6	20-mins	1 in 70 years

The reason that the July event has caused many drainage problems is that it happened over a short period of time, and far exceeds contemporary design standards for both flooding and drainage. In comparison, the January 2018 storm in which 119.4 mm of rain fell over 18 hours created very few reported problems because there was time for the runoff to infiltrate and not cause flooding. Figure 2 displays the 9th of July storm relative to intensity frequency duration (IFD) data (Bureau of Meteorology, 2016).

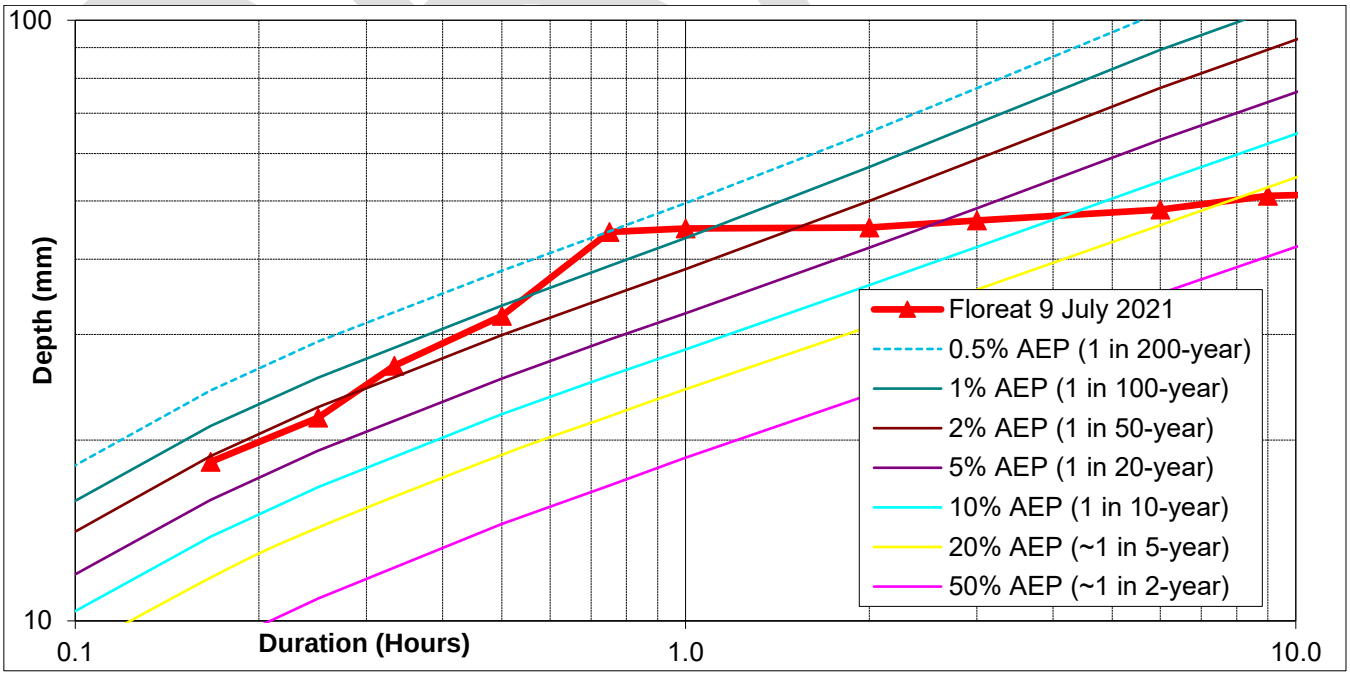

Figure 2 Floreat 9th July 2021 IFD

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The 9th July rainfall event generated numerous flooding complaints from local residents and business owners. The severity of flooding ranged widely, but included:

- Flooding of the road reserve
- Flooding of private gardens
- Flooding of private garages
- Over-floor flooding of residential housing and commercial tenancies.

Flooding was reported in the suburbs of Dalkeith, Nedlands, Mount Claremont, and Swanbourne, with Dalkeith and Nedlands making up the majority of complaints. Typical flooding causes for these locations are;

- Low set kerbs and crossovers
- Trapped low points in roads (lack of safe overland flow path for major events)
- Insufficient stormwater network capacity (noting that it is not designed for such an event)
- Lack of inlets in some locations

2.6.2 Resident meetings and inspections

Following an initial round of flood inspections undertaken by the City of Nedlands, GHD undertook inspections and interviews of both residents and commercial tenants to understand overland flood flow paths and impacts. The City of Nedlands issued impacted residents a letter advising them of the opportunity to meet with GHD to discuss their drainage issues, impacts and process moving forward. This allowed the residents to be heard, involved in the process, and advise GHD what they observed during the flood. This was critical information as it enabled flood model calibration and validation against flooding observations.

The meetings generally commenced in November 2021 until the end of January 2022. There was a high participation rate among affected residents with some additional residents requesting meetings. In total, 55 sites were included in the scope. We met with 37 out of the 55 sites. The residents were forthcoming with valuable information on the damage caused by the floods, performance of drainage system, and the observed overland flow paths. Suggestions for potential solutions were often provided to GHD.

Residents were also queried regarding how often flooding occurred at their properties. Some properties flooded yearly, while others flooded during large storm events and the remainder only had issues during the July 2021 storm event. It was advised to residents that this storm event is considered an uncommon storm event and exceeded the design capacity of the drainage network.

GHD also explained to the residents the various functions of the road drainage network such as the underground pit and pipe network is designed for more frequently occurring storms and that the roads are used to channel the runoff in less frequent, larger storm events. The general similarity and issue of most of the sites was that the resident's road frontage was located at the lowest point of the road (trapped low point) and their house was often located lower than the verge and/or road. When the road flooded and overtopped the kerb then the runoff would enter their property.

Once the flow path was established with the resident, potential solutions were discussed such as additional drainage soakwells to capture the runoff upstream, raising kerb/crossover heights to increase the road storage and redirecting of runoff upstream.

Whilst GHD didn't meet with all the residents, the solutions provided are for all flood affected properties in GHD's scope of works, with the proposed upgrades also befitting a much larger cohort of residents that

2.7 Design rainfall

In addition to simulating the 9th July storm, design rainfall was obtained for the study areas for the 5%, 2%, 1%, 0.5% and 0.2% Annual Exceedance Probability (AEP) storms from the Bureau of Meteorology (Rainfall 2016 IFD Data System, 2016), for ten durations between 30 minutes and 24 hours, together with ten temporal patterns for the Southern and South Western Flatlands region and pre-burst depths (Babister, 2016) (**Error! Reference source not found.**). This equates to 500 existing scenario events and 500 design scenario events.

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3. Hydrologic and hydraulic modelling

3.1 Model build

Hydrologic and hydraulic modelling was undertaken using TUFLOW, developed by BMT Group Ltd. TUFLOW is a flooding mapping tool that provides one-dimensional (1D) and two-dimensional (2D) solutions of the free-surface flow equations to simulate flood and tidal wave propagation.

The City of Nedlands was modelled as one catchment using the direct rain-on-grid approach. This approach applies rainfall directly to each cell of the model, where hydrologic calculations are performed to determine the runoff volume, followed by hydraulic calculations to determine the velocity and direction of flow.

The 9th July rainfall event was simulated, together with design storms in accordance with procedures described in Australian Rainfall and Runoff (Ball, et al., 2019). A grid size of 2m was adopted with sub-grid sampling at 1m.

Eight soil types were defined for the study area (Table 2). A groundwater boundary condition was adopted from published maximum groundwater levels (Depatment of Water, 2004). This was observed to intersect a number of basins, therefore limiting the ability of these basins to infiltrate during and after the storms.

3.2 Model calibration and validation

No gauging data was available to calibrate the model, however photographic and anecdotal evidence of flooding was used to verify and validate the model. The model was simulated for the 9th July 2021 storm, with initial and continuous soil loss parameters adjusted until runoff observations resembled the photographic and anecdotal evidence. Noting that the calibration storm duration was only 45 minutes, the initial loss parameter was found to dictate the results. Pervious surfaces configured to contribute very little runoff. At many basin locations, the model over-estimated flood depths. An unusually high initial loss value was adopted for the impervious roads surface to reduce simulated flood depths. The model accurately predicts flood observations in the Masons Gardens basin, under-estimated flood levels Philip Rd Dalkeith by 200 mm, and over-estimated flood depth at the Bulimba Rd basins by approximately 500 mm.

Table 2 Calibrated model soil losses

Soil ID	Initial Loss (mm)	Continuing Loss (mm/hr)	Description
1	20	20	Paved indirectly connected surfaces
2	40	2.9	Bare earth
3	40	2.9	Short grass
4	40	2.9	Moderate vegetation
5	40	2.9	Tree cover with bush or grass underneath
6	20	20	Buildings draining to soakwells
7	40	208	Basins
8	5	0.5	Roads

The above losses were adopted for all design storms.

3.3 Model simulation

The model was simulated for 501 storm events and two scenarios: Existing and Design, totalling 1002 simulations. For each storm duration, the storm temporal pattern producing the median hydraulic head in each pit was extracted. Of these ten storm durations, the critical duration storm representing the maximum hydraulic head was then extracted for each pit. The critical duration storm varied widely across the study area, with pits near the top of the catchment peaking in short duration storms, and storages, such as sumps, experiencing the highest flood levels in long duration storms. The critical storm event for the Existing scenario was not always the same storm as the Design scenario.

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4. Flood risk and network performance assessment

4.1 9th July storm flood risk

In many locations, due to the resolution and accuracy of the topographic data relative to the shallow overland flow, it was not possible to accurately map and analyse flood behaviour. However, based on resident descriptions of the flooding incidents and the experience of the project team, the cause of flooding is generally well understood.

The short duration high-intensity nature of the 9th July event is associated with flash flooding and storm conveyance problems rather than rising water from overflowing sumps. The most common mechanisms of flooding are:

- Runoff spilling over kerbs and crossovers on roads with a gradient, and then entering property via a verge that grades away from the road;
- Runoff pooling at the sag point of roads, spilling over verges and entering properties that are set lower than the road and verge

Other, less common mechanisms of flooding are stormwater upwelling from blocked drainage systems, overtopping of basins, and runoff from one lot into another lot.

The primary cause of flooding on the 9th July 2021 was a storm event that far exceeds the design capacity of the road and stormwater network. Secondary causes of flooding are numerous, and may be a combination of one or more factors, including:

- Lack of a safe overland flow path from trapped low points in roads
- Verges that drain away from roads
- Low-set and substandard kerbs or crossovers
- Pit and pipe blockage
- Poorly graded roads
- Absent or undersized sumps

Many of the above causes are the legacy of former planning and design standards that no longer perform under current levels of development density, or no longer achieve higher community expectations.

Site specific flood risks and their causes are discussed in greater detail in section 5.1.

4.2 Network performance

4.2.1 Performance objectives and measures

In the absence of stormwater design criteria or policy for public infrastructure, the following performance objectives and measures have been assumed for the City of Nedlands:

1. Roads are to be trafficable in the 20% AEP storm. Trafficability has a wide range of definitions, from no runoff in vehicle lanes, to various extents of gutter spread width inundation. Due to the survey limitations, spread width cannot be determined, and therefore the performance of the subsurface drainage system has been adopted as a substitute. A 150 mm freeboard within pits is typically adopted as the maximum hydraulic grade line, and is adopted for this study to measure pit and pipe performance.
2. Roads and drainage, in combination, safely collect, convey the 1% AEP storm to a suitable outlet or basin. A road is deemed to meet this objective if the water level at the edge of the road (measured at the pit inlet) is less than 113 mm, the standard kerb height. Due to survey limitations, this objective is difficult to measure accurately.
3. Basins to detain and dispose of the 1% AEP storm via infiltration or other means, without overtopping. This is measured by comparing the modelled top water level against the estimated basin capacity level.

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4.2.2 Performance assessment

All stormwater pits and associated pipes have been assessed against the first two criteria listed in section 4.2.1. Results of the assessment are tabulated in a digital deliverable supplied with this report (Appendix E). A failure of an individual component to meet the performance objective does not indicate that the specific pit or pipe is under capacity, or needs upgrading. The pit and pipe network has complex interactions with both the surface water network and other parts of the pit and pipe network. Underperformance at one location may cause flooding in many other parts of the system.

Modelled water levels in all stormwater basins were assessed against estimated top water levels and reported in Appendix E.

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5. Flood mitigation and drainage improvements

5.1 Drainage upgrade philosophy

43 drainage upgrade and improvement projects have been identified to address flooding at the 55 properties under this project scope. The projects followed the following philosophy:

1. Retain and infiltrate stormwater close to source. This avoids the need for infrastructure to convey runoff, and infrastructure to dispose or infiltrate stormwater at another location.
2. Keep and convey runoff within the road or road reserve where possible. Runoff on the road is more likely to be captured by soakwells or the pit and pipe network. A 6 m wide road has approximately five times the hydraulic capacity of a 300 mm stormwater pipe on the same grade.
3. Minimise the use of underground solutions, particularly pipe upgrades. Excavations are costly and disruptive. Pipe upgrades at the problem location can involve extensive downstream upgrades far from the starting point, and potentially transferring the problem to another location.

5.2 Site specific assessments

Details of the sites subject to drainage upgrades are provided in Appendix B. Detailed descriptions of the resident observations, drainage problem, upgrade solution, estimated construction cost, and project priority are provided. This is supplemented by flood mapping of the existing and proposed flood risk under the 9th July storm scenario, and sketches illustrating the proposed works. Additional explanations for the more complex and problematic catchments are described below.

5.2.1 Bulimba Road catchment

5.2.1.1 Resident observations and model results

The Bulimba Road sump catchment, particularly Jenkins Avenue, Taylor Road, and Bulimba Road, is the worst affected area, with 11 flood complaints. The catchment extends to the north past Stirling Highway, to the east as far as Mountjoy Road, south to Princess Road, and west to Bay Road. The catchment has four basins, with the two Bulimba Road basins receiving the majority of runoff. A Main Roads WA basin located in Taylor Road was observed to receive little runoff, which was confirmed by modelling. The basin in Waroonga Road was also observed to have spare capacity.

Recent works on Jenkins Avenue as part of the Safe Active Streets program, have been affirmed by many residents as the cause of the flooding, or at least a contributing factor. Residents recounted runoff arriving at the Jenkins Avenue - Taylor Road intersection from the east and north, and continuing along both roads, flooding a number of properties on this block. The traffic calming devices were filmed blocking the flow of water and diverting runoff it into 54 Jenkins Rd.

Taylor Road has a trapped low point or sag, where runoff accumulated and spilled into 19 Taylor Road. Runoff passed through this property into the rear property at 18 Bulimba Road. This resident reported extensive surface water runoff from 19 Taylor Road but little runoff from the 300 mm pipe that connects Taylor Road with the Bulimba Road sump.

Runoff from the Jenkins-Taylor intersection spilled into the gardens, garages, and houses of 13 and 15 Taylor Road. Residents at 3A Bulimba Road, 30 Bulimba Road, 60 Jenkins Avenue, 1A Doonan Road, and 5A Doonan Road also received runoff that spilled from the road as it made it's way to the Bulimba basins.

The resident at 4A Waroonga Road reported runoff arriving from the footpath and verge that flooded his garage and house.

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5.2.1.2 Solutions

To reduce the volume of runoff arriving at Jenkins Avenue, Taylor Road, and the Bulimba Road basins, it is proposed to send more stormwater to the under-utilised basins in Waroonga Road and Taylor Road. This will be facilitated by providing an overland flow path from the road to the basin, by lowering the existing maintenance access driveways.

To address the flooding associated with Jenkins Avenue and Taylor Road, three options were considered:

1. Option 1 uses horizontal directional drilling of a new pipe connection from Taylor Road to the Bulimba Road basin. This option was abandoned due to high cost, lack of formal drainage easement, and construction risk to adjacent properties.
2. Option 2 involves regrading Jenkins Rd pavement from Taylor Road intersection to Bulimba Road. This will be effective for properties facing Jenkins Avenue, but was discarded as it didn't protect Taylor Road properties, involved extensive pavement works, and introduced a risk to underground services.
3. Option 3 is a combination of drainage, road, and verge works to safely convey runoff in Jenkins Avenue and Bulimba Road. This option was adopted and is described in detail below.

The 300 mm pipe in Jenkins Avenue and Bulimba Road is significantly under capacity, and requires upgrade. Upgrading the pit and pipe capacity from 300 mm to 600 mm will boost capacity to 0.4 m^3/s, improving trafficability in minor storms, but is insufficient for major storms. With over 2.2 m^3/s arriving at the intersection, a safe overland flow path is also required. Overland flow must be via Jenkins Avenue and Bulimba Road. Options include conveyance via a roadside swale or the road itself. The roadside swale option was discarded due to the expense of service relocations and difficulties with the swale crossing driveways. To facilitate road conveyance without lowering the road, the southern verge must be raised. Given that it is over 7 m wide, vehicle will have sufficient space to traverse a raised driveway. To prevent discharge into Taylor Road, a trapezoidal speed hump is proposed at the entrance to Taylor Road, to direct overland flows westward along Jenkins.

The raised traffic calming measures in Jenkins Avenue, between Taylor Road and Bulimba Road, are to be removed or made flush with the road surface, to avoid intercepting and diverting runoff.

With no runoff entering the lower section of Taylor Road, the 300 mm pipe from Taylor Road to the basin has sufficient capacity for the local Taylor Road catchment. This pipe should be inspected for damage, in light of the resident observations. The diversion of flows down Jenkins Avenue will alleviate flooding at 18 Bulimba Road from the rear of 19 Taylor Road.

5.2.2 Aberdare Road catchment

5.2.2.1 Resident observations and model results

Flooding was experienced by residents 37, 39, and 39A Aberdare Road in Nedlands. The residents at 39 and 39A Aberdare Road reported floodwaters entering the property from the road and flooding the garden. Early iterations of the hydraulic model reflect this observation, to a much greater extent. These properties are located on the low side of the road, at the longitudinal sag of the road. The Aberdare Road catchment extends west to Railway Road, north into the City of Subiaco, south to Monash Avenue, and east to Derby Road. Runoff drains to the Aberdare Road Water Corporation ornamental lake in Kilgour Park, which is pumped to Lake Jualbup.

There are at least nine drainage systems that discharge into Aberdare Road and aren't connected to an outlet pipe. These have therefore been modelled as surcharging systems. Drainage surveys conducted by both the City of Nedlands and the City of Subiaco were inconclusive to where these systems drained. GHD are of the opinion that a trunk drain is located under Aberdare Road that drains to the Aberdare Road Water Corporation ornamental lake. This would explain where these pipes discharge to, and why the observed flooding is less than what was modelled.

A pipe was added to the model connecting all the dead-end drainage systems to the Aberdare Road Water Corporation ornamental lake. Widespread flooding from early model iterations in Croydon Street, Campsie Street, Aberdare Road, and Kingston Street was reduced as a result of this pipe addition. Flooding of 37, 39, and 39A Aberdare Road was still reflected by the model.

Hydraulic modelling indicates that floodwaters arrive east from Aberdare Road and north from Hilda Street.

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5.2.2.2 Solutions

If there is no central Aberdare Road pipeline route, the widespread flooding of this trapped needs to be mitigated through the use of a 600 m^3 underground storage chamber located in Campsie Park, together with additional inlets located in Aberdare Road. This solution is presented and costed in Appendix B.

If the presence of the Aberdare Road pipe can be confirmed, the problem is less severe than original model iterations predicted, additional stormwater inlets on the southern side of Aberdare Road will be sufficient to capture and convey runoff to the 600 mm pipe located in Kingston Street.

5.3 Construction cost estimate

Cost estimates have been developed based on supplier budget quotes and a concept design for the purposes of comparing options. These estimates are typically developed based on cost curves, budget quotes for some equipment items, extrapolation of recent similar project pricing, discussions with the City of Nedlands and GHD experience. It should be noted that at this level of design, the scope and quality of the works has not yet been fully identified and some items are not included. Therefore the estimates are not warranted by GHD and the accuracy of the estimates is typically not expected to be better than about ± 50%.

The construction cost estimate was prepared for the proposed solutions to assist the City of Nedlands in applying for grants and budgeting forecasts. The construction cost estimated included labour to construction, machinery hire, drainage pits, raising crossovers/kerbs, reinstatement of verge/pavements/footpaths, traffic management and pipe construction.

5.3.1 Preliminary cost estimate

Appendix C displays the relevant cost estimate for the drainage upgrade works. Major uncertainties in estimating the cost of construction applied to various locations include:

1. Existing services. Service protection/relocation will need to be reviewed at detailed design.
2. Traffic volumes in various locations. A nominal amount has been budgeted for traffic management costing however as certain solutions such as pipe construction will need more traffic management, this will need to be reviewed for each location at detailed design.
3. In the absence of detailed site-specific survey data and modelling, the current level of service is estimated only, and a target level of service of 1% AEP was adopted.

The quantities used in the cost estimate are based on conceptual hydrologic and hydraulic modelling. Detailed site-specific survey and modelling is required to support detailed design and associated quantities. The address of flooding may not be the same address as the associated drainage solution as upstream flows may be redirected to alleviate flooding downstream.

To estimate the construction cost the following assumptions were made;

- No soakwell connections
- Construction cost estimates are excluding GST
- Drainage pipes are within 2m below the ground
- Existing drainage network is still fit for purpose
- We have not allowed for any service relocation
- We have not allowed surveying/pot holing.
- We have not allowed for detailed design and construction supervision costs
- A 30% contingency was added to account for missing or uncertain items, quantities, or rates.

The adopted rates are presented in Table 3 and include ancillary works such as excavation, reinstatement of surfaces (whether asphalt, concrete, grass or paving), waste disposal, and basic traffic management. The total of all projects is estimated at $2.45 million.

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Table 3 Adopted rates

Item	Rate (ex GST) excluding contingency
Grated, side entry, or lidded soakwell (each)	$8000
Manhole (each)	$8000
Grated or side entry inlet (each)	$8000
Raise crossover (each)	$4000
Raise kerb (m)	$1400
Raise verge (linear m)	$600
225mm Reinforced Concrete Pipe (RCP) (m)	$330
300mm PRC (m)	$330
375mm RCP (m)	$335
450mm RCP (m)	$350
600mm RCP (m)	$420
Subsurface plastic arch storage (m^3)	$400

Table 4 Top 3 projects by construction cost

Project	Construction cost (ex GST)
Taylor Road & Jenkins Avenue, Nedlands	$381,000
Aberdare Road, Nedlands	$376,000
Bedford St, Nedlands	$156,000

5.4 Project prioritisation

Projects have been assigned a priority using a semi-quantitative risk assessment process. The likelihood of flooding is expressed by the Annual Exceedance Probability (AEP) of the flood occurring at the site. This has been estimated from both the results of the Existing scenario flood simulations, and observations from residents on the history of flooding at the site.

The consequence of flooding has been categorised as either road, garden, garage, or house. This was also estimated where residents were not interviewed or couldn't clarify the extent of flooding.

A priority score was assigned, based on the combination of likelihood and consequence, with frequent house flooding assigned the highest priority, and rare road flooding the lowest priority. Where a single project benefitted multiple properties, the priority score was assigned from the property with the greatest flood risk.

Table 5 Risk and prioritisation matrix

Estimated Flood Frequency (AEP)	Flood impact and priority			
	Road (low consequence)	Garden	Garage	House (high consequence)
50% (very likely)	9	6	2	1
20%	9	7	3	1
10%	10	7	4	1
5%	10	8	4	2
2%	10	8	5	2
1%	10	8	5	3
0.50% (rare)	10	9	6	3

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Referring to Figure 3, this prioritisation process results in a spread of between zero and nine properties in each category. Referring to Figure 4, priority one projects are estimated to cost $490,000.

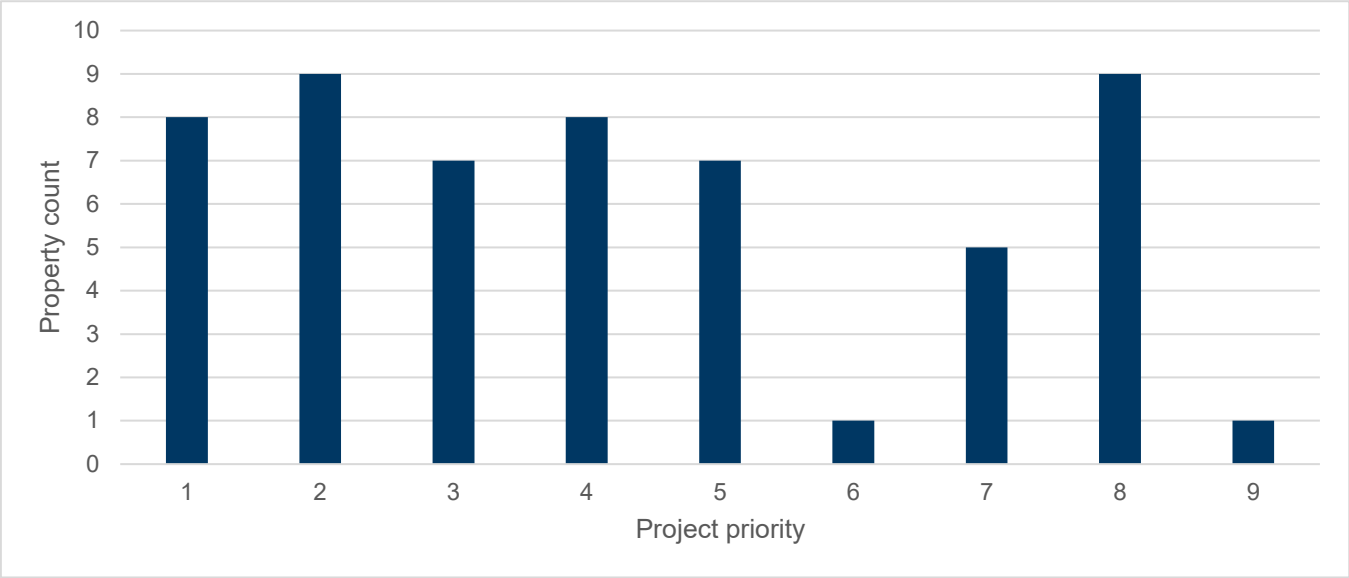

Figure 3 ***Project priority distribution***

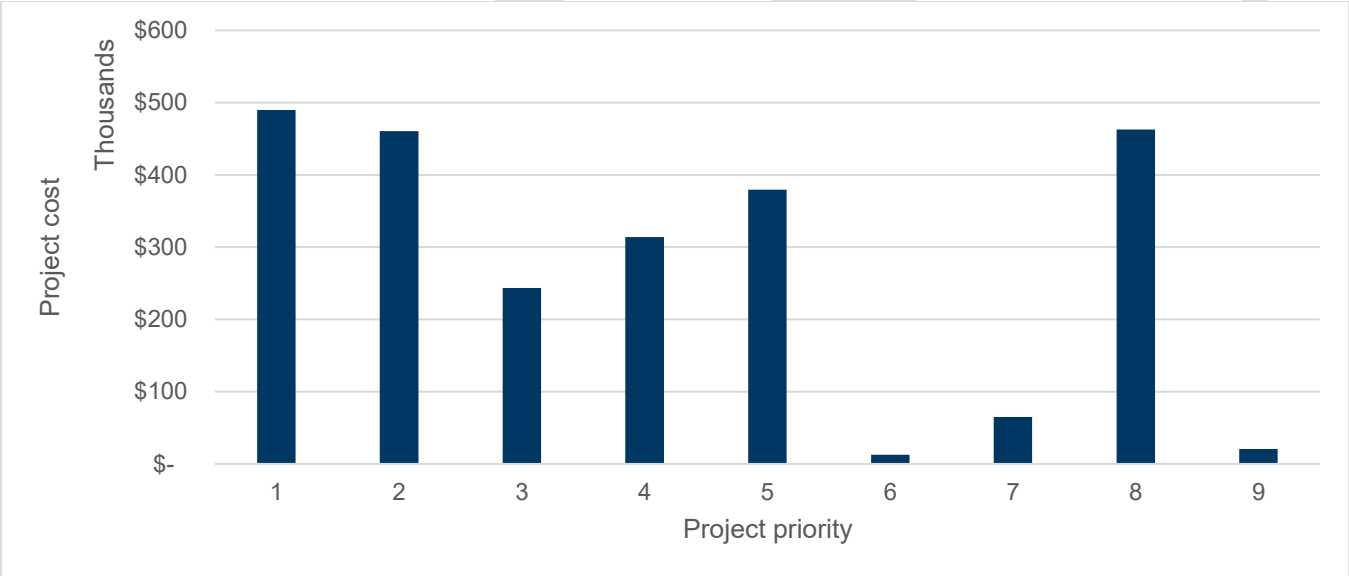

Figure 4 ***Costs by project priority***

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6. Conclusion and recommendations

This report has identified the causes of flooding experienced at 55 properties during the 9th July 2021 storm and assessed the existing level of performance of the drainage system under a range of design storms. GHD recommend that works are undertaken to protect residential and commercial properties from flooding in the 1 in 100-year event, where practicable. In most cases, this will involve works that safely collect and convey floodwaters via the road network. Where roads don't have capacity for this level of service, subsurface drainage will be upgraded to provide this capacity. Further detailed design, service locating, and detailed flood modelling is required to confirm the recommended solution is both practical and achievable for the 100-year storm. In highly constrained locations, a lower level of service may be necessary.

The works have been costed and prioritised using a risk-based methodology. In addition to the works, it is recommended that the City consider adopting the following planning and design policies or standards:

- Lots are to retain the 1% AEP storm on-site.
- Roads are to be trafficable in the 20% AEP storm.
- Roads and drainage, in combination, are to safely collect and convey the 1% AEP storm to a suitable outlet or basin.
- Basins are to detain and dispose of the 1% AEP storm via infiltration or other means, without overtopping.

During the course of this study, a number of locations were identified that are subject to flooding, or where drainage performance didn't meet the objective describes in section 4.2.1. It is recommended that these locations be investigated further for future upgrade and renewal.

6.1 Next steps

6.1.1 Capital works program

The capital works prioritised in this report were recommended based on their simplicity, performance, and cost effectiveness. This simplicity will enable to City to undertake the works with minimal engineering input. For some of the more complex sites, for example with large numbers of soakwells or drainage pipe diversion/upgrades, it is recommended that the following work is undertaken:

- Service location (potholing);
- Feature survey; and
- Detailed hydrologic and hydraulic modelling of proposed upgrades;
- Detailed engineering designs that take into account:
  - proximity to underground services;
  - proximity to trees and other vegetation;
  - proximity to other infrastructure, such as roads, footpaths and crossovers;
  - optimal inlet locations and connectivity between devices (if any);
  - measures to limit blockage and reduce maintenance; and
  - construction methodology and traffic impacts.

6.1.2 Asset management plan

It is recommended that a drainage asset management is prepared to supplement and expand the above capital works program. This asset management plan requires the following work to be completed:

- A CCTV inspection to identify and document pipe condition, debris, sediment, roots, jointing, and connections.
- An estimated year of construction of drainage assets through cross referencing with historic aerial imagery or other dating method.
- As updated asset inventory including results of the condition assessment and construction dating.

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The asset management plan should include:

- Target levels of service for both flood risk and water quality;
- Target levels of service for asset condition and failure rates;
- A maintenance plan for the repair and upkeep of assets ensuring safety, functionality and operational capacity.
- Financial evaluations, including an Asset Consumption Ratio, Asset Sustainability Ratio, and Asset Renewal Funding Ratio.

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Appendices

Appendix A

Model build maps

Legend

Flooding locations

Paper Size ISO A3

0 0.5 1 km

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Model Build
Reported Flooding Locations

Project No. **12555894**
Revision No. **A**
Date. **23/02/2022**

FIGURE A.1

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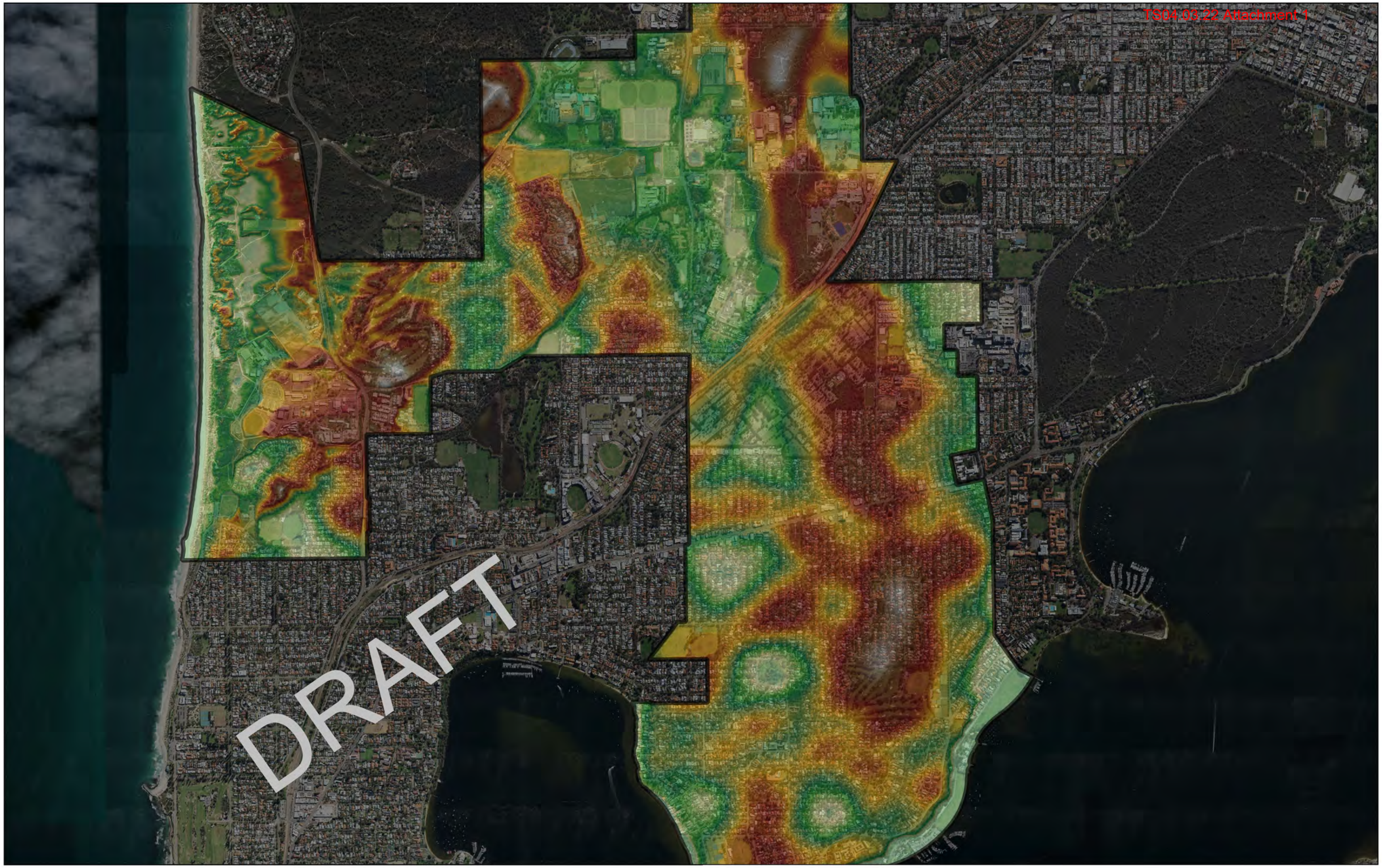

Legend

DWER Lidar (m)

48

-0

Paper Size ISO A3

0 0.5 1 km

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Model Build Topography

Project No. **12555894**
Revision No. **A**
Date. **23/02/2022**

FIGURE A.2

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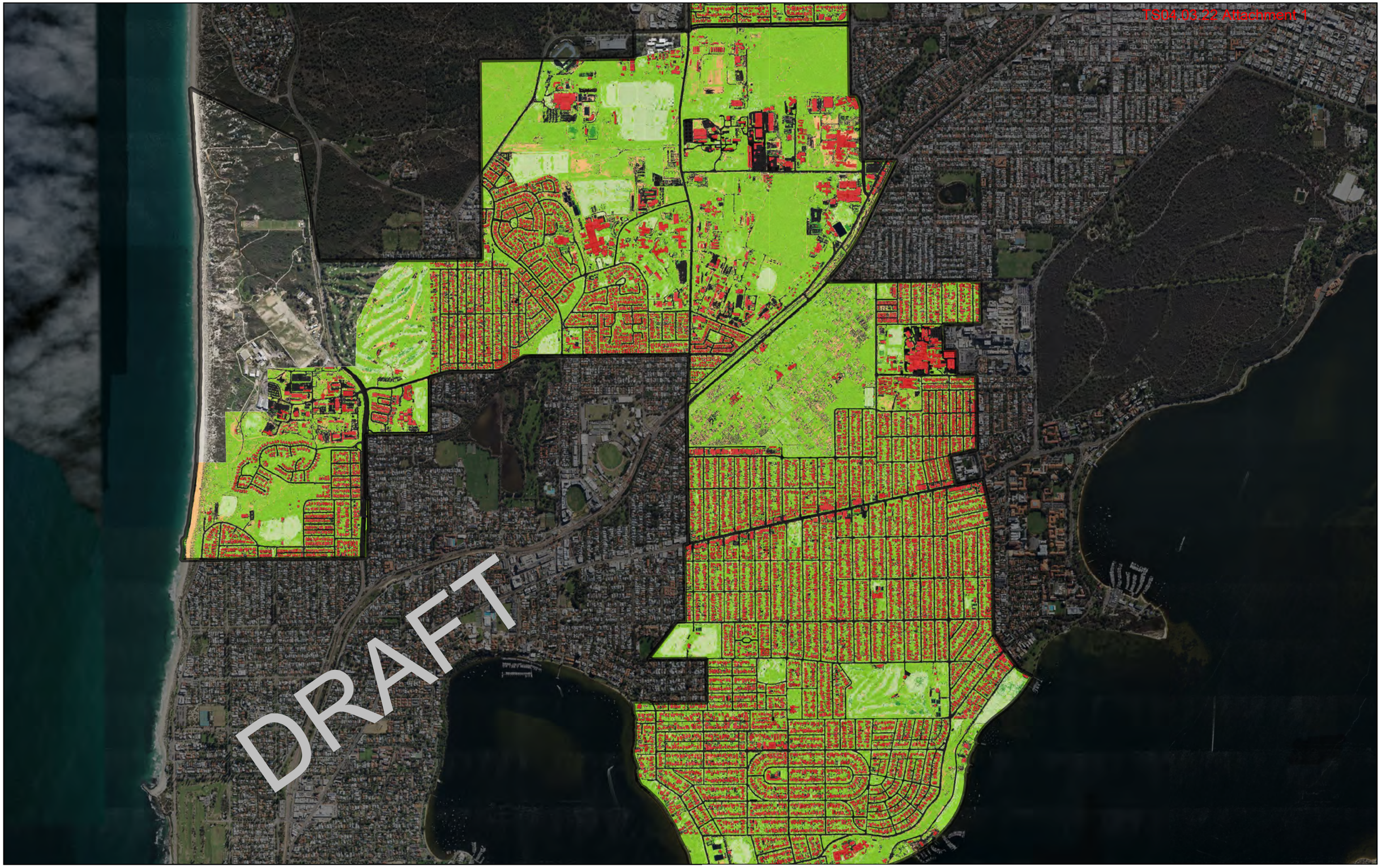

Legend

Roughness category

- Roads or pavement
- Bare earth
- Short grass
- Moderate vegetation
- Heavy vegetation
- Buildings

Paper Size ISO A3

0 0.5 1 km

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Model Build Roughness

Project No. **12555894**
Revision No. **A**
Date. **23/02/2022**

FIGURE A.3

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Appendix B

Flood mapping, causes, and solutions for flood affected properties

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Address	Figure
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12 Edwards Grn, Floreat	Figure B.3
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13 Minora Rd, Dalkeith	Figure B.6
13 Taylor Rd, Nedlands	Figure B.7
15 Taylor Rd, Nedlands	Figure B.8
18 Bulimba Rd, Nedlands	Figure B.9
19 Taylor Rd, Dalkeith	Figure B.10
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1A Doonan Rd, Nedlands	Figure B.12
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5a Doonan Rd, Nedlands	Figure B.37
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Address	Figure
60 Jenkins Av, Nedlands	Figure B.39
62 Goldsmith Rd, Dalkeith	Figure B.40
65 Hobbs Av, Dalkeith	Figure B.41
66 Archdeacon St, Nedlands	Figure B.42
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82 Monash Av, Nedlands	Figure B.53
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Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 1 Birdwood Pde, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.1

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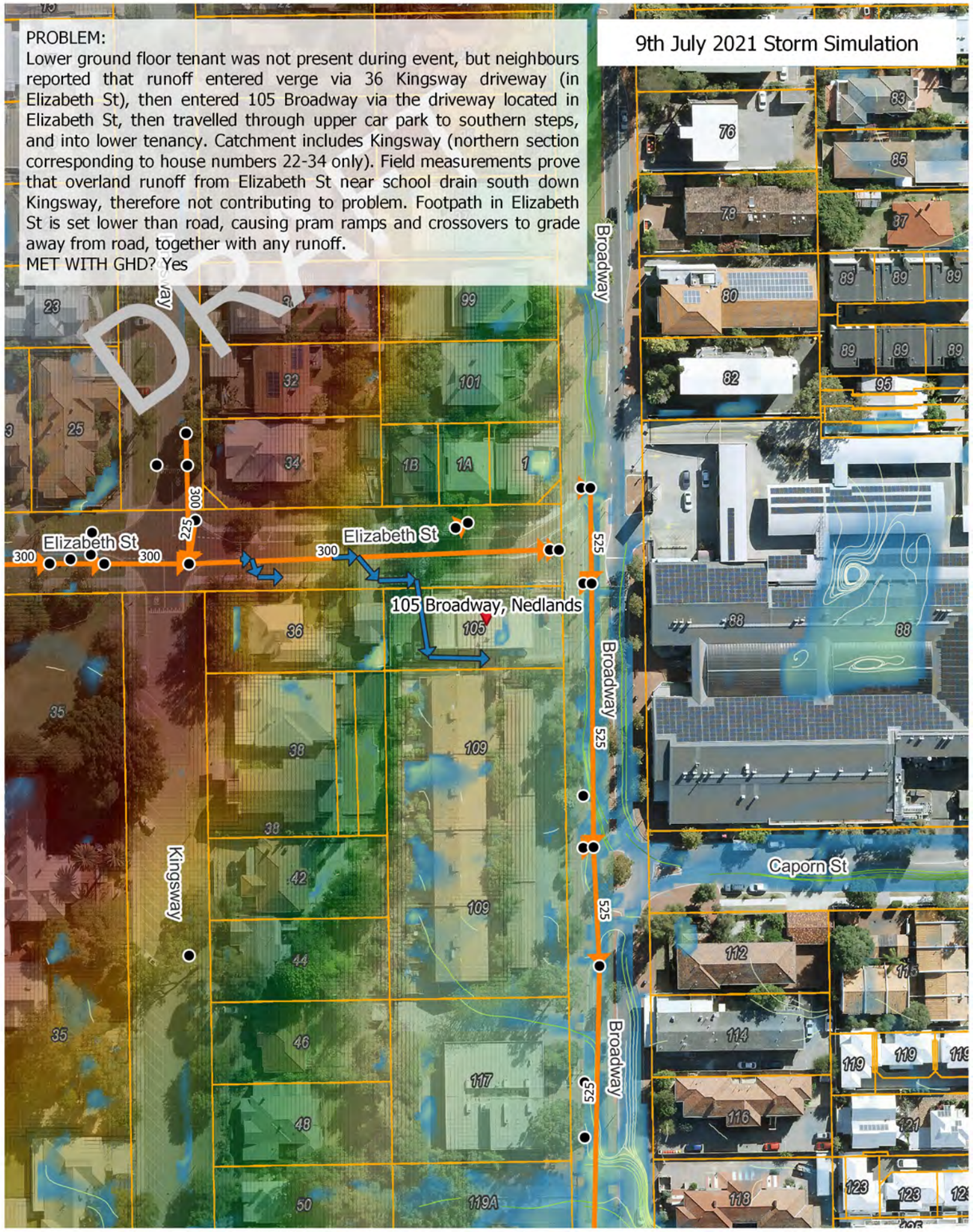

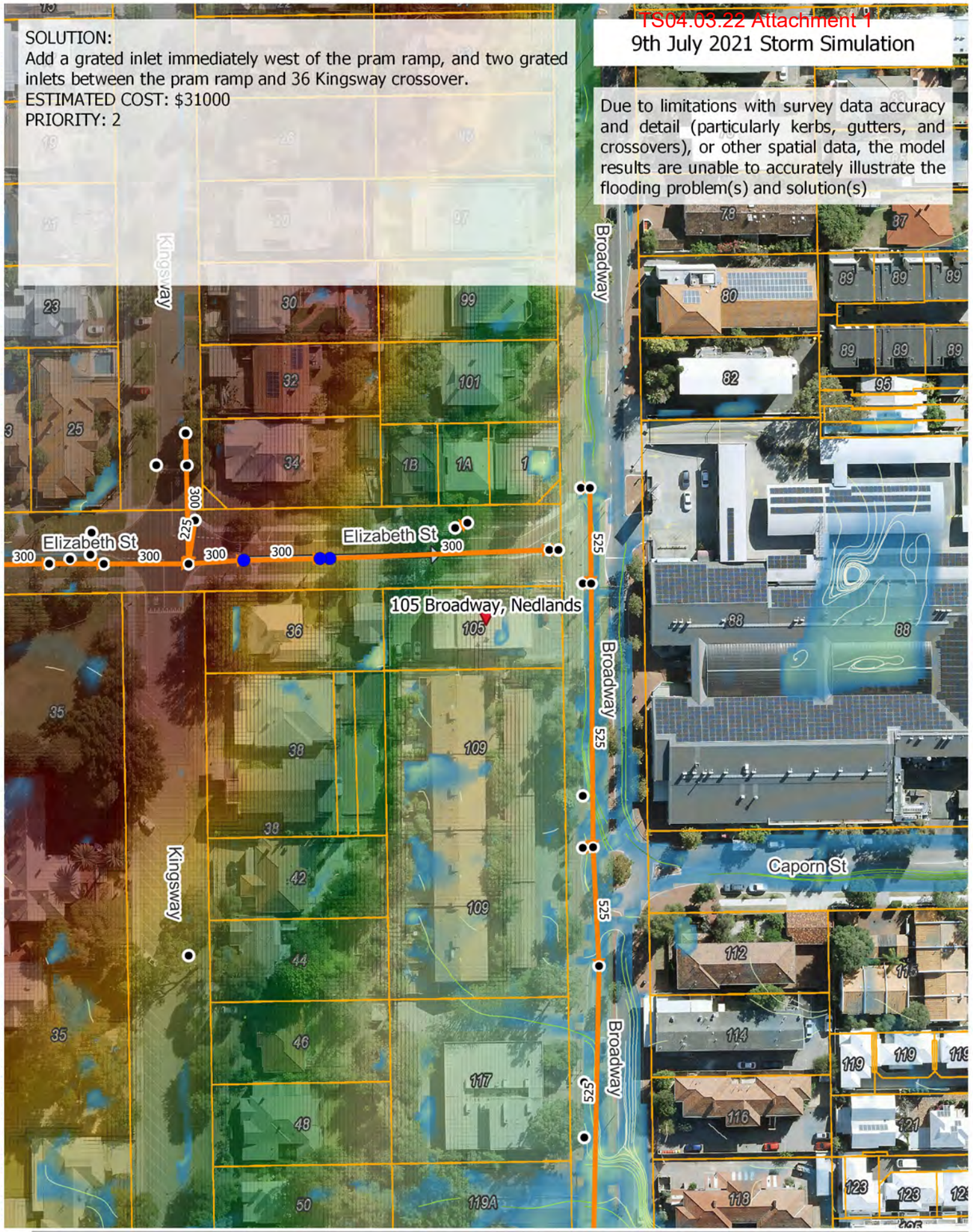

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 105 Broadway, Nedlands

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FIGURE B.2

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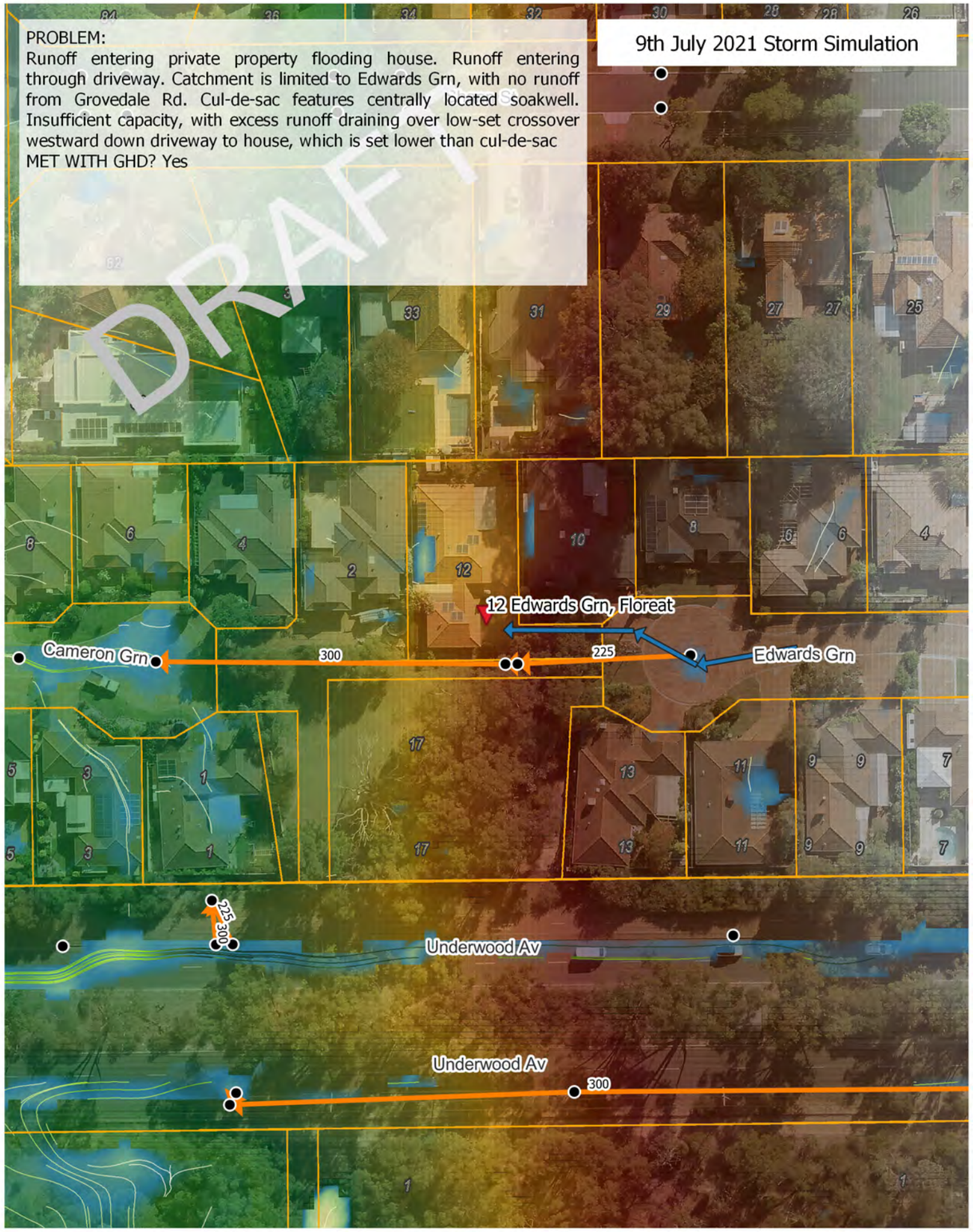

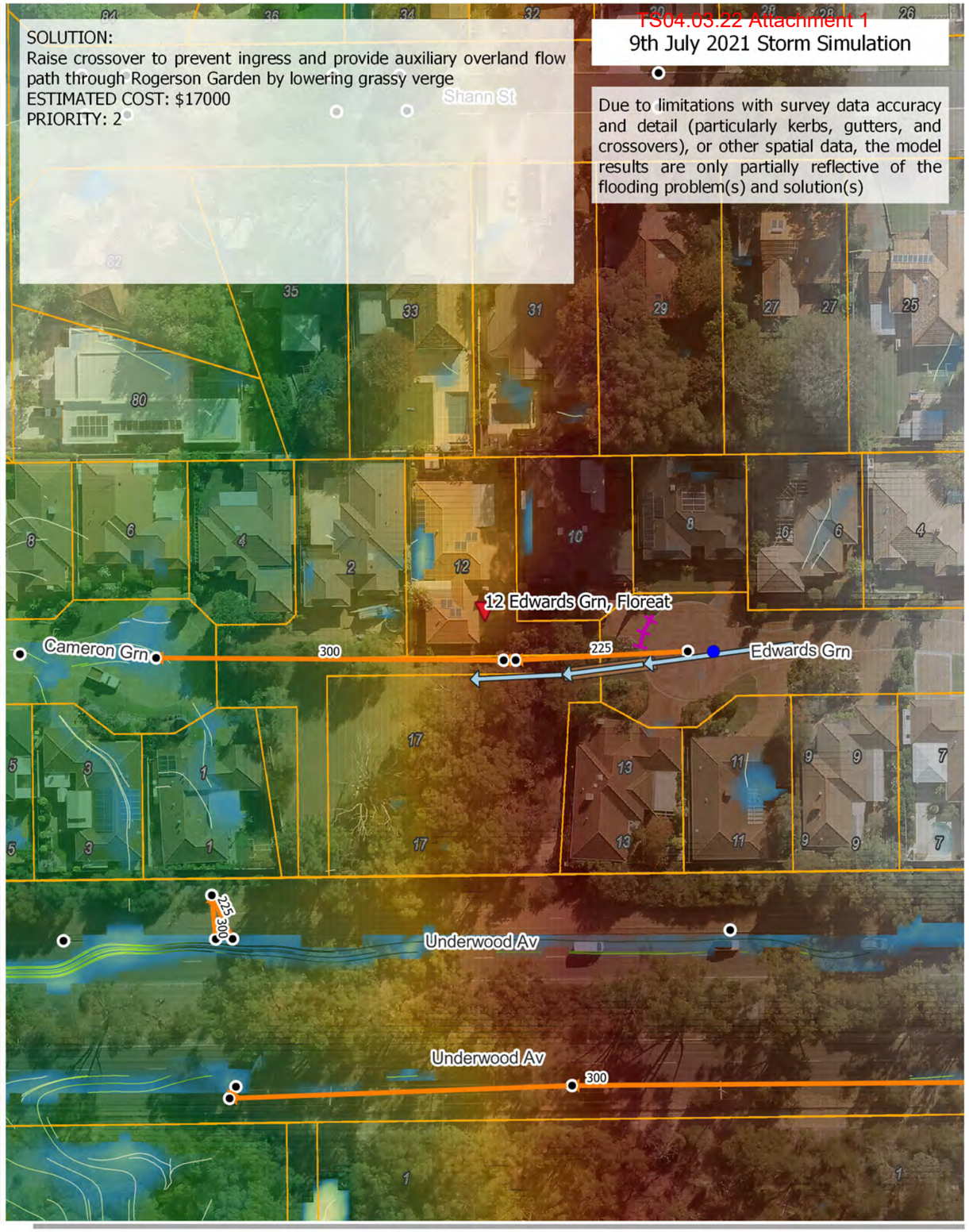

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 12 Edwards Grn, Floreat

Project No. 12555894
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FIGURE B.3

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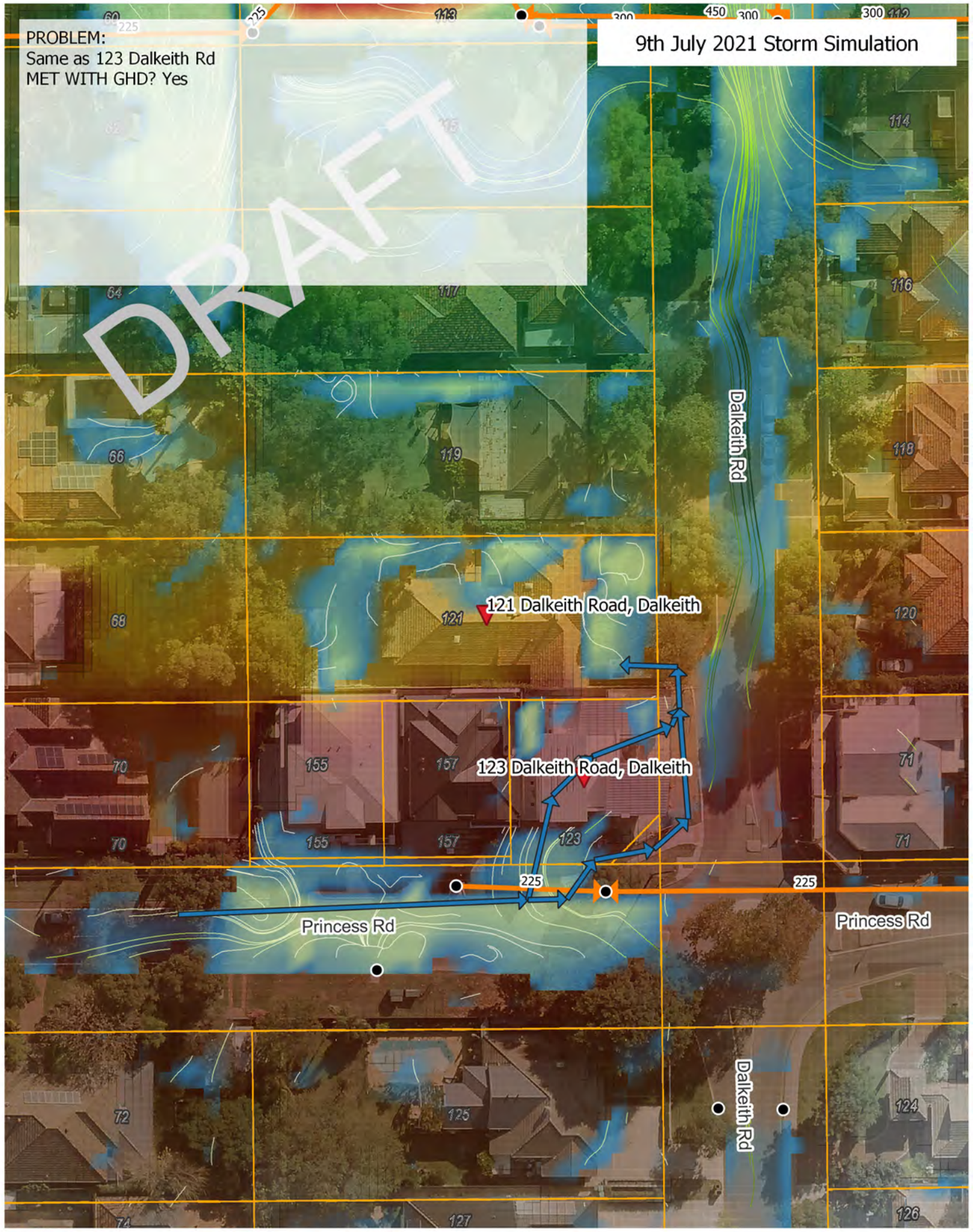

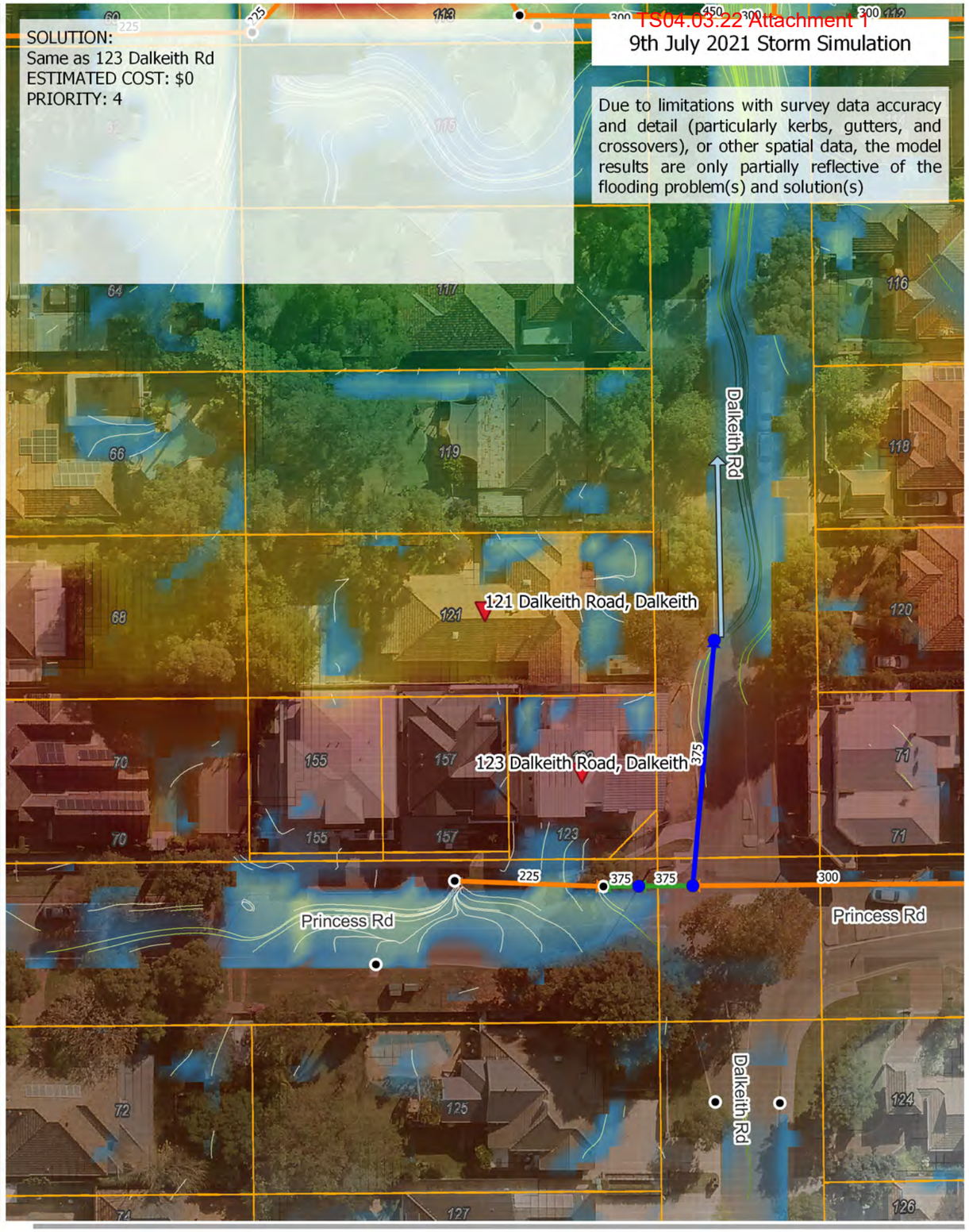

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 121 Dalkeith Road, Dalkeith

Project No. 12555894
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FIGURE B.4

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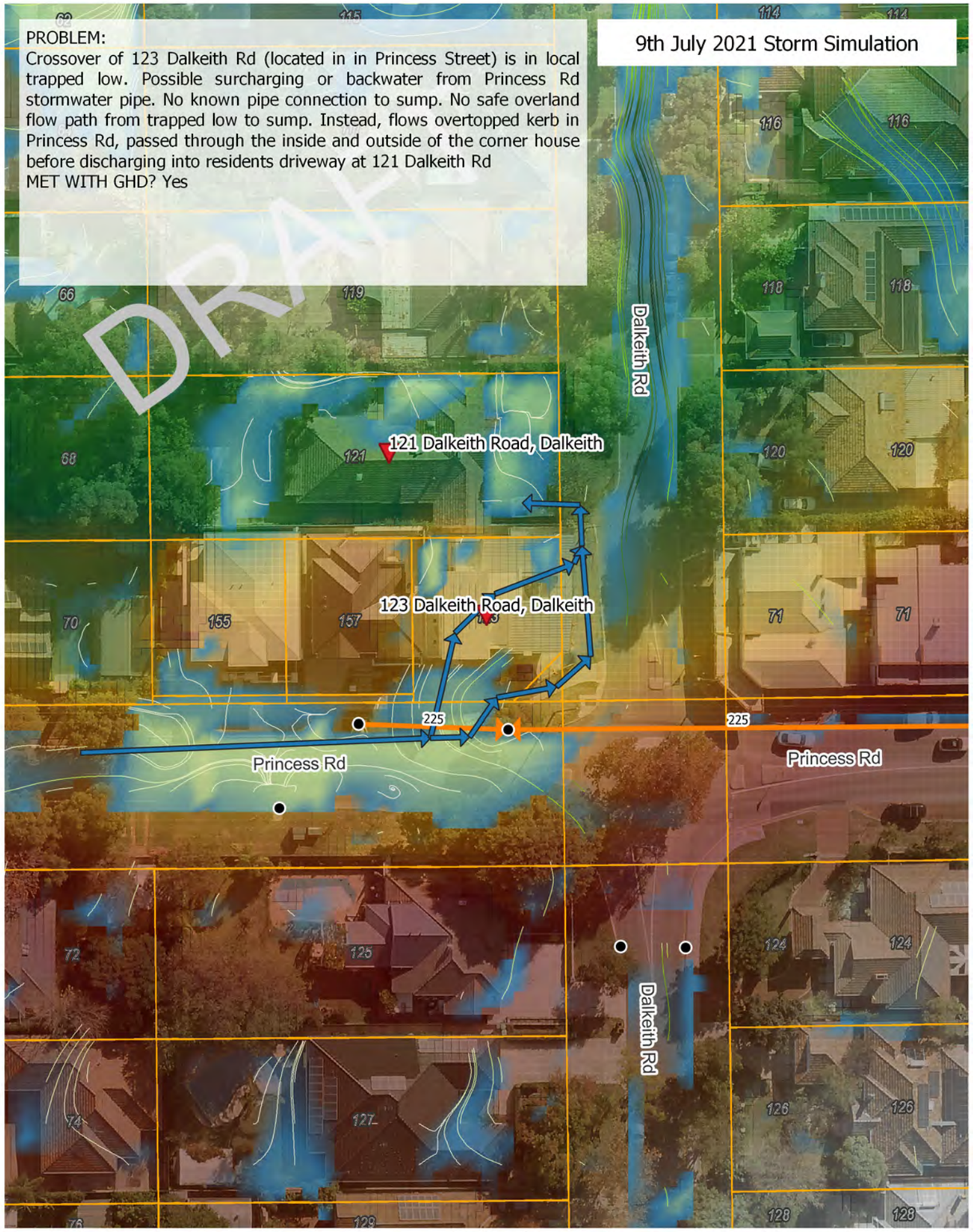
PROBLEM:
Crossover of 123 Dalkeith Rd (located in in Princess Street) is in local trapped low. Possible surcharging or backwater from Princess Rd stormwater pipe. No known pipe connection to sump. No safe overland flow path from trapped low to sump. Instead, flows overtopped kerb in Princess Rd, passed through the inside and outside of the corner house before discharging into residents driveway at 121 Dalkeith Rd
MET WITH GHD? Yes

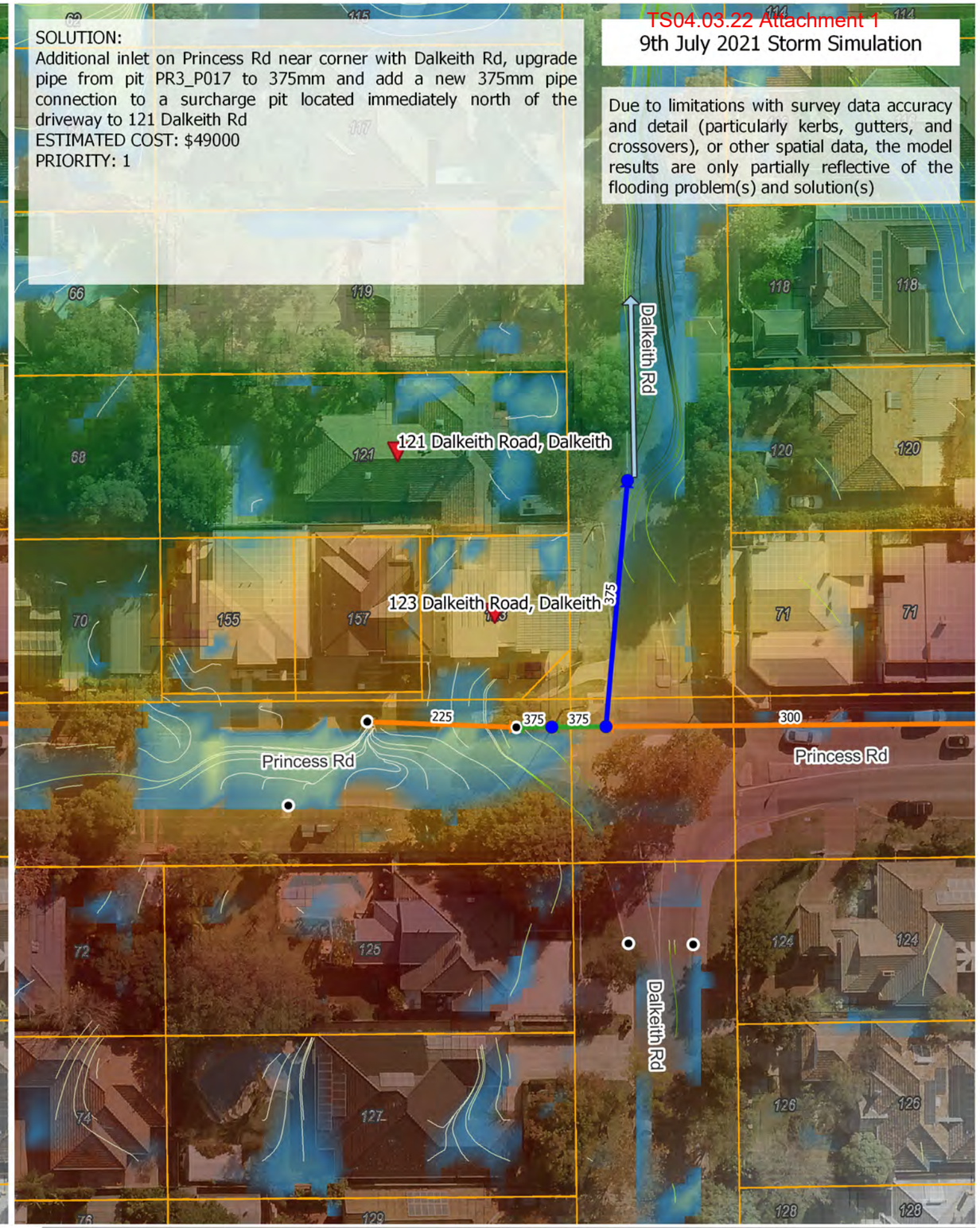
9th July 2021 Storm Simulation



SOLUTION:
Additional inlet on Princess Rd near corner with Dalkeith Rd, upgrade pipe from pit PR3_P017 to 375mm and add a new 375mm pipe connection to a surcharge pit located immediately north of the driveway to 121 Dalkeith Rd
ESTIMATED COST: $49000
PRIORITY: 1

9th July 2021 Storm Simulation

Due to limitations with survey data accuracy and detail (particularly kerbs, gutters, and crossovers), or other spatial data, the model results are only partially reflective of the flooding problem(s) and solution(s)



Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 123 Dalkeith Road, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.5

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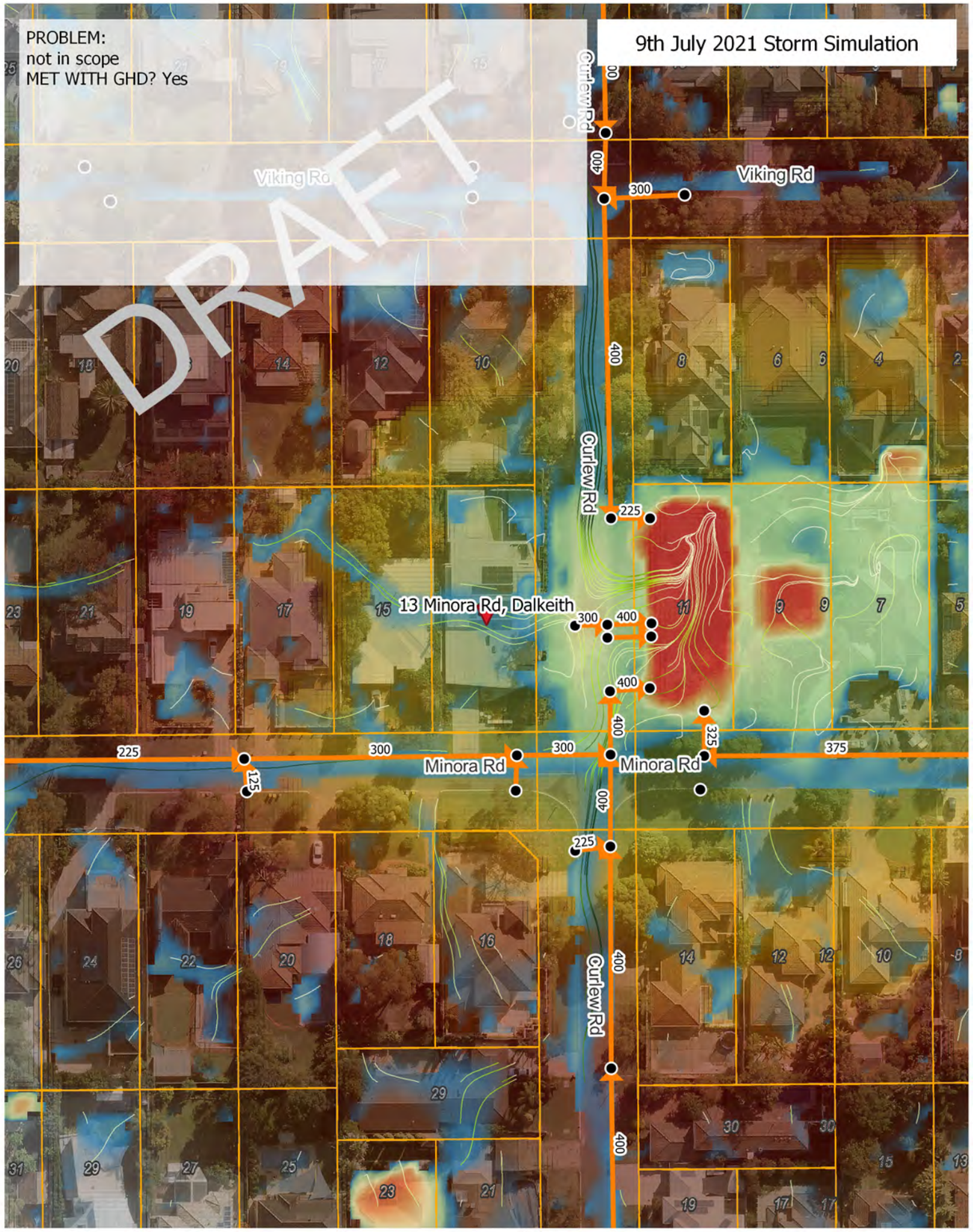

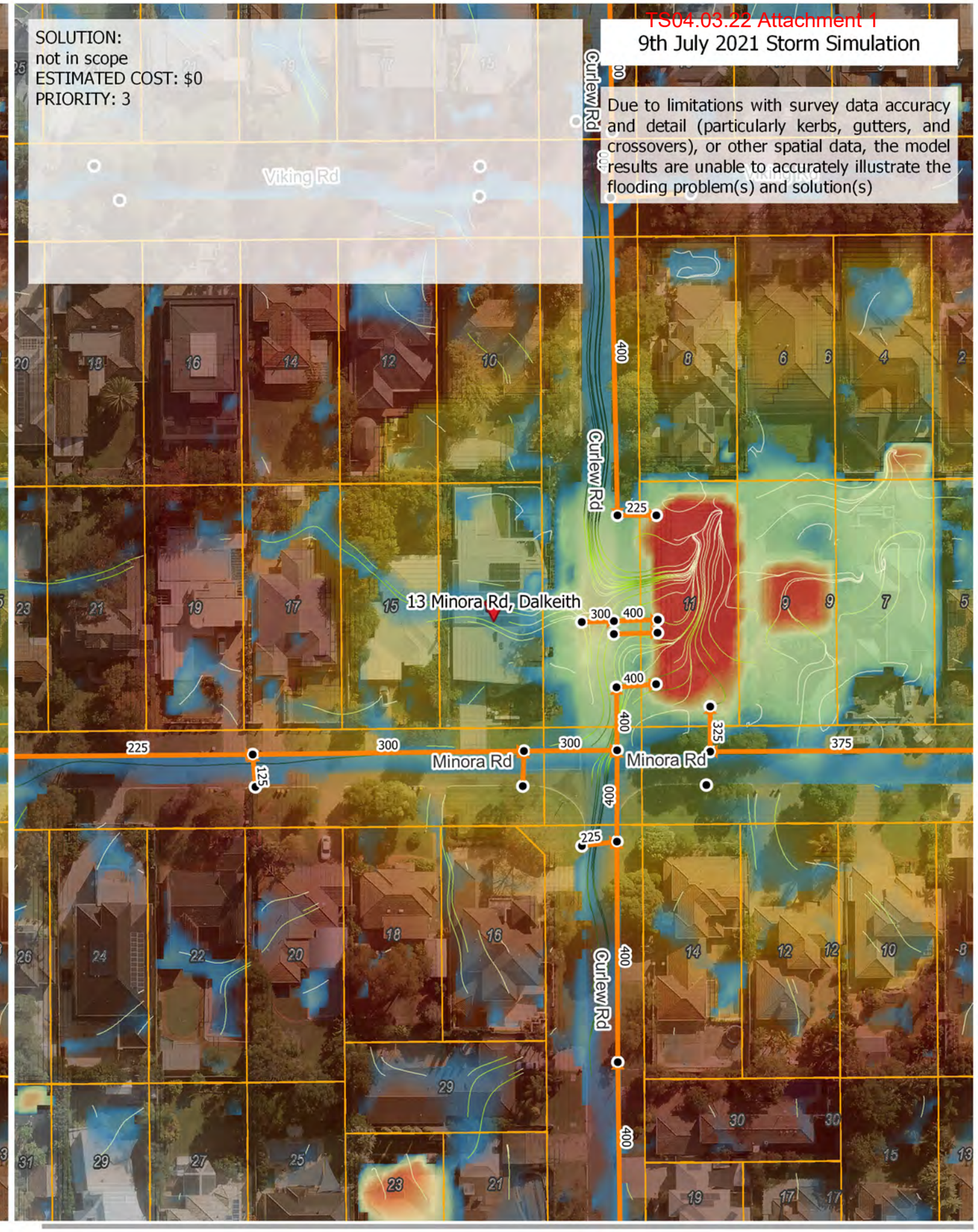

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
13 Minora Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.6

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Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 13 Taylor Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.7

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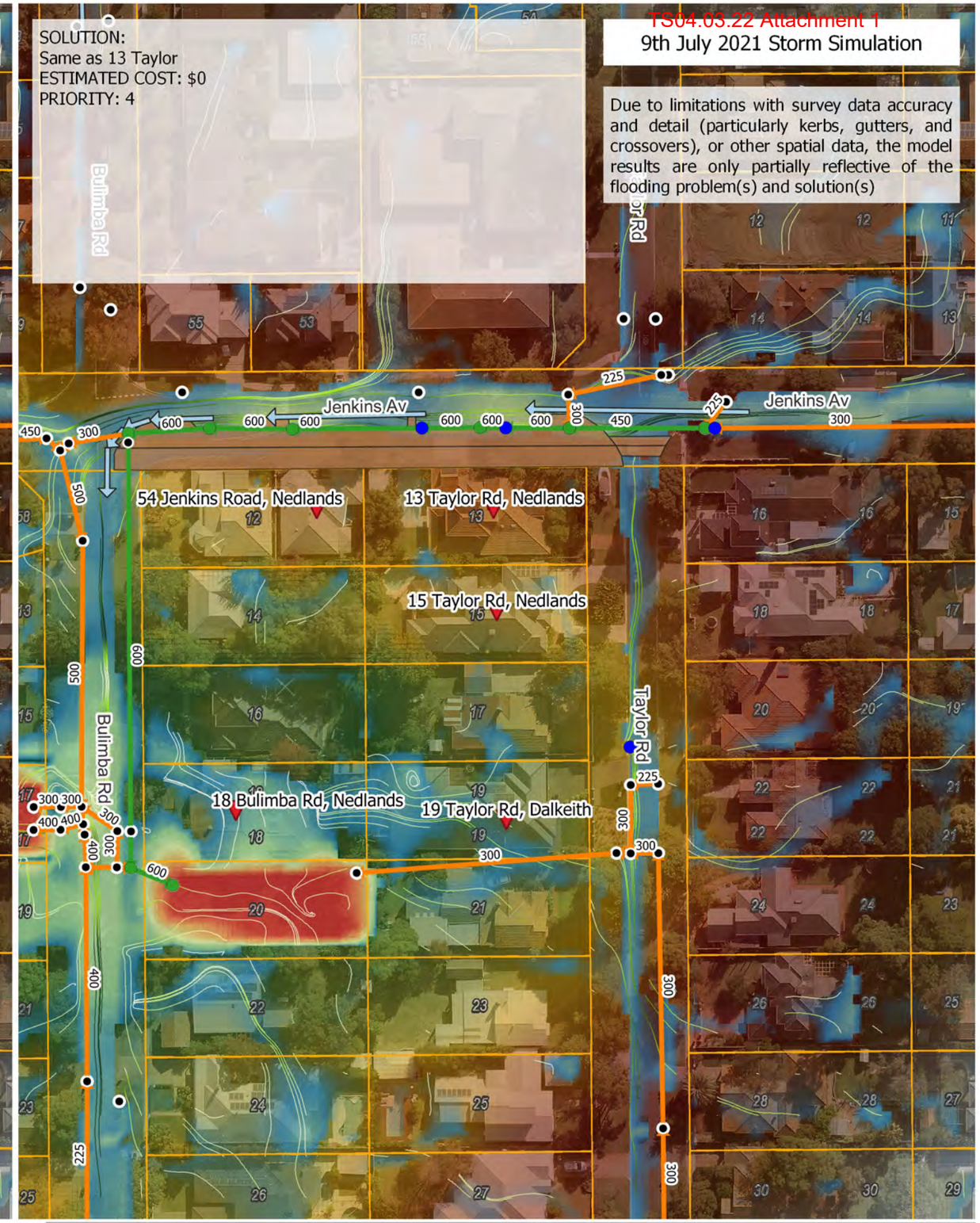

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 15 Taylor Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.8

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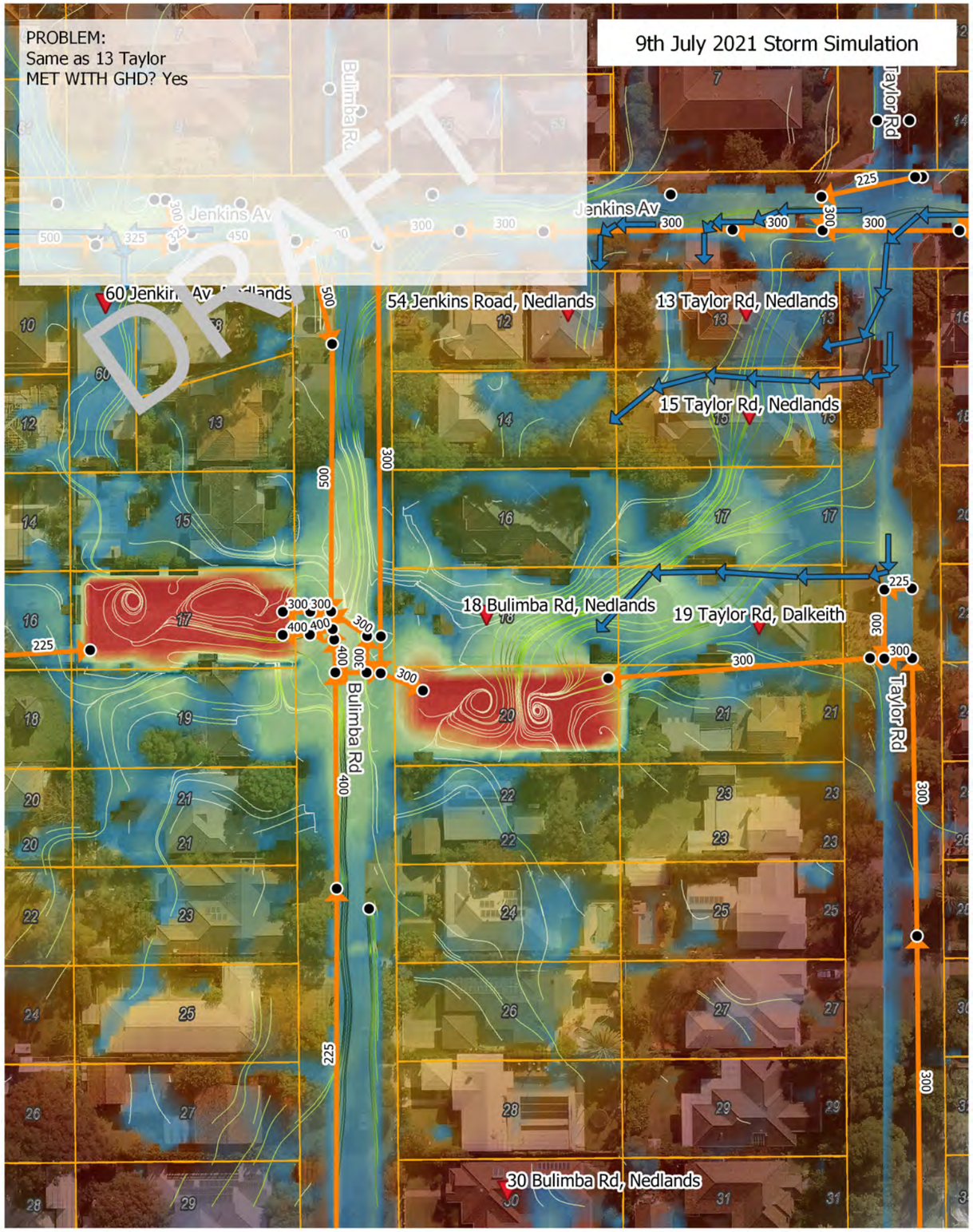

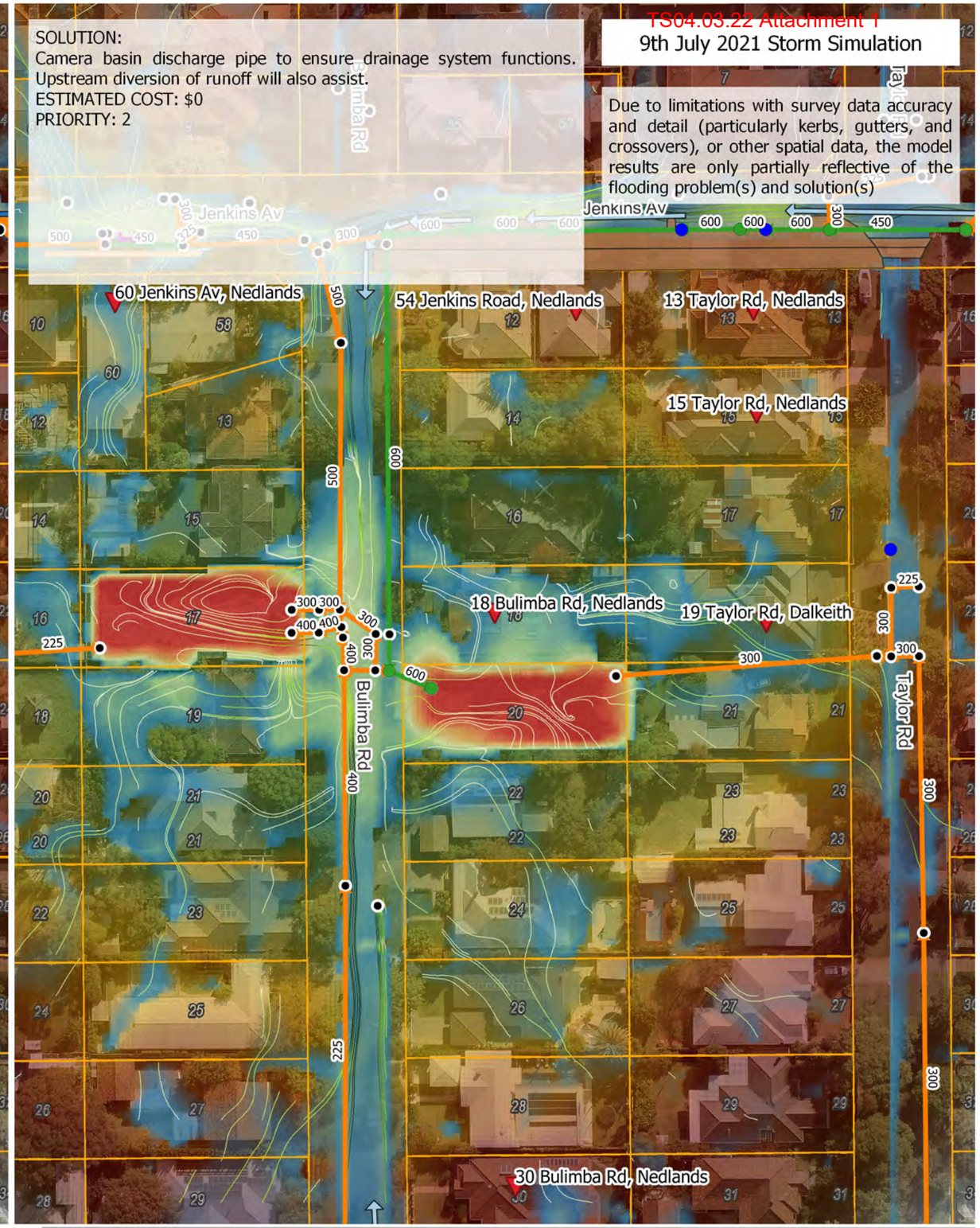

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 18 Bulimba Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.9

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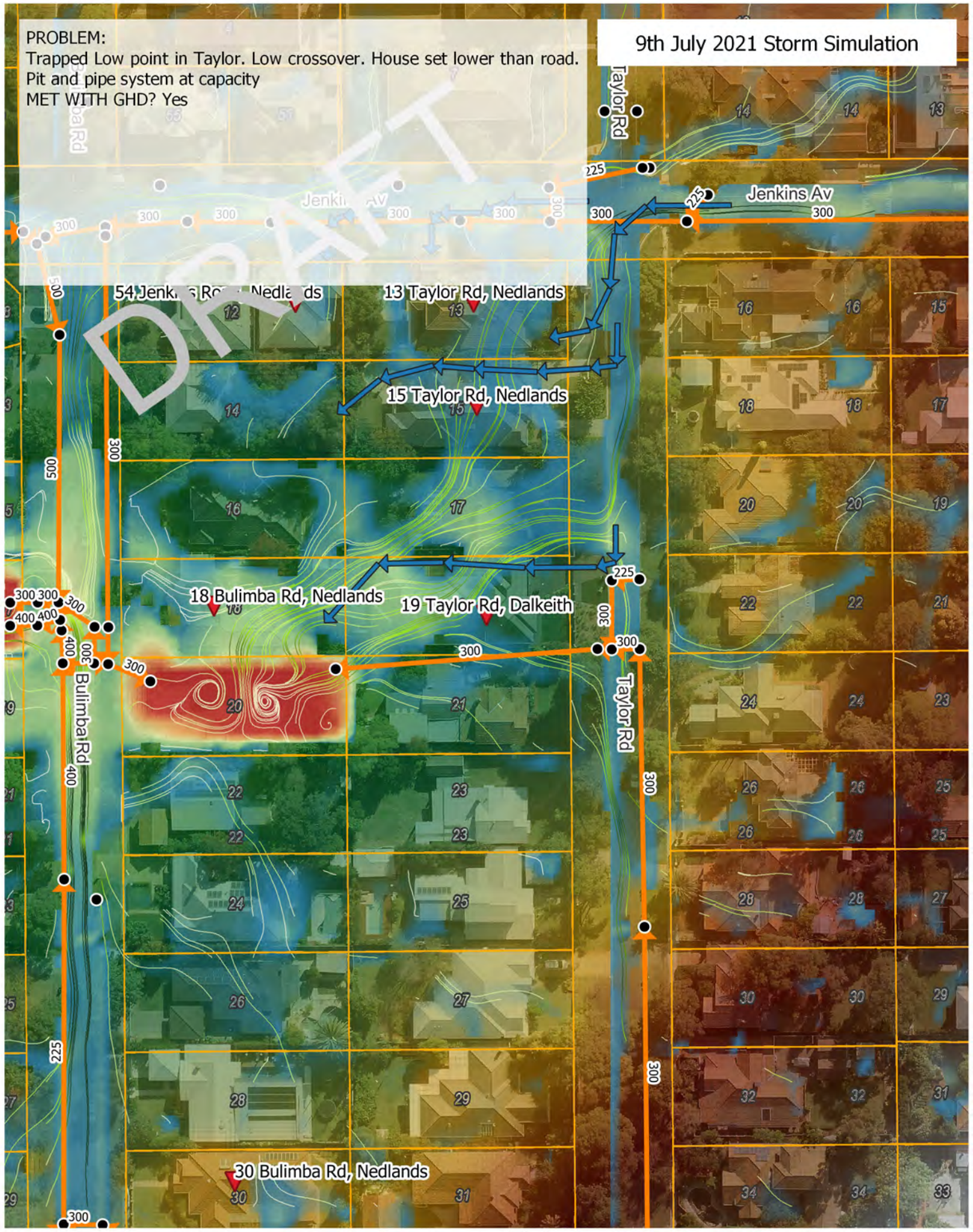

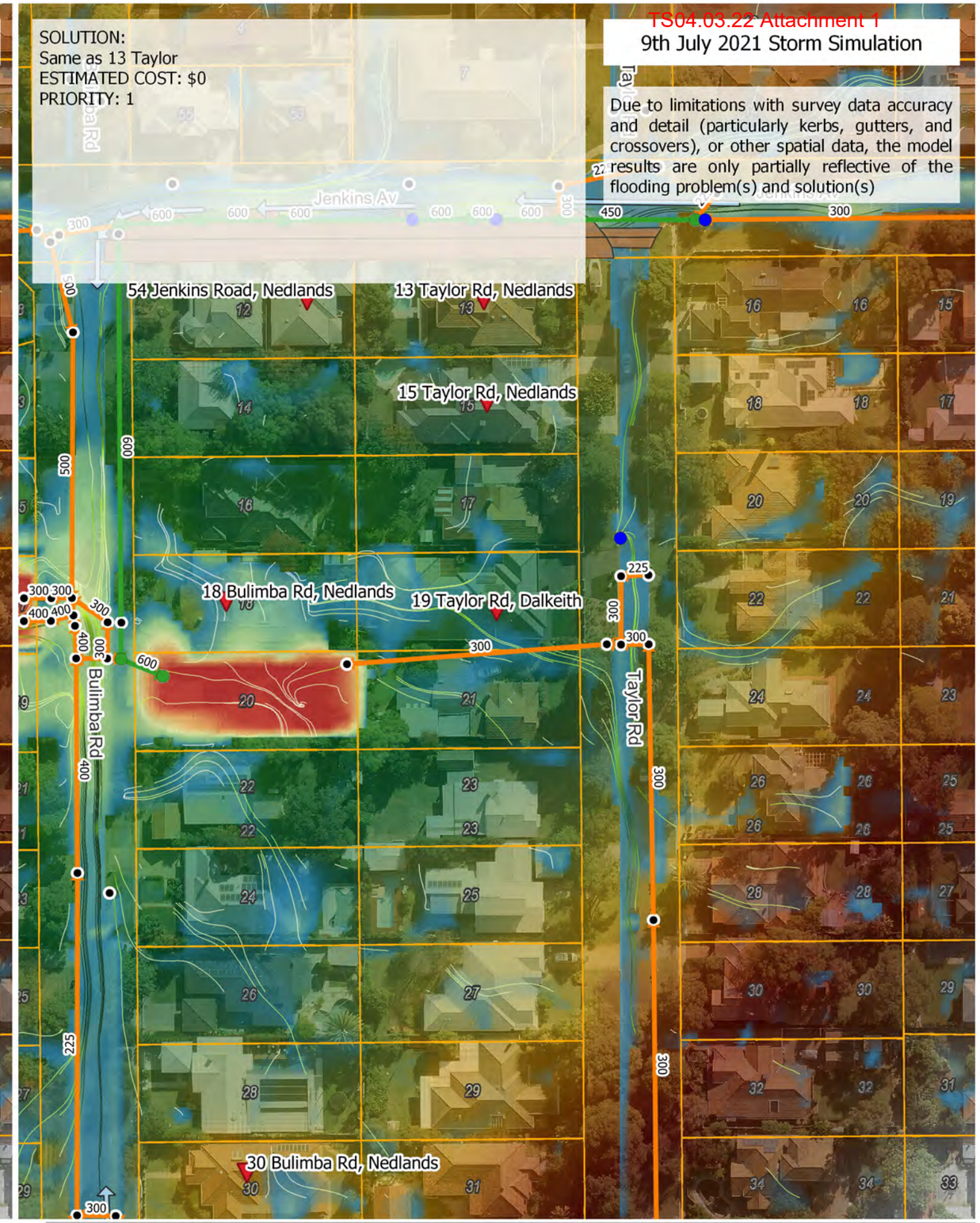

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 19 Taylor Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.10

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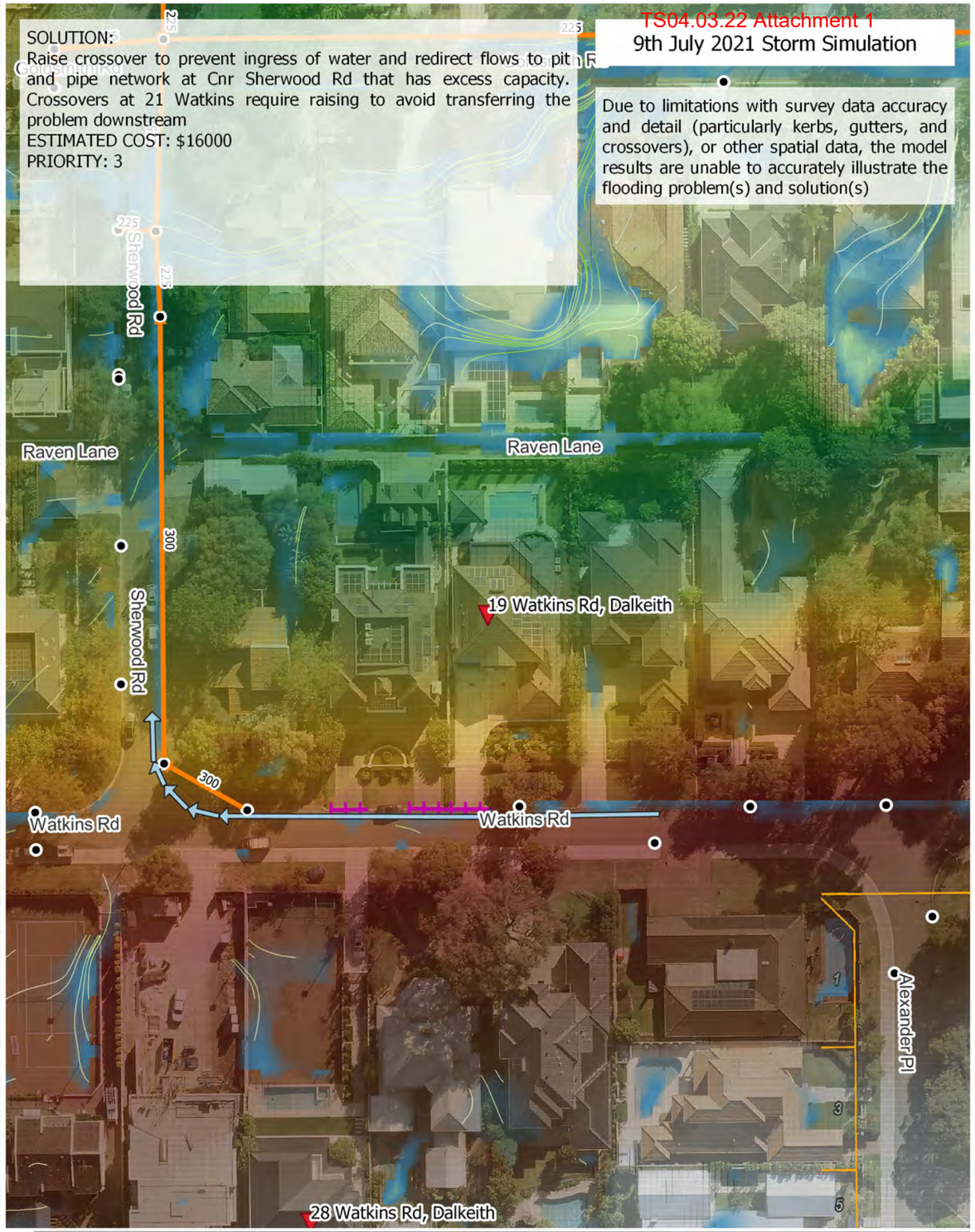

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 19 Watkins Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.11

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Created By: Nick Deeks

PROBLEM:
Flood report not provided. Runoff appears to overtop kerb and/or crossover and drain down driveway to garage, set much lower than road level. Catchment includes Stirling Hwy. Most of the properties on western side of Doonan between Stirling Hwy and Jenkins Rd are low set, and there is no pit and pipe network, only soakwells. Flooding also reported at 5A Doonan. An estimated 190m3 of runoff in July 2021 event.
MET WITH GHD? Yes

9th July 2021 Storm Simulation

SOLUTION:
Many kerbs and crossovers would need to be altered to protect these properties or provision of a new pipe connection made to the Jenkins Avenue system. Given the Jenkins Ave system is also flooding, preference is to collect and infiltrate runoff locally. This is best achieved by adding a series of 8 grated inlets and soakwells (36m3) along the inflexion point in the road surface associated with the parallel parking besides 136 Stirling Hwy. This will also contribute to improving outcomes downstream.
ESTIMATED COST: $104000
PRIORITY: 5

9th July 2021 Storm Simulation

Due to limitations with survey data accuracy and detail (particularly kerbs, gutters, and crossovers), or other spatial data, the model results are unable to accurately illustrate the flooding problem(s) and solution(s)

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 1A Doonan Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.12

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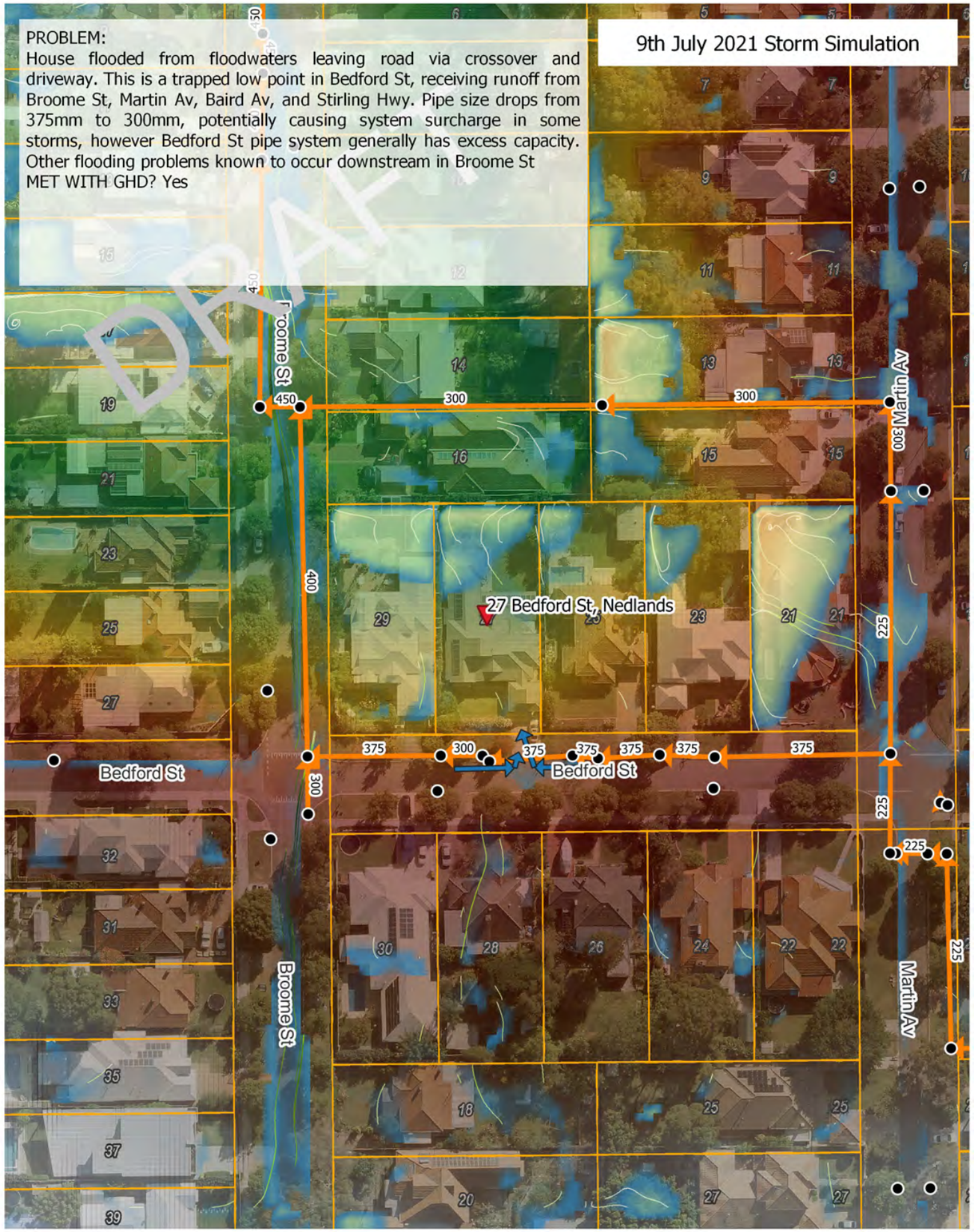

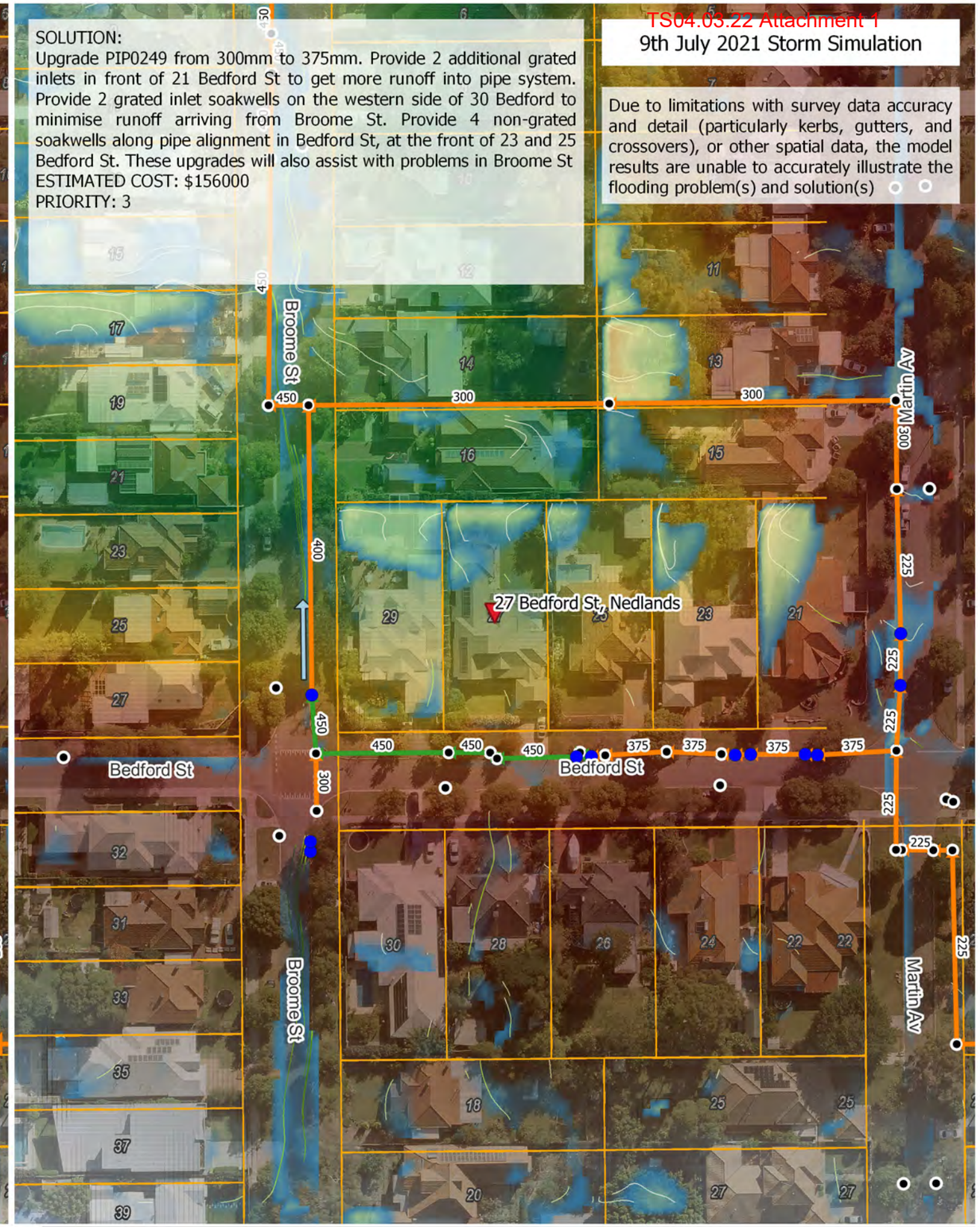

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 27 Bedford St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.13

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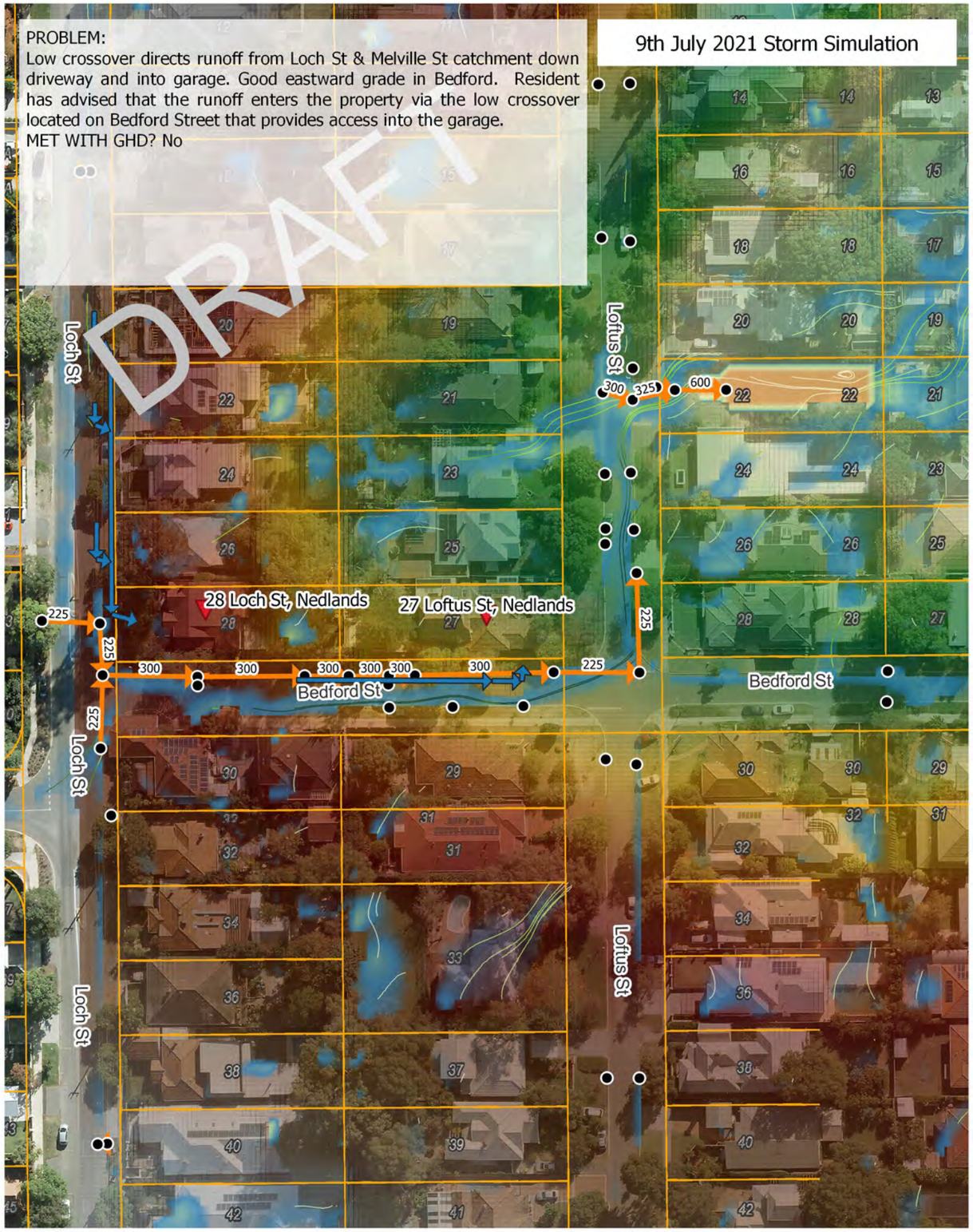

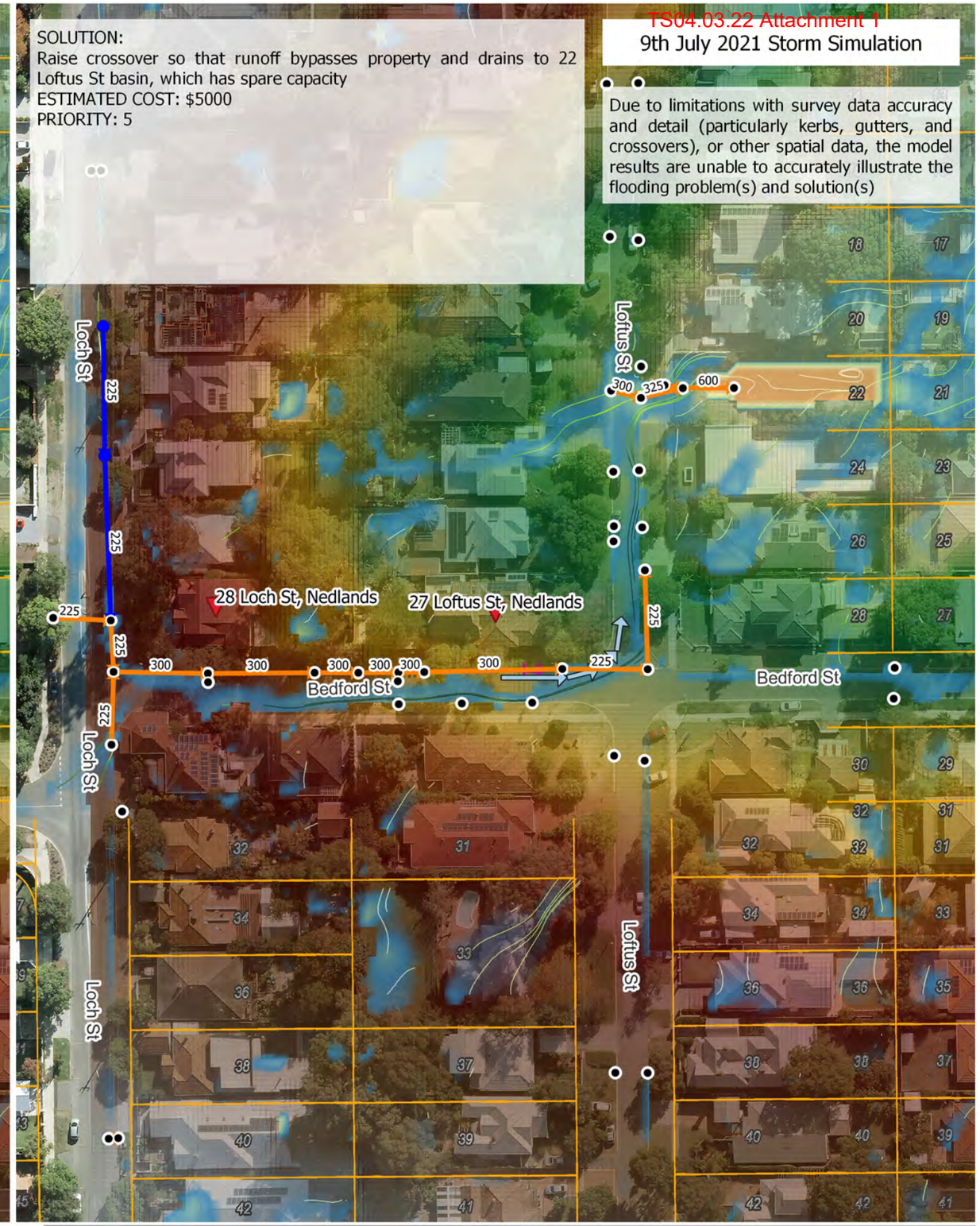

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
27 Loftus St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.14

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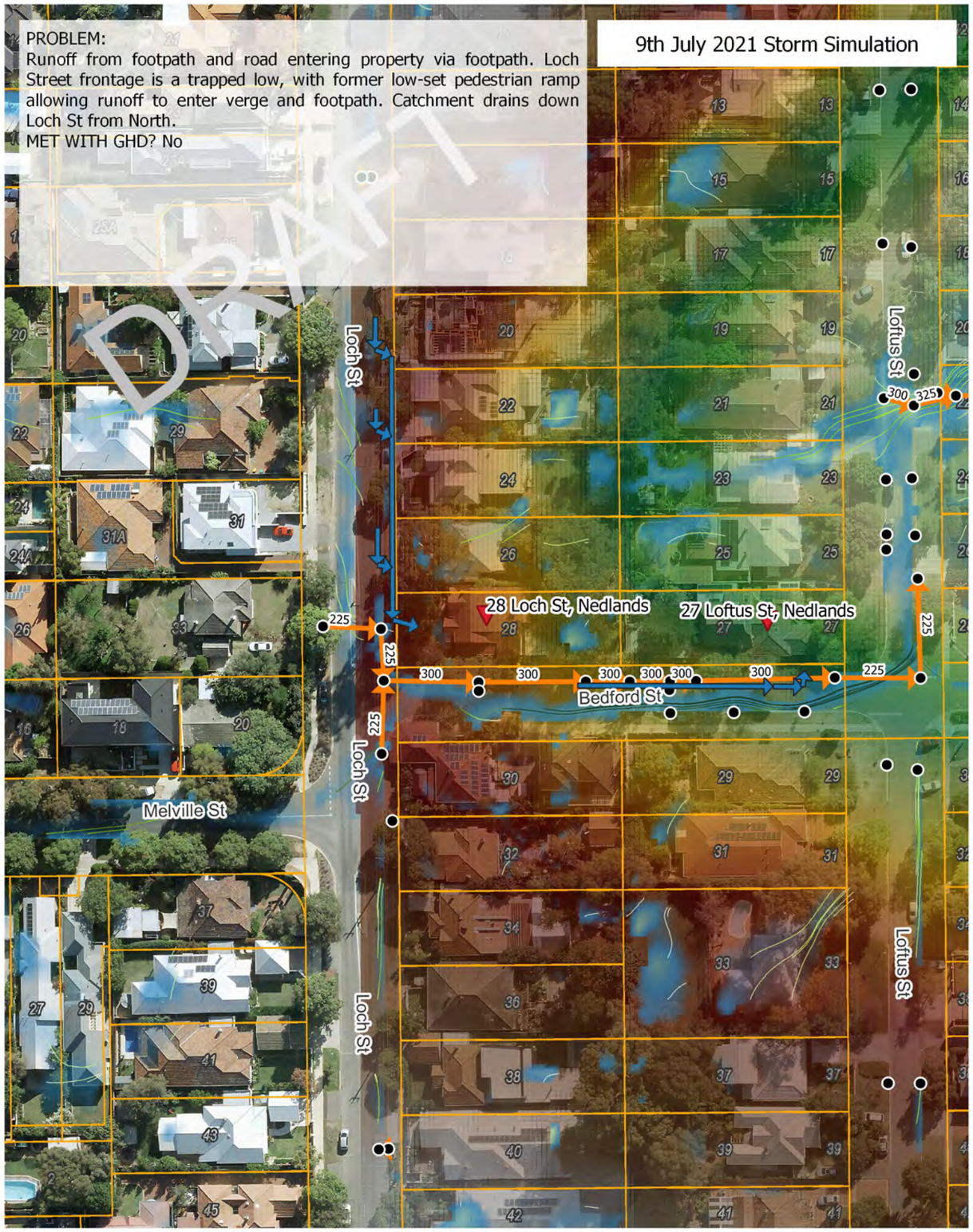
PROBLEM:
Runoff from footpath and road entering property via footpath. Loch Street frontage is a trapped low, with former low-set pedestrian ramp allowing runoff to enter verge and footpath. Catchment drains down Loch St from North.
MET WITH GHD? No

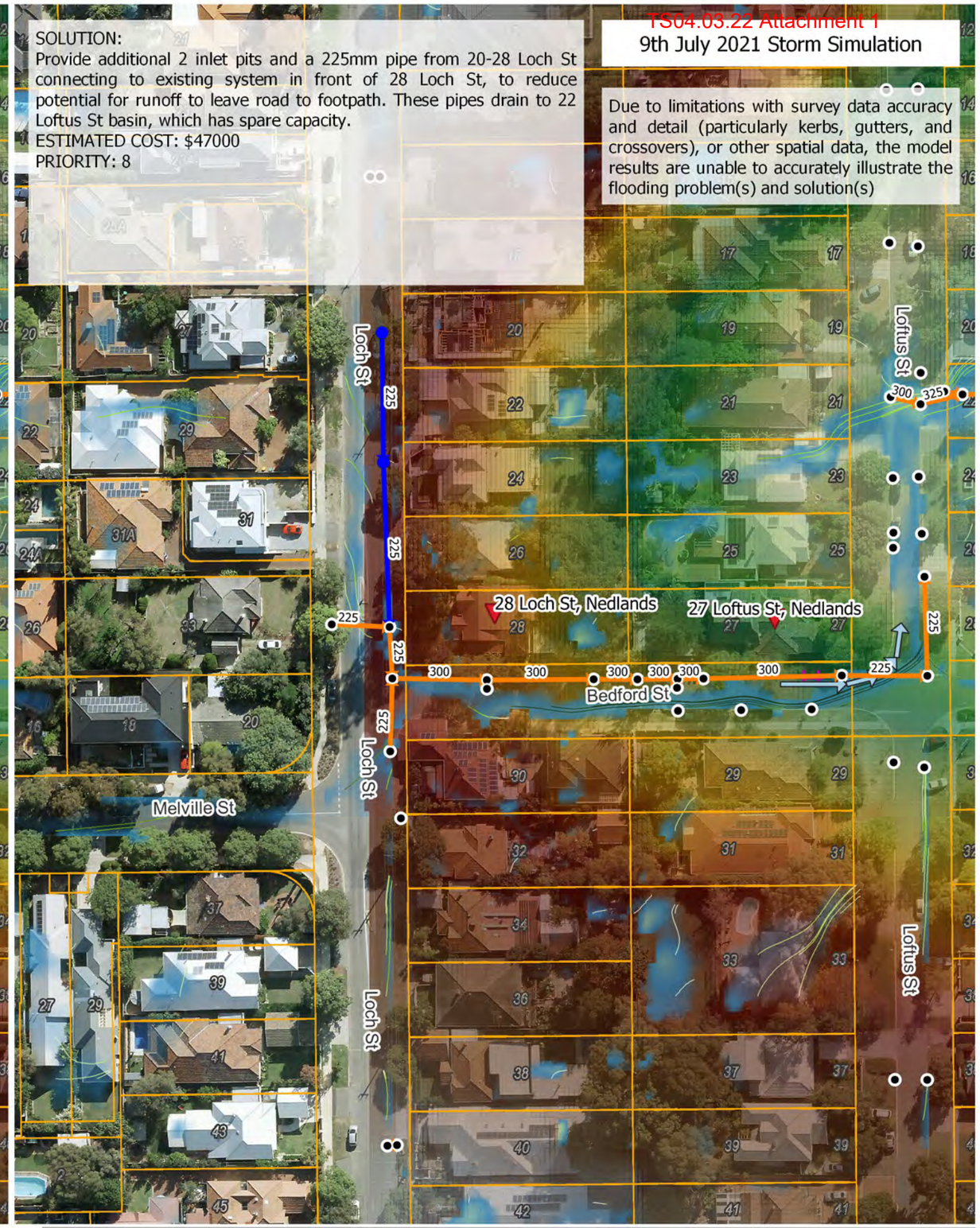
9th July 2021 Storm Simulation



SOLUTION:
Provide additional 2 inlet pits and a 225mm pipe from 20-28 Loch St connecting to existing system in front of 28 Loch St, to reduce potential for runoff to leave road to footpath. These pipes drain to 22 Loftus St basin, which has spare capacity.
ESTIMATED COST: $47000
PRIORITY: 8

9th July 2021 Storm Simulation

Due to limitations with survey data accuracy and detail (particularly kerbs, gutters, and crossovers), or other spatial data, the model results are unable to accurately illustrate the flooding problem(s) and solution(s)



Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 28 Loch St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.15

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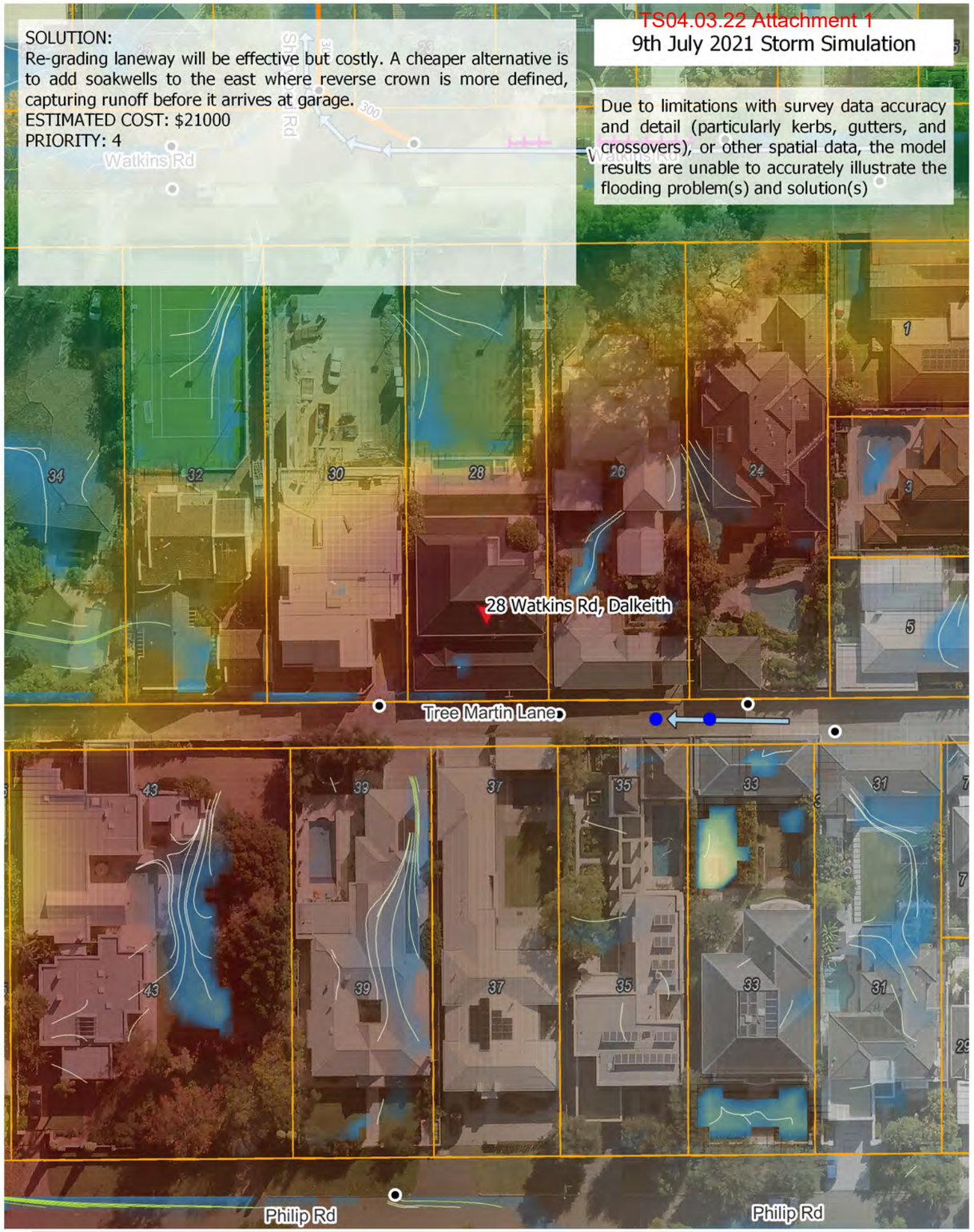

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 28 Watkins Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.16

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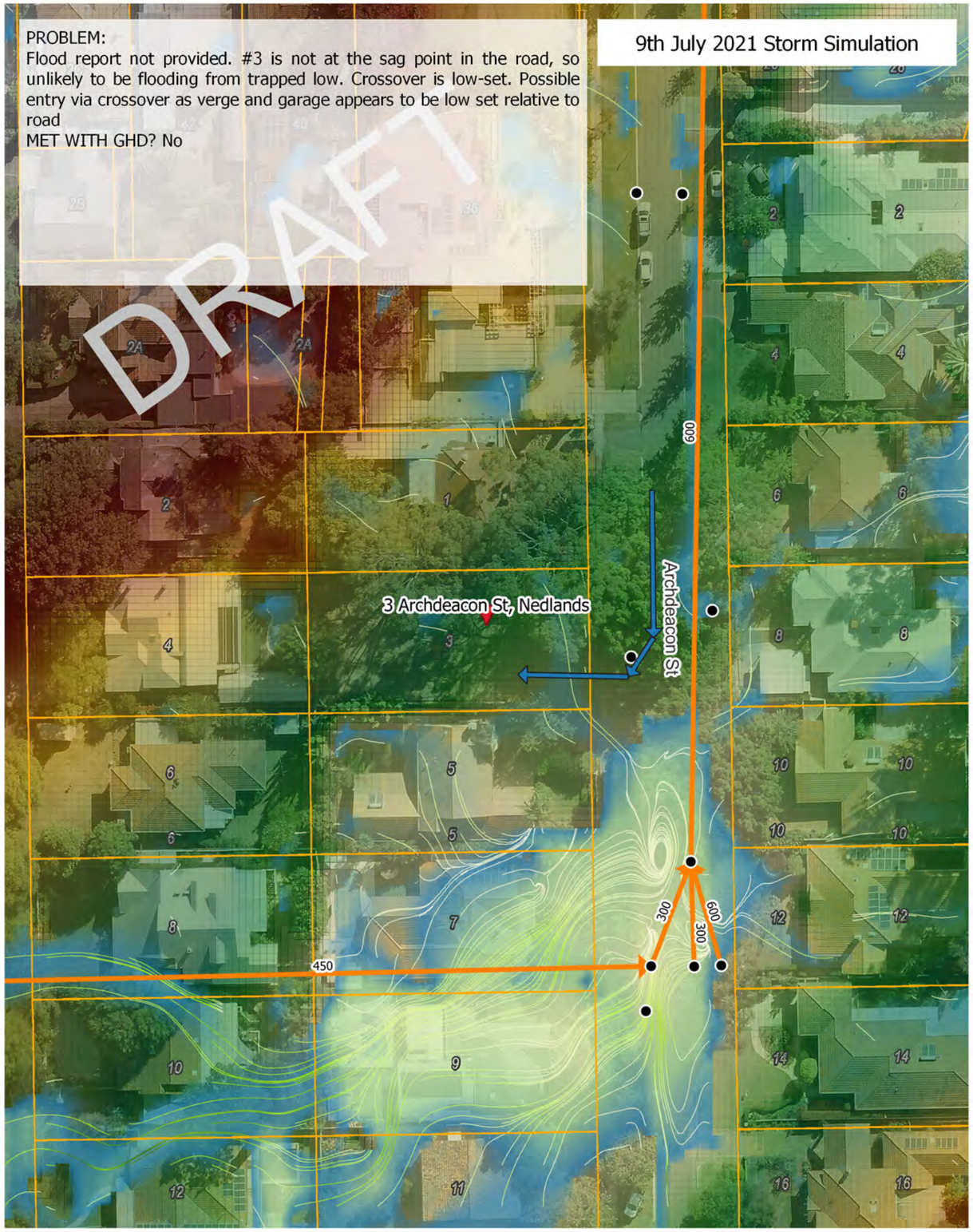

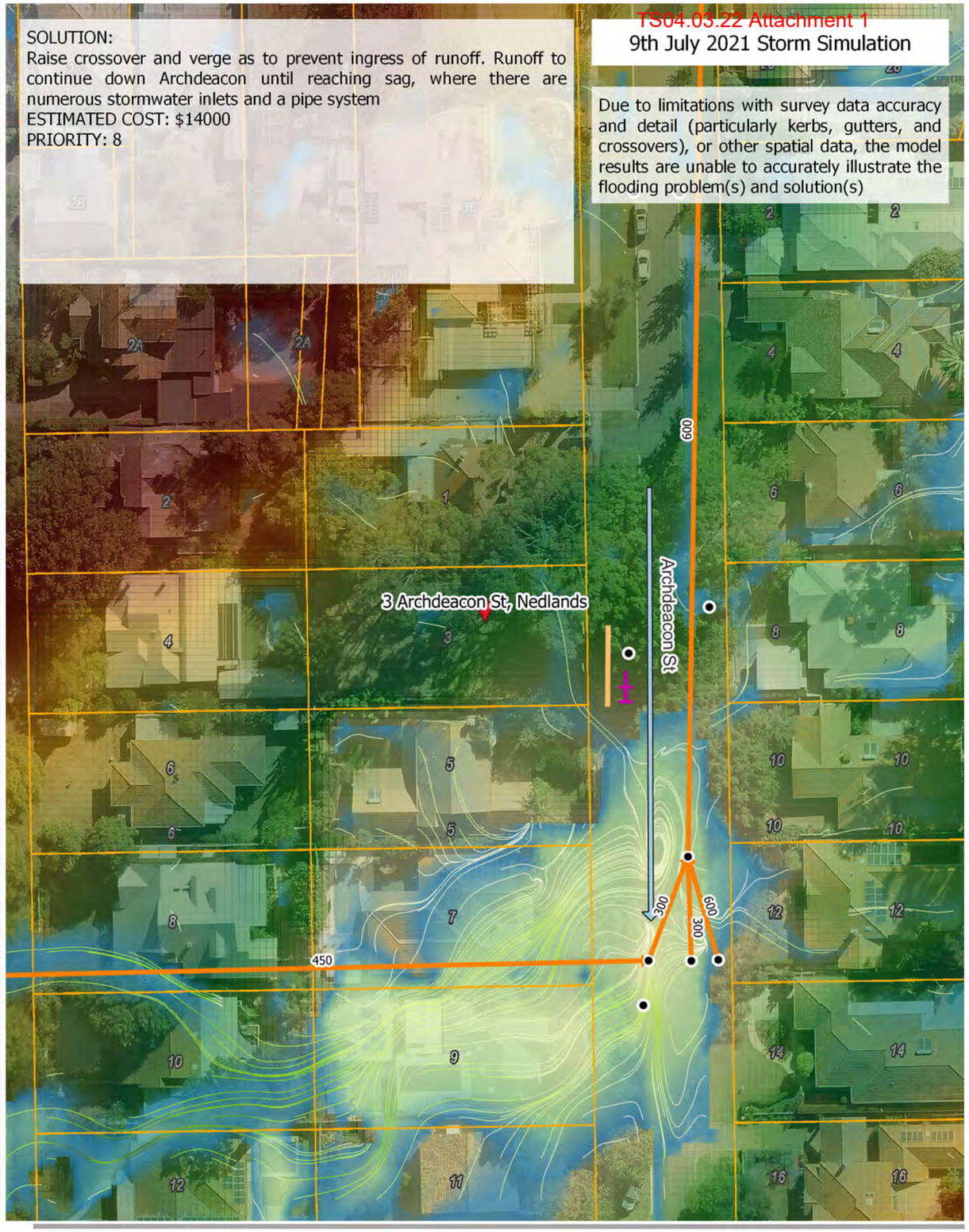

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
3 Archdeacon St, Nedlands

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.17

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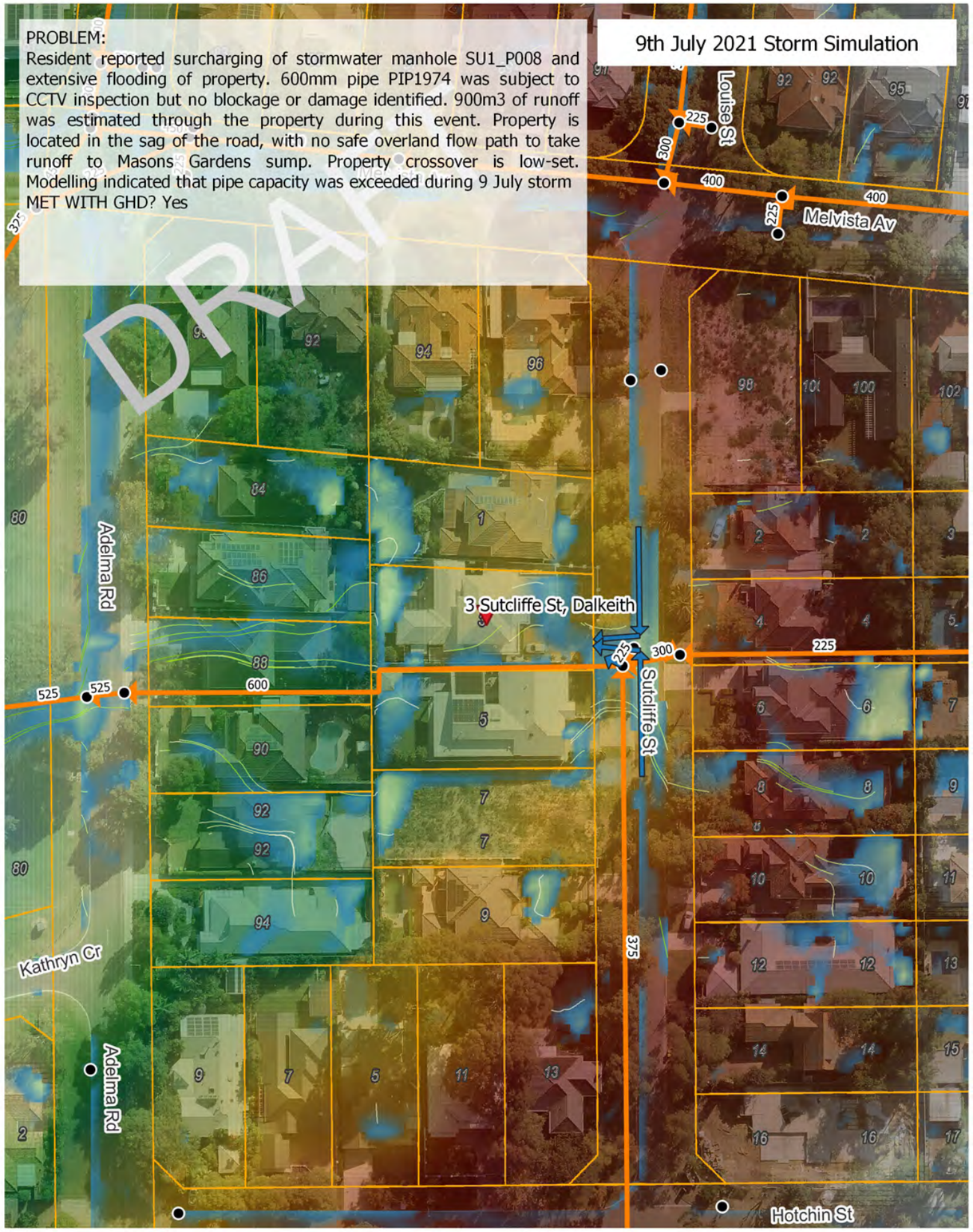
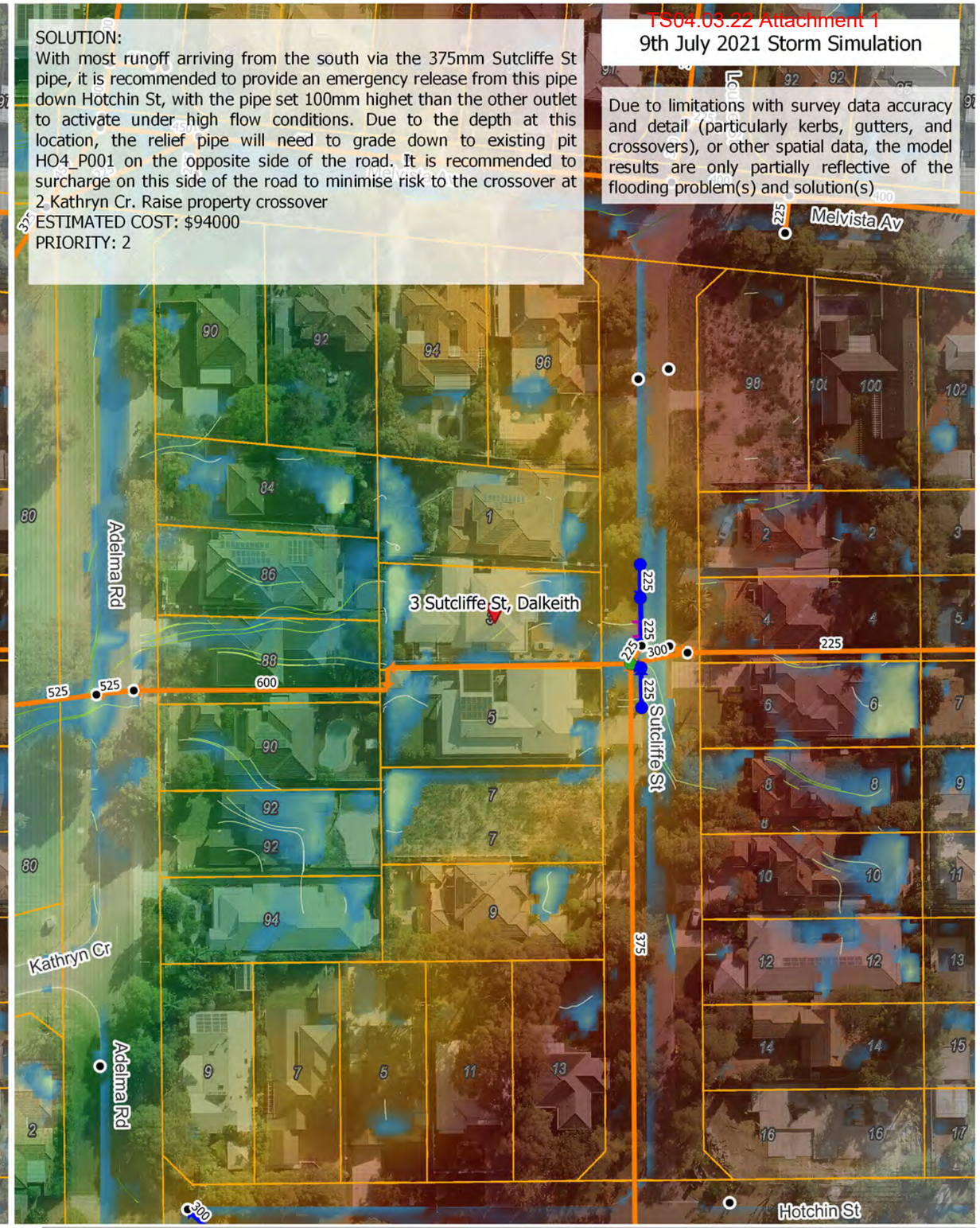
PROBLEM:
Resident reported surcharging of stormwater manhole SU1_P008 and extensive flooding of property. 600mm pipe PIP1974 was subject to CCTV inspection but no blockage or damage identified. 900m3 of runoff was estimated through the property during this event. Property is located in the sag of the road, with no safe overland flow path to take runoff to Masons Gardens sump. Property crossover is low-set. Modelling indicated that pipe capacity was exceeded during 9 July storm
MET WITH GHD? Yes



SOLUTION:
With most runoff arriving from the south via the 375mm Sutcliffe St pipe, it is recommended to provide an emergency release from this pipe down Hotchin St, with the pipe set 100mm highet than the other outlet to activate under high flow conditions. Due to the depth at this location, the relief pipe will need to grade down to existing pit HO4_P001 on the opposite side of the road. It is recommended to surcharge on this side of the road to minimise risk to the crossover at 2 Kathryn Cr. Raise property crossover
ESTIMATED COST: $94000
PRIORITY: 2



Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
3 Sutcliffe St, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.18

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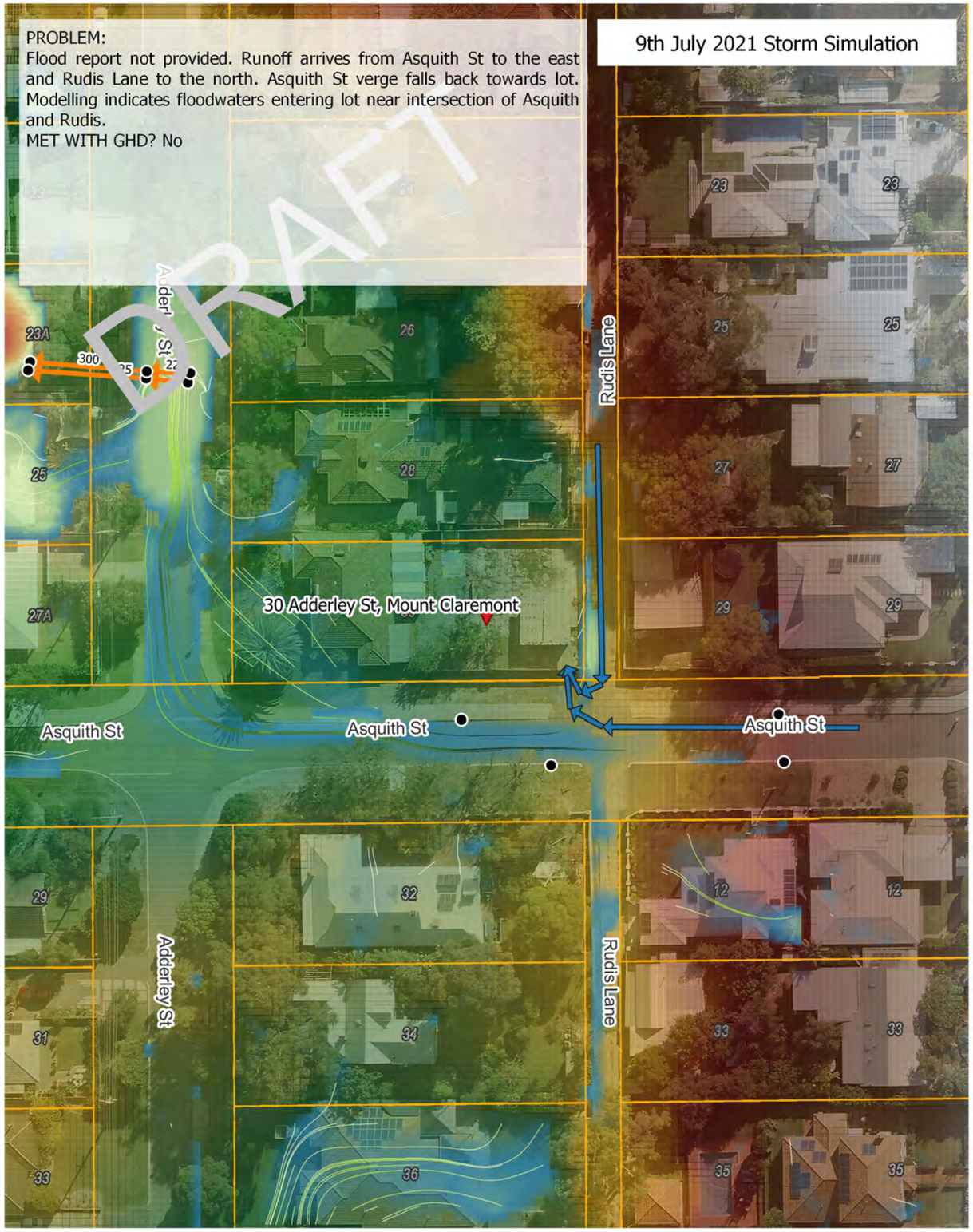

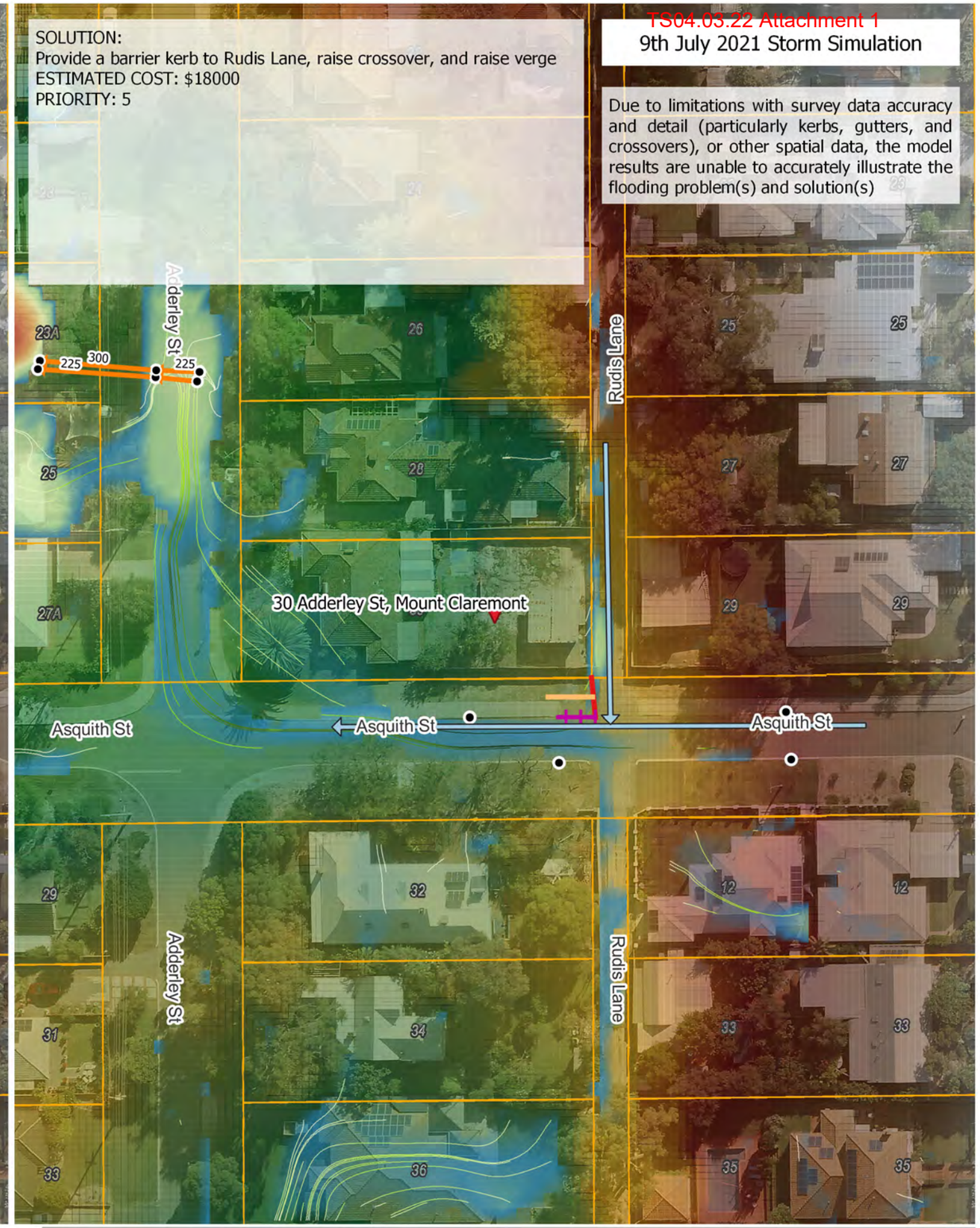

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
30 Adderley St, Mount Claremont

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.19

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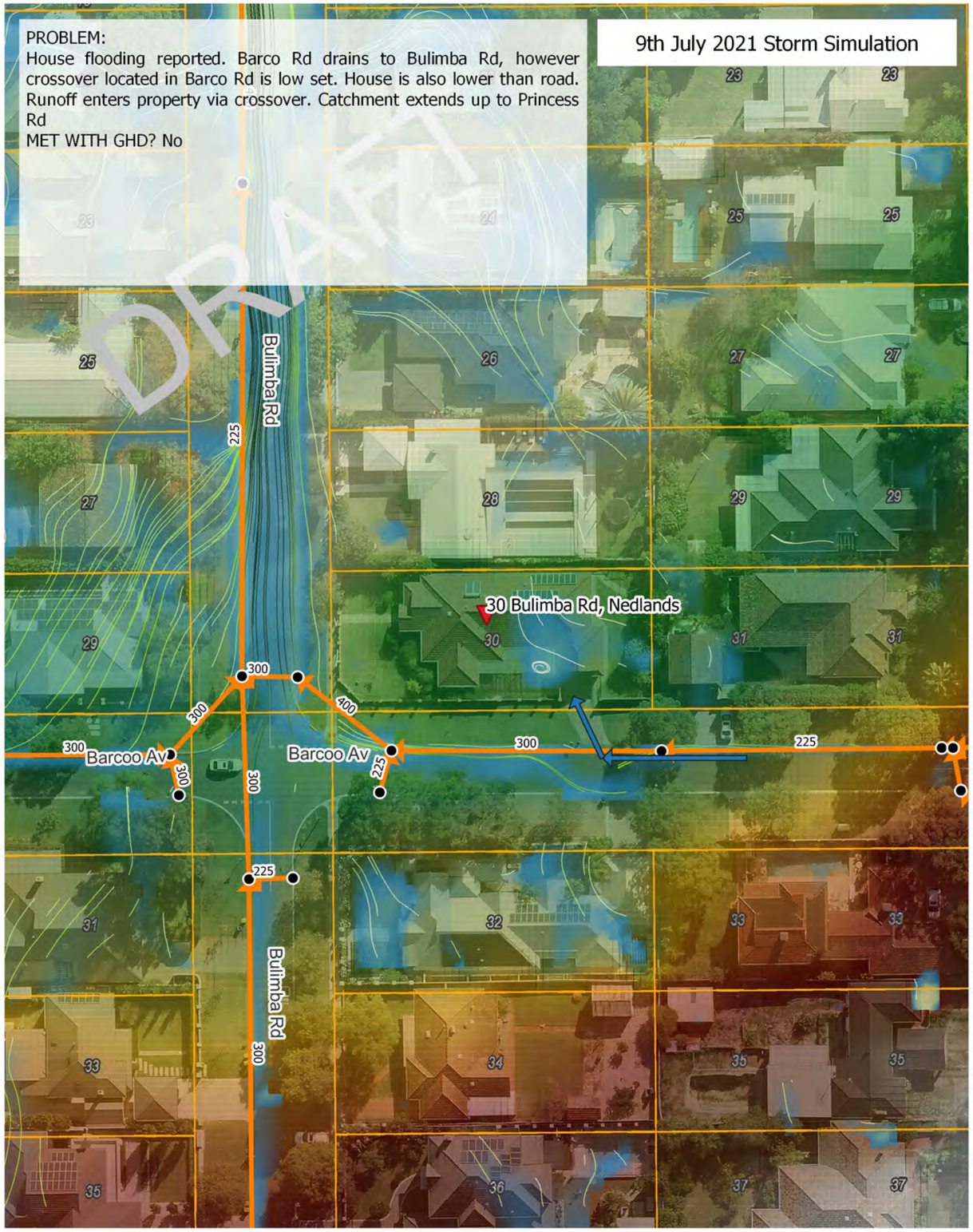

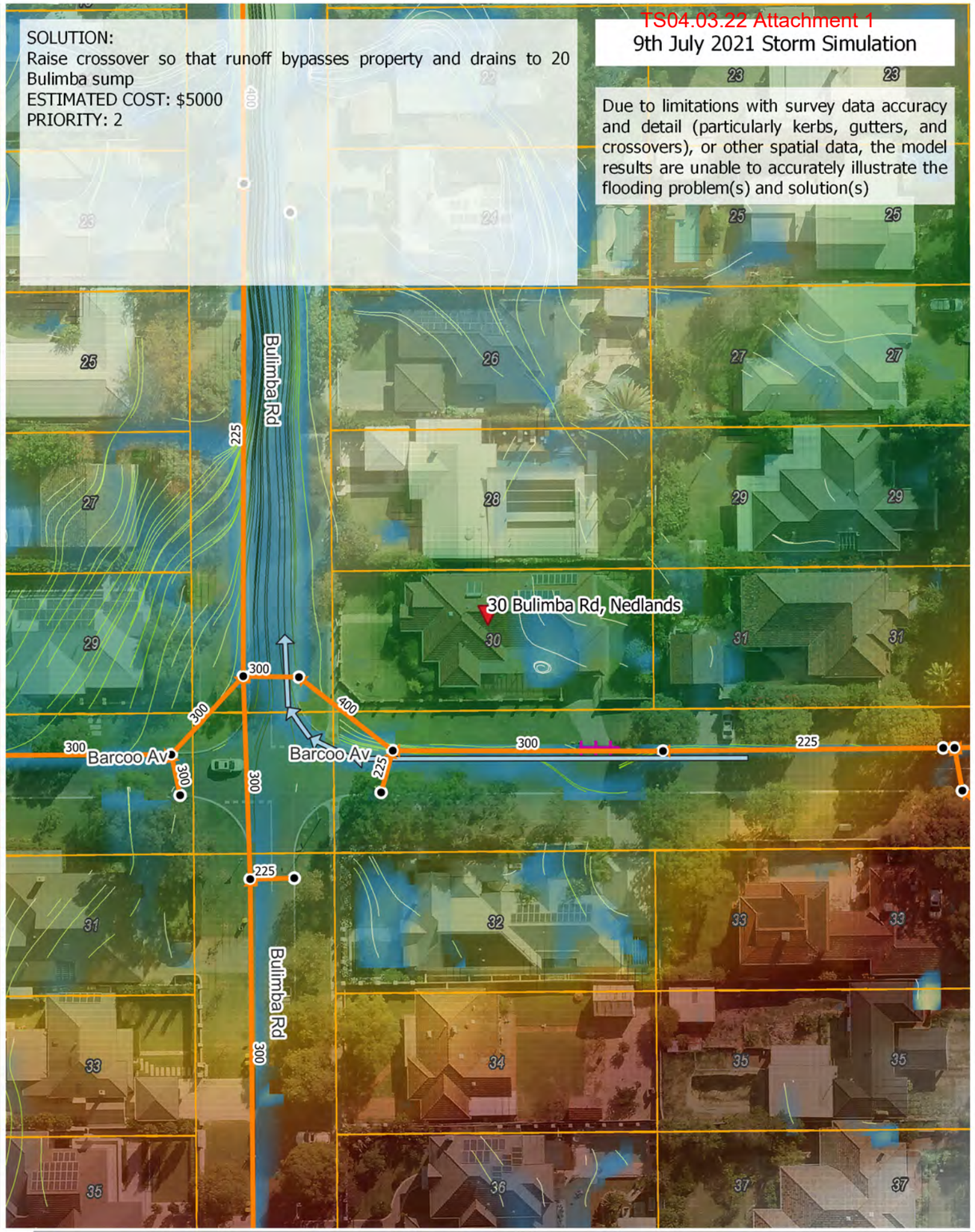

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 30 Bulimba Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.20

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Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 32 Quintillian Rd, Mount

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.21

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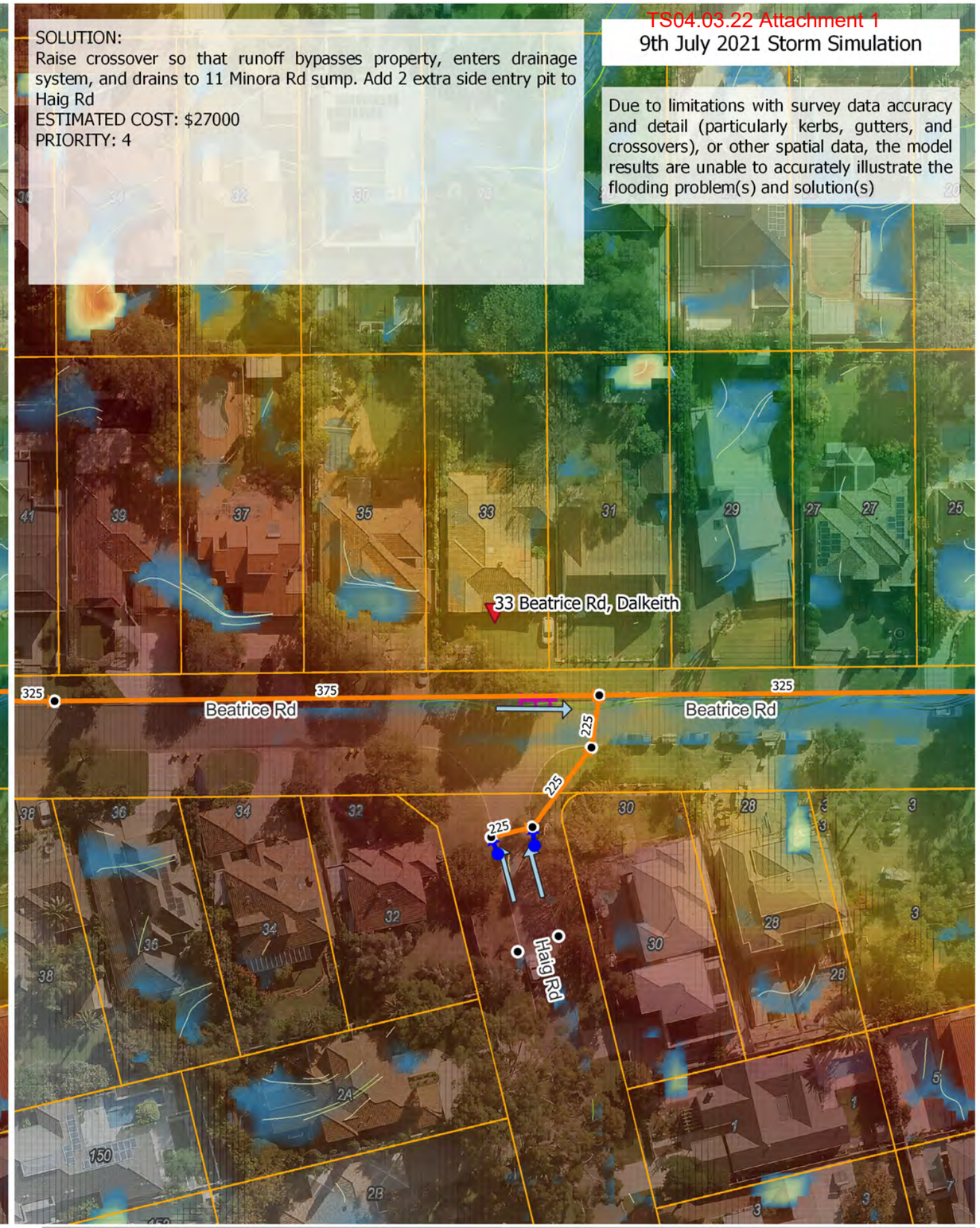
PROBLEM:
House flooded from excess water on crossroad pushing over crossover. Road is well graded, however crossfall is toward north and crossover is low. House is lower than road. Runoff enters property via crossover. High velocity flows down Haig Rd likely to bypass inlet pits
MET WITH GHD? No

SOLUTION:
Raise crossover so that runoff bypasses property, enters drainage system, and drains to 11 Minora Rd sump. Add 2 extra side entry pit to Haig Rd
ESTIMATED COST: $27000
PRIORITY: 4



Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 33 Beatrice Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.22

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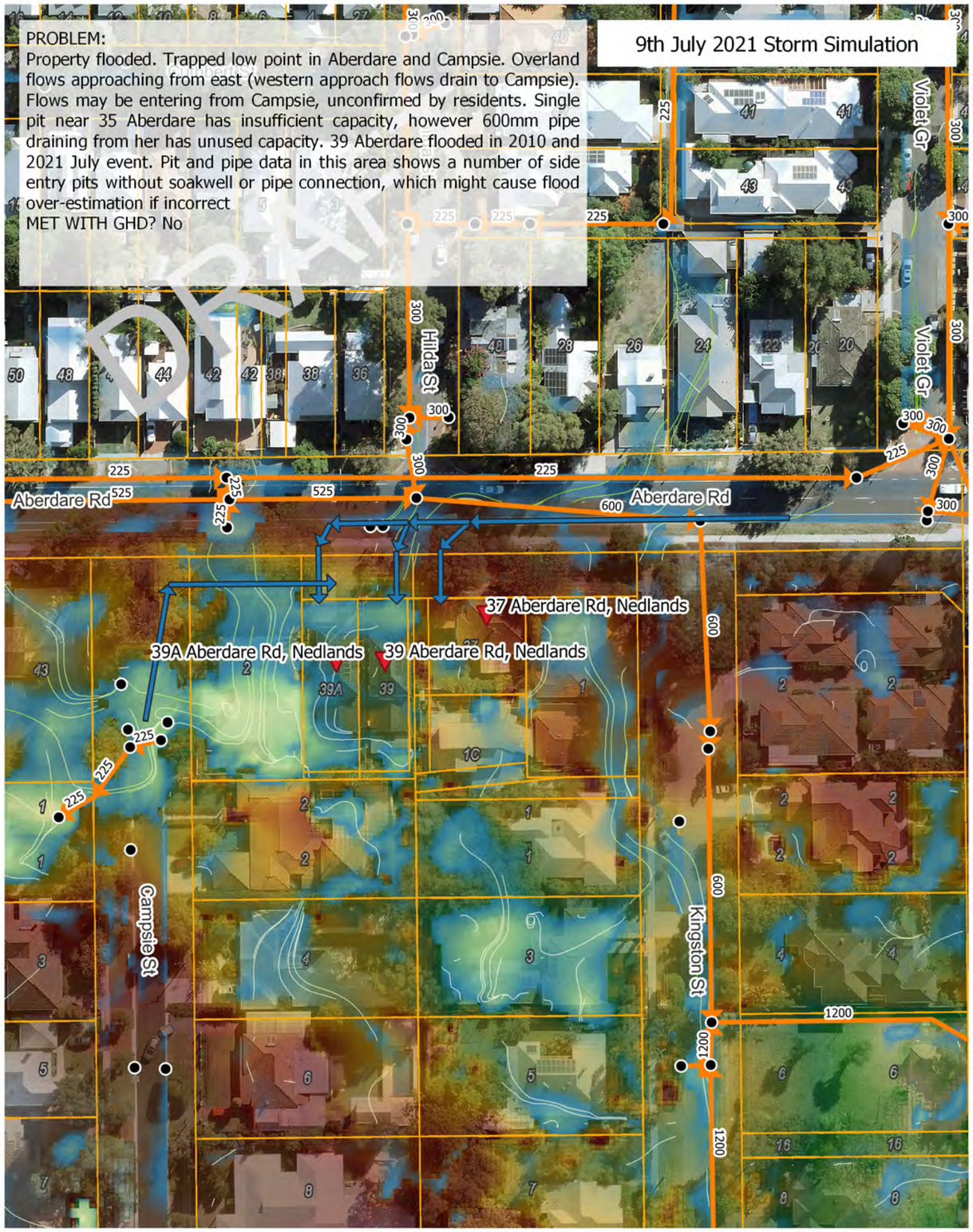

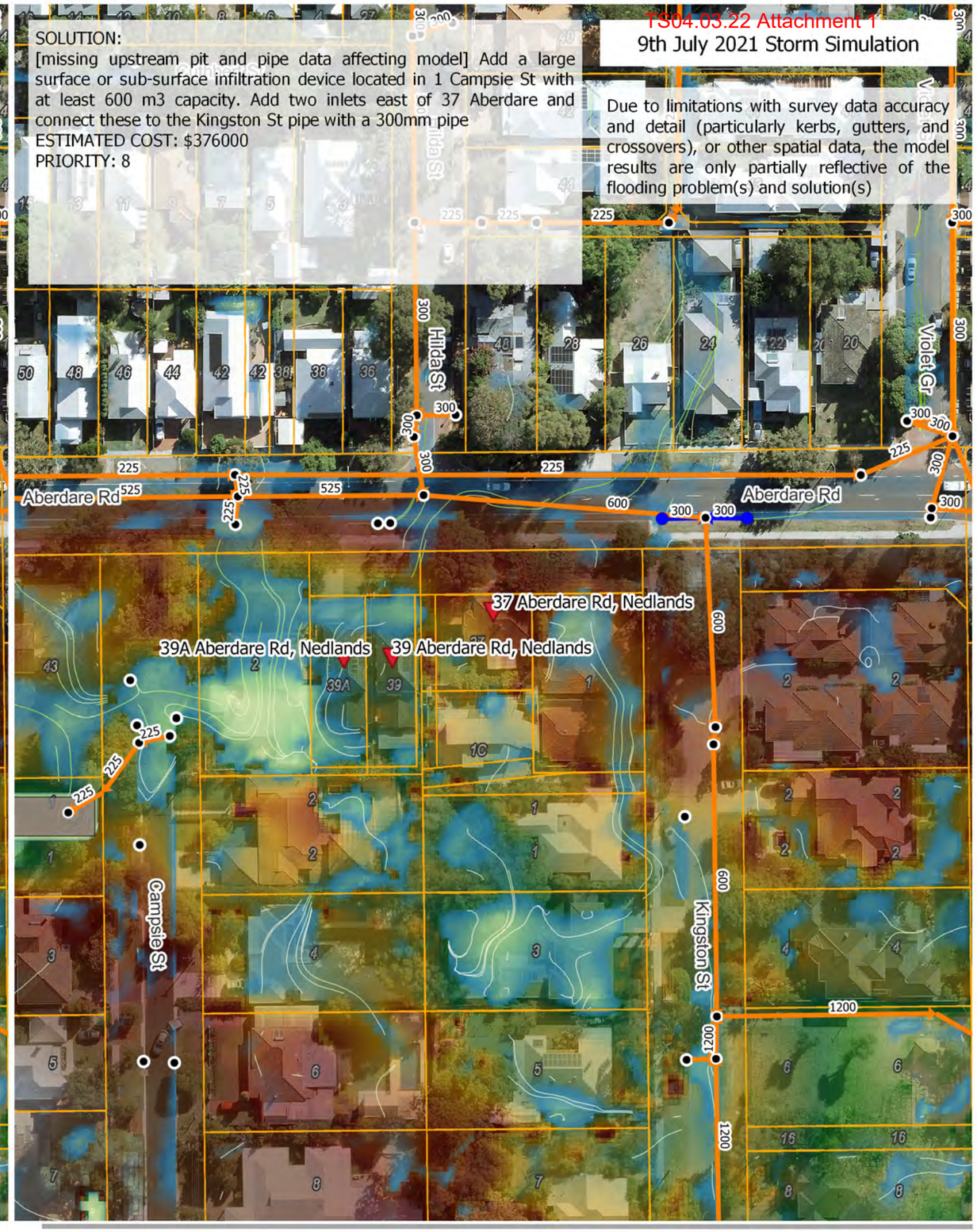

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 37 Aberdare Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.23

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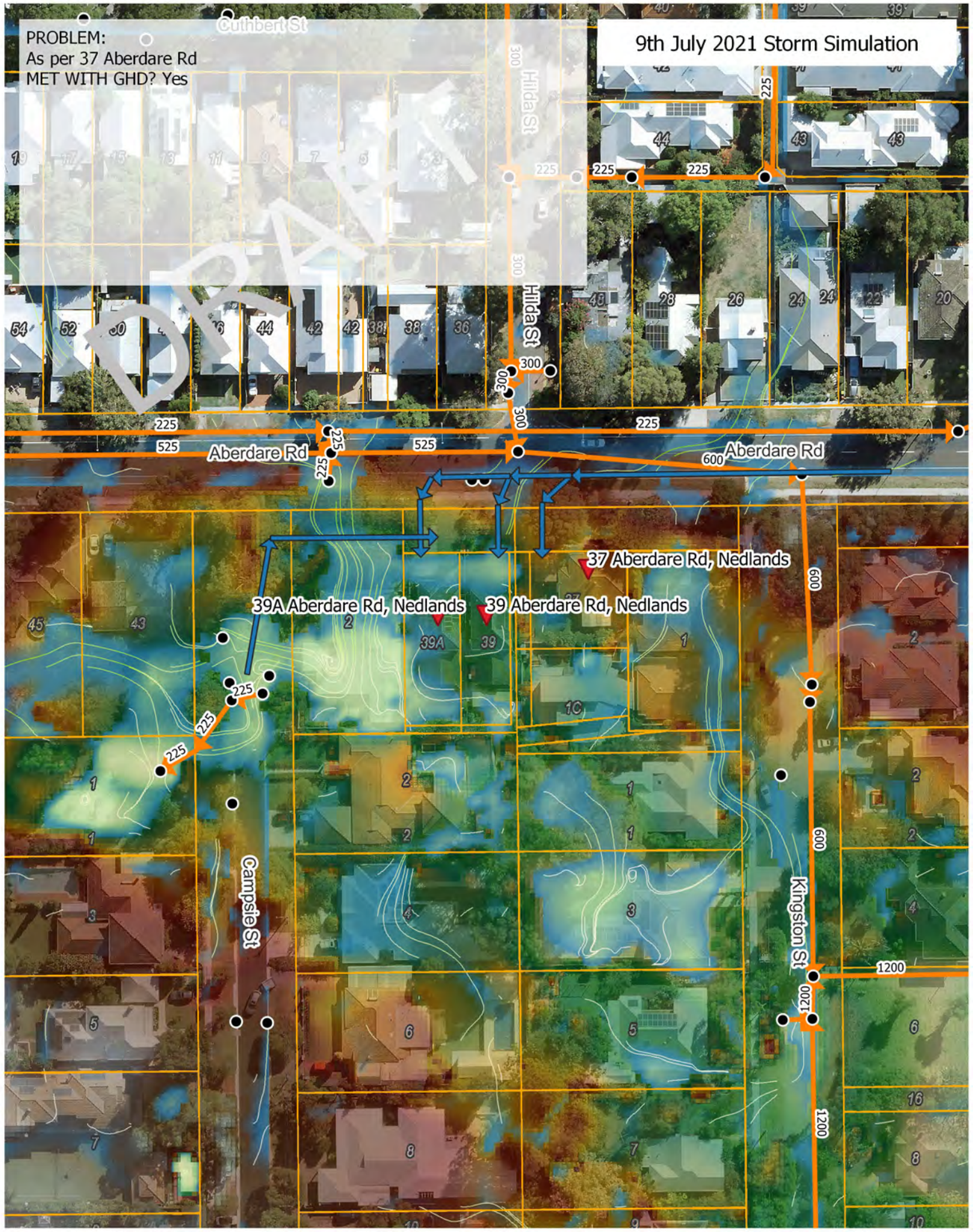

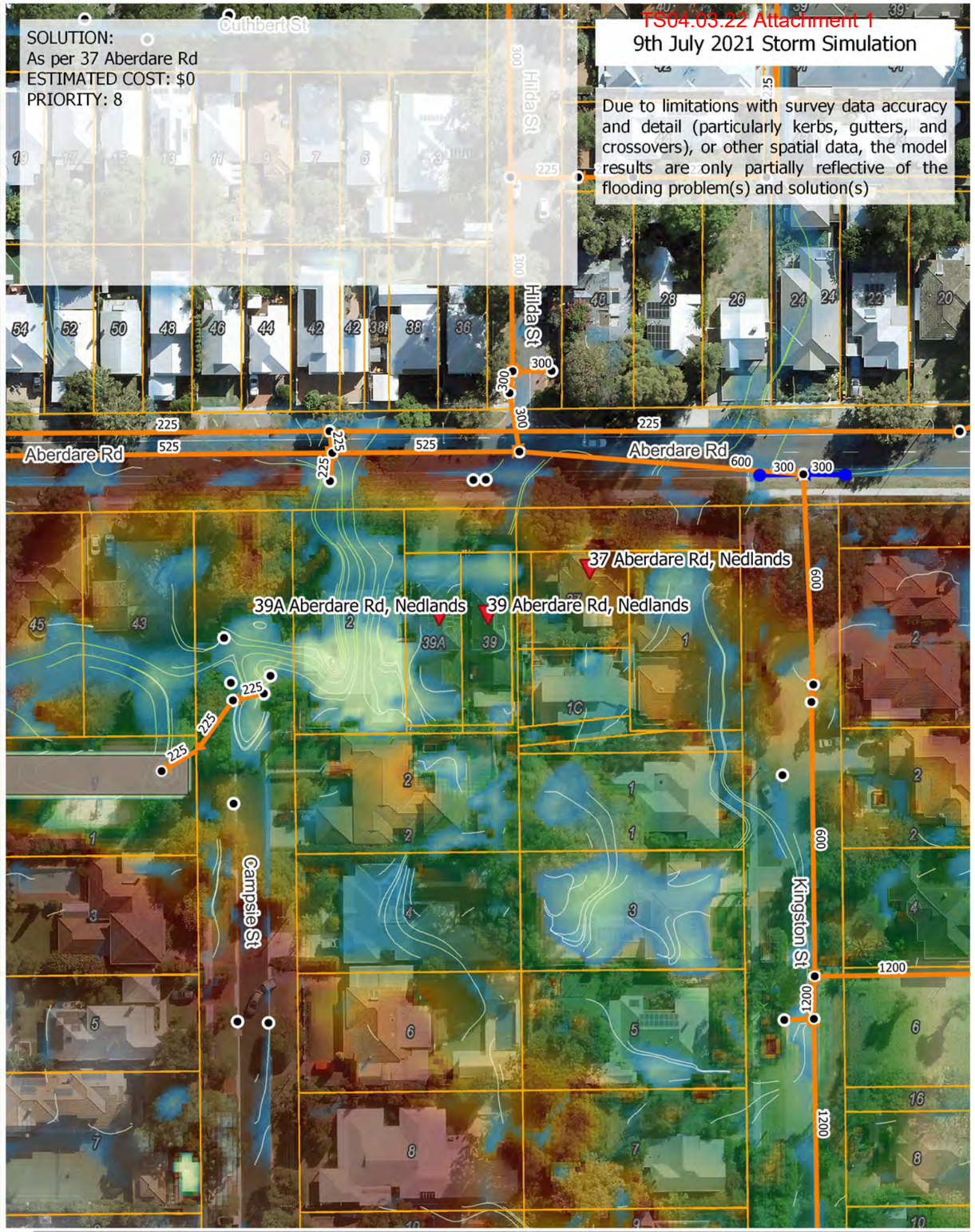

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 39 Aberdare Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.24

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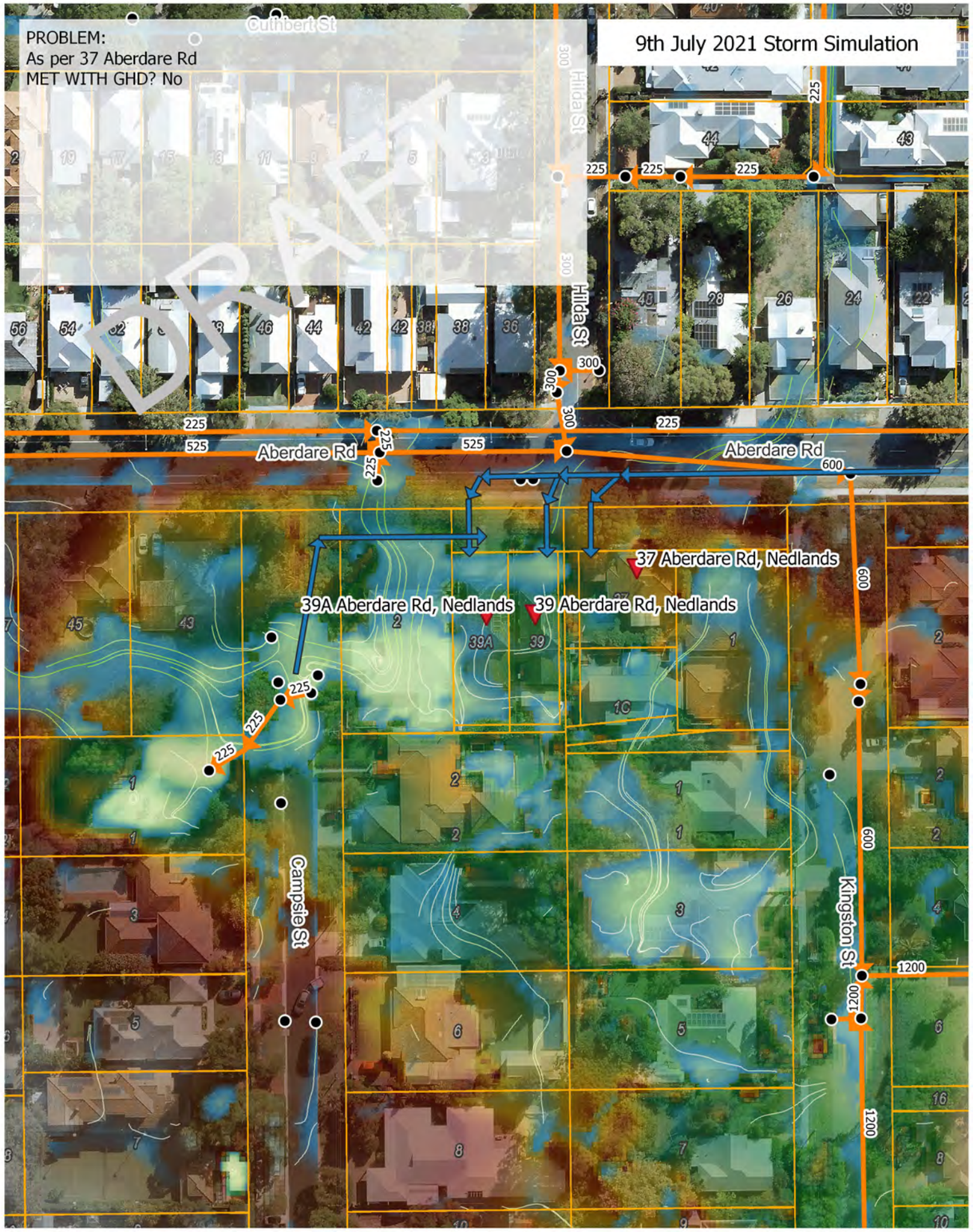

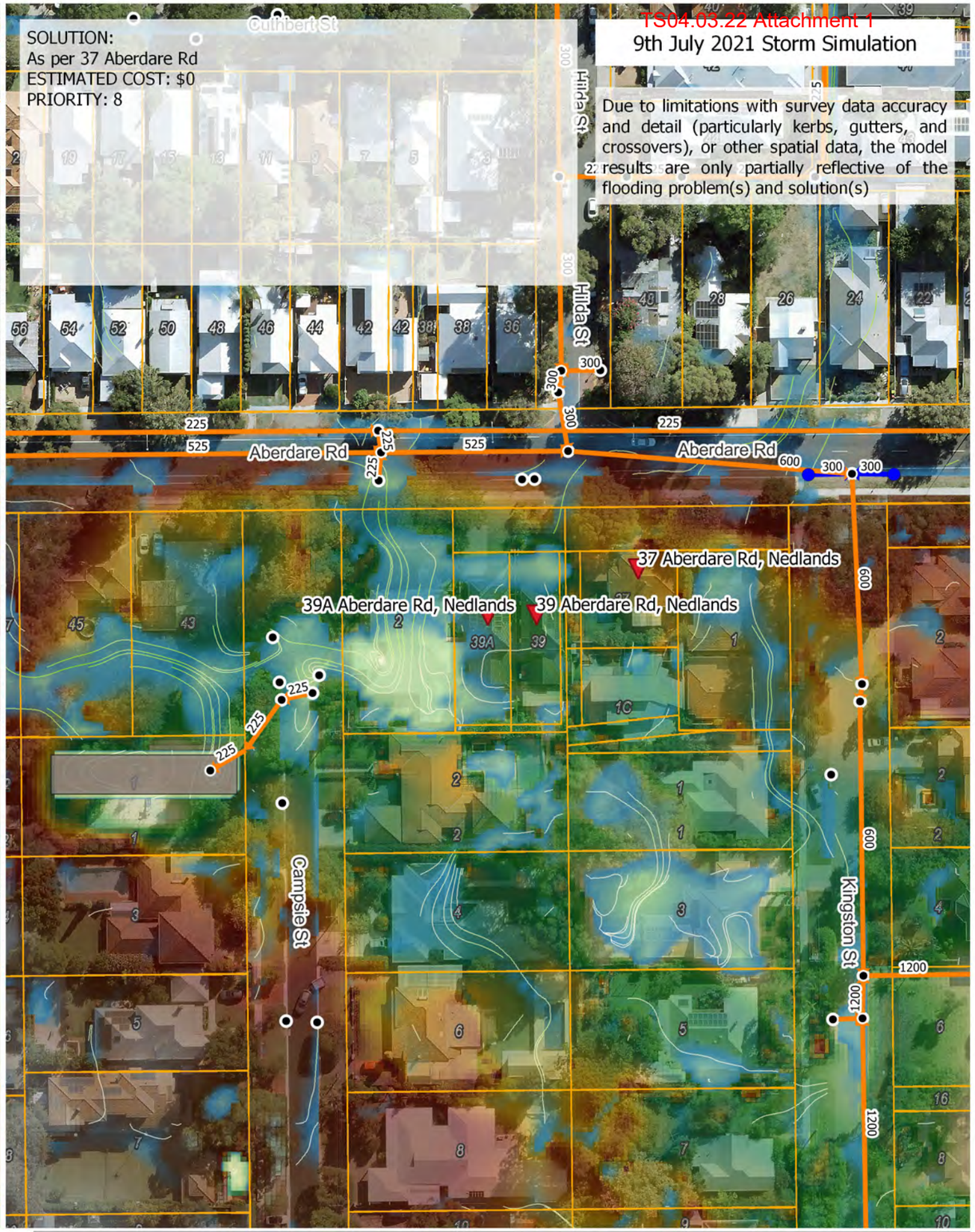

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 39A Aberdare Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.25

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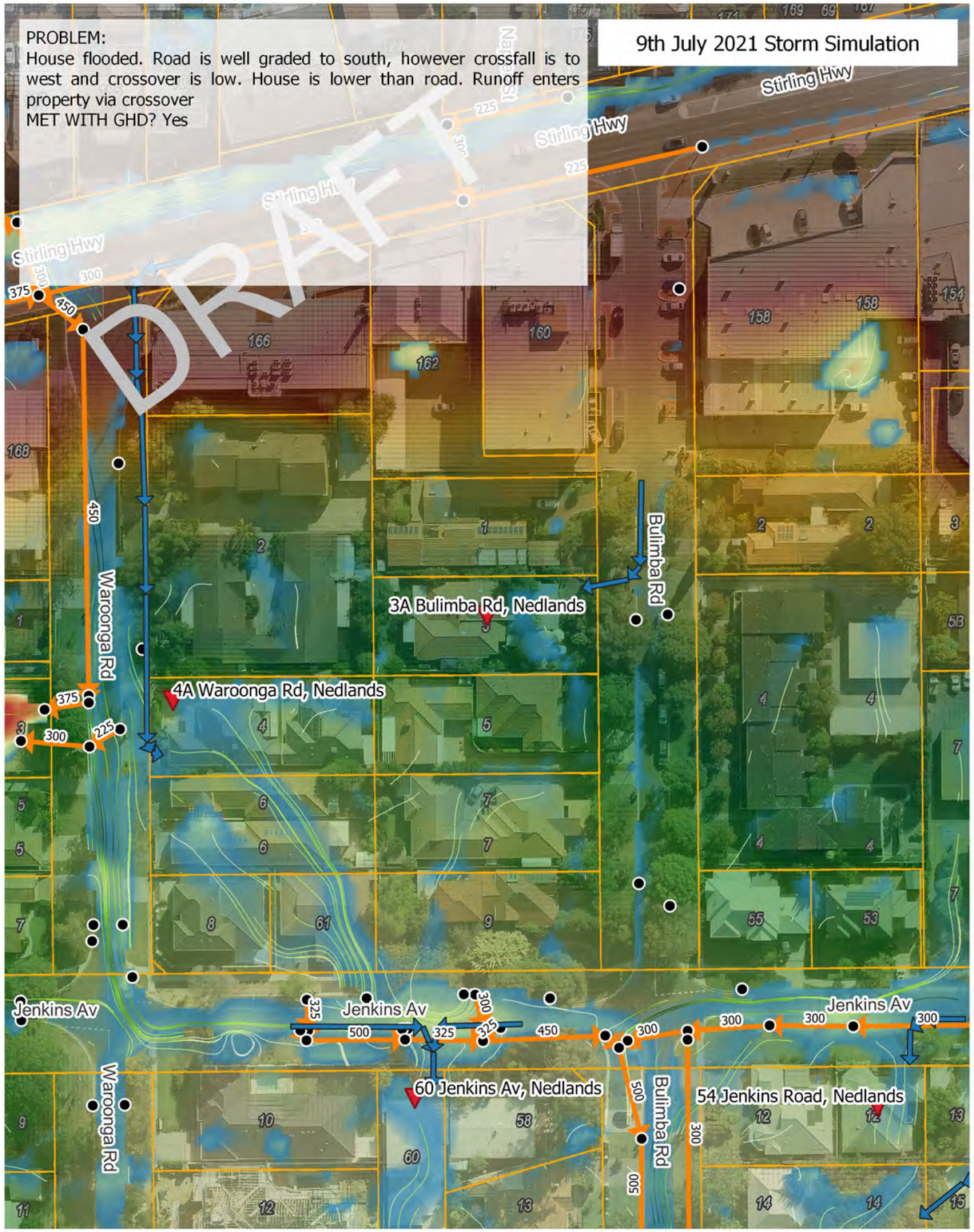

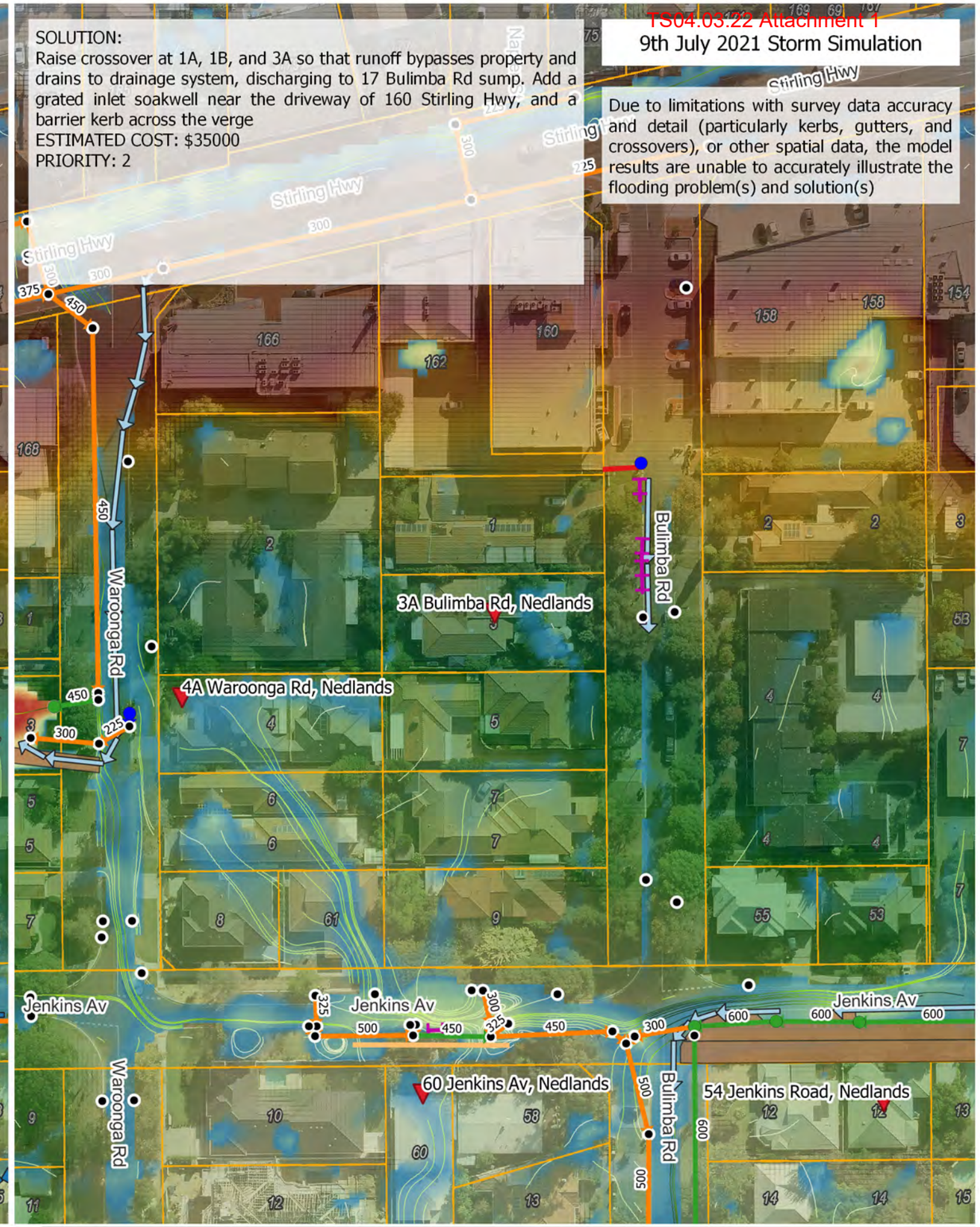

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 3A Bulimba Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.26

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz

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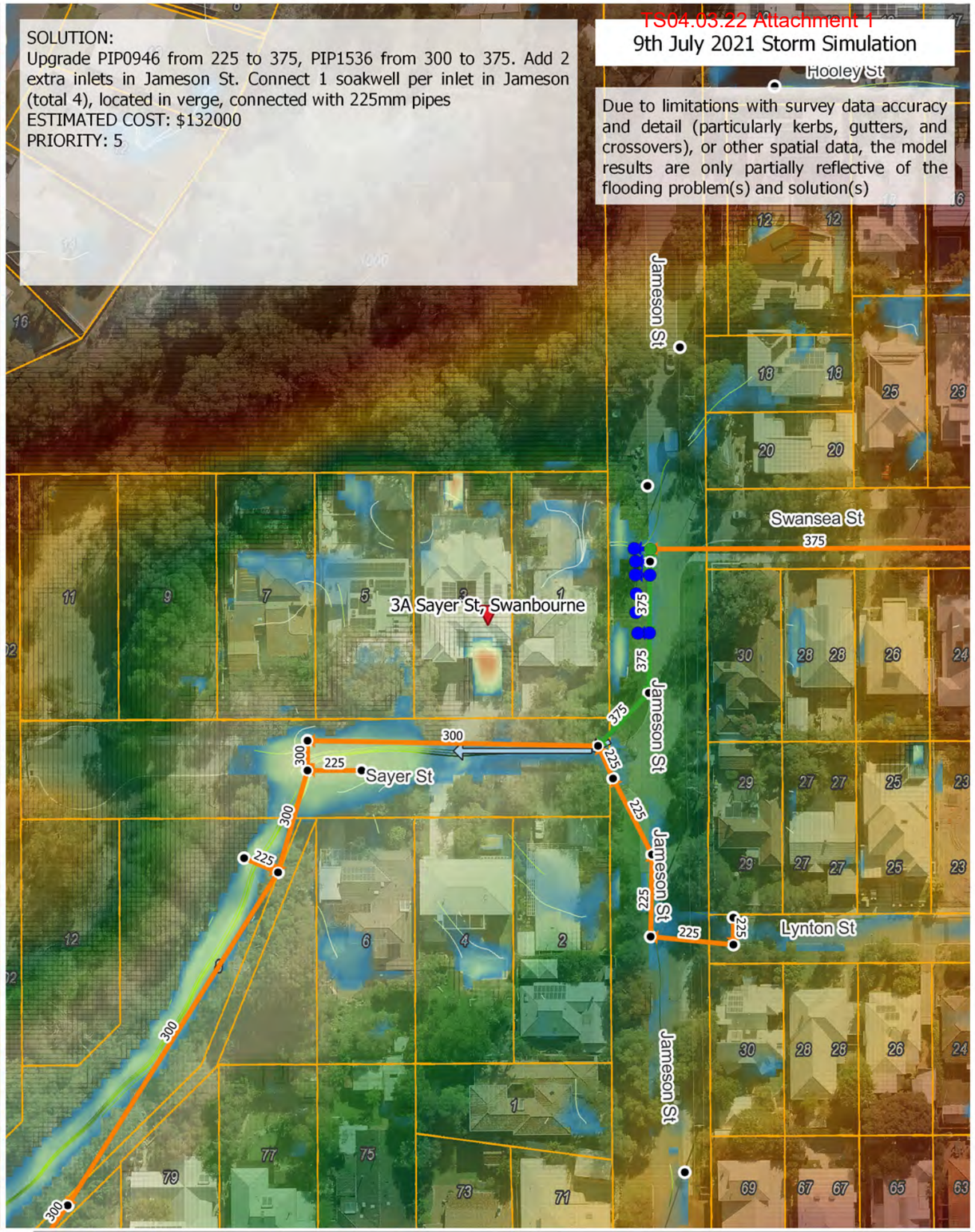

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
3A Sayer St, Swanbourne

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.27

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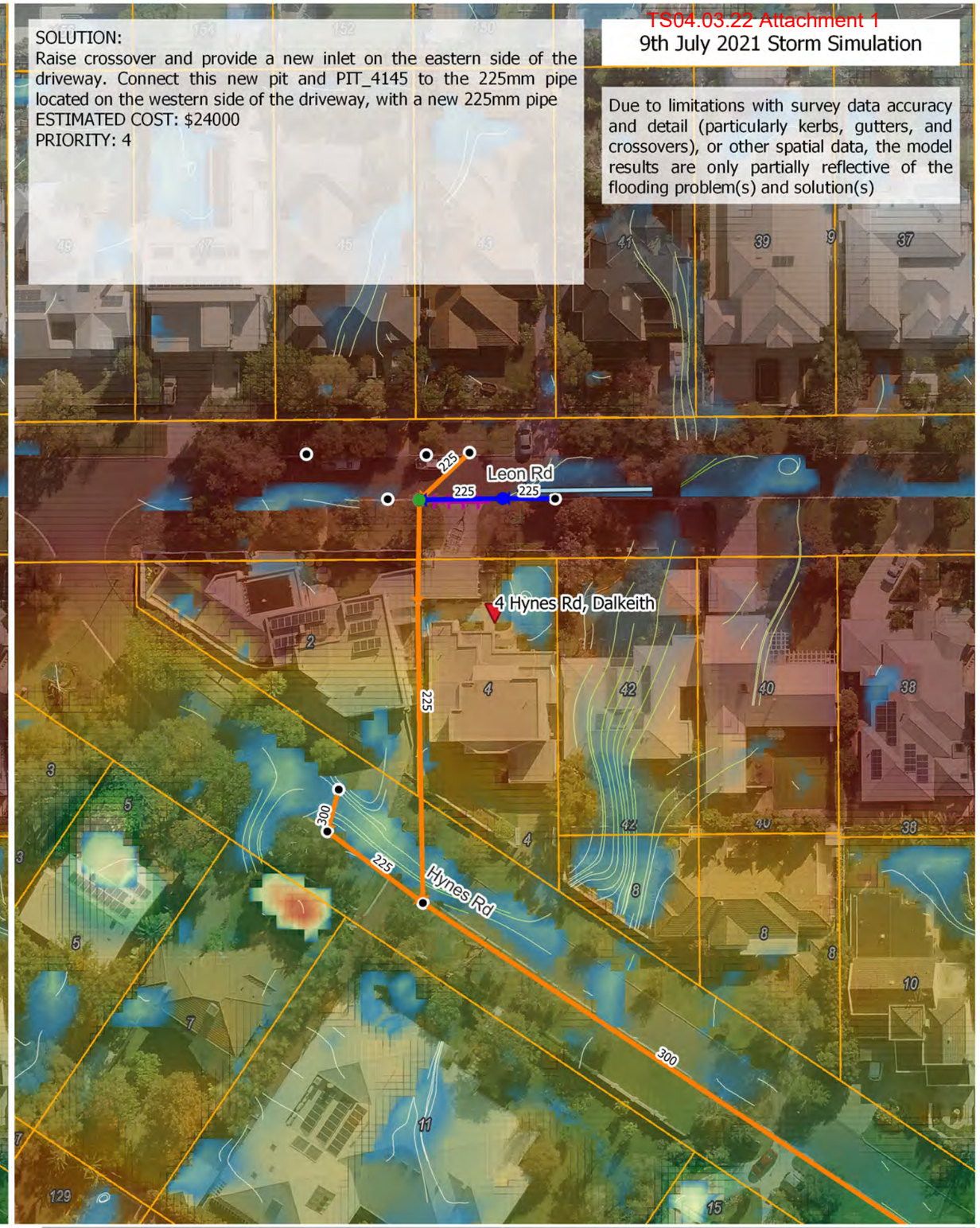

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 4 Hynes Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.28

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz
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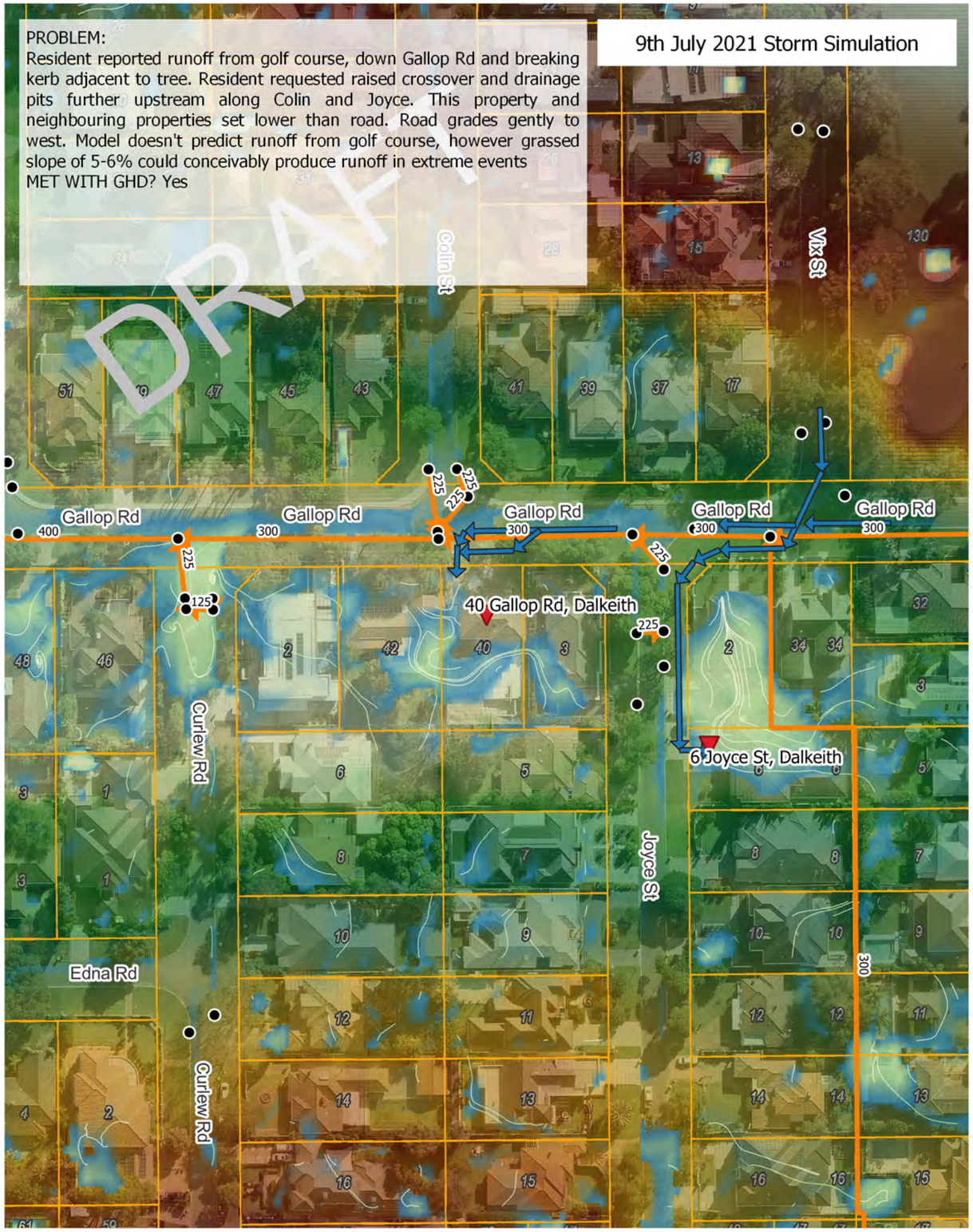

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 40 Gallop Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.29

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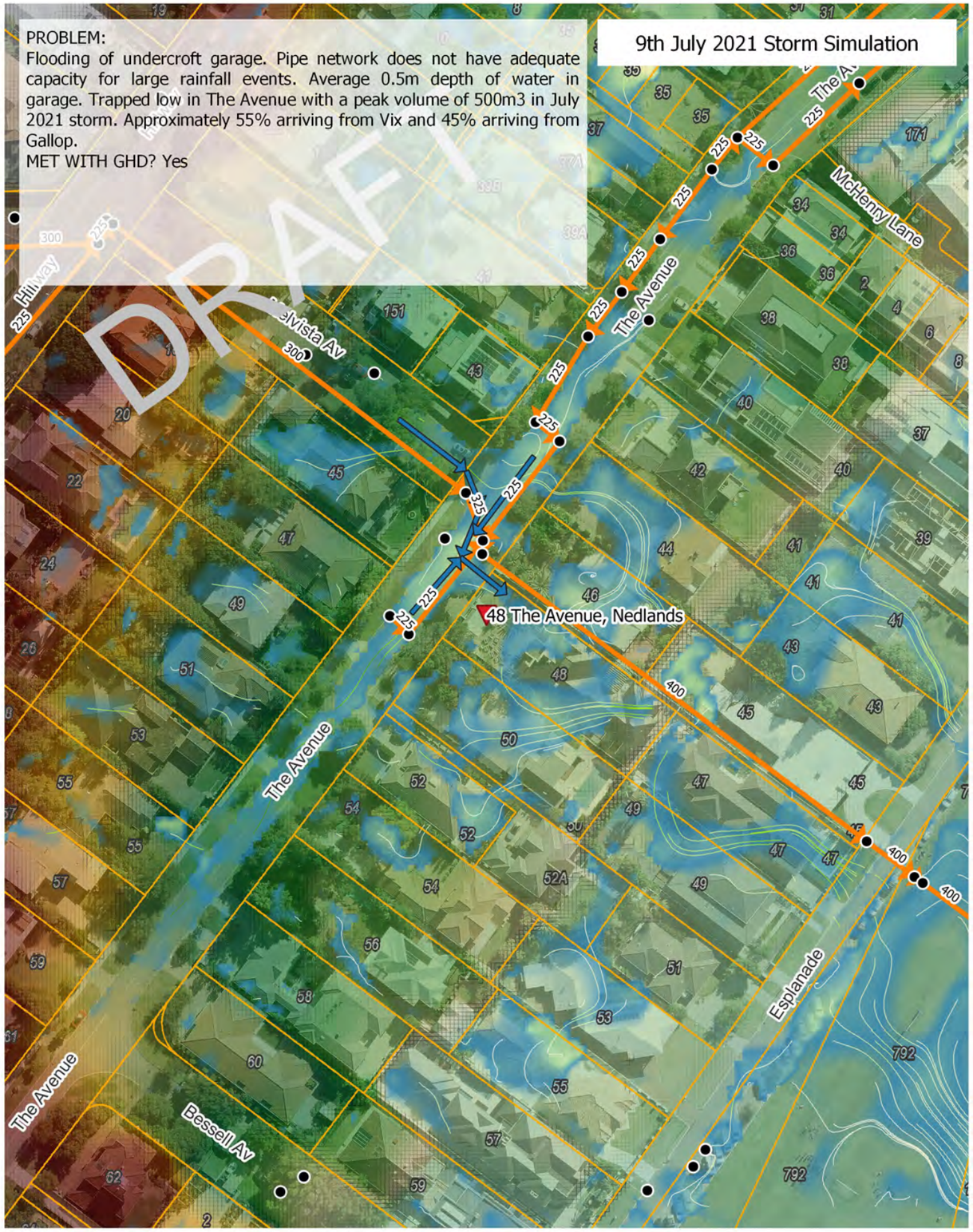

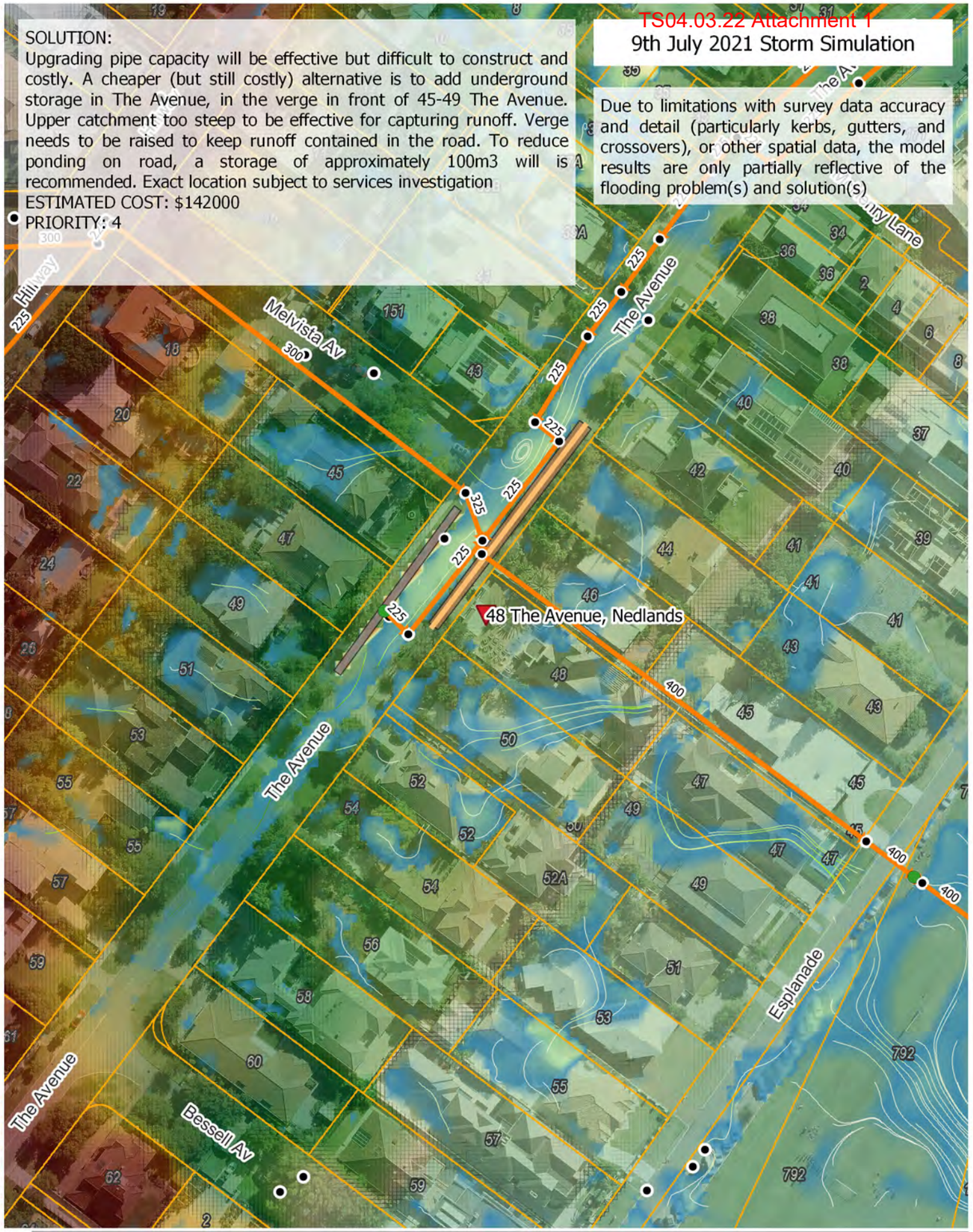

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
48 The Avenue, Nedlands

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.30

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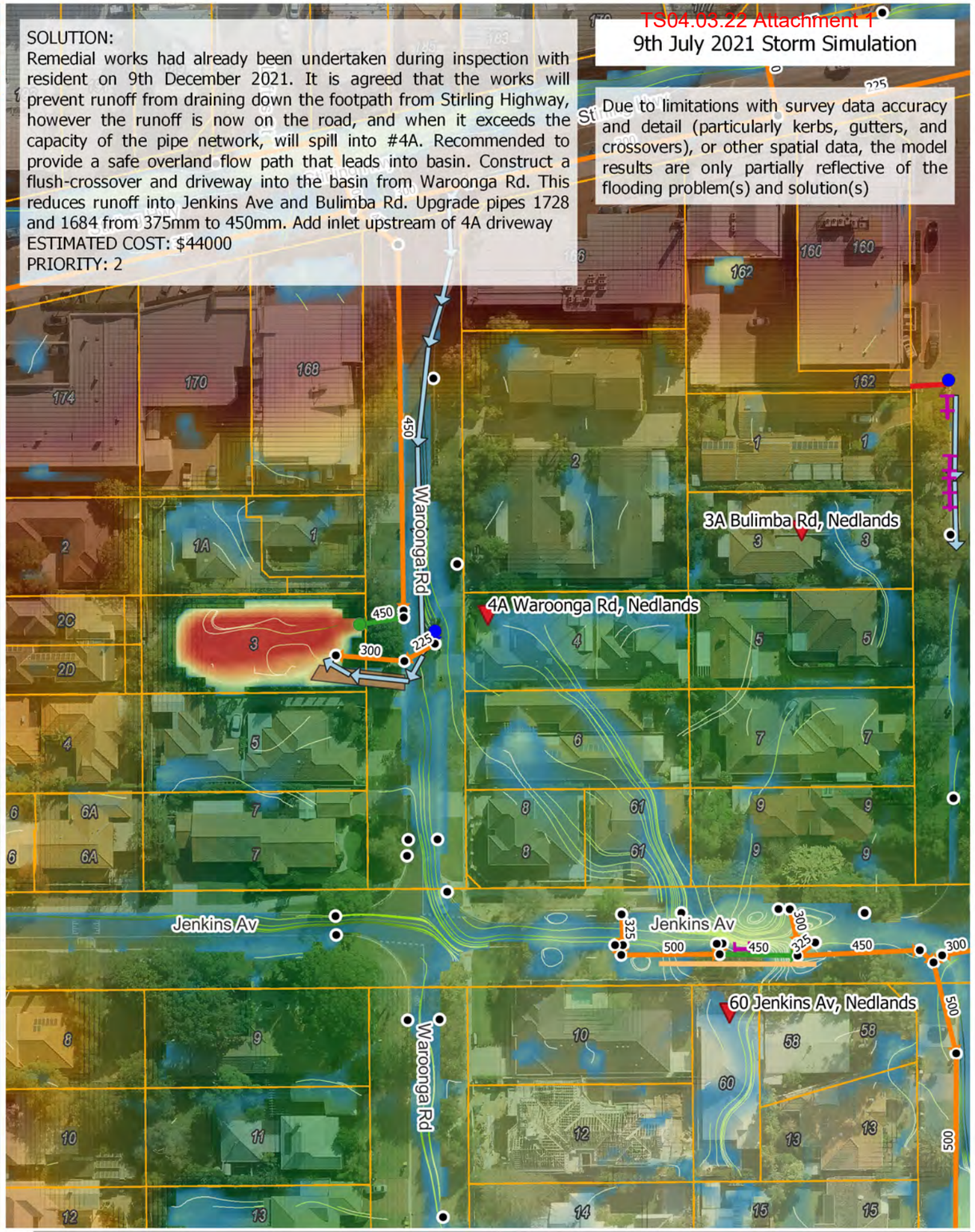

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 4A Waroonga Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.31

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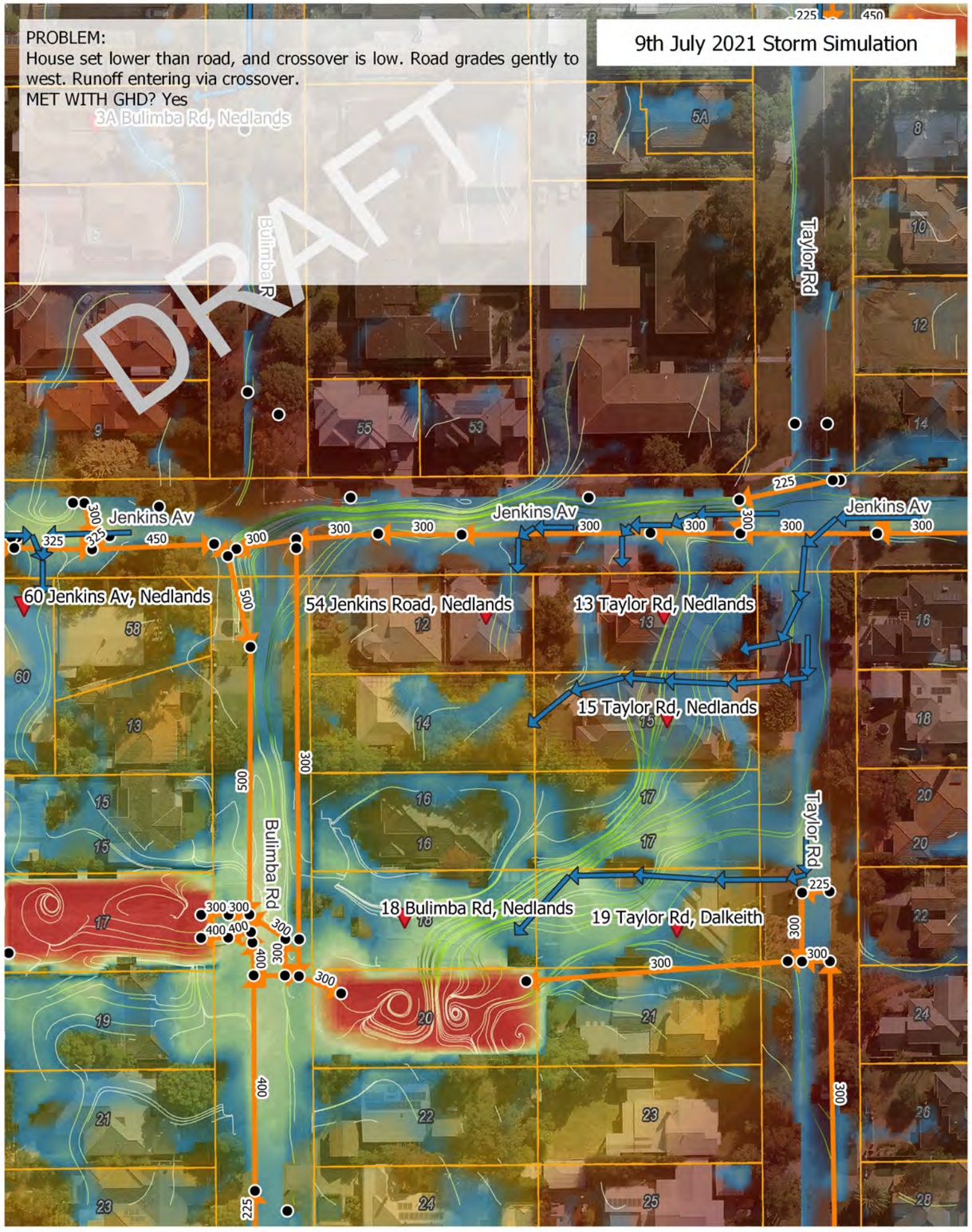

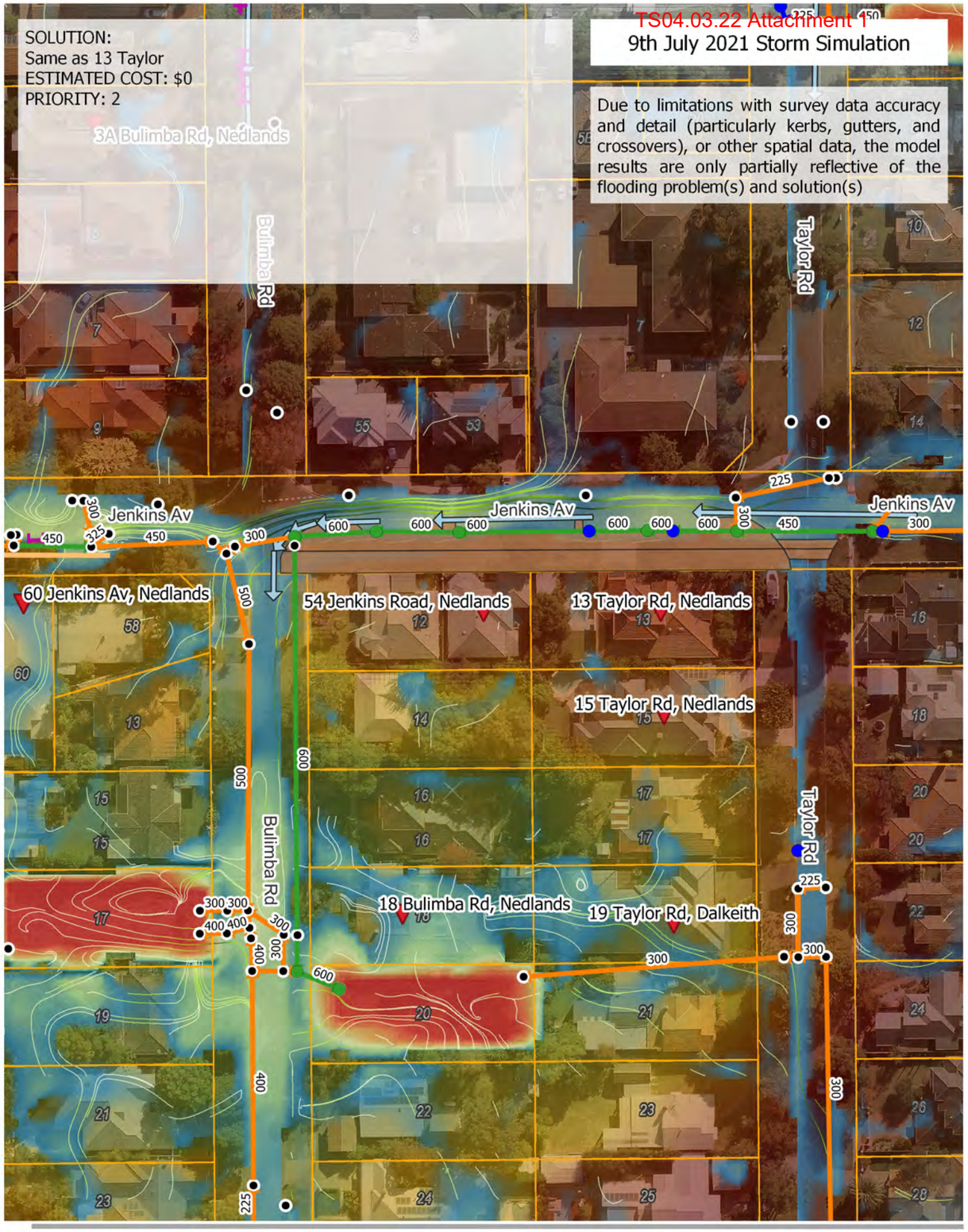

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
54 Jenkins Road, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.32

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Print Date:
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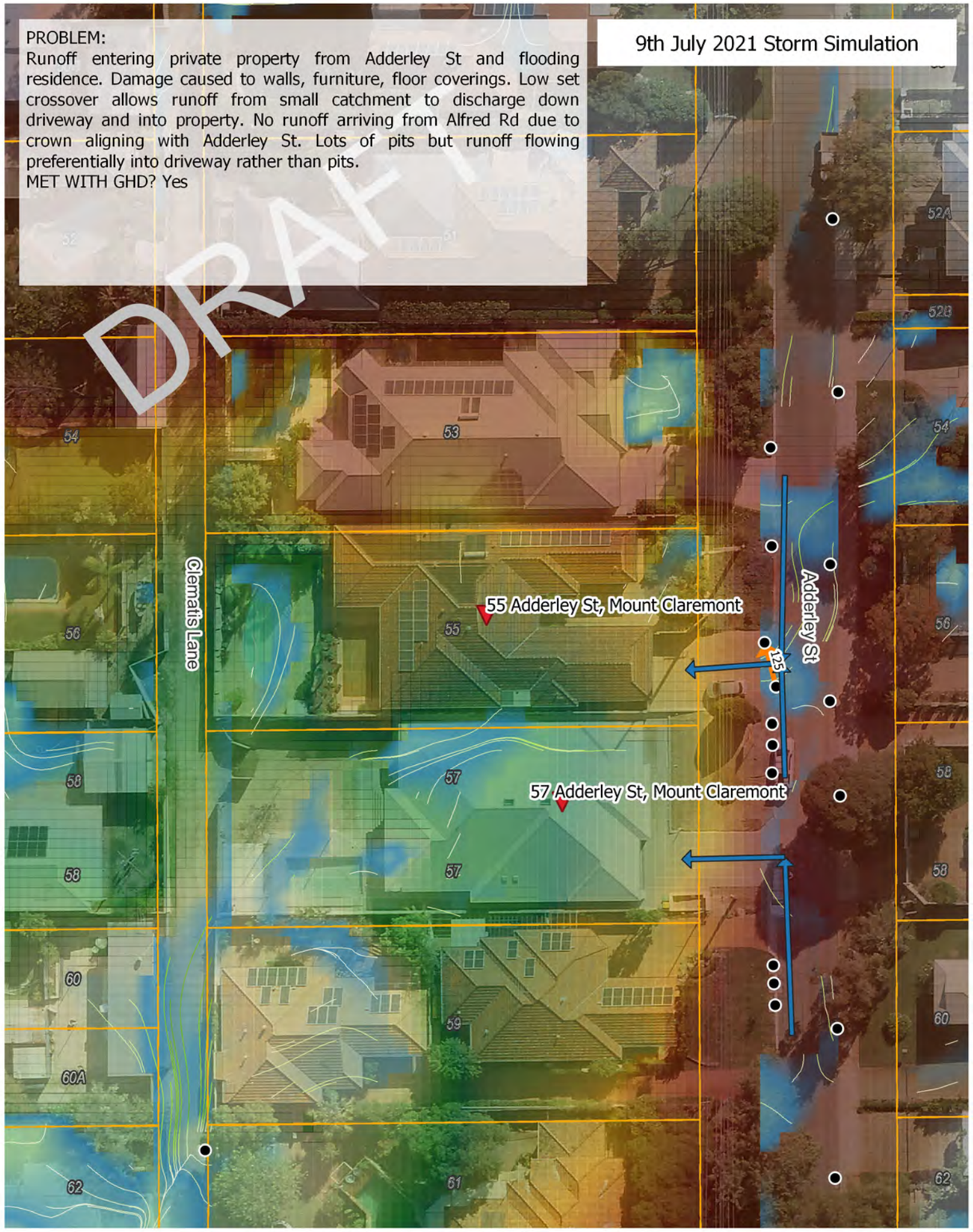
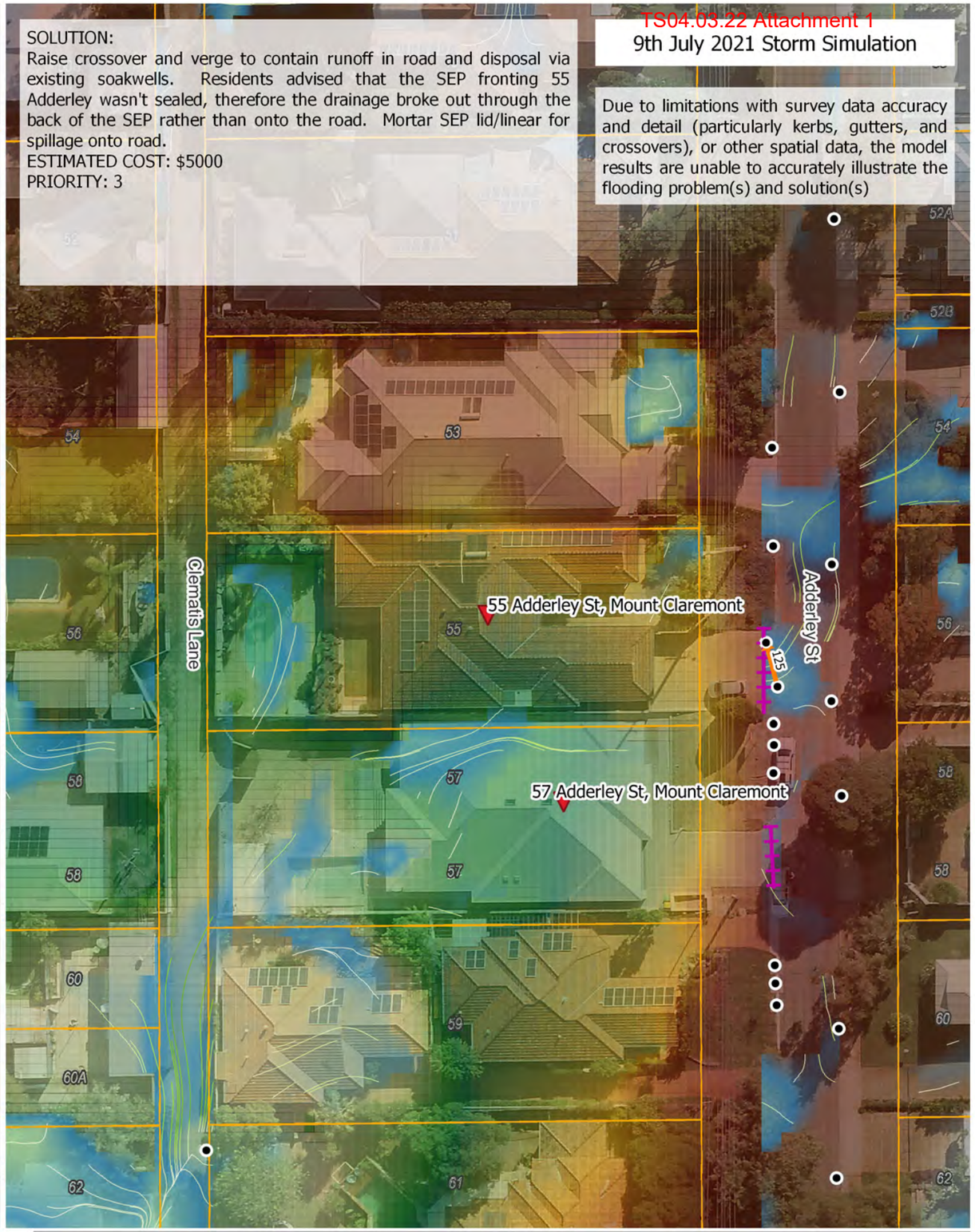
PROBLEM:
Runoff entering private property from Adderley St and flooding residence. Damage caused to walls, furniture, floor coverings. Low set crossover allows runoff from small catchment to discharge down driveway and into property. No runoff arriving from Alfred Rd due to crown aligning with Adderley St. Lots of pits but runoff flowing preferentially into driveway rather than pits.
MET WITH GHD? Yes



SOLUTION:
Raise crossover and verge to contain runoff in road and disposal via existing soakwells. Residents advised that the SEP fronting 55 Adderley wasn't sealed, therefore the drainage broke out through the back of the SEP rather than onto the road. Mortar SEP lid/linear for spillage onto road.
ESTIMATED COST: $5000
PRIORITY: 3

Due to limitations with survey data accuracy and detail (particularly kerbs, gutters, and crossovers), or other spatial data, the model results are unable to accurately illustrate the flooding problem(s) and solution(s)



Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
55 Adderley St, Mount Claremont

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.33

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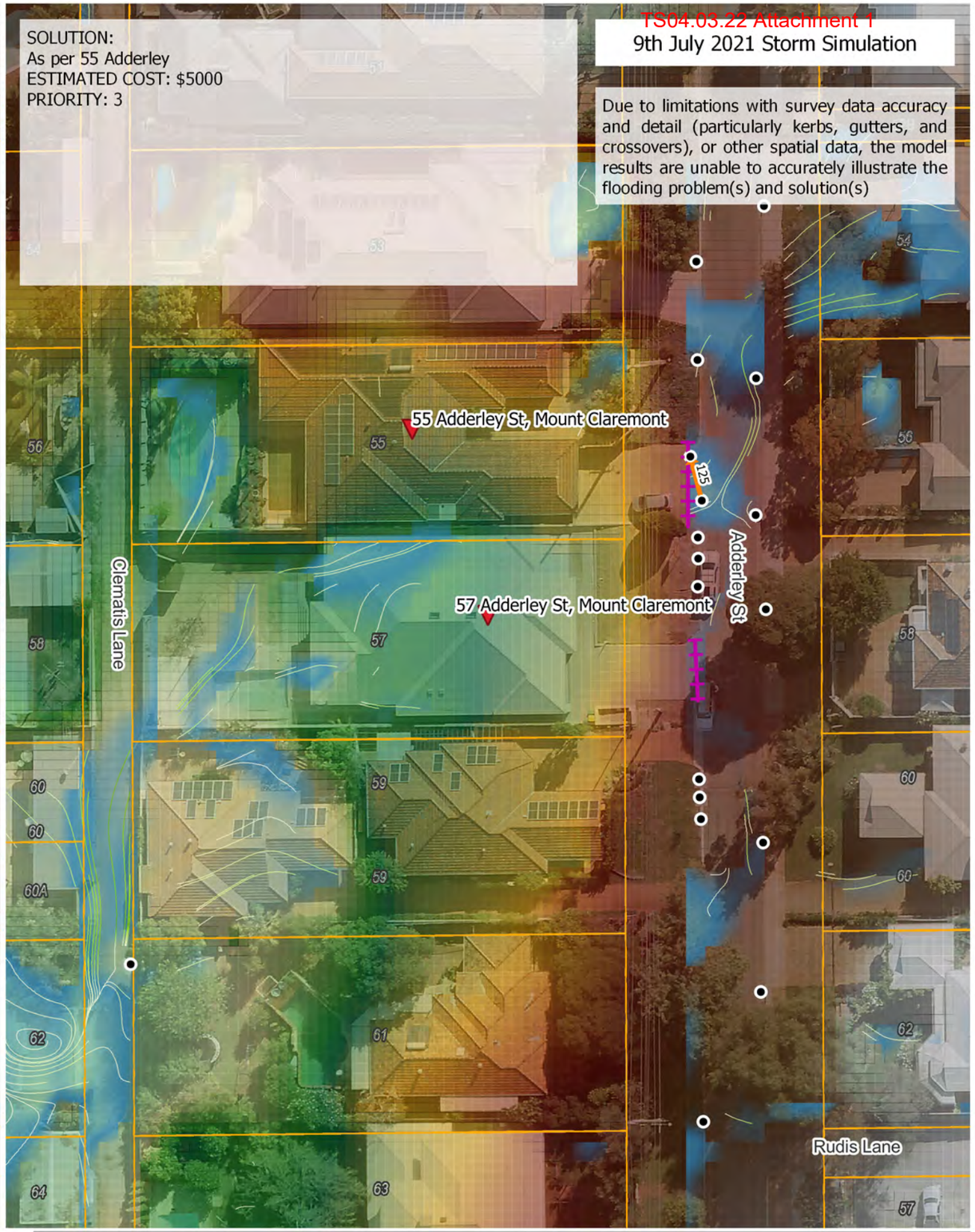

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 57 Adderley St, Mount Claremont

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.34

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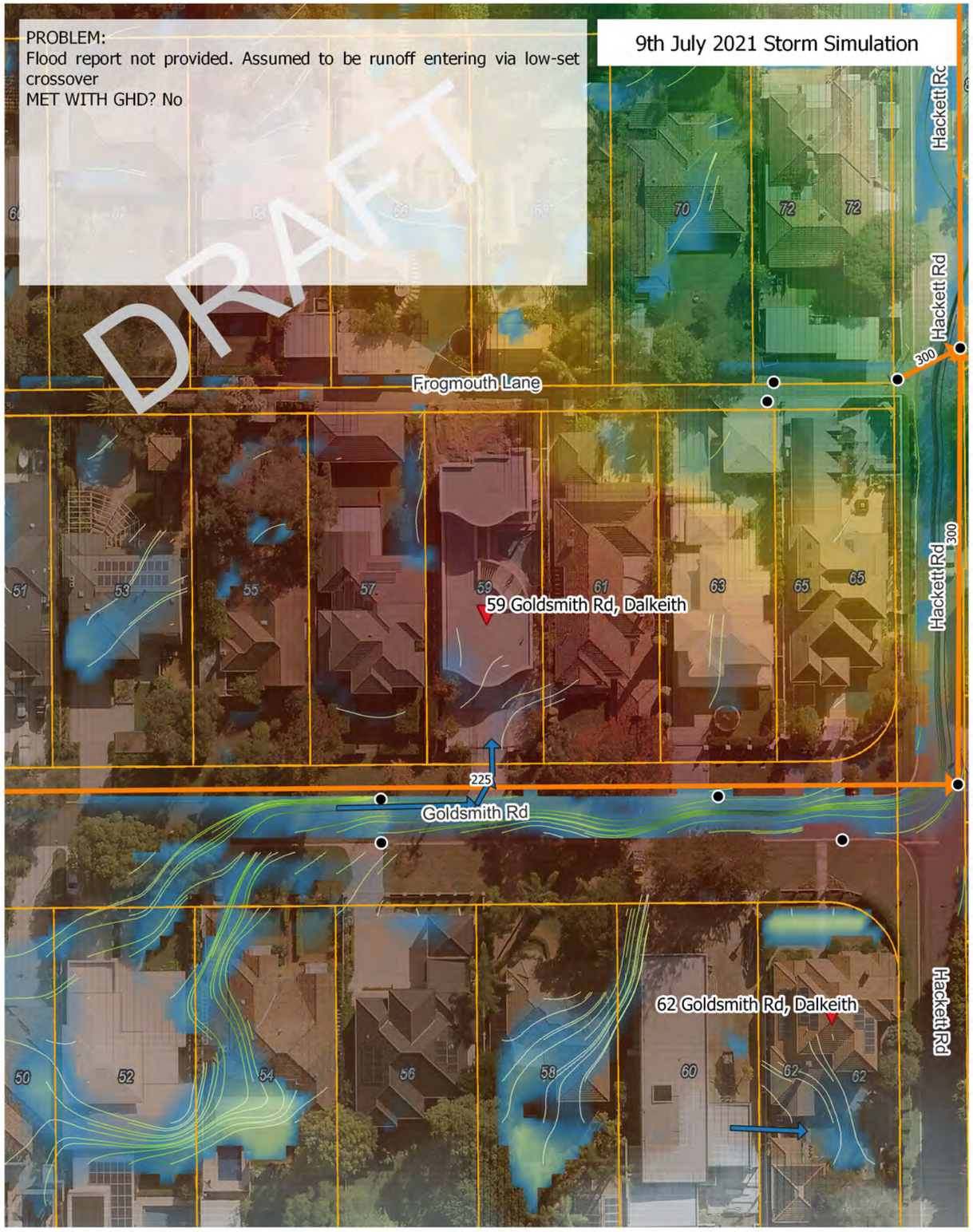

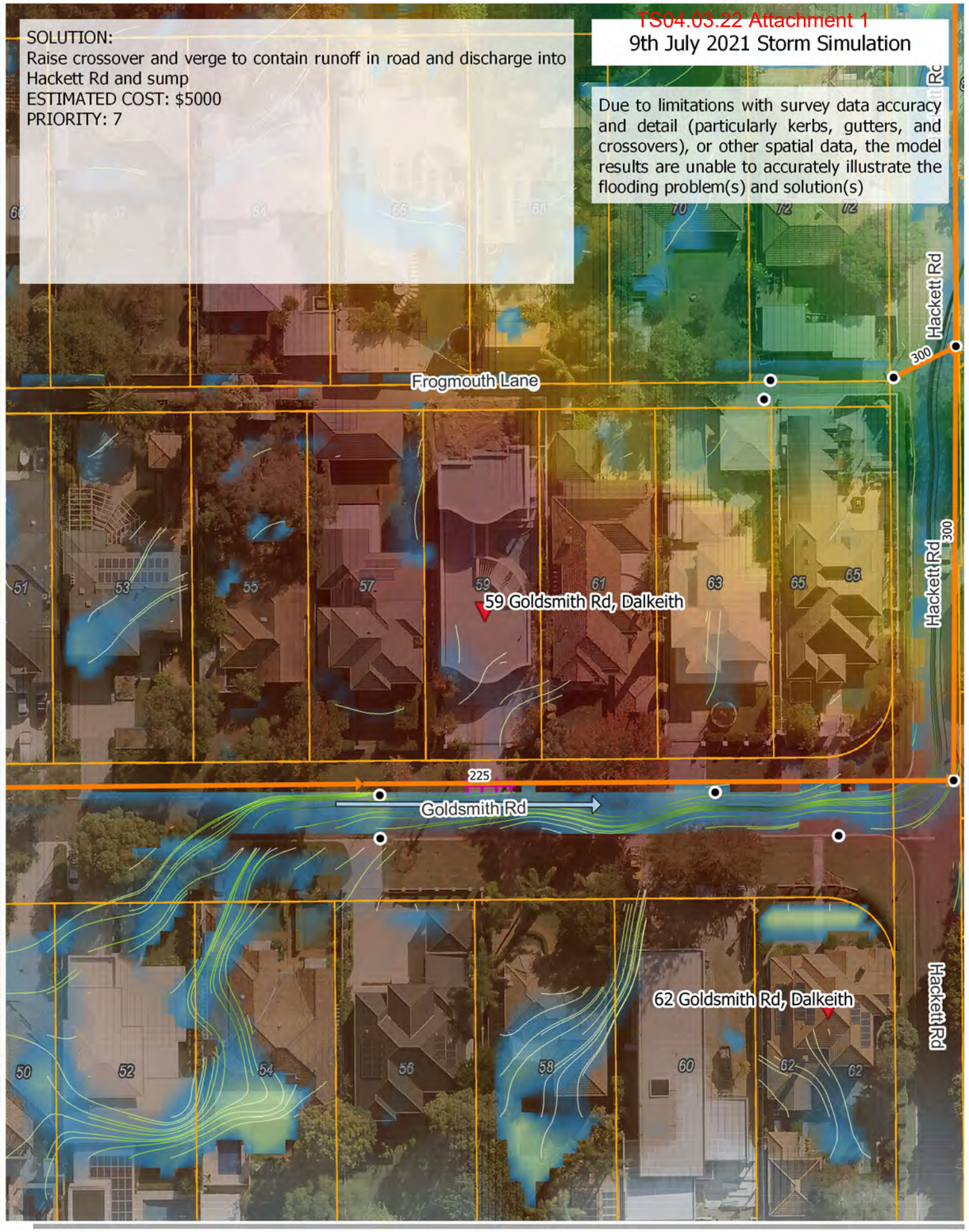

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
59 Goldsmith Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.35

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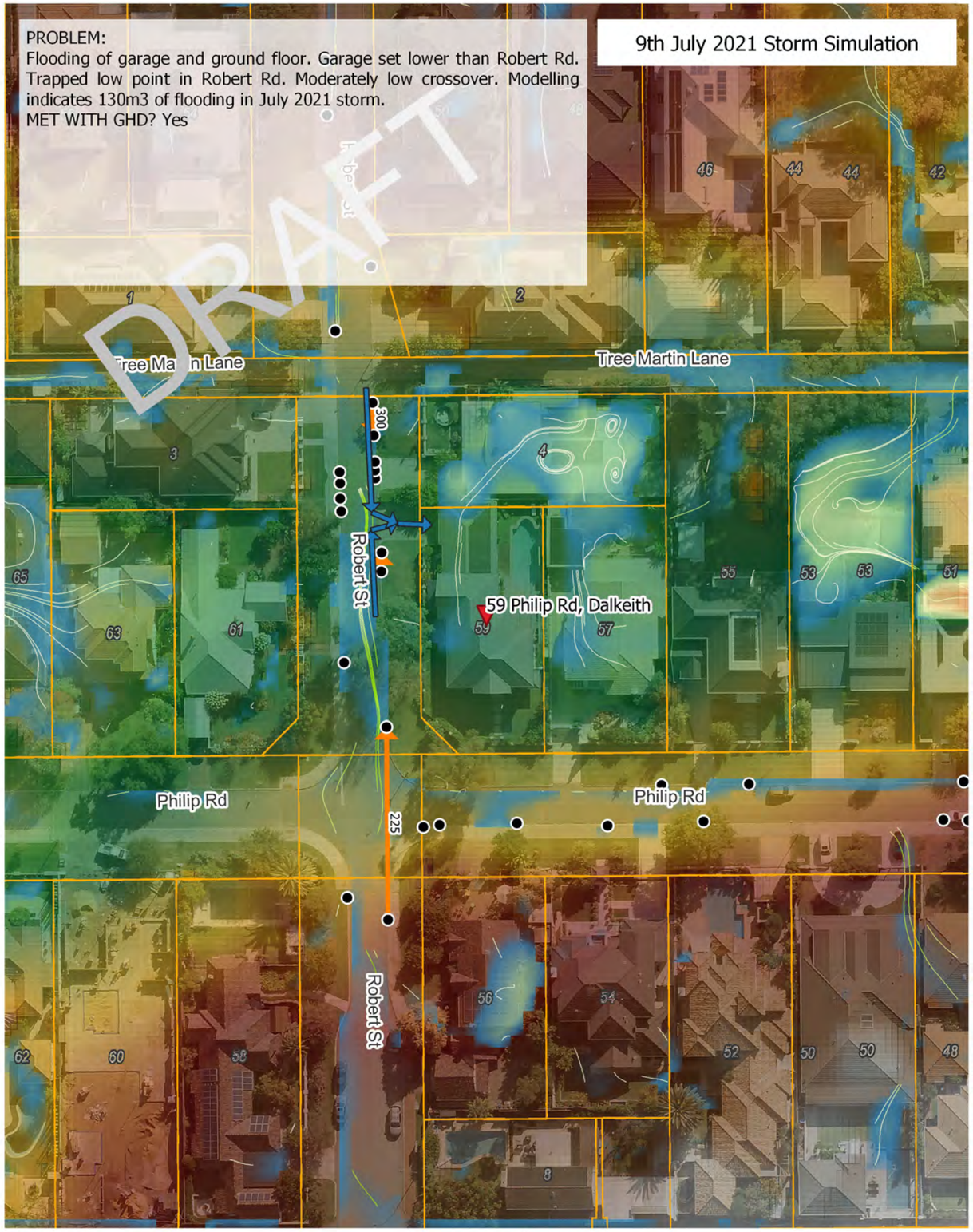

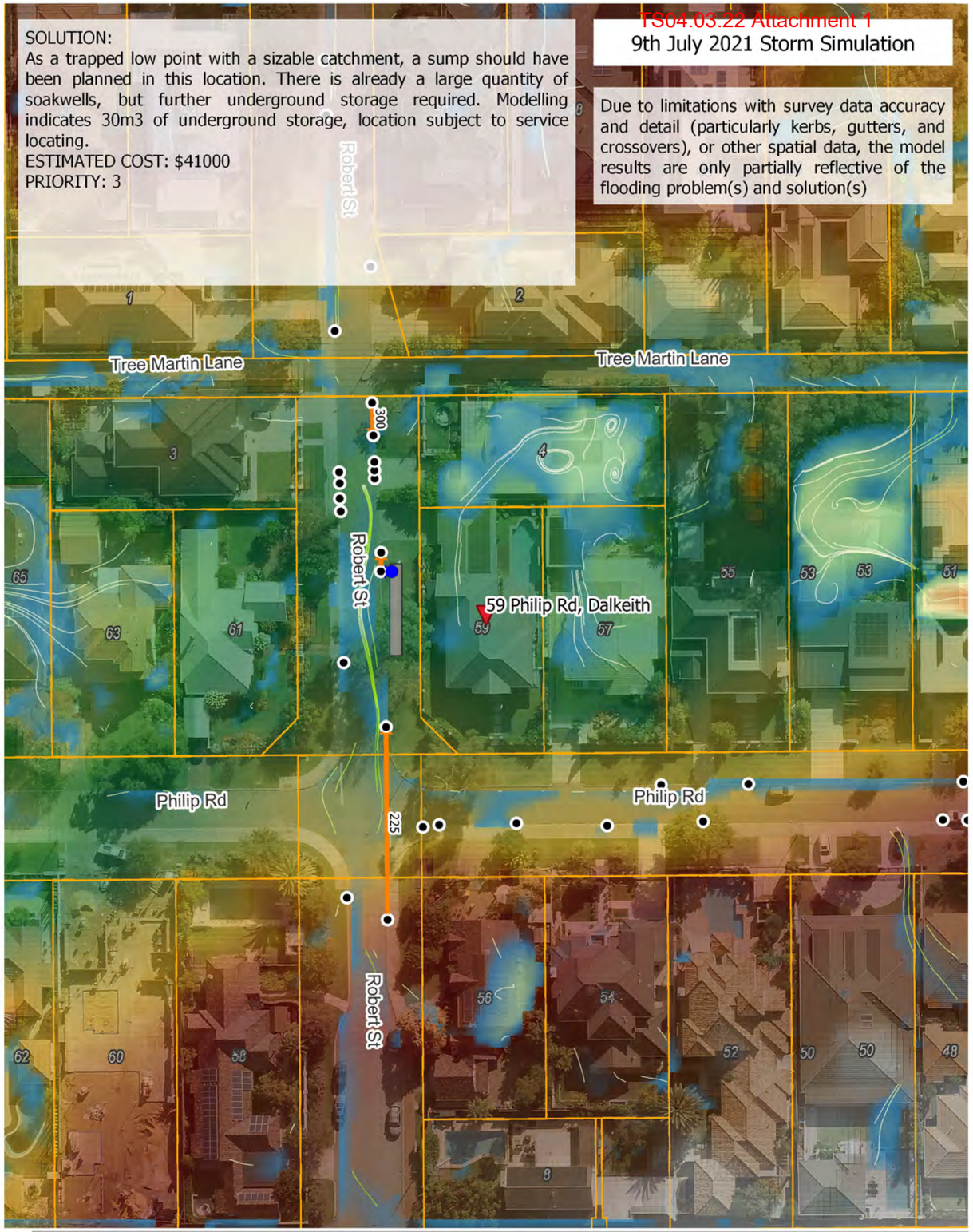

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 59 Philip Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.36

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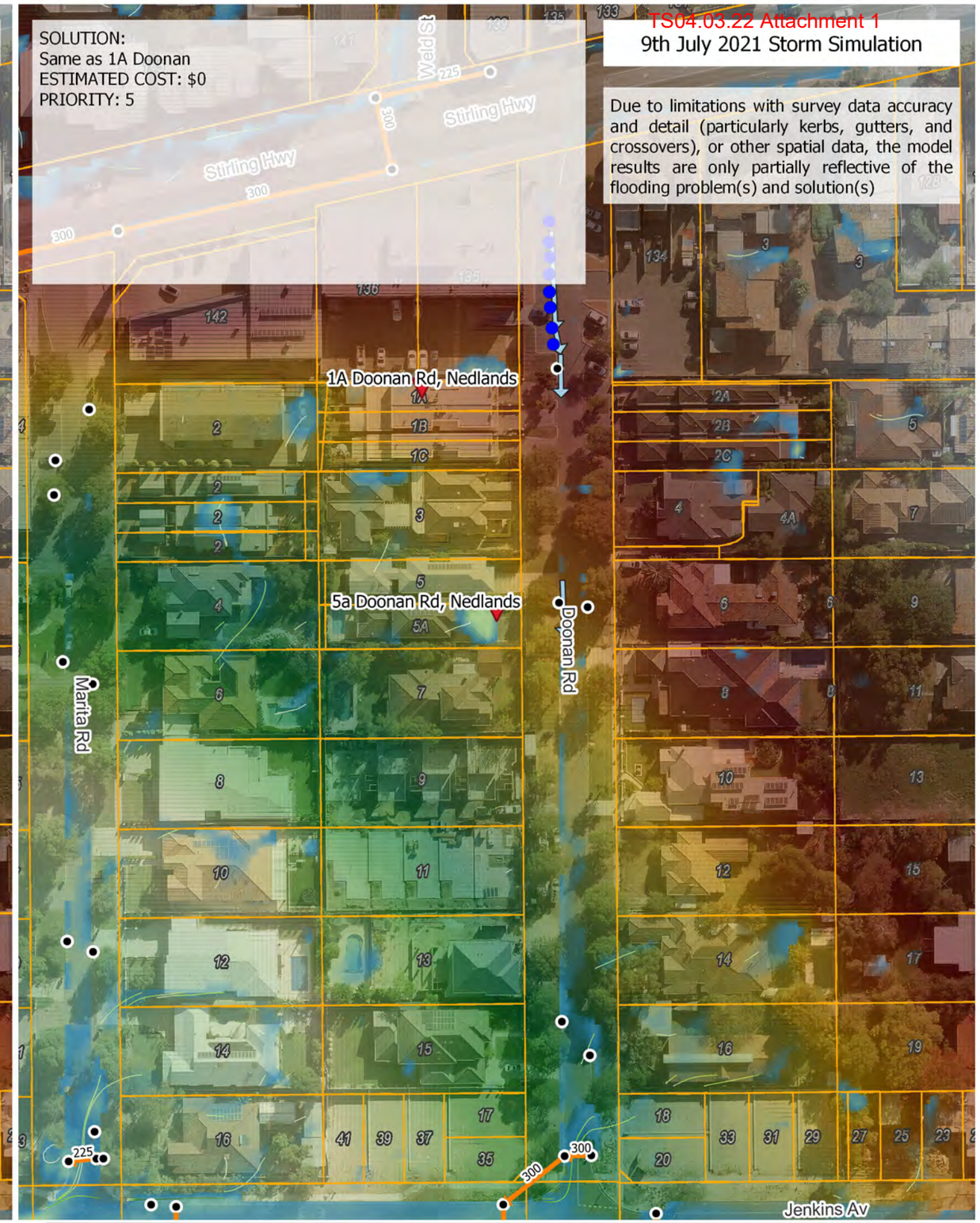

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 5a Doonan Rd, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.37

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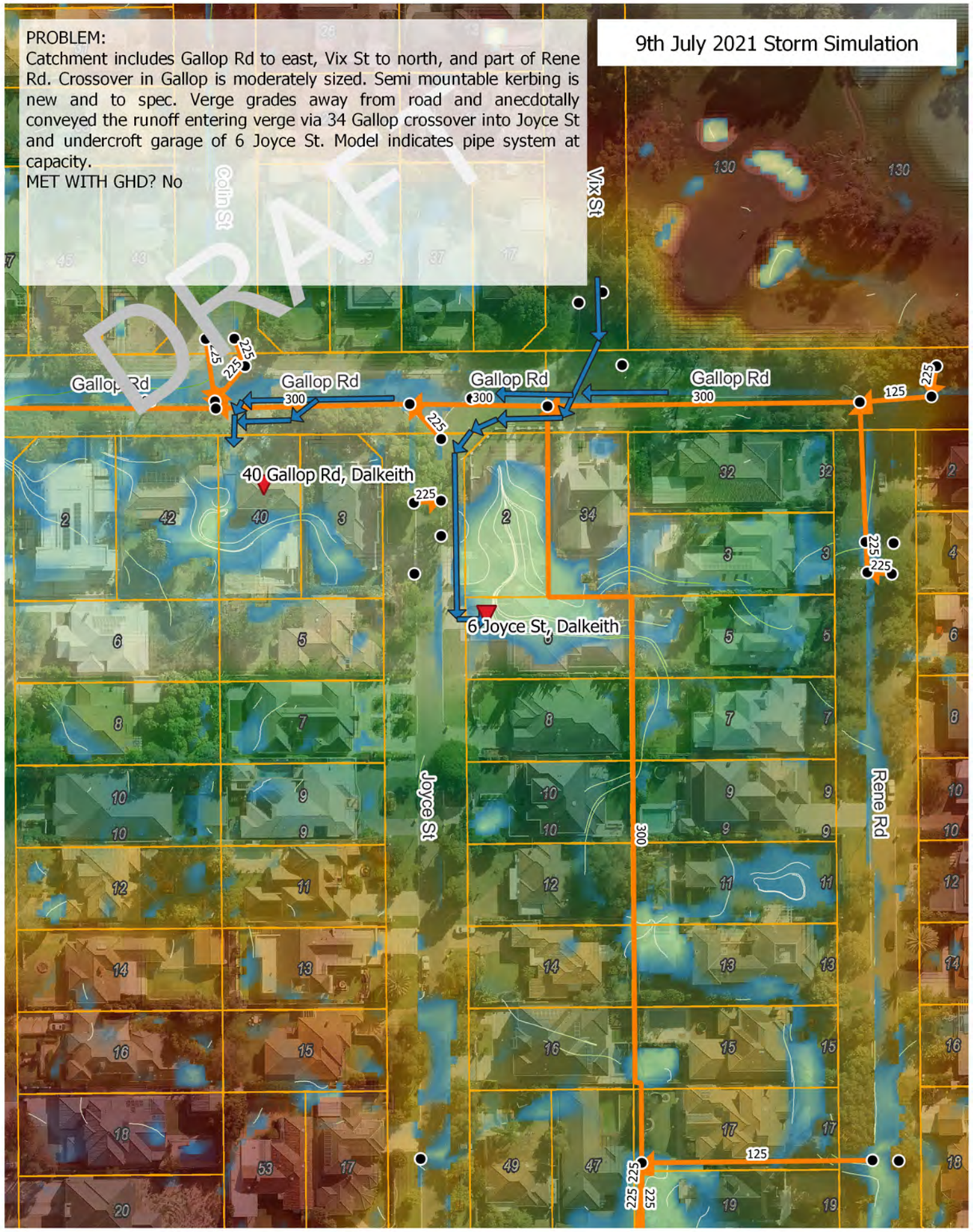

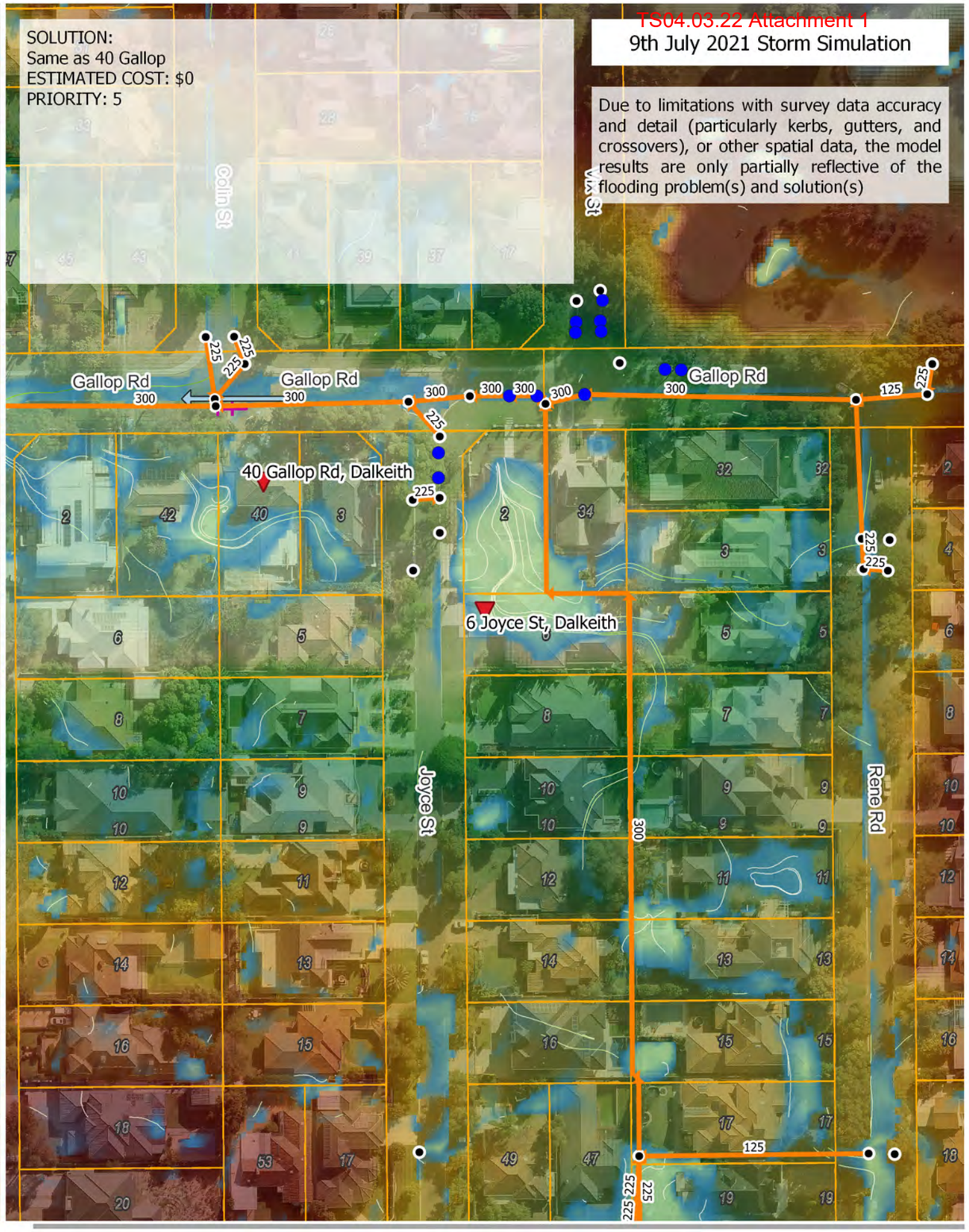

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 6 Joyce St, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.38

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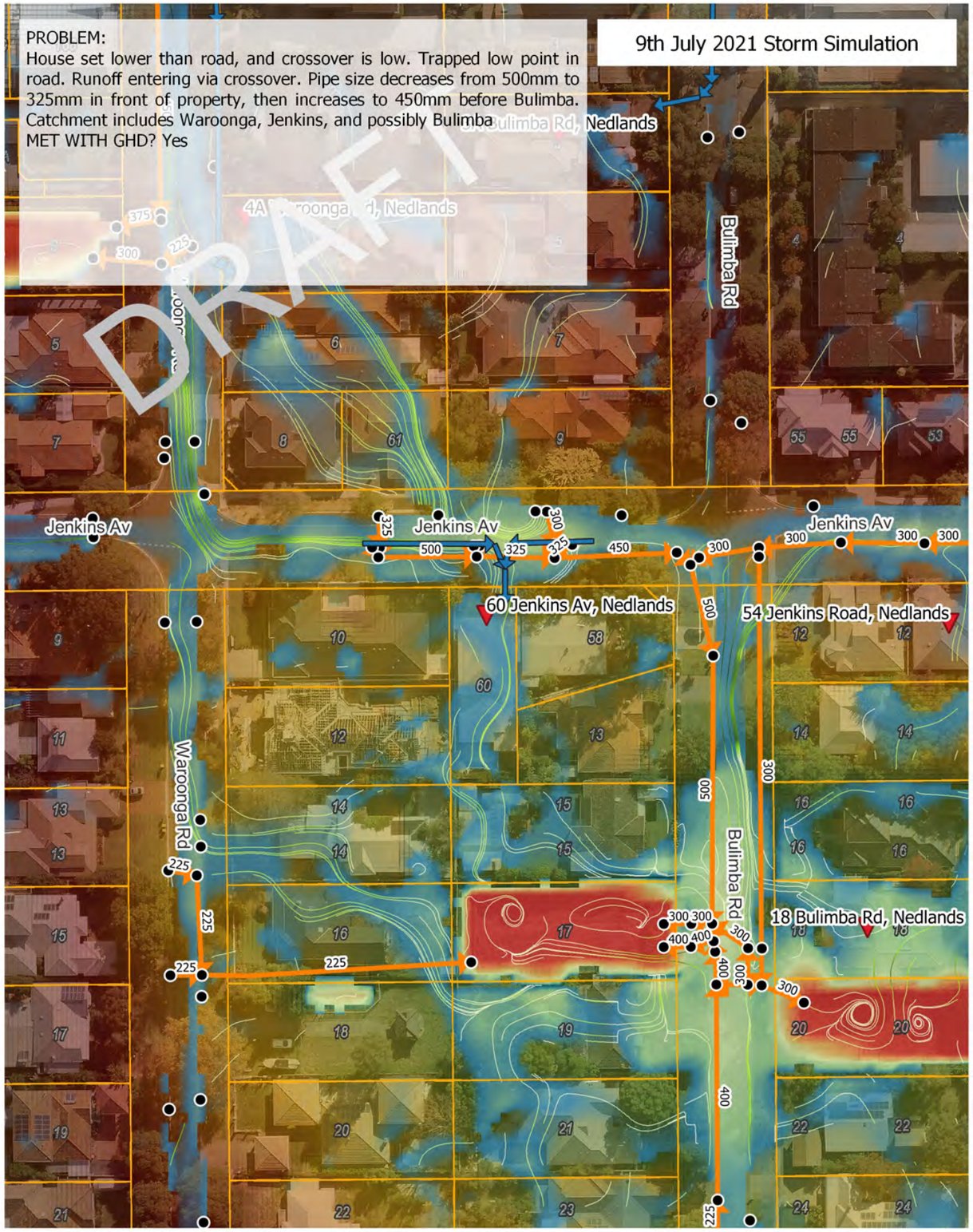

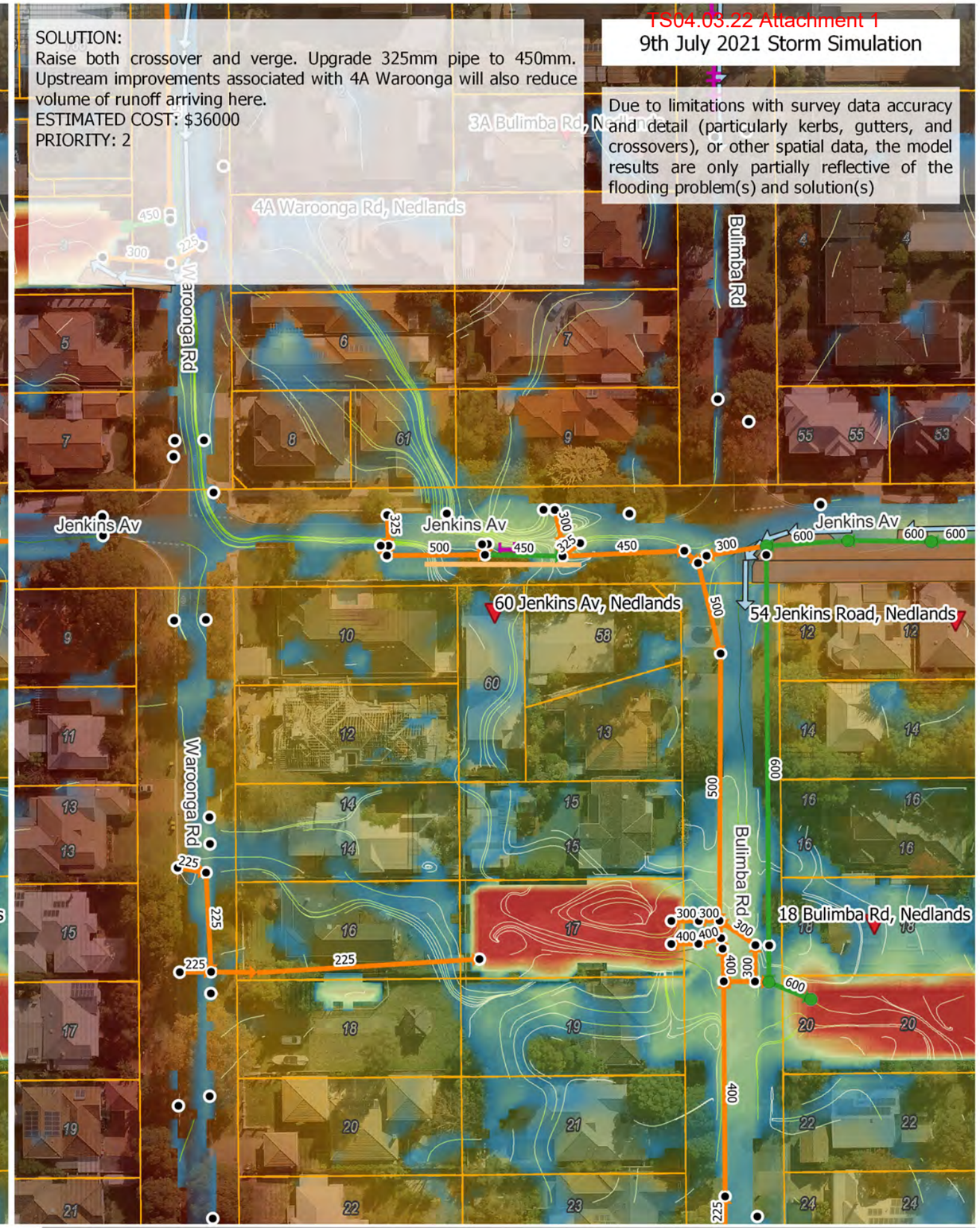

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m) 2 – 0.05
Topography (m AHD) 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
60 Jenkins Av, Nedlands

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.39

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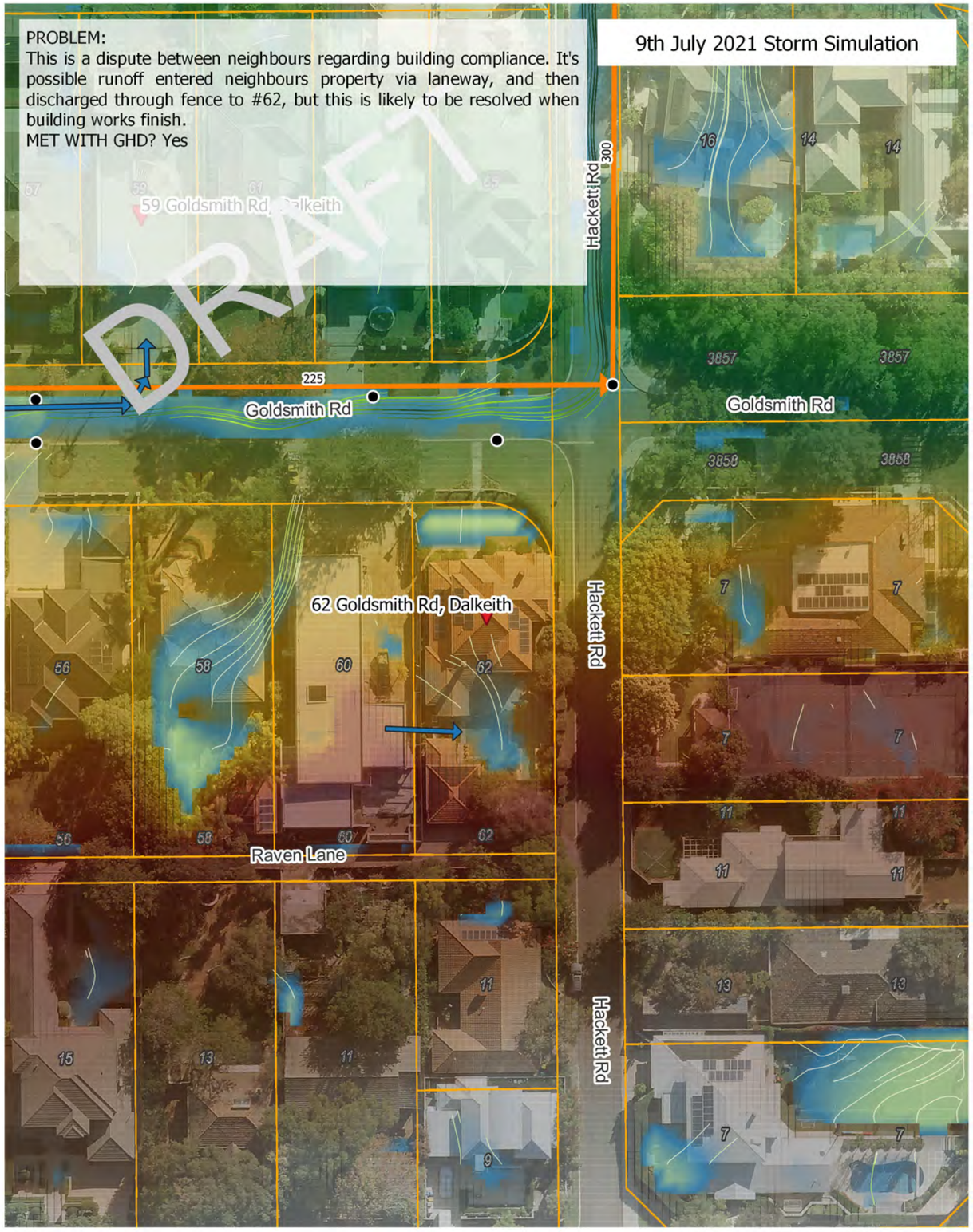

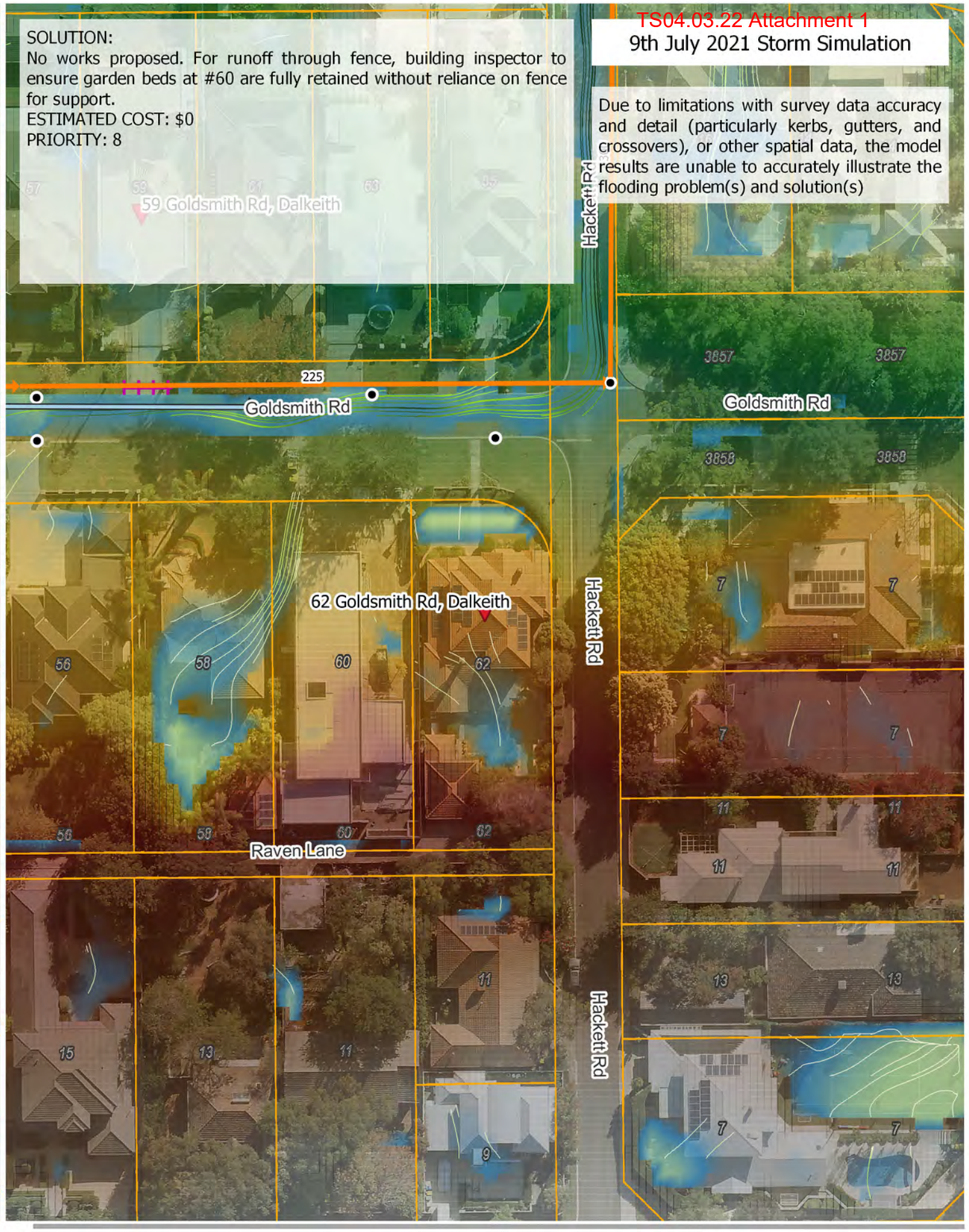

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 62 Goldsmith Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.40

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz
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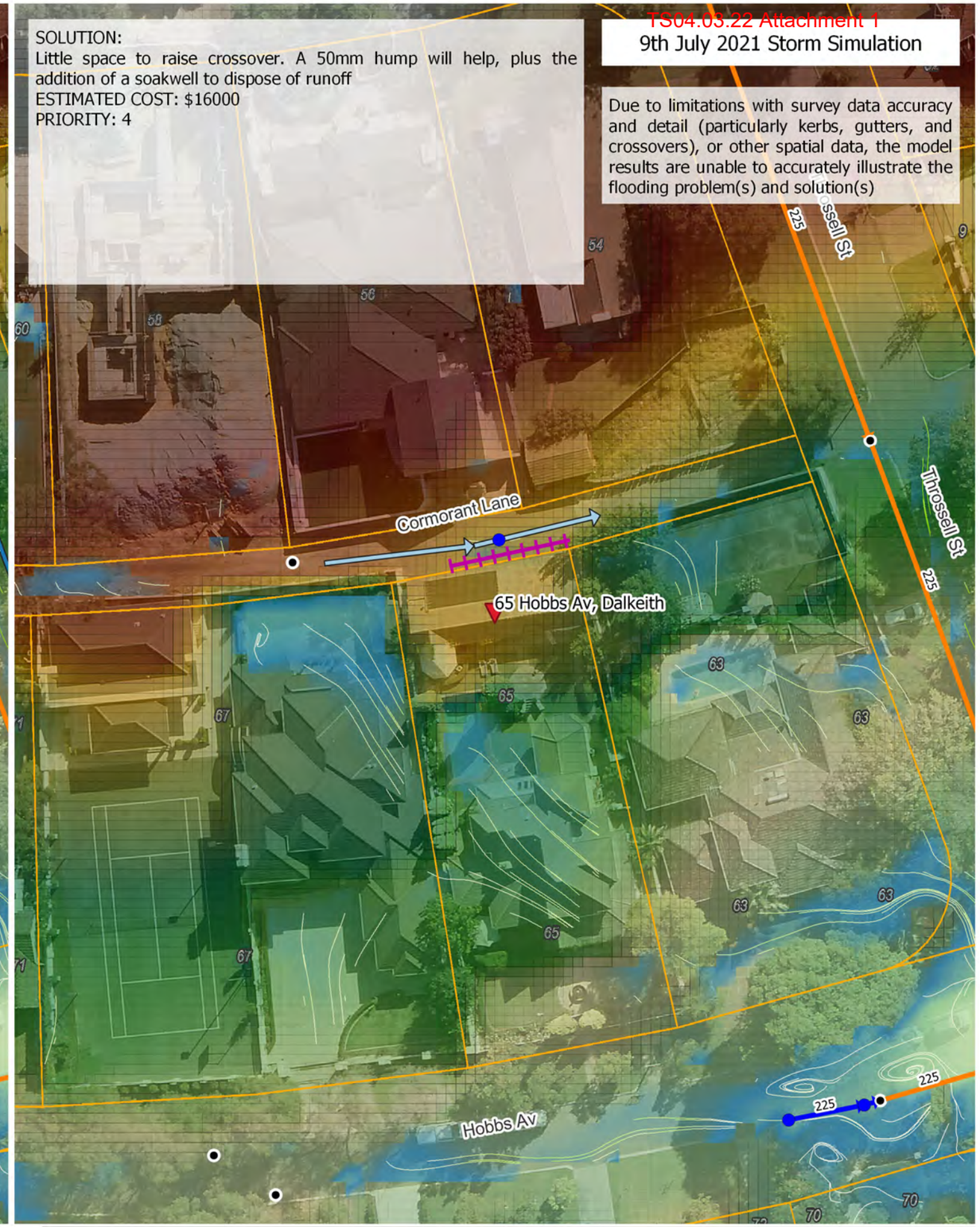

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
65 Hobbs Av, Dalkeith

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.41

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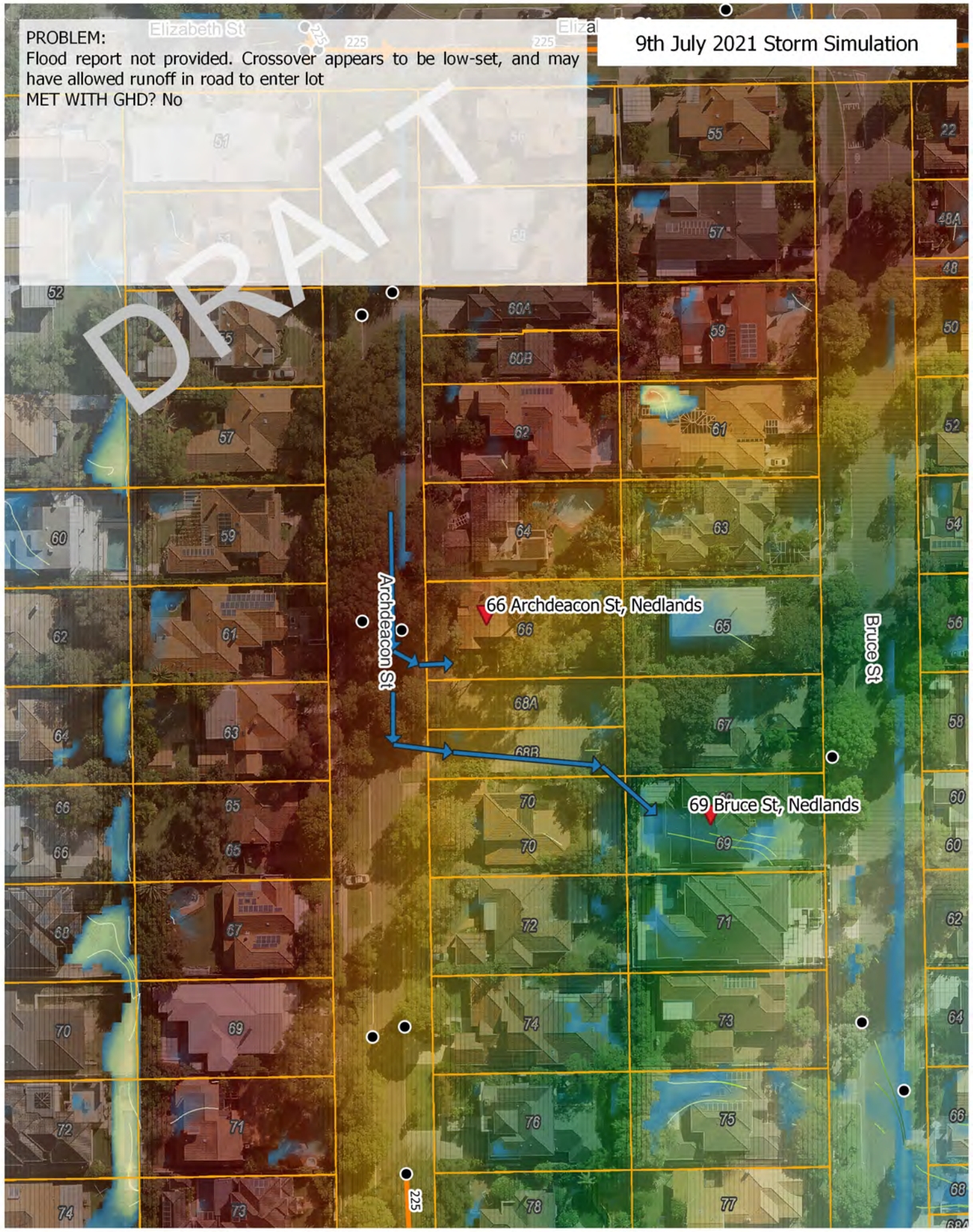

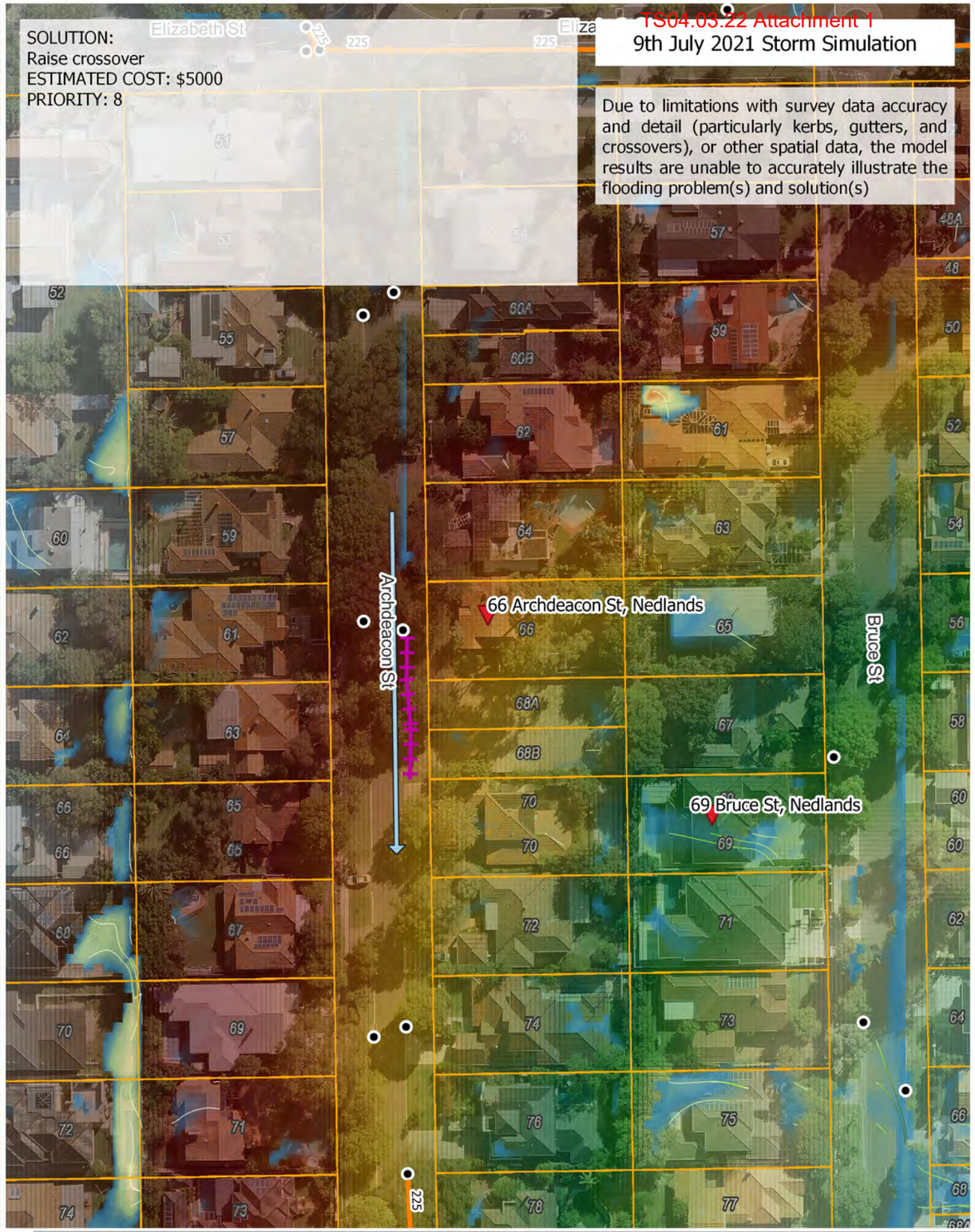

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
66 Archdeacon St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.42

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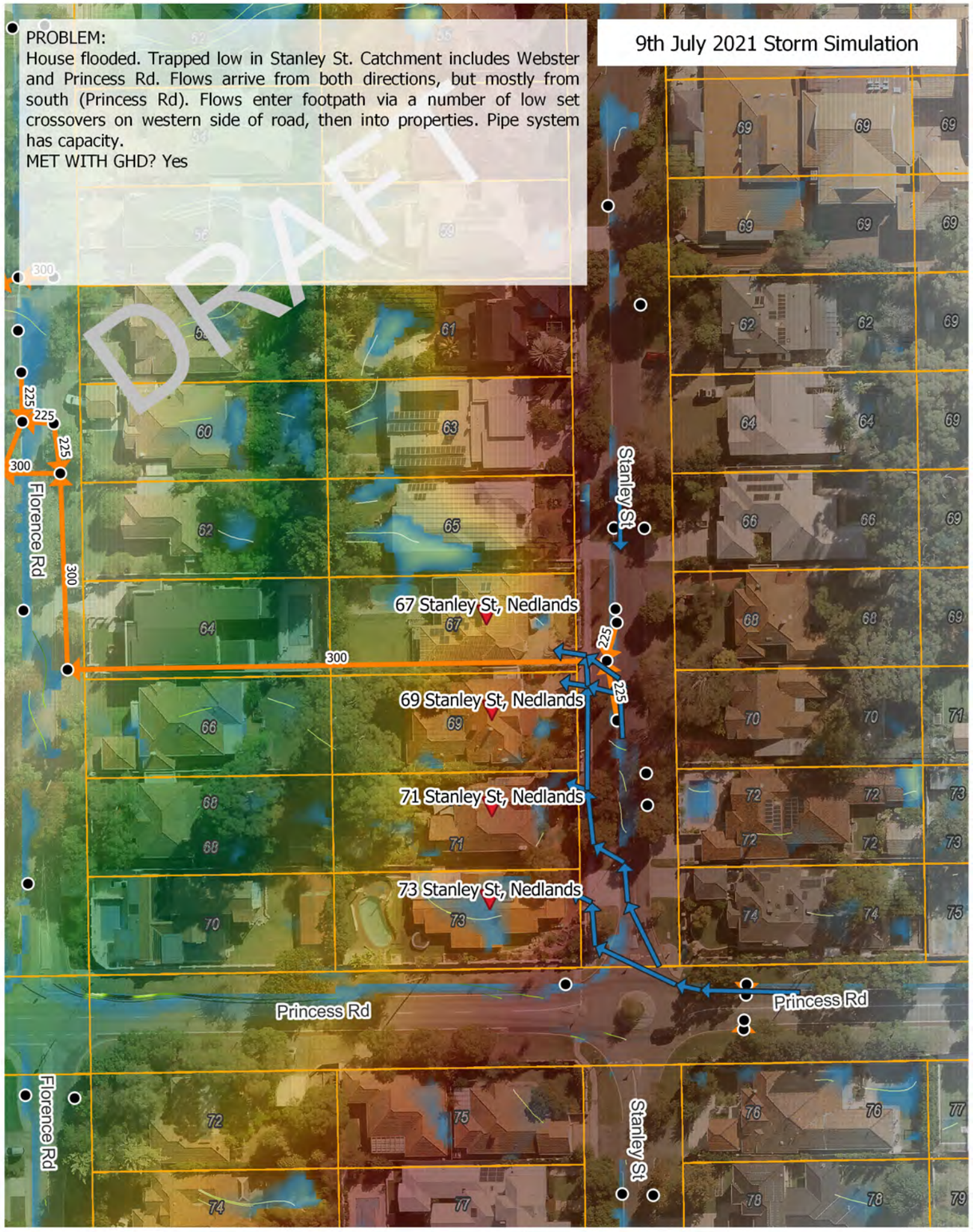

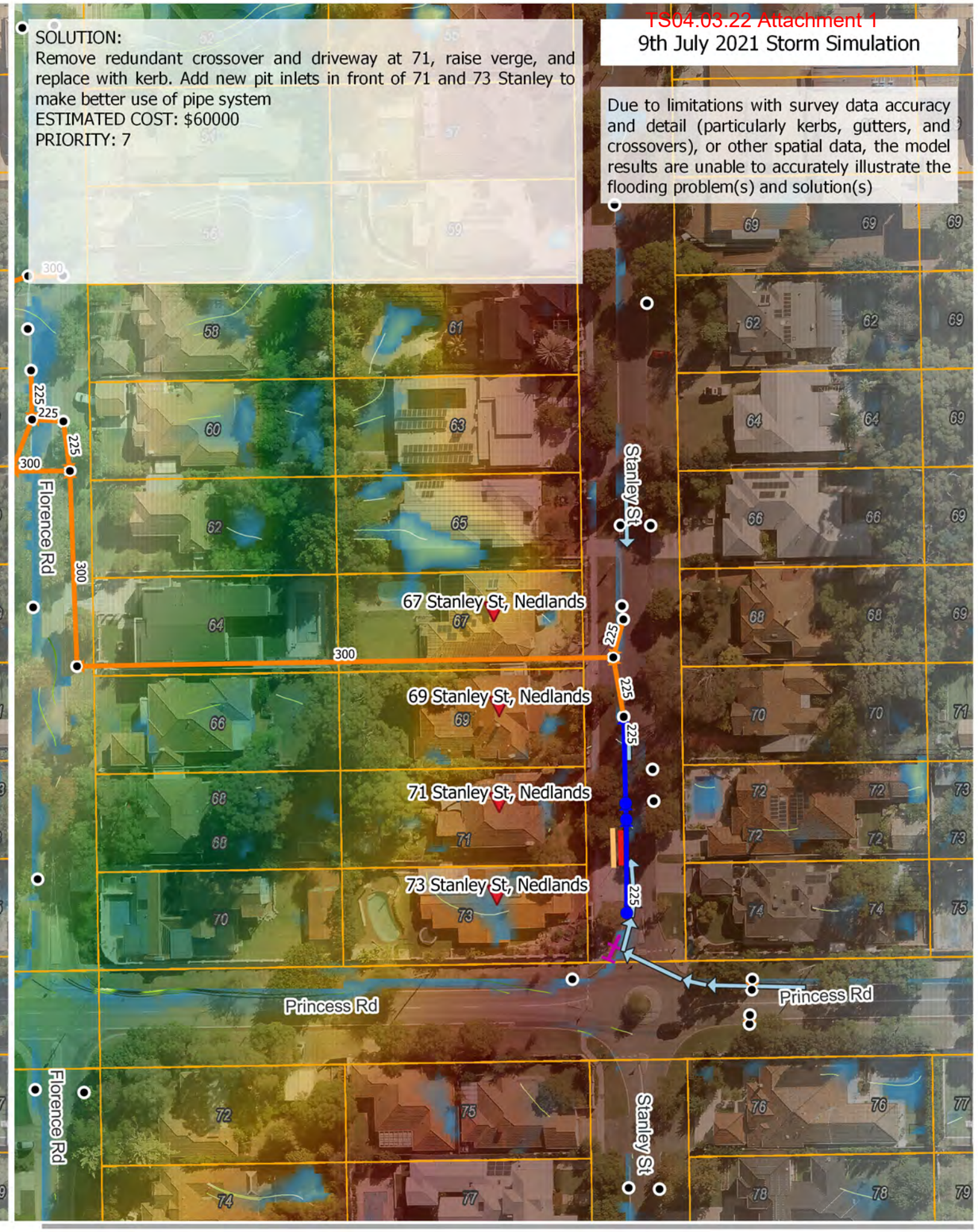

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 67 Stanley St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.43

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz
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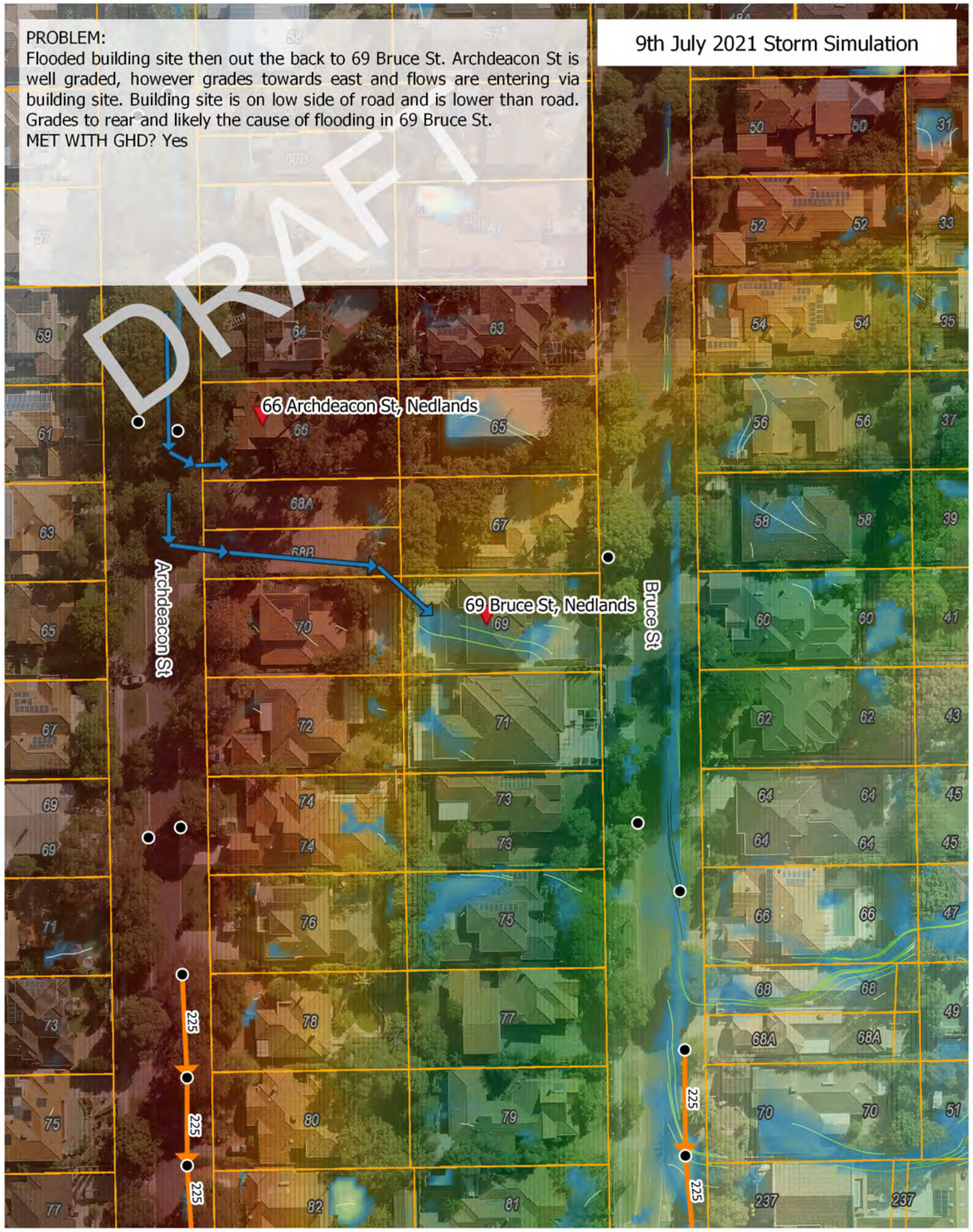

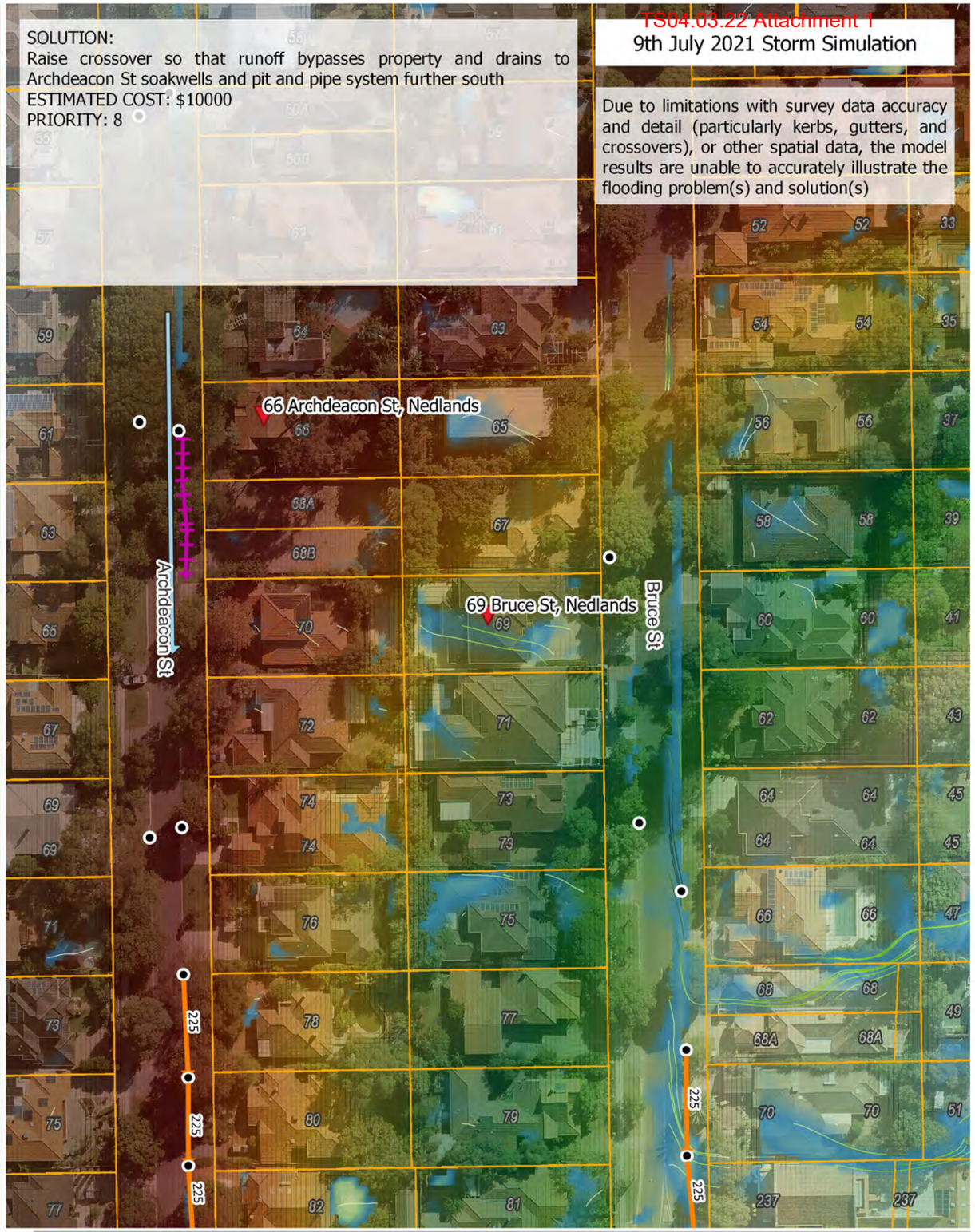

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 69 Bruce St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.44

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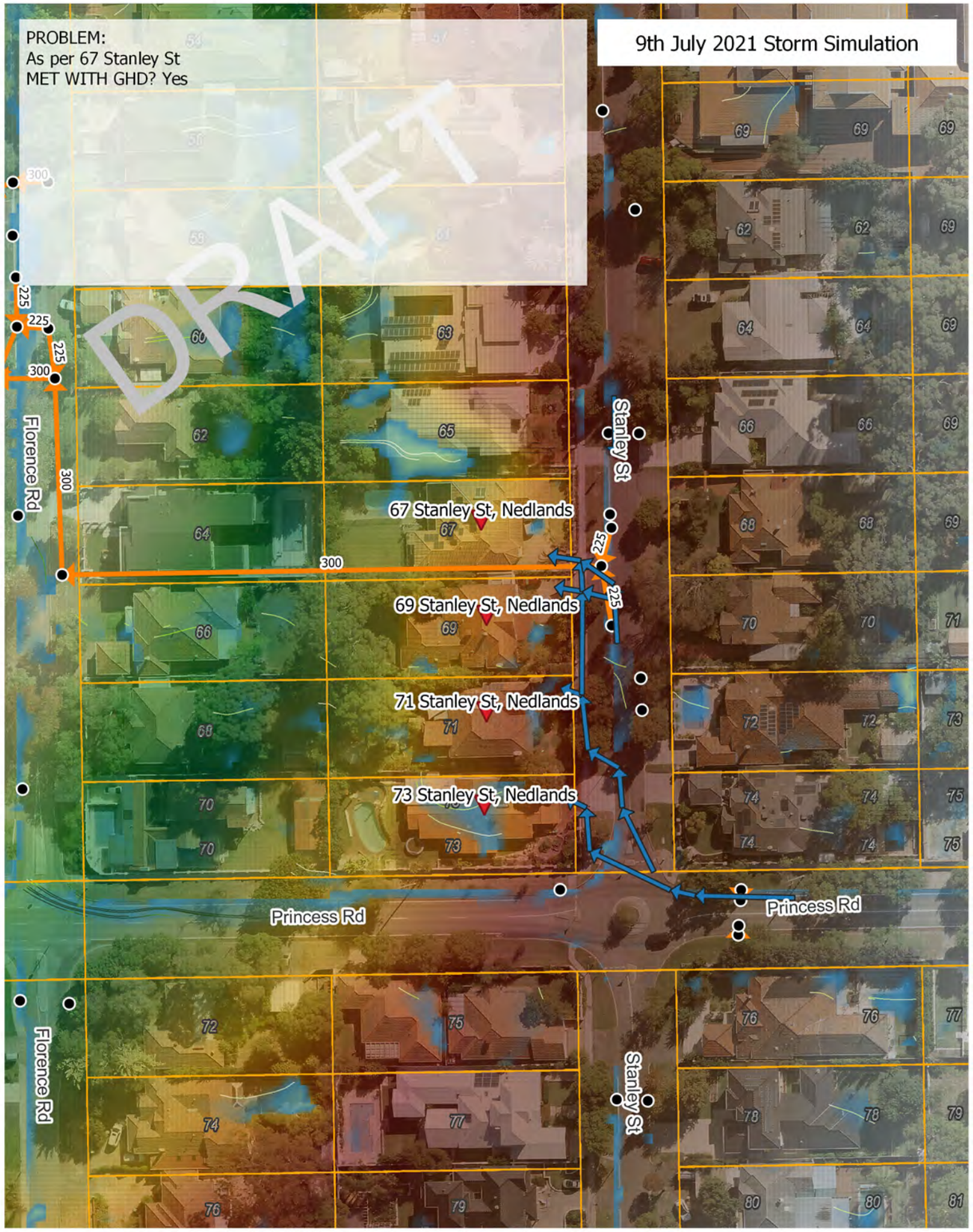

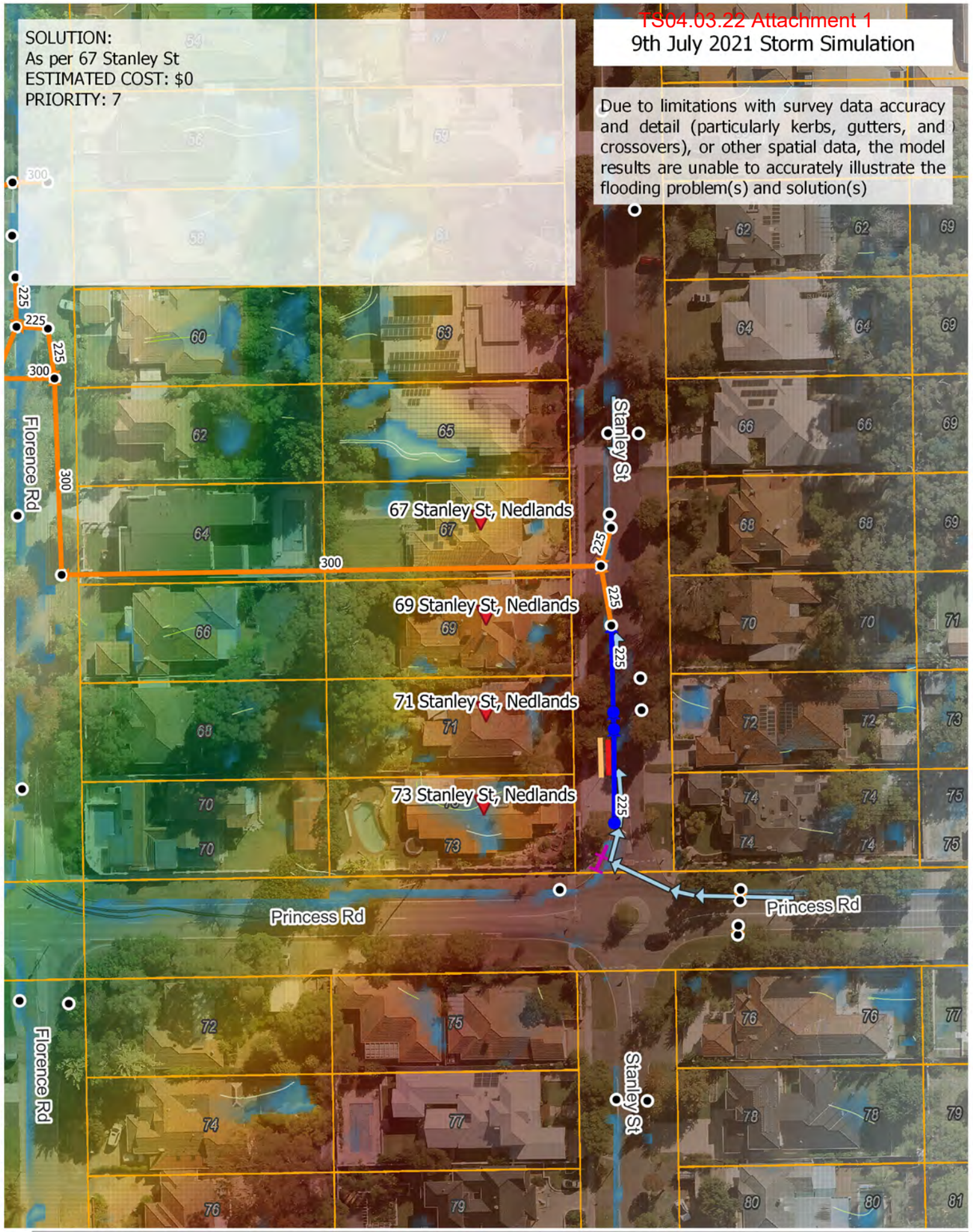

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 69 Stanley St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.45

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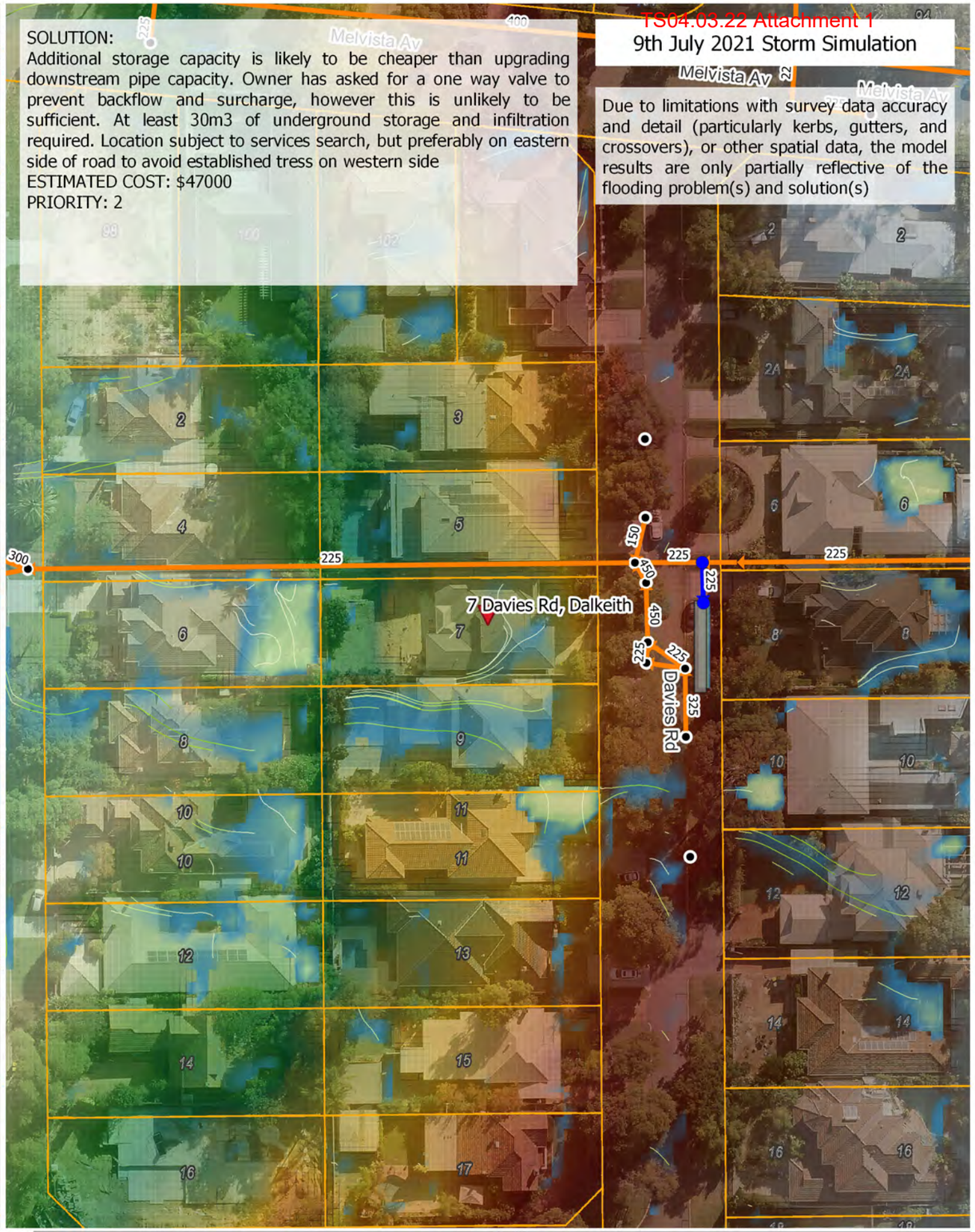

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
7 Davies Rd, Dalkeith

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.46

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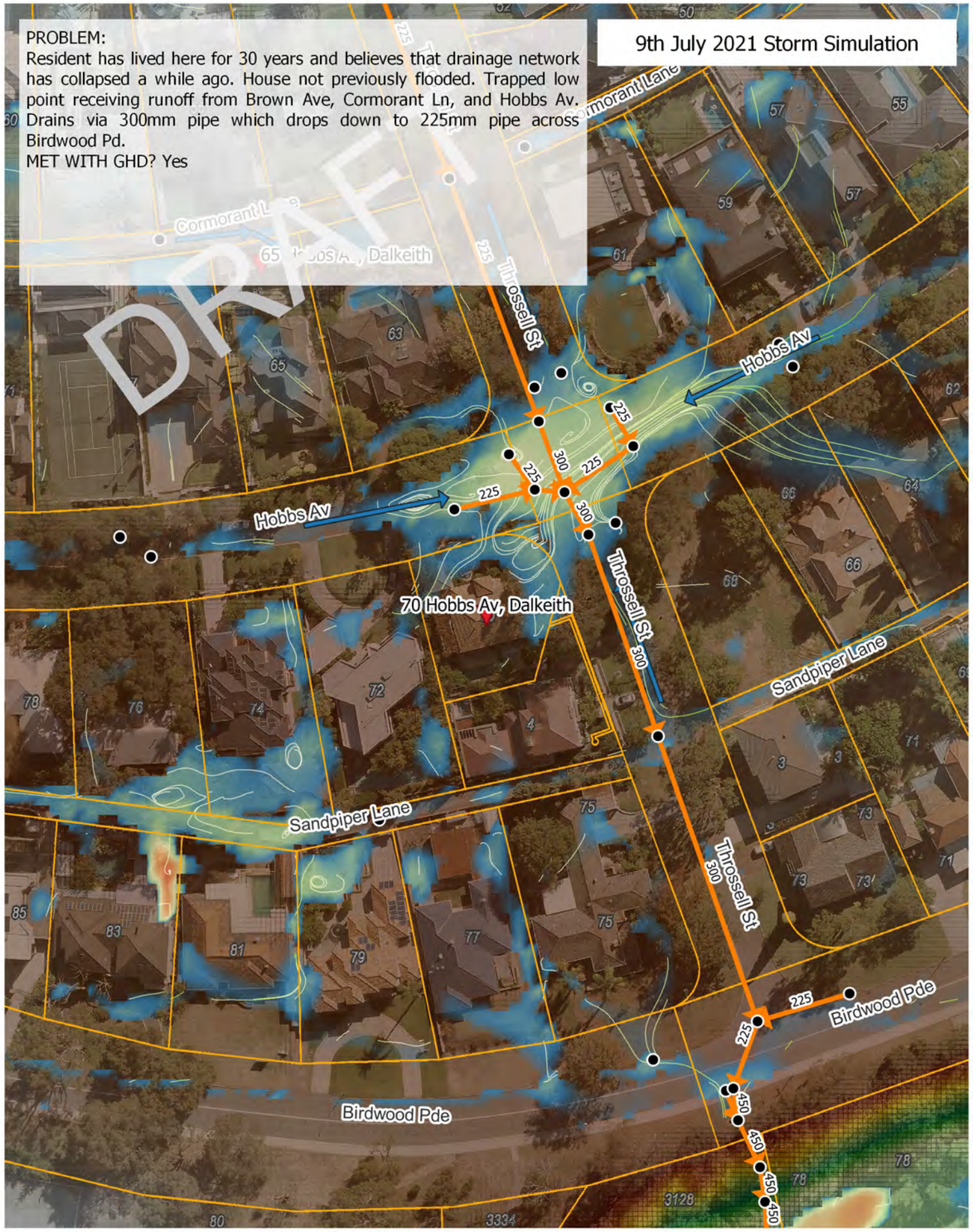

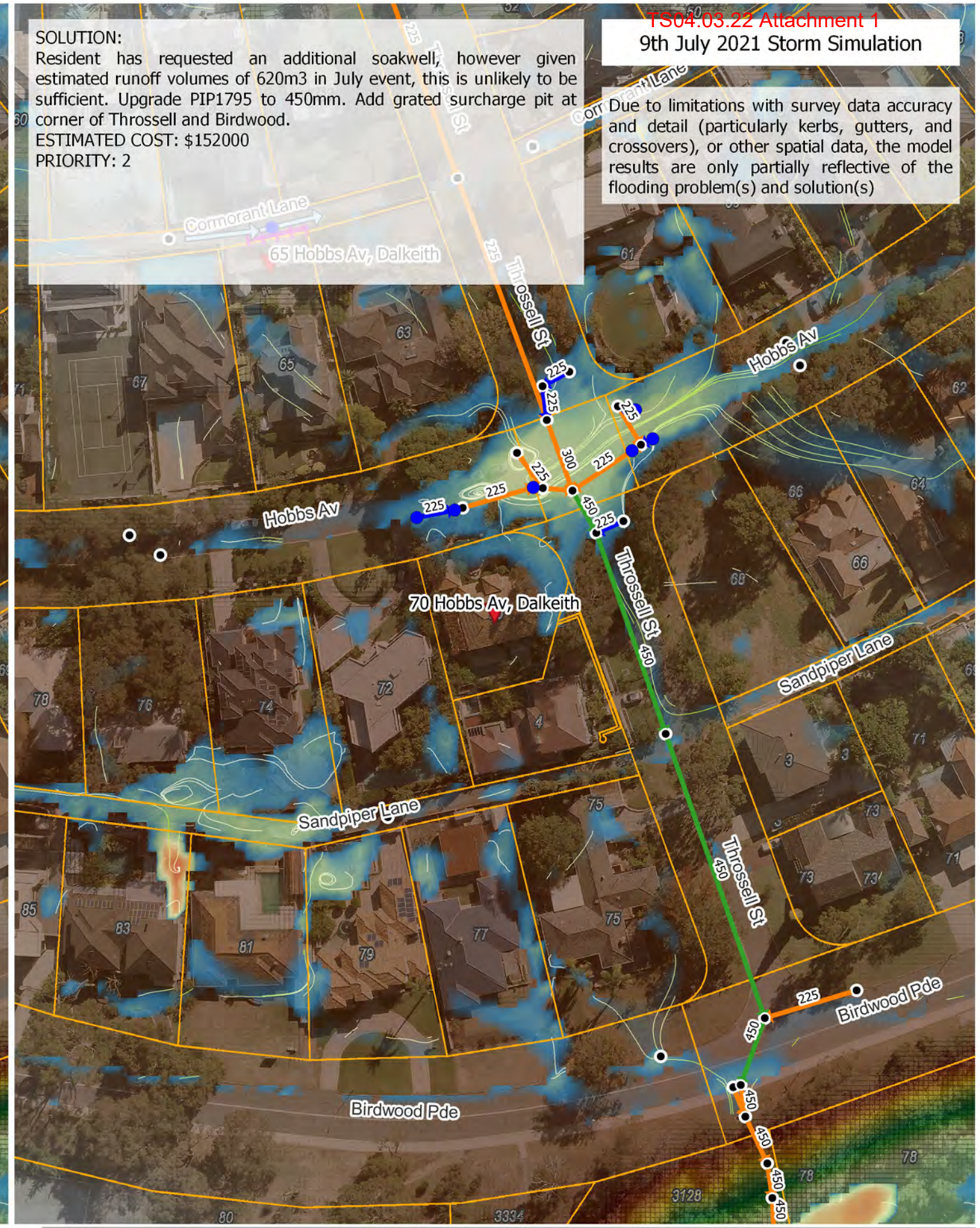

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing

Cadastre (Landgate)

Flood Depth (m): 2 – 0.05

Topography (m AHD): 31 – 17

New pit
Upgraded pit
New pipe
Upgraded pipe

Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage

Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 70 Hobbs Av, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.47

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz

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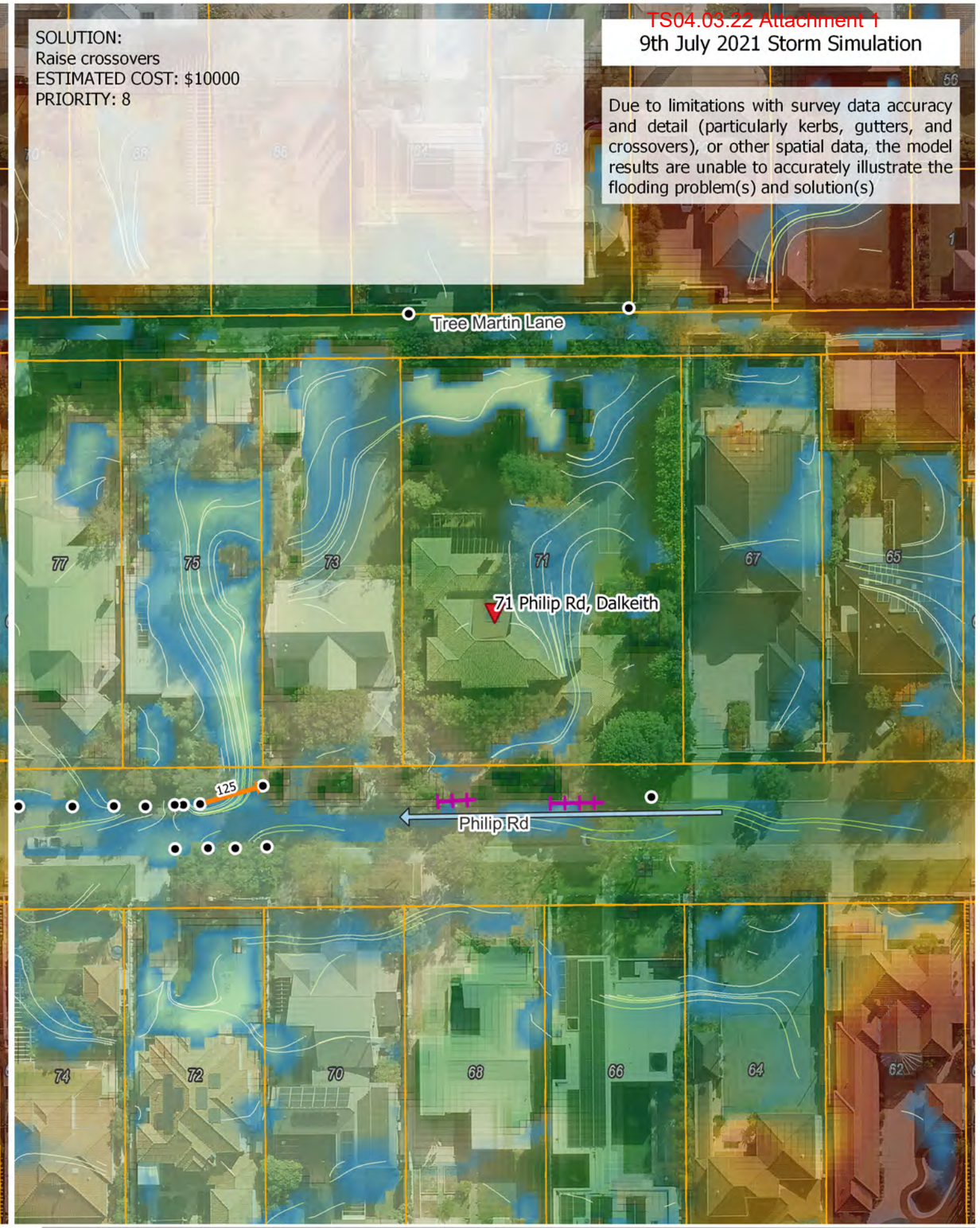

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 71 Philip Rd, Dalkeith

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.48

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz

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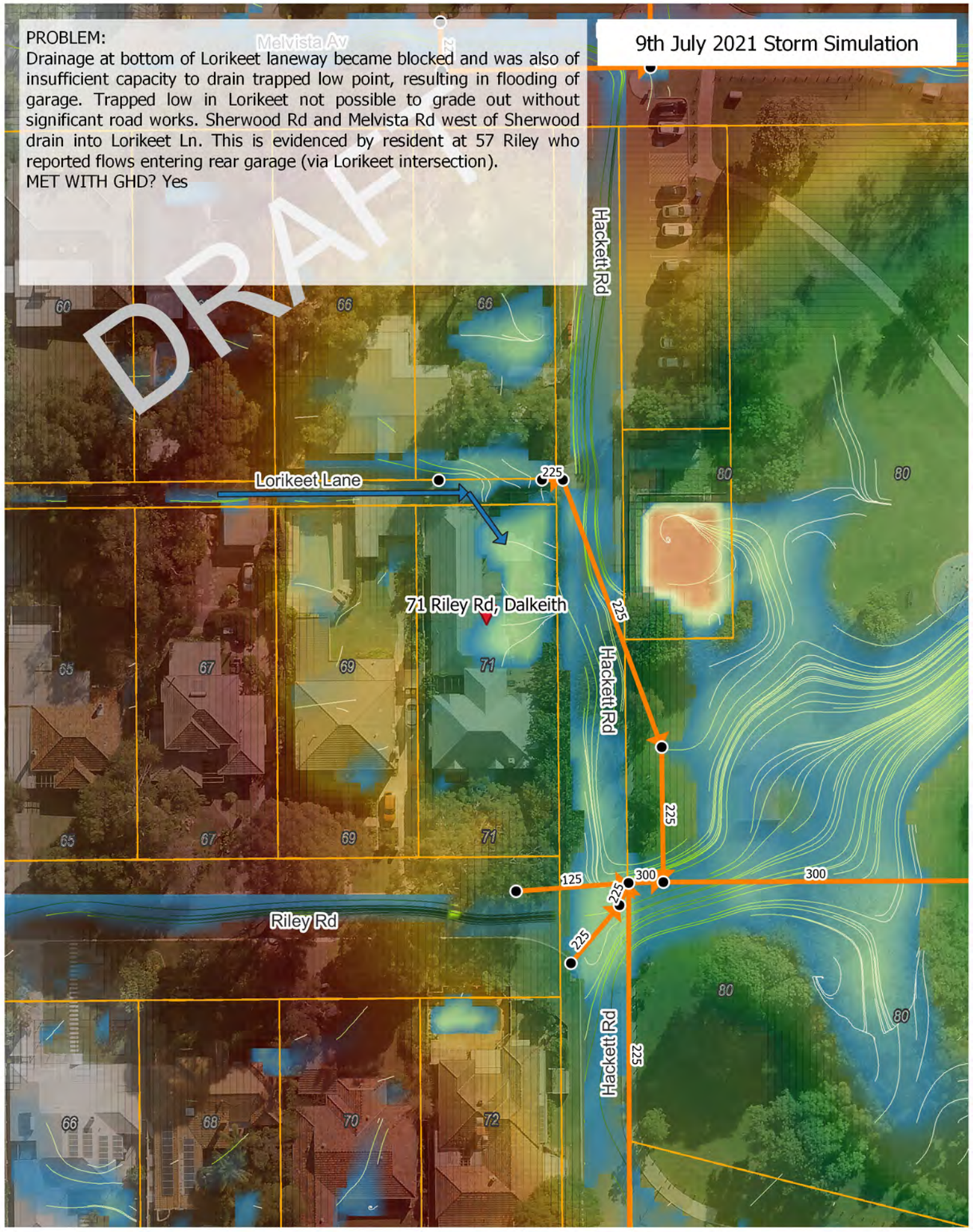

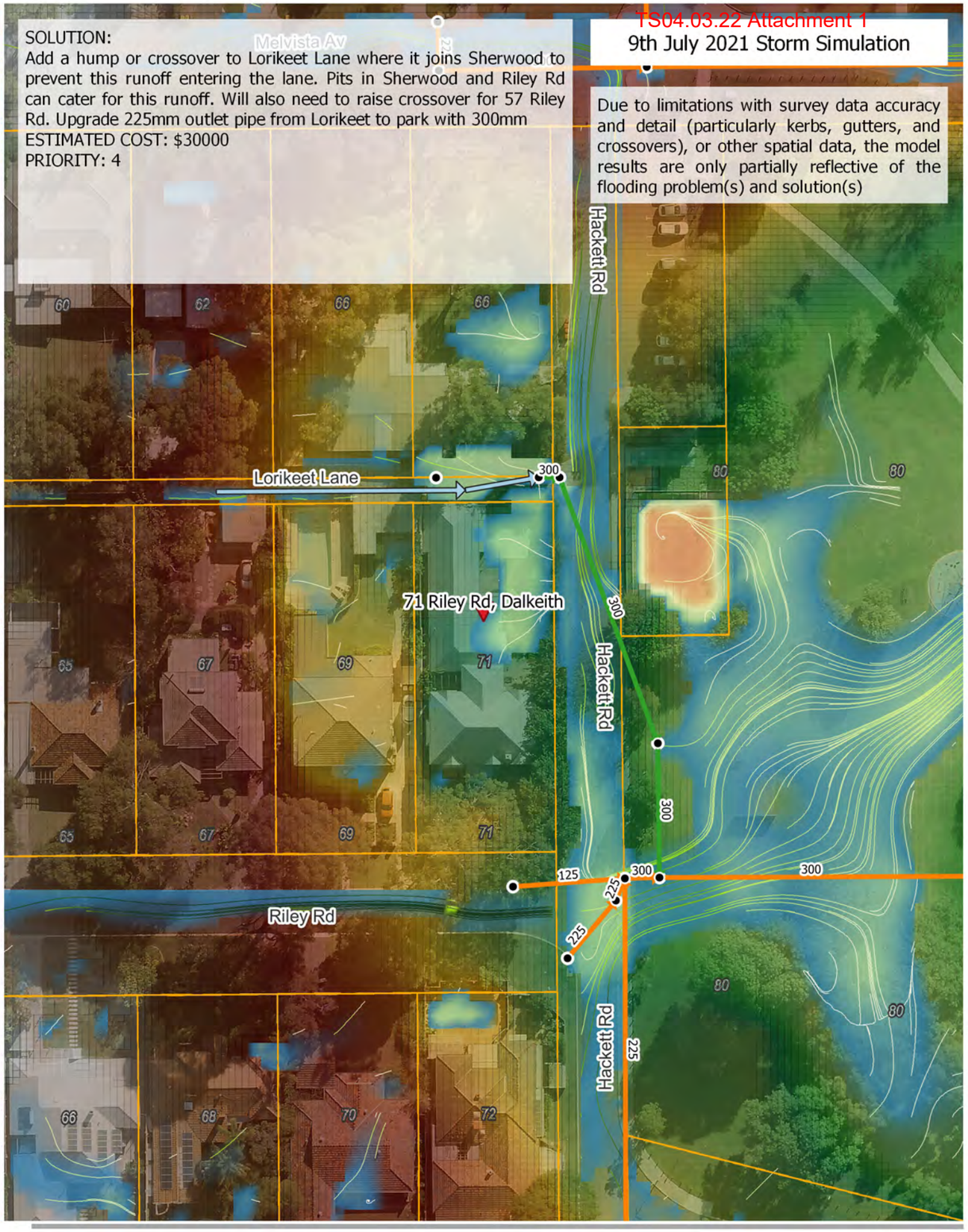

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
71 Riley Rd, Dalkeith

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.49

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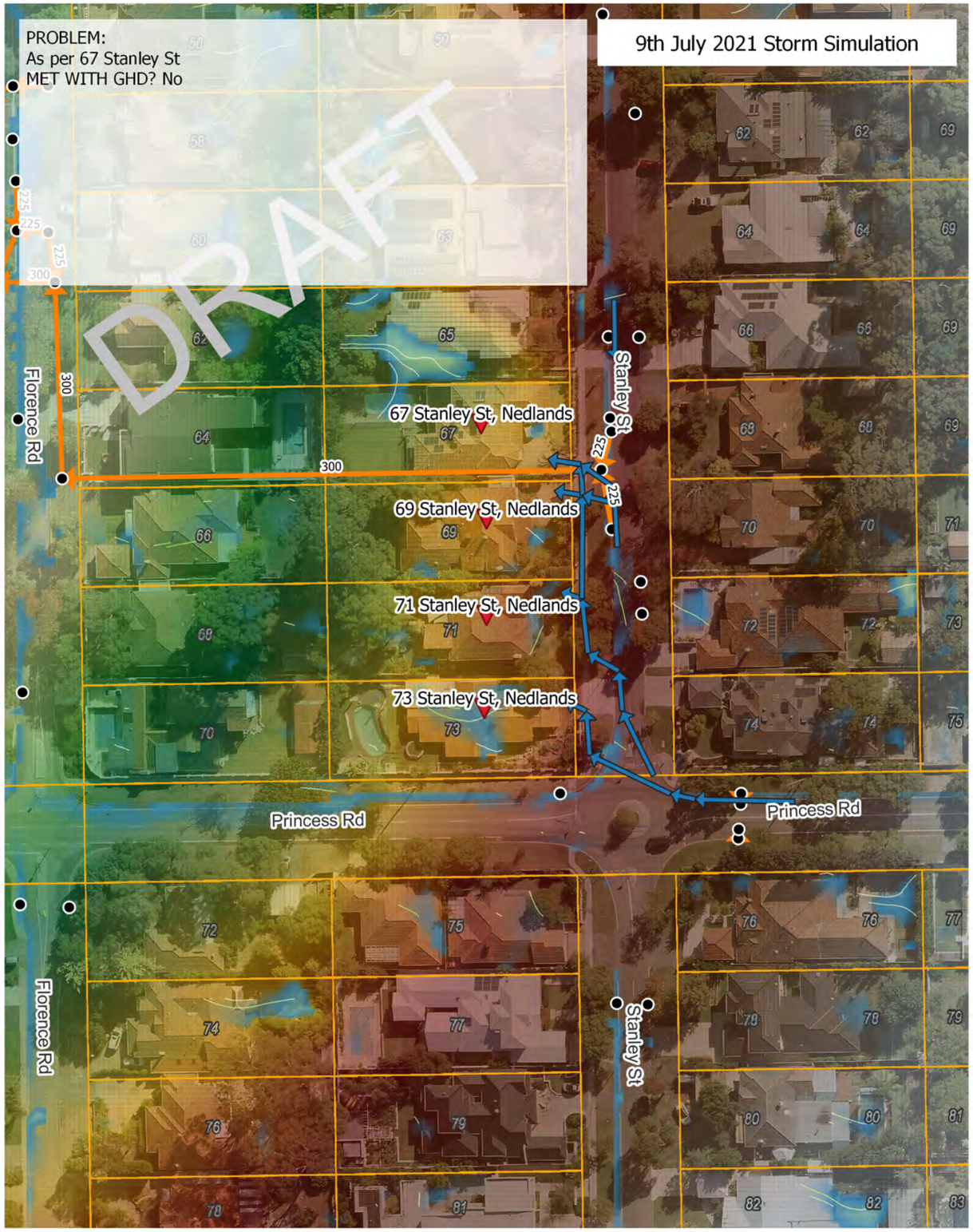

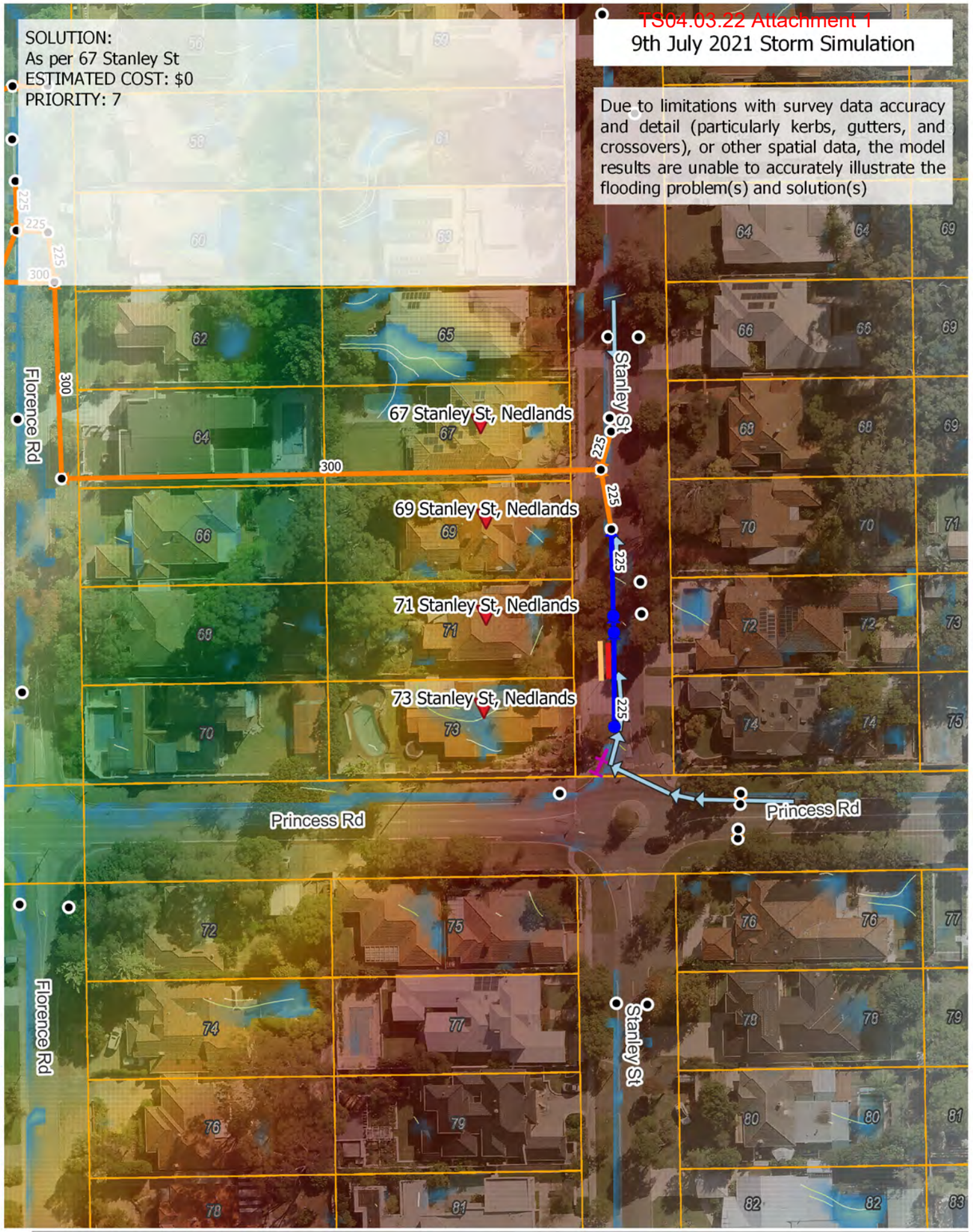

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation
71 Stanley St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.50

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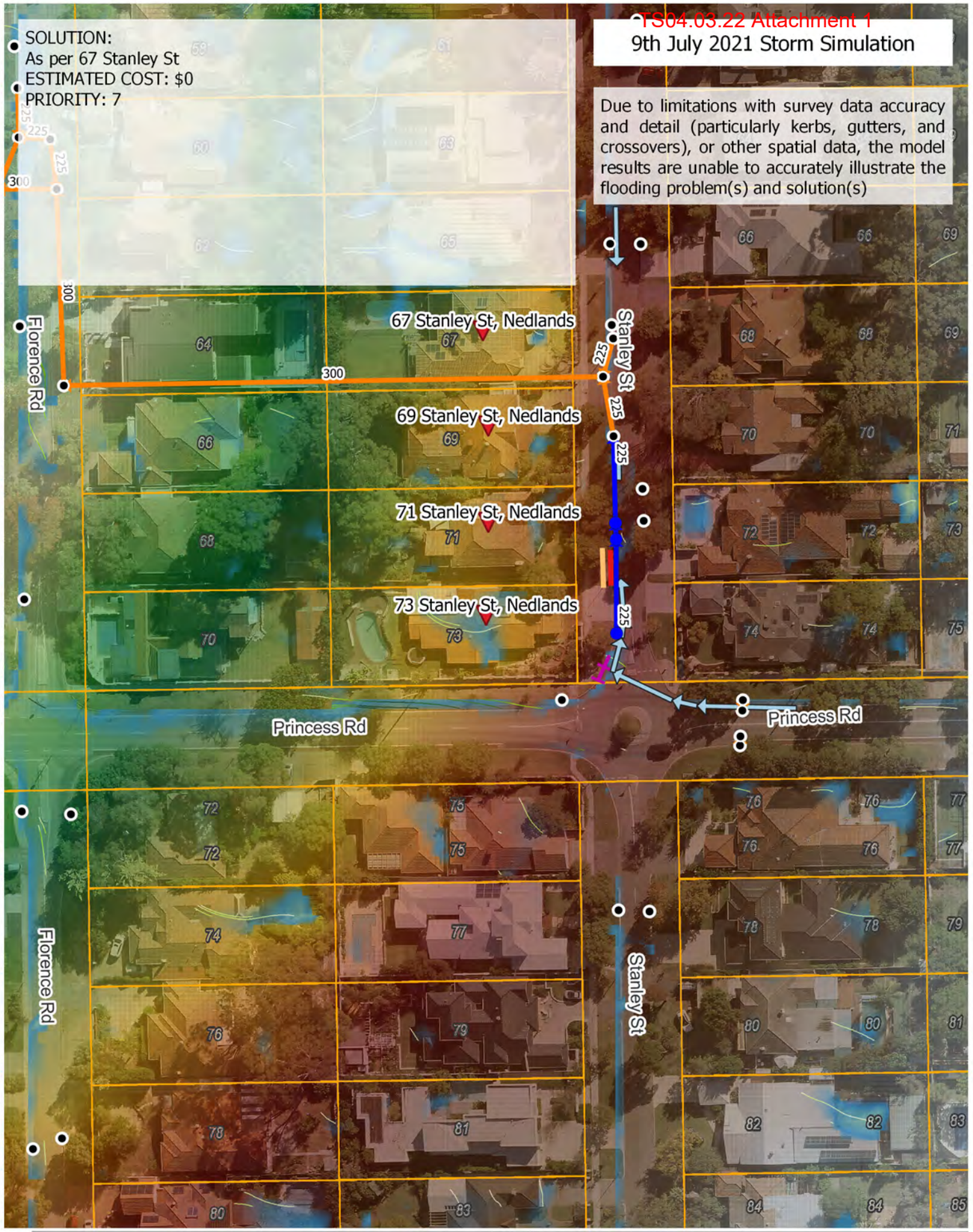

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 73 Stanley St, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.51

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz

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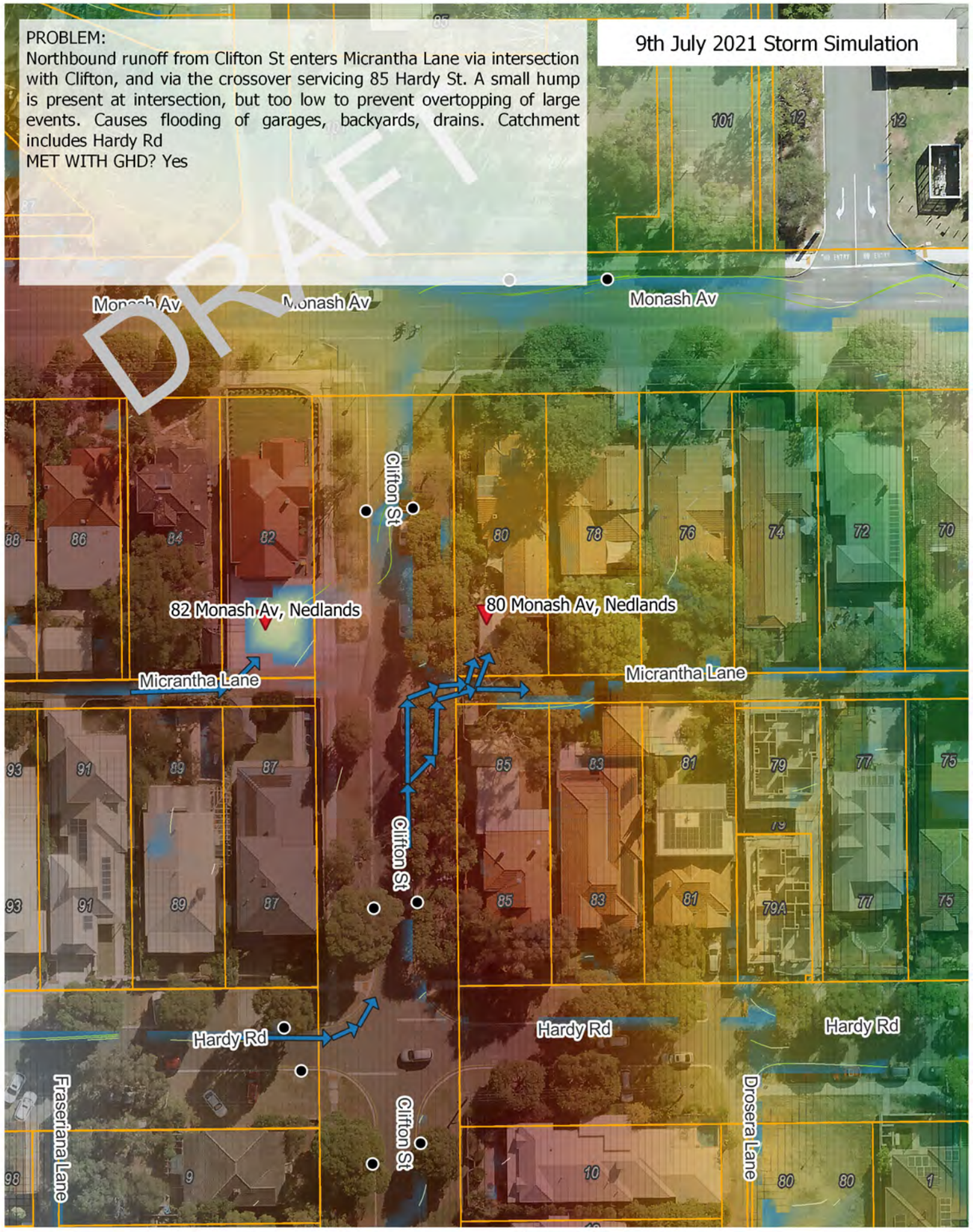

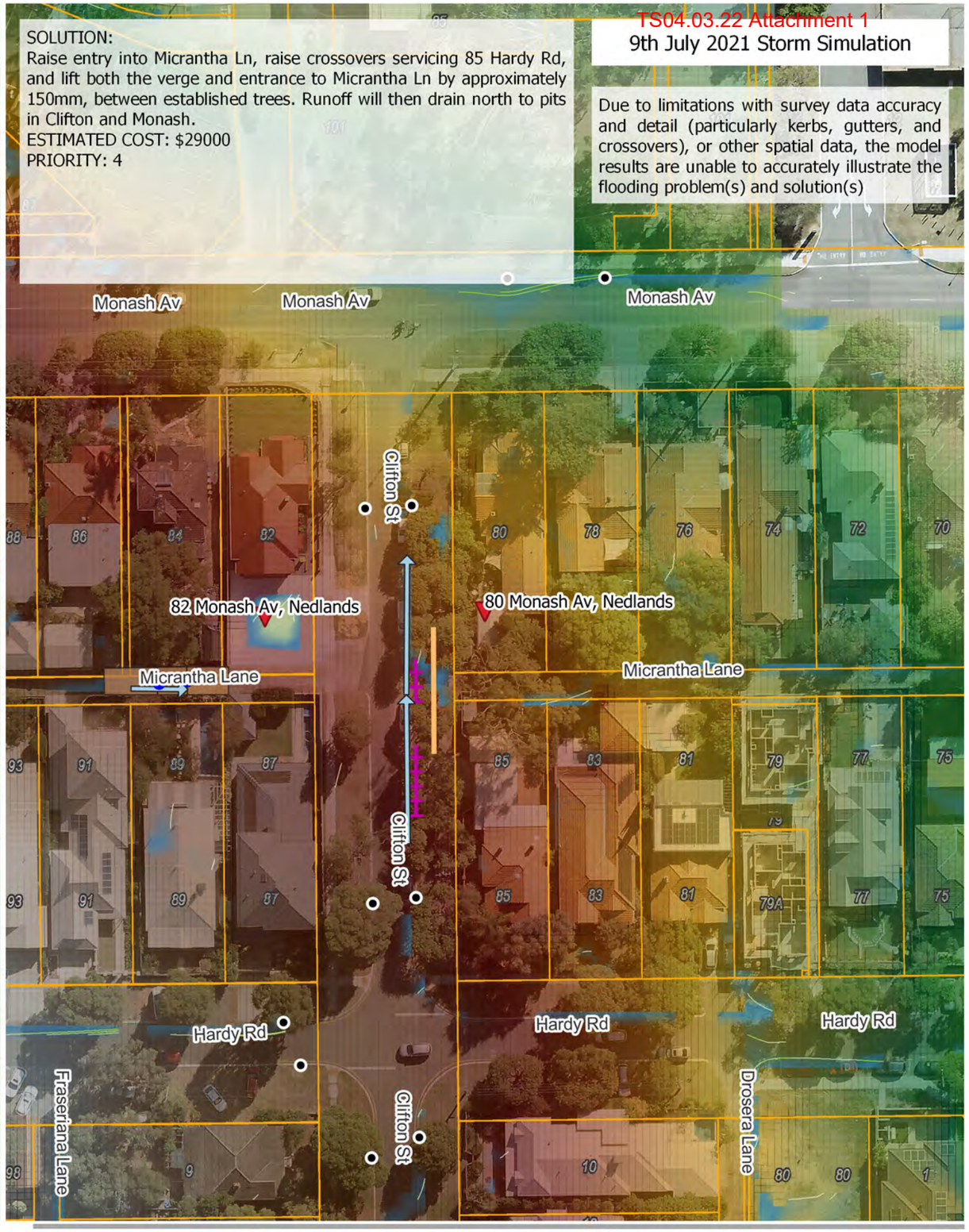

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation 80 Monash Av, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.52

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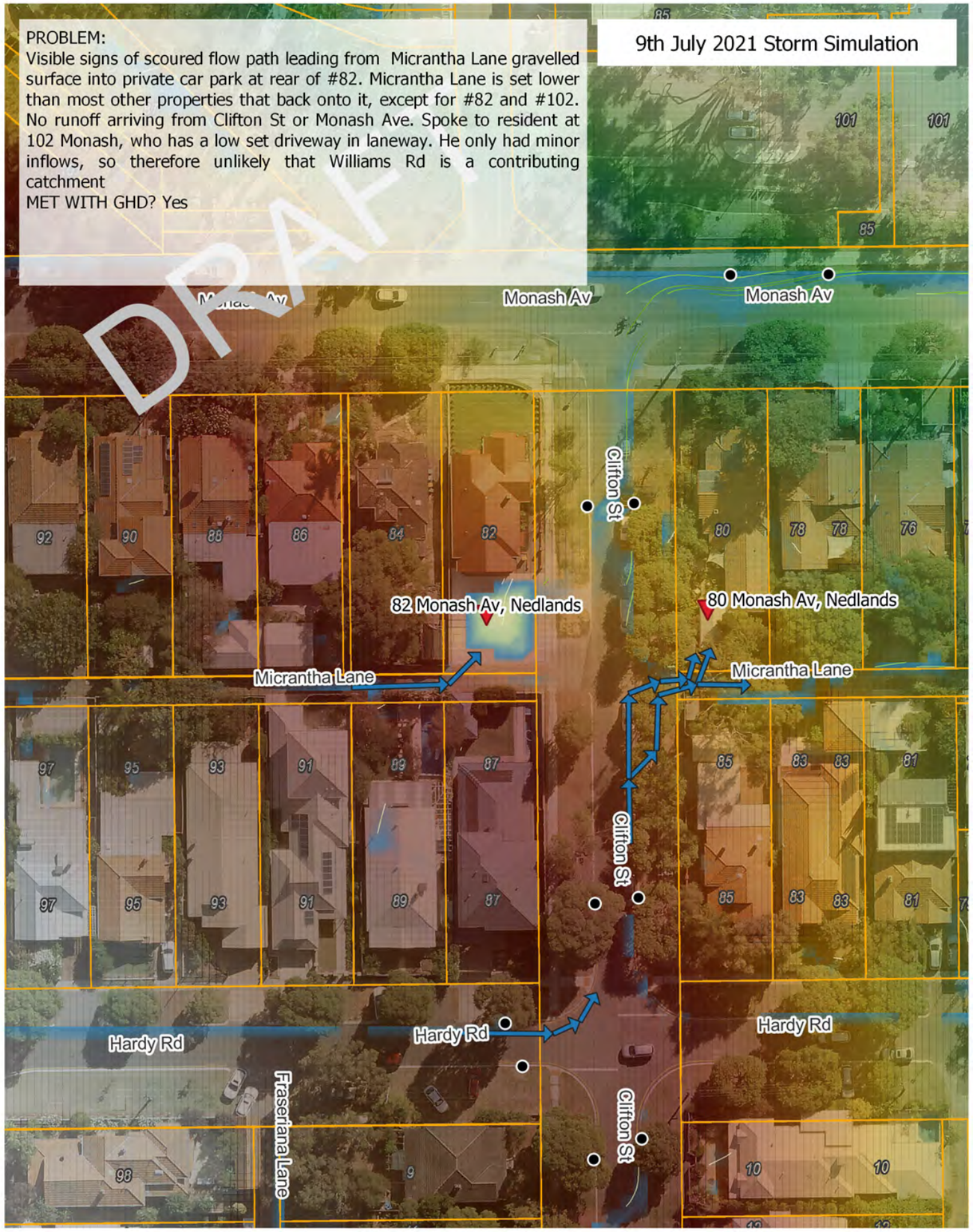
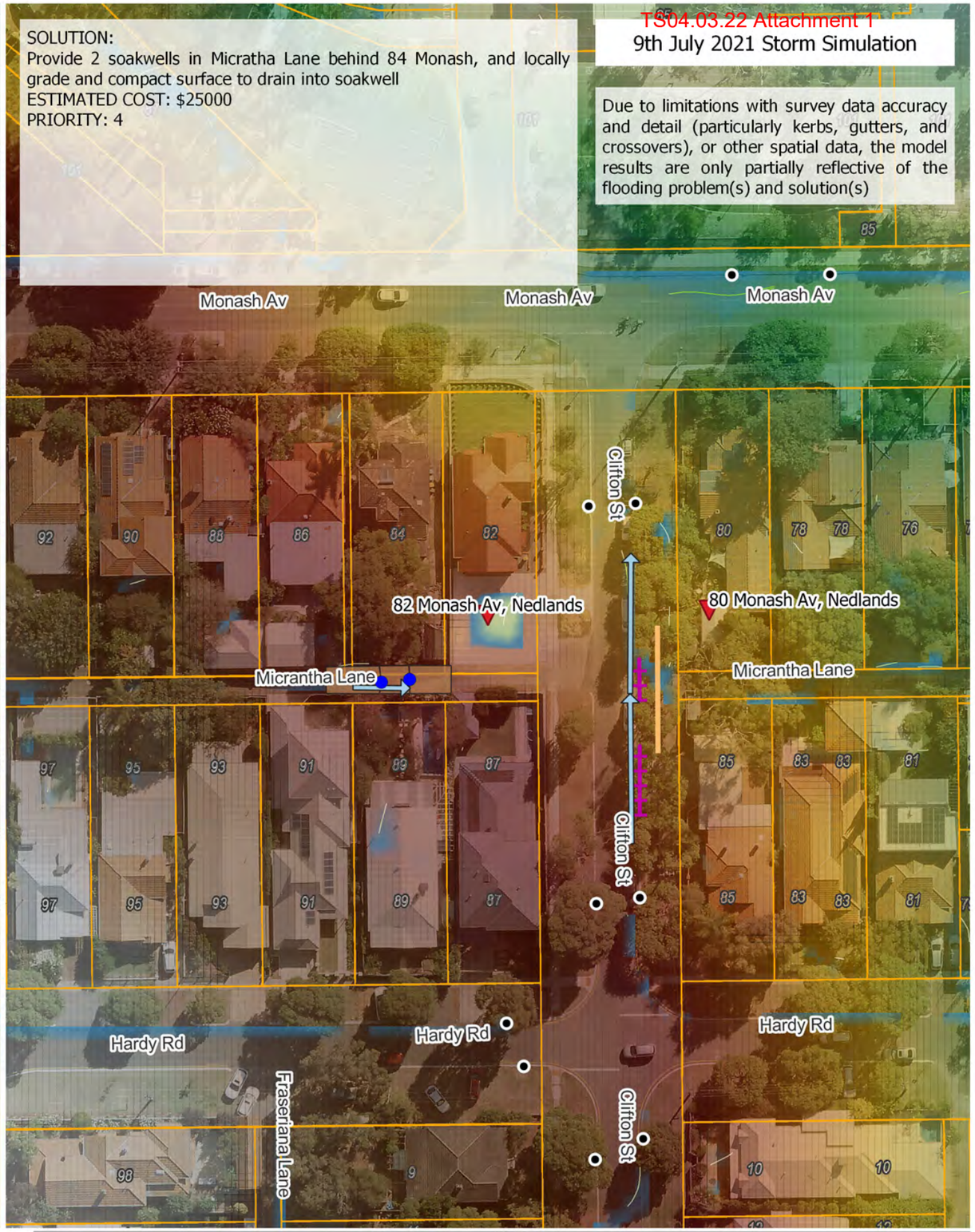
PROBLEM:
Visible signs of scoured flow path leading from Micrantha Lane gravelled surface into private car park at rear of #82. Micrantha Lane is set lower than most other properties that back onto it, except for #82 and #102. No runoff arriving from Clifton St or Monash Ave. Spoke to resident at 102 Monash, who has a low set driveway in laneway. He only had minor inflows, so therefore unlikely that Williams Rd is a contributing catchment
MET WITH GHD? Yes



SOLUTION:
Provide 2 soakwells in Micratha Lane behind 84 Monash, and locally grade and compact surface to drain into soakwell
ESTIMATED COST: $25000
PRIORITY: 4



Due to limitations with survey data accuracy and detail (particularly kerbs, gutters, and crossovers), or other spatial data, the model results are only partially reflective of the flooding problem(s) and solution(s)

Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation 82 Monash Av, Nedlands

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.53

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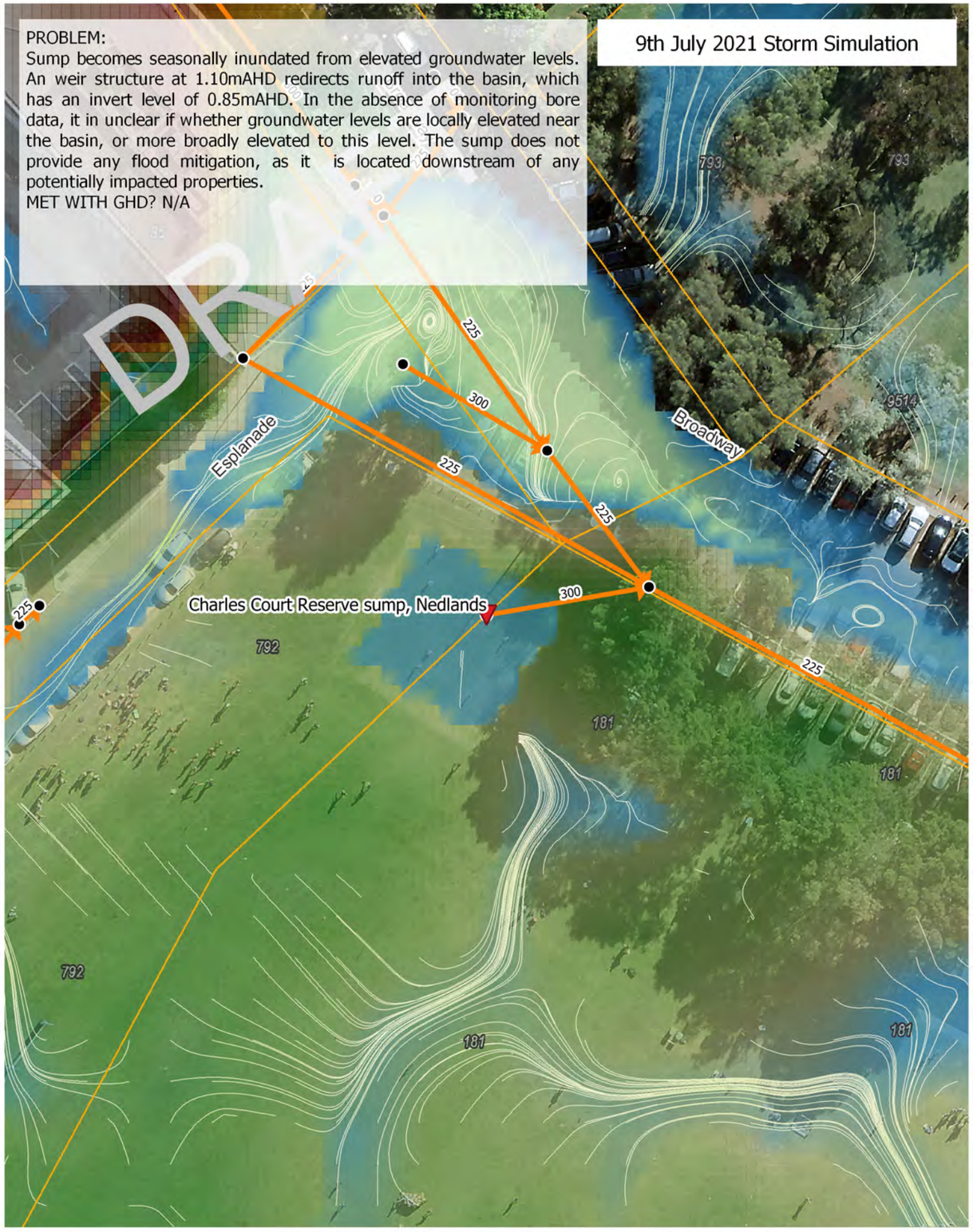
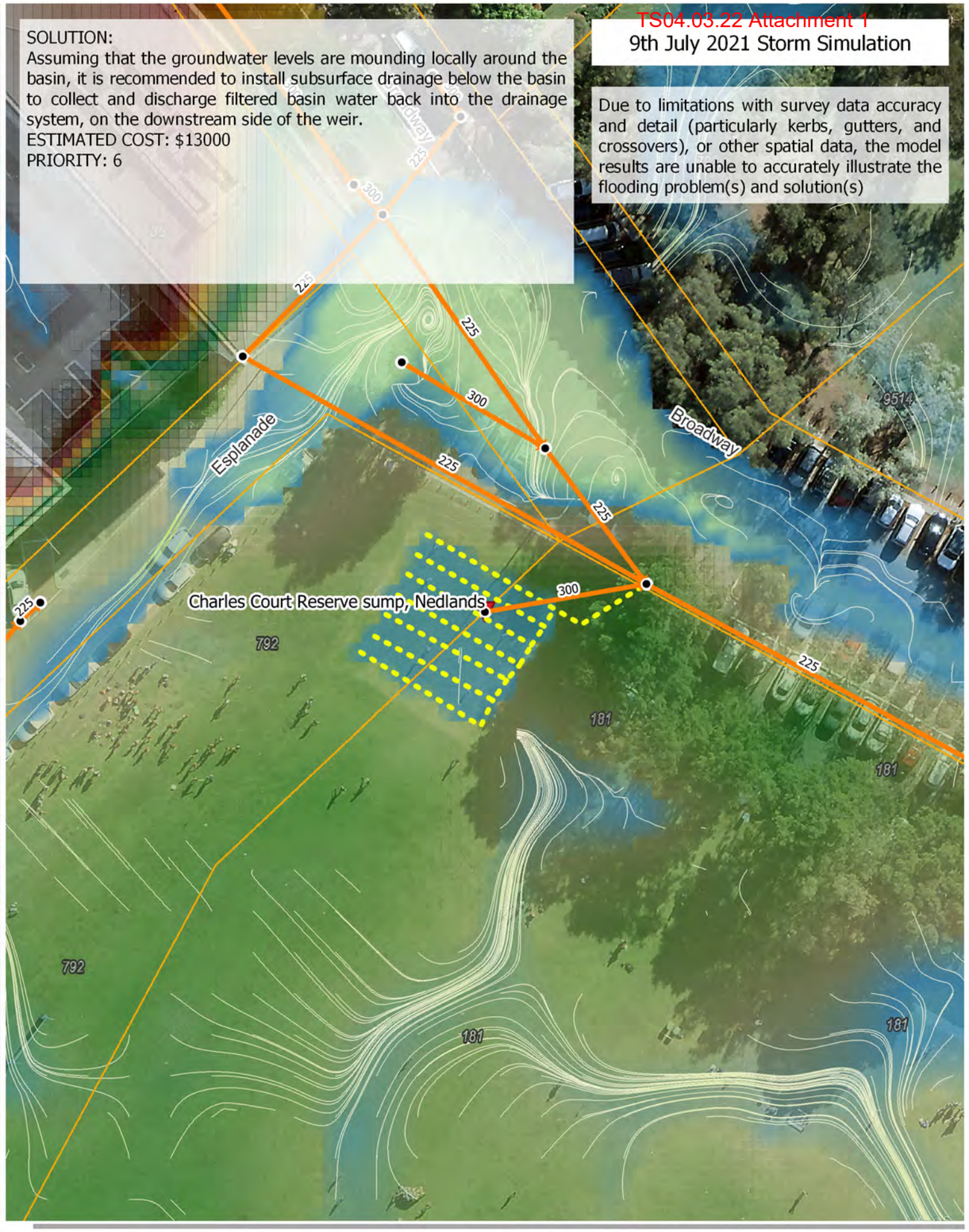
Created By: Nick Deeks





Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
Verge raise
New subsoil drainage
Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxillary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT

Existing Flood Risk and Proposed Flood Mitigation Charles Court Reserve sump,

Project No. **12555894**
Revision No. **A**
Date. **22/02/2022**

FIGURE B.54

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz

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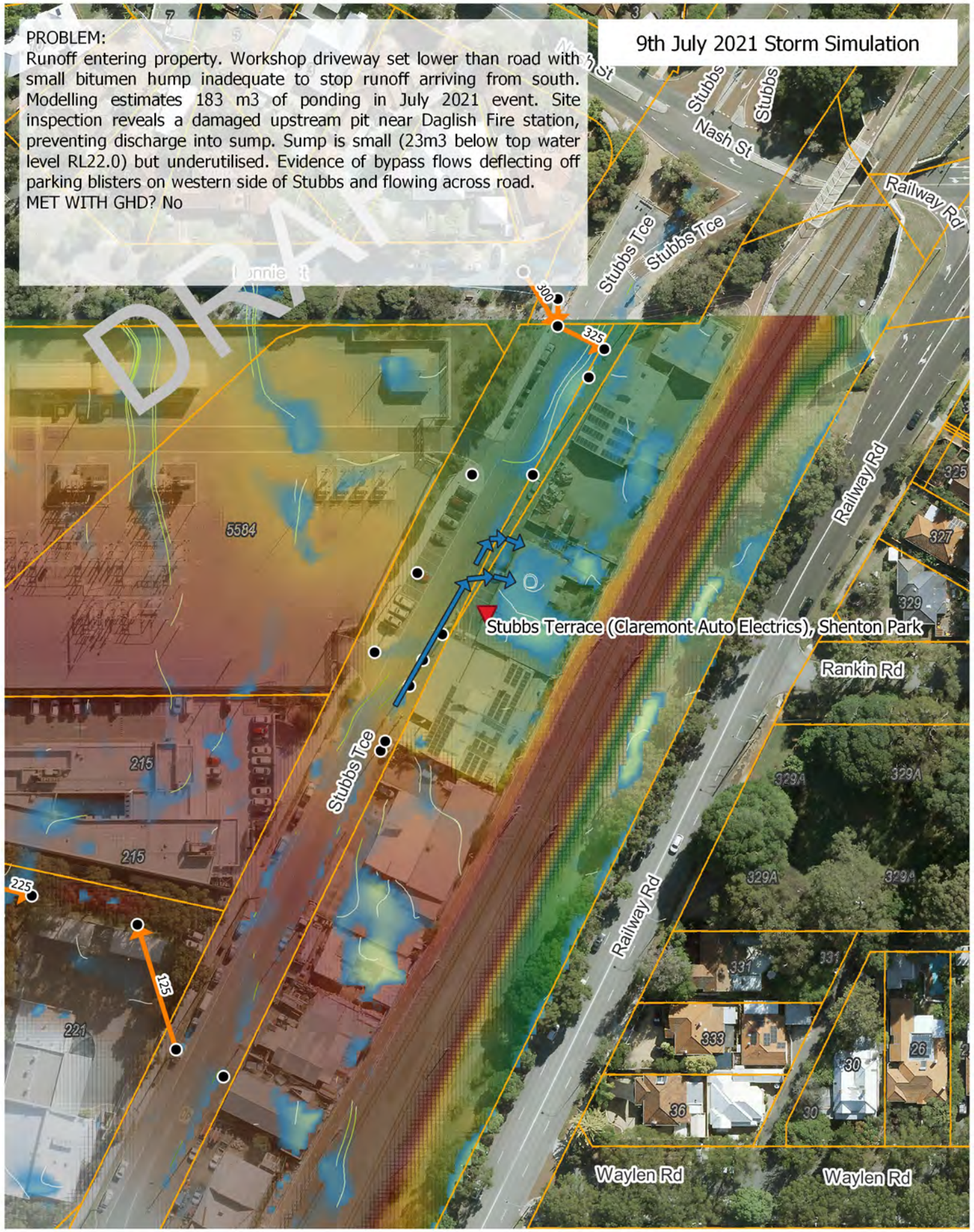
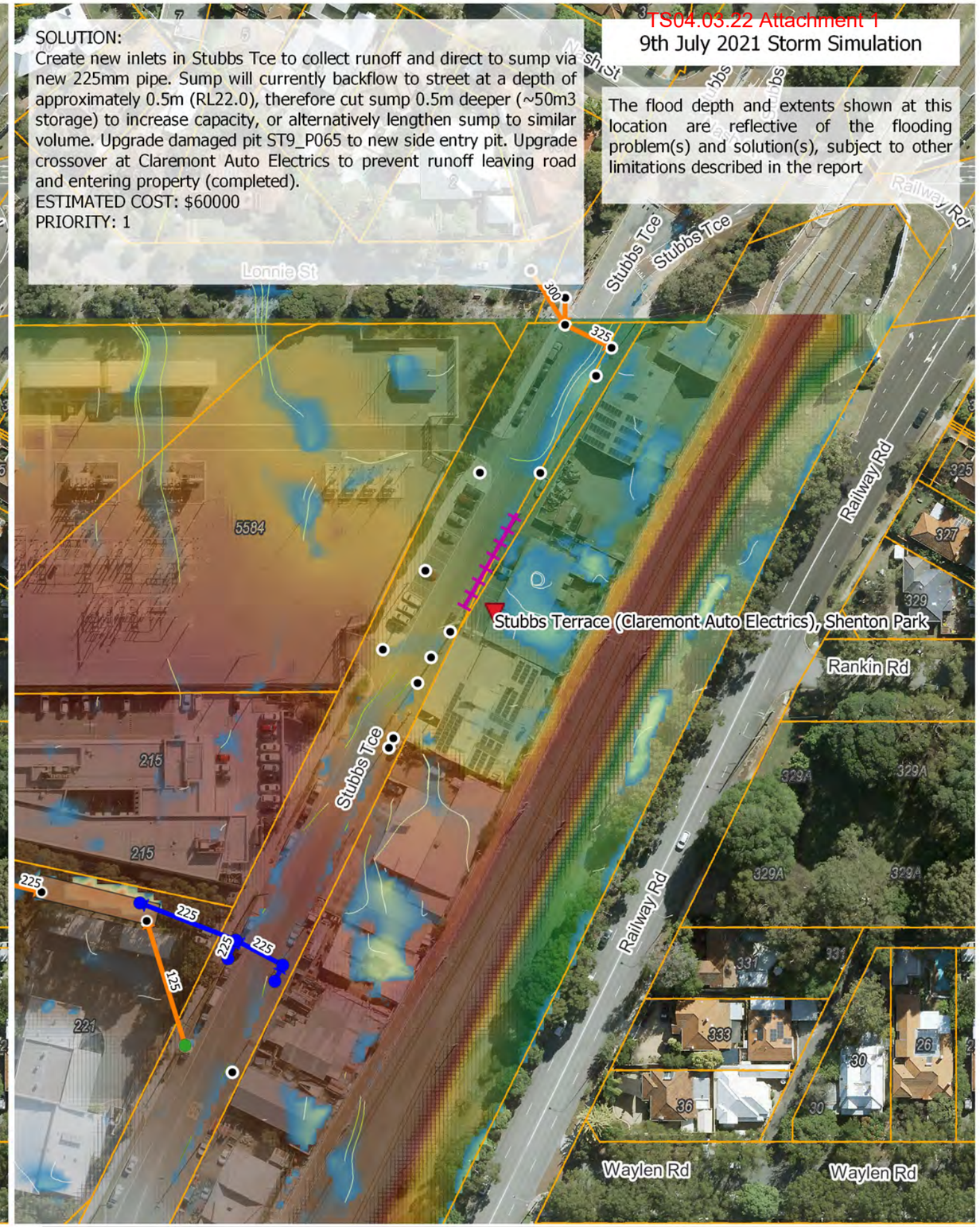
Data Source:

Created By: Nick Deeks





Address of flood report
Existing flow direction
Pits - existing
Pipes - existing
Cadastre (Landgate)
Flood Depth (m): 2 – 0.05
Topography (m AHD): 31 – 17
New pit
Upgraded pit
New pipe
Upgraded pipe
Design flow direction
New or upgraded crossover
New or upgraded kerb
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Proposed earthworks
Proposed infiltration device

Paper Size ISO A3

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

GHD

CITY OF NEDLANDS
DRAINAGE INFRASTRUCTURE UPGRADES PROJECT
Existing Flood Risk and Proposed Flood Mitigation Stubbs Terrace (Claremont Auto

Project No. 12555894
Revision No. A
Date. 22/02/2022

FIGURE B.55

Document Path: \\ghdnet\ghd\AU\Perth\Projects\61\12555894\GIS\Maps\Deliverables\12555894-report_maps_rev01.qgz
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Created By: Nick Deeks

Appendix C

Cost Estimate

Cost estimates are subject to the limitations described in sections 1.2 and 5.3. Addresses with zero quantities and cost are either not subject to upgrade, or are reported as a combined cost at another nearby address.

Table 6 Project quantities and estimated total cost

Address	Quantities													TOTAL COST
	Grated or SEP soakwell (each)	Sealed soakwell (each)	Manhole (each)	Grated or SEP inlet (each)	Raise crossover (each)	Raise kerb (m)	Raise verge (m)	225mm RCP (m)	300mm PRC (m)	375mm RCP (m)	450mm RCP (m)	600mm RCP (m)	Subsurface storage (m^3)	
1 Birdwood Pde, Nedlands	2													$20,800
105 Broadway, Nedlands				3										$31,200
12 Edwards Grn, Floreat					1		15.3							$17,134
121 Dalkeith Road, Dalkeith														
123 Dalkeith Road, Dalkeith			1	2						41				$49,056
13 Minora Rd, Dalkeith														
13 Taylor Rd, Nedlands	1		2	10		15	130	2			28	190		$381,238
15 Taylor Rd, Nedlands														
18 Bulimba Rd, Nedlands														
19 Taylor Rd, Dalkeith														
19 Watkins Rd, Dalkeith					3									$15,600
1A Doonan Rd, Nedlands	2	1		7										$104,000

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Address	Quantities													TOTAL COST
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27 Bedford St, Nedlands	2	5		5							68.4			$155,922
27 Loftus St, Nedlands					1									$5,200
28 Loch St, Nedlands				2				60.5						$46,755
28 Watkins Rd, Dalkeith	2													$20,800
3 Archdeacon St, Nedlands					1		11							$13,780
3 Sutcliffe St, Dalkeith			1	4					97					$93,613
30 Adderley St, Mount Claremont					1	5	5							$18,200
30 Bulimba Rd, Nedlands					1									$5,200
32 Quintillian Rd, Mount Claremont	2													$20,800
33 Beatrice Rd, Dalkeith				2	1			2						$26,858
37 Aberdare Rd, Nedlands			2	4					4				600	$376,116
39 Aberdare Rd, Nedlands														
39A Aberdare Rd, Nedlands														
3A Bulimba Rd, Nedlands	1				3	5								$35,100

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3A Sayer St, Swanbourne		6		4				24		41.5				$132,369
4 Hynes Rd, Dalkeith				1	1			19.5						$23,966
40 Gallop Rd, Dalkeith	8			3	1									$119,600
48 The Avenue, Nedlands			2	2			62						100	$141,960
4A Waroonga Rd, Nedlands		1		1	1		15	3			11			$43,992
54 Jenkins Road, Nedlands														
55 Adderley St, Mount Claremont					1									$5,200
57 Adderley St, Mount Claremont					1									$5,200
59 Goldsmith Rd, Dalkeith					1									$5,200
59 Philip Rd, Dalkeith				2				5	5				30	$40,690
5a Doonan Rd, Nedlands														
6 Joyce St, Dalkeith														
60 Jenkins Av, Nedlands					1		30				16			$35,880
62 Goldsmith Rd, Dalkeith														

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65 Hobbs Av, Dalkeith	1				1									$15,600
66 Archdeacon St, Nedlands					1									$5,200
67 Stanley St, Nedlands				3	2		7	30						$59,930
69 Bruce St, Nedlands					2									$10,400
69 Stanley St, Nedlands														
7 Davies Rd, Dalkeith				3									30	$46,800
70 Hobbs Av, Dalkeith			1	6				46			130			$151,684
71 Philip Rd, Dalkeith					2									$10,400
71 Riley Rd, Dalkeith					2		3		41					$30,329
71 Stanley St, Nedlands														
73 Stanley St, Nedlands														
80 Monash Av, Nedlands					3		17							$28,860
82 Monash Av, Nedlands	2						6							$25,480
Charles Court Reserve sump, Nedlands								30						$12,870

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	Grated or SEP soakwell (each)	Sealed soakwell (each)	Manhole (each)	Grated or SEP inlet (each)	Raise crossover (each)	Raise kerb (m)	Raise verge (m)	225mm RCP (m)	300mm PRC (m)	375mm RCP (m)	450mm RCP (m)	600mm RCP (m)	Subsurface storage (m^3)	
Stubbs Terrace (Claremont Auto Electrics), Shenton Park				4				42						$59,618

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Appendix D

Councillor presentation

→ Nick Deeks
Technical Director - Hydrology

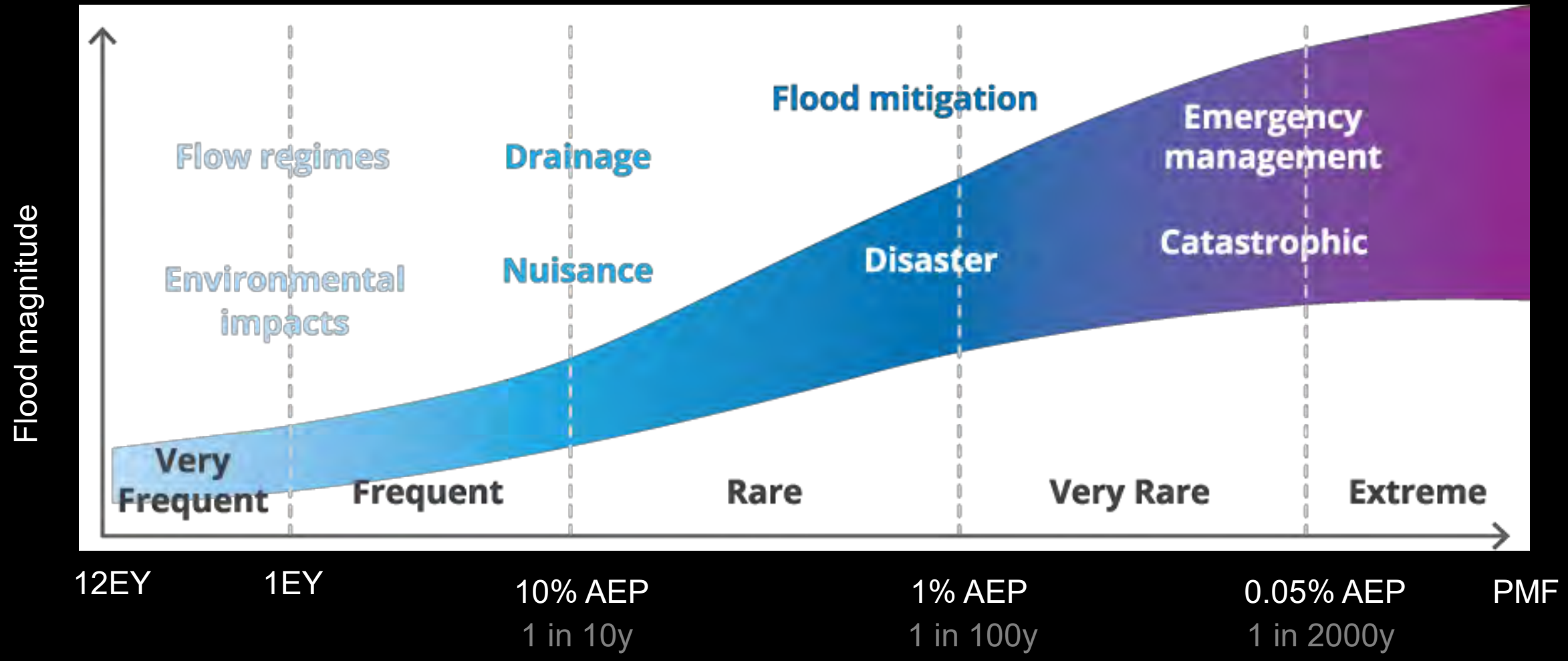
City of Nedlands flood mitigation and drainage improvements

Welcome

Background and objectives

→ City of Nedlands

Drain nuisance runoff, protect assets from flood damage, maintain flood safety



Typical causes of flooding

- Planning and design:
  - Uncontrolled high runoff from impervious surfaces
  - Undersized stormwater infrastructure (e.g. pits, pipes, kerbs, soakwells, sumps, overland flow paths, etc.)
  - Poor design

- Environmental:
  - High intensity rainfall events
  - Blockage from vegetation, litter or sediment

- Operational:
  - Lack of maintenance (e.g. pipe jetting, pit vacuuming, sump cleaning, etc.)
  - Unrepaired damaged assets (e.g. broken pipes)

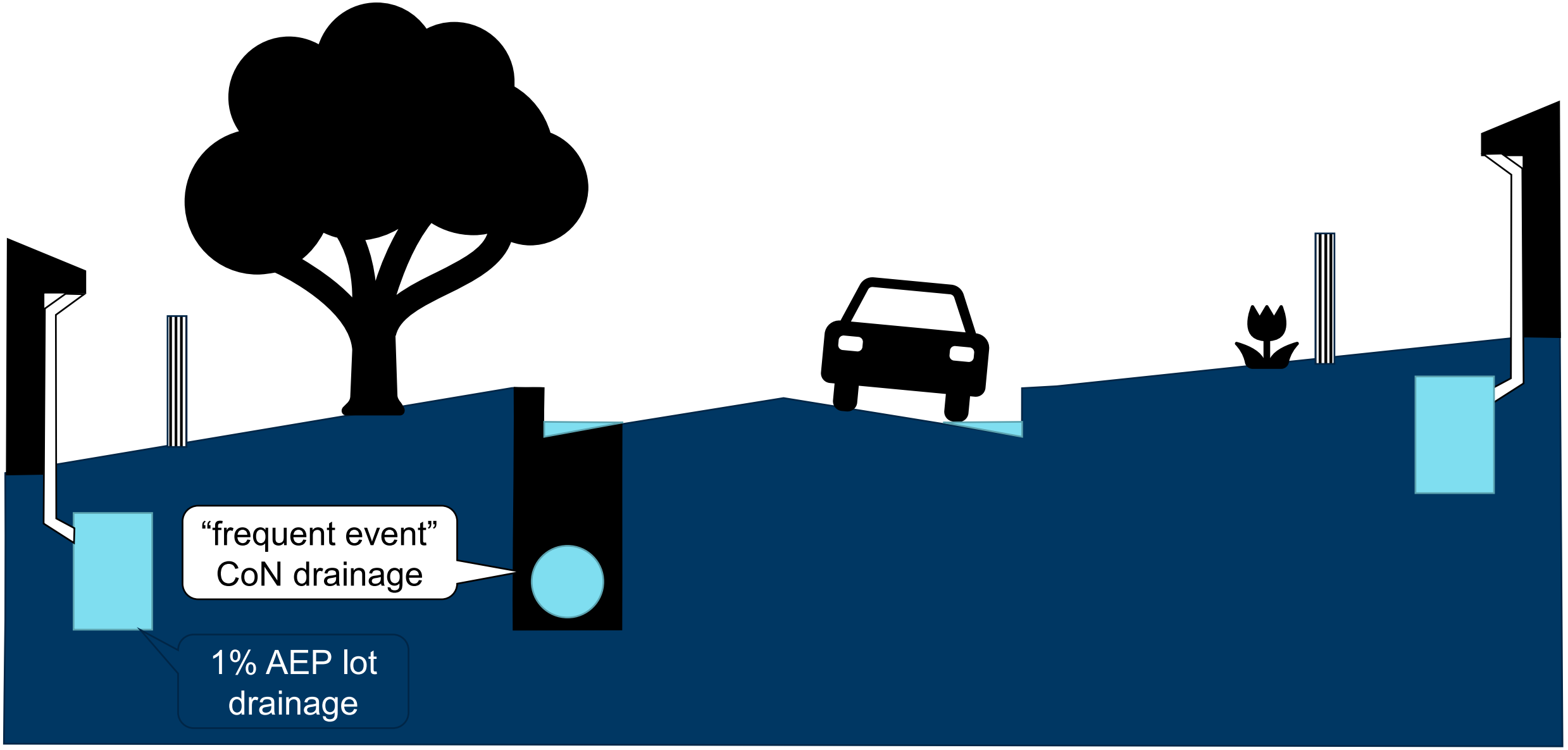
Background and objectives

Background and objectives

TS04.03.22 Attachment 1

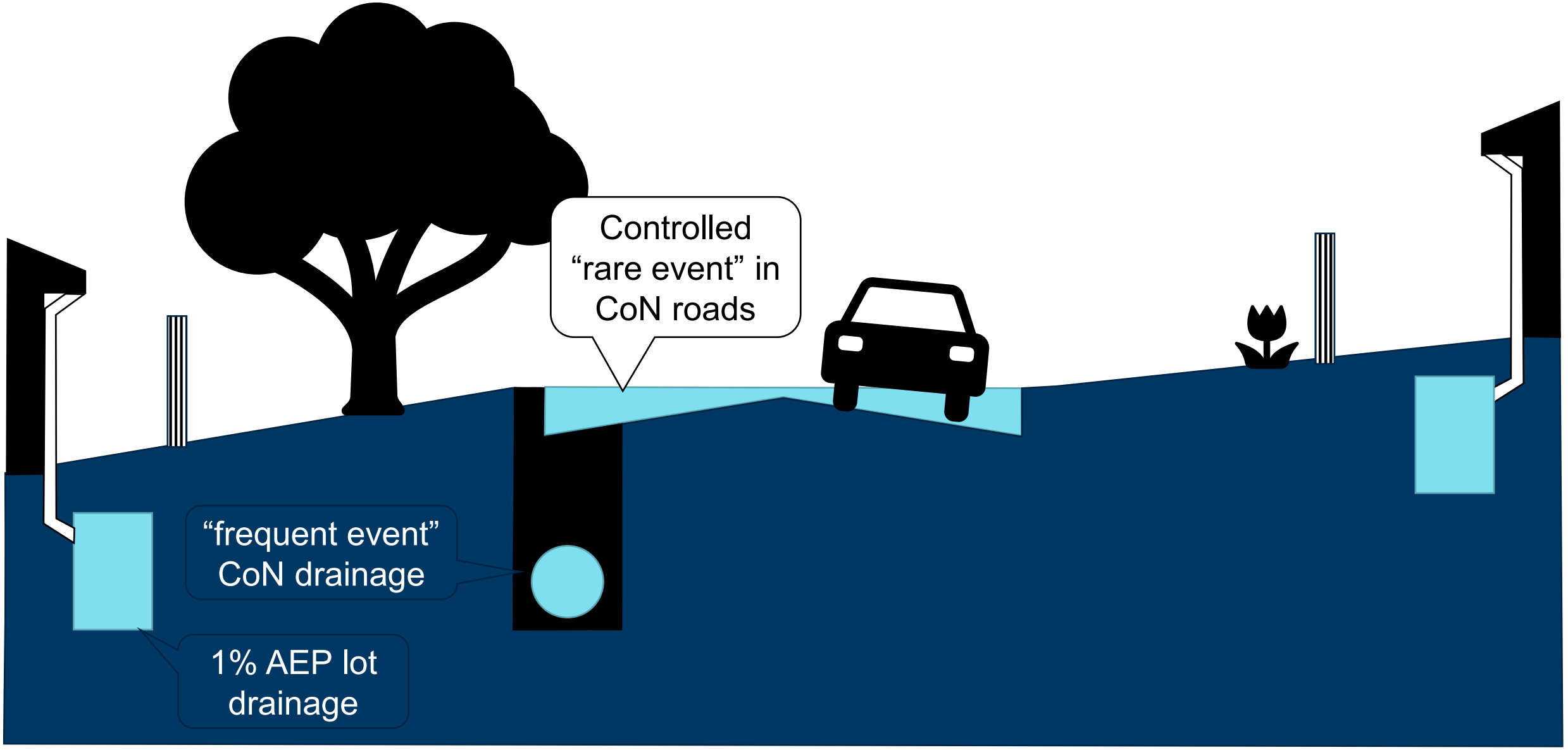
Background and objectives

TS04.03.22 Attachment 1



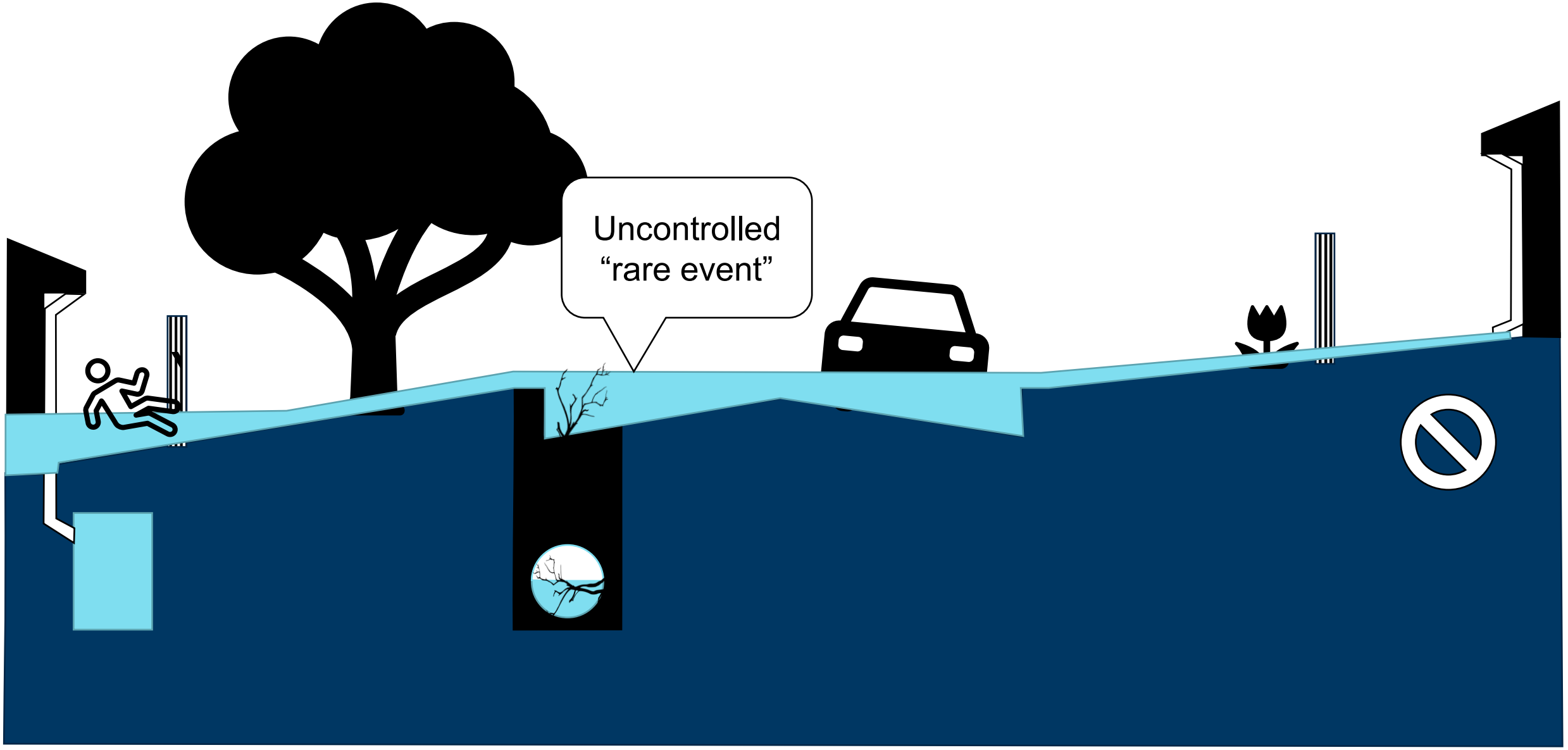
Background and objectives

TS04.03.22 Attachment 1



Background and objectives

TS04.03.22 Attachment 1

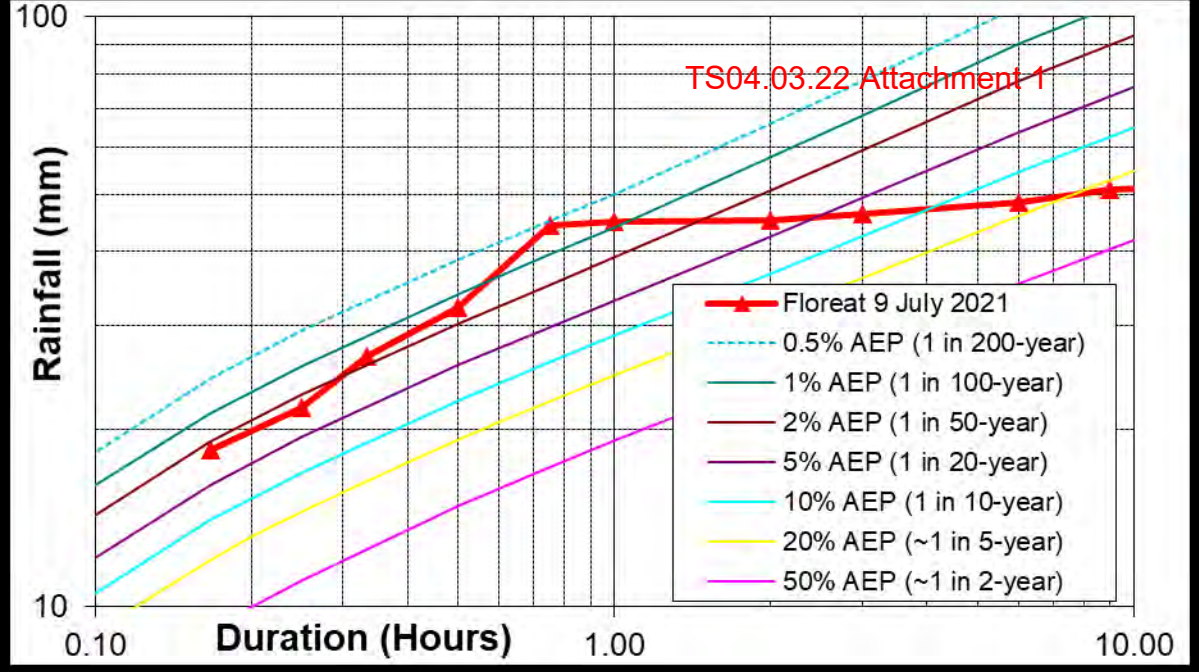


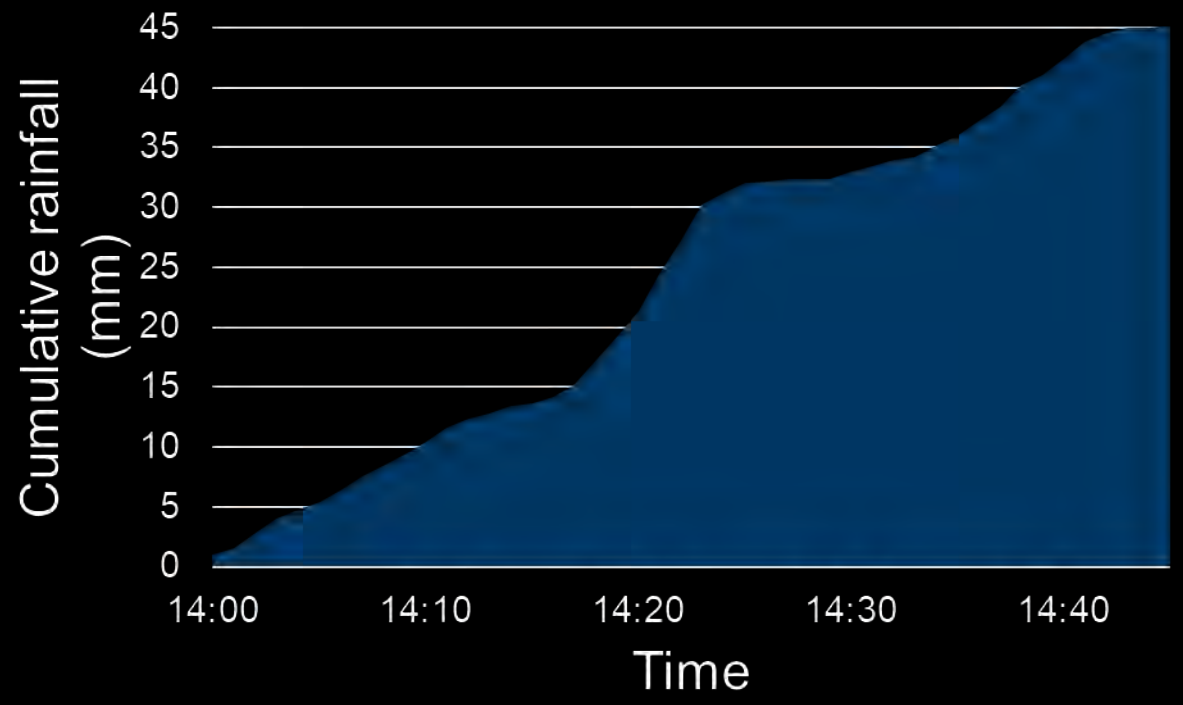
9th July Storm and other historical events

→ City of Nedlands

9th July Storm Event

→ 1 in 180-year storm over 45 mins

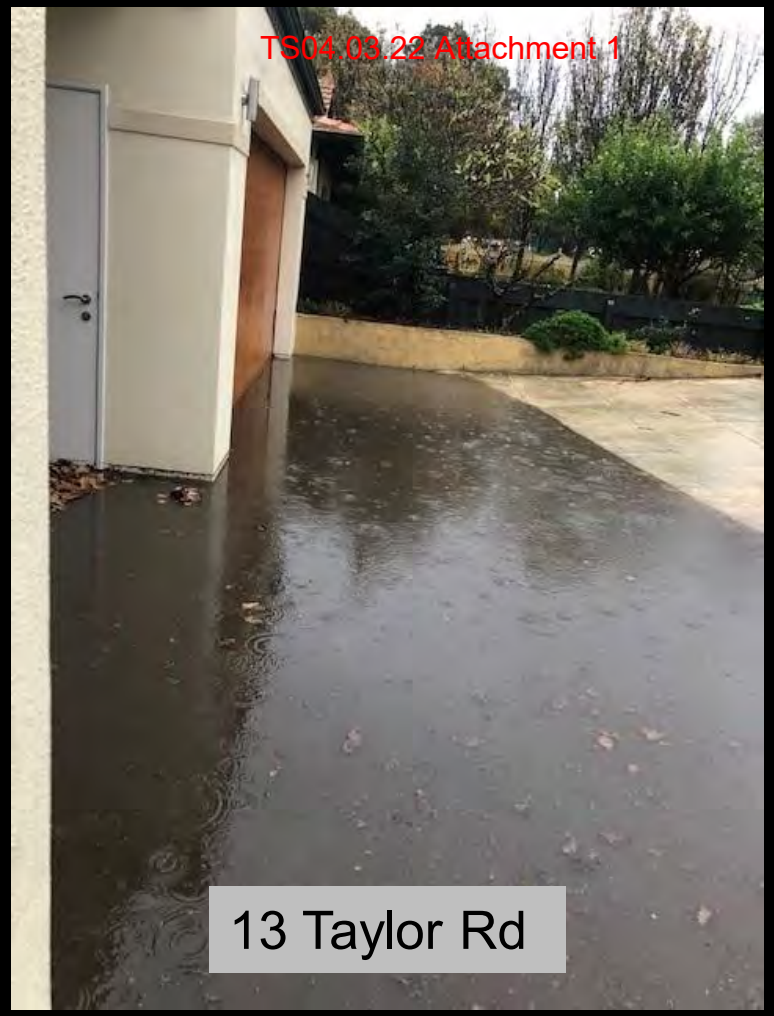




Date	Rainfall (mm)	Duration	Probability
9 July 2021	44.4 (Floreat) 46.8 (Kings Park)	45-mins	1 in 180-years
15 Jan 2018	119.4	18-hours	>1 in 100-years
9-10 Feb 2017	85.9	6-hours	1 in 50-years
22 Mar 2010	27.6	20-mins	1 in 75-years

9th July Storm

→ **Resident reports**



9th July Storm

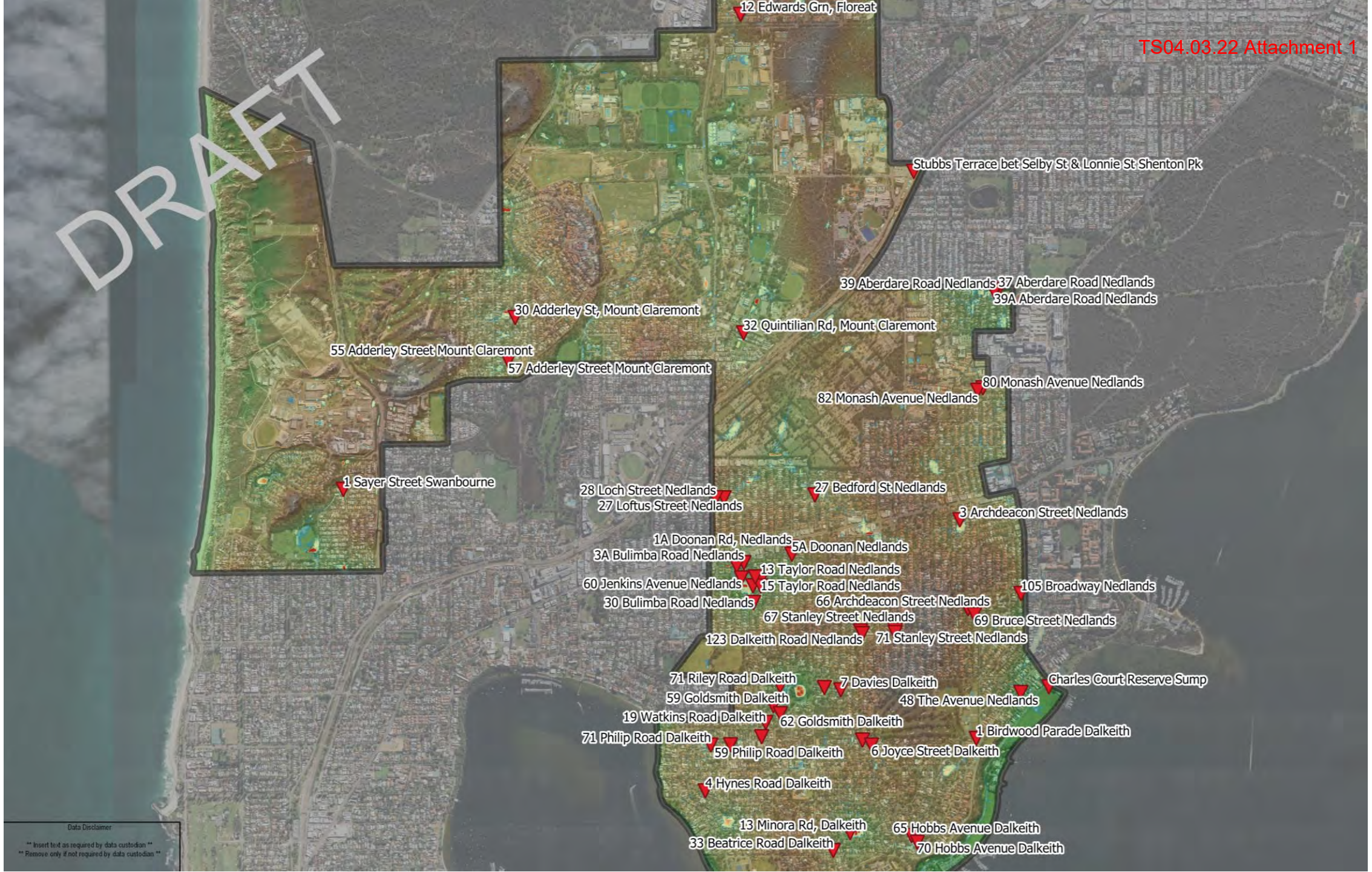
→ **Resident reports**

9th July Storm Event

→ **Resident reports**

Flood modelling

→ City of Nedlands


TS04.03.22 Attachment 1
DRAFT
12 Edwards Grn, Floreat
Stubbs Terrace bet Selby St & Lonnie St Shenton Pk
39 Aberdare Road Nedlands
37 Aberdare Road Nedlands
39A Aberdare Road Nedlands
30 Adderley St, Mount Claremont
32 Quintilian Rd, Mount Claremont
55 Adderley Street Mount Claremont
57 Adderley Street Mount Claremont
80 Monash Avenue Nedlands
82 Monash Avenue Nedlands
1 Sayer Street Swanbourne
28 Loch Street Nedlands
27 Loftus Street Nedlands
27 Bedford St Nedlands
3 Archdeacon Street Nedlands
1A Doonan Rd, Nedlands
5A Doonan Nedlands
3A Bulimba Road Nedlands
13 Taylor Road Nedlands
60 Jenkins Avenue Nedlands
15 Taylor Road Nedlands
105 Broadway Nedlands
30 Bulimba Road Nedlands
66 Archdeacon Street Nedlands
67 Stanley Street Nedlands
69 Bruce Street Nedlands
123 Dalkeith Road Nedlands
71 Stanley Street Nedlands
71 Riley Road Dalkeith
7 Davies Dalkeith
Charles Court Reserve Sump
59 Goldsmith Dalkeith
48 The Avenue Nedlands
19 Watkins Road Dalkeith
62 Goldsmith Dalkeith
1 Birdwood Parade Dalkeith
71 Philip Road Dalkeith
59 Philip Road Dalkeith
6 Joyce Street Dalkeith
4 Hynes Road Dalkeith
13 Minora Rd, Dalkeith
65 Hobbs Avenue Dalkeith
33 Beatrice Road Dalkeith
70 Hobbs Avenue Dalkeith
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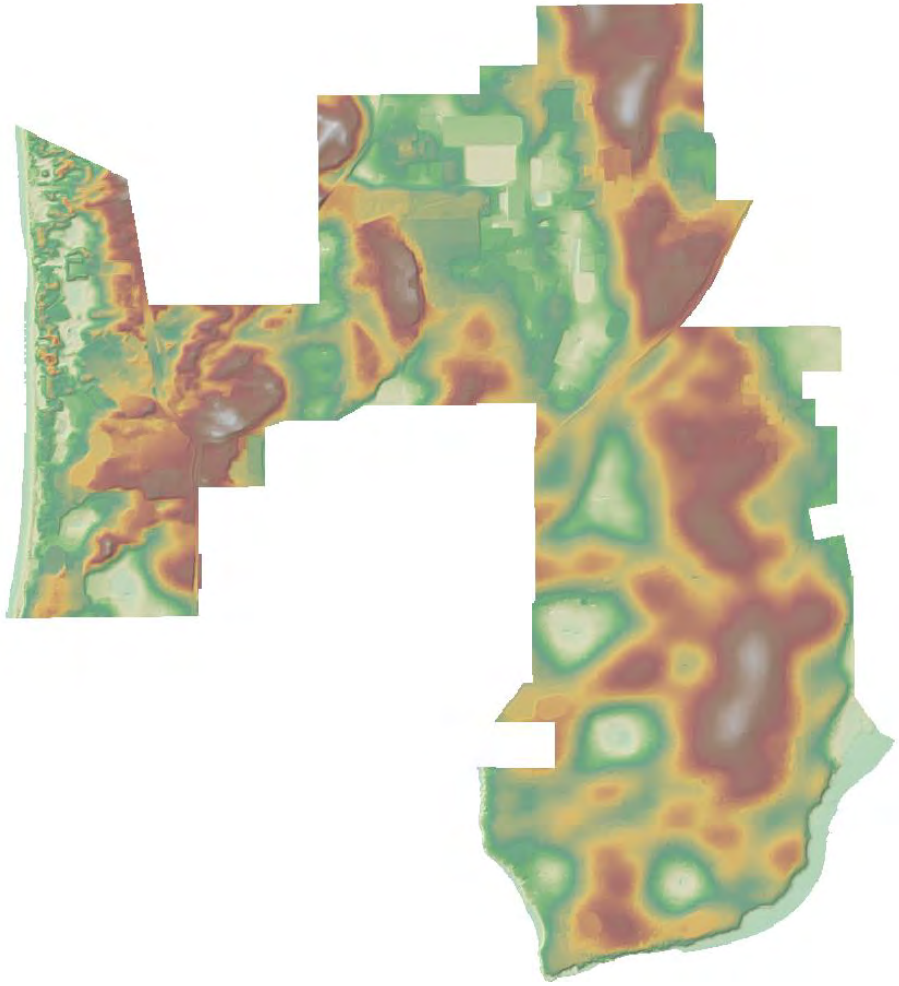
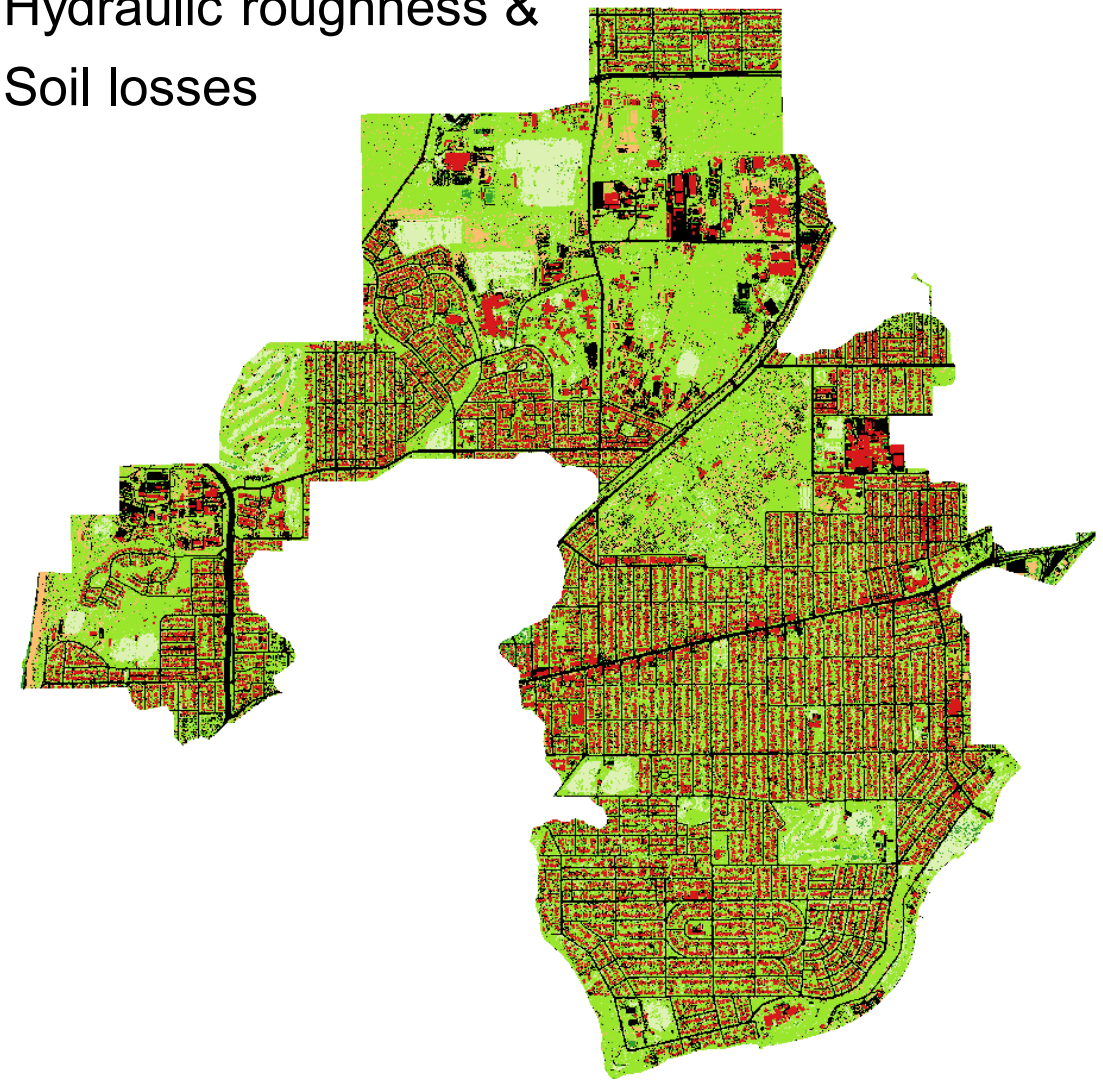
Model inputs

Topography



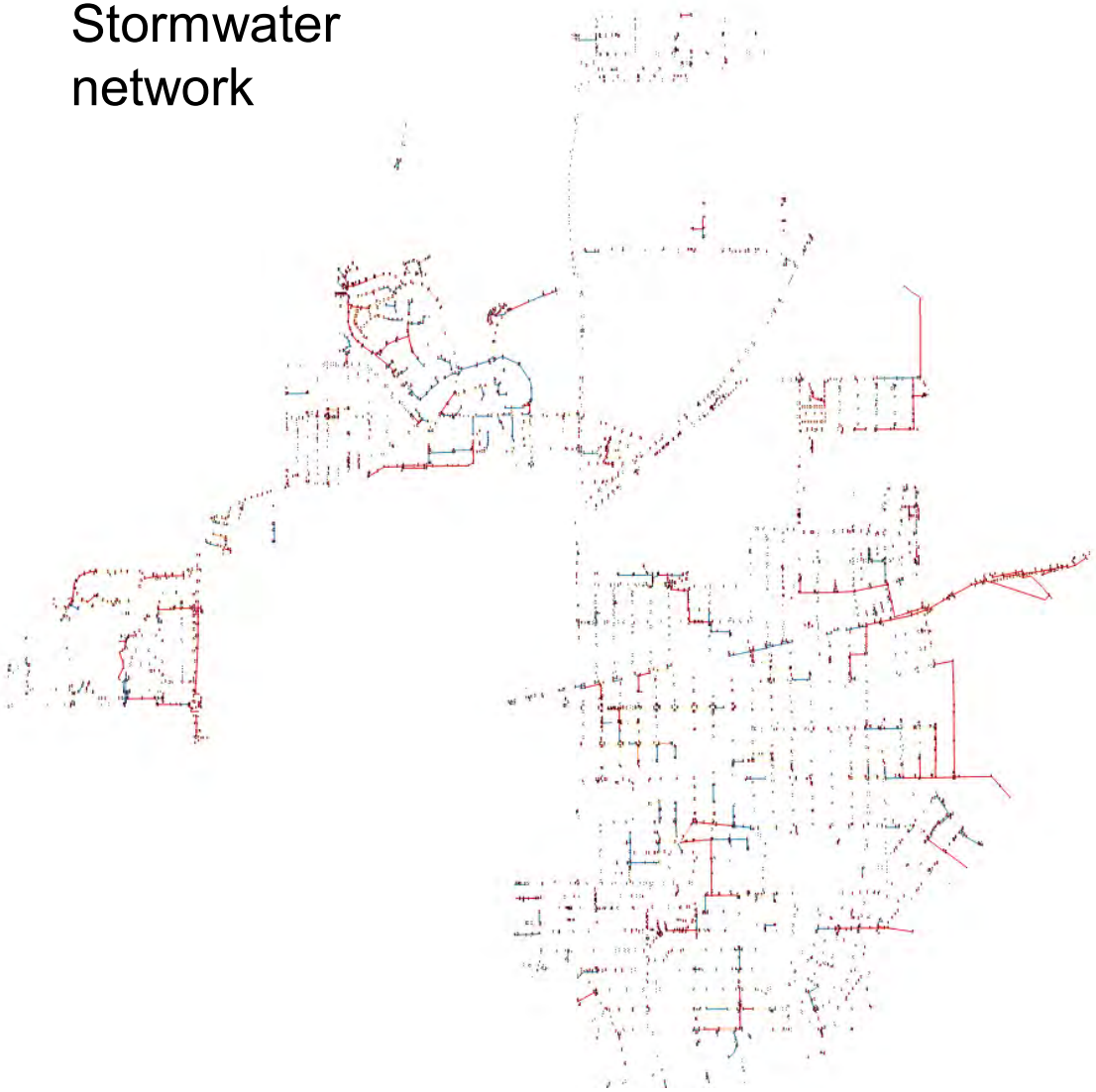
Hydraulic roughness &

Soil losses



Model inputs

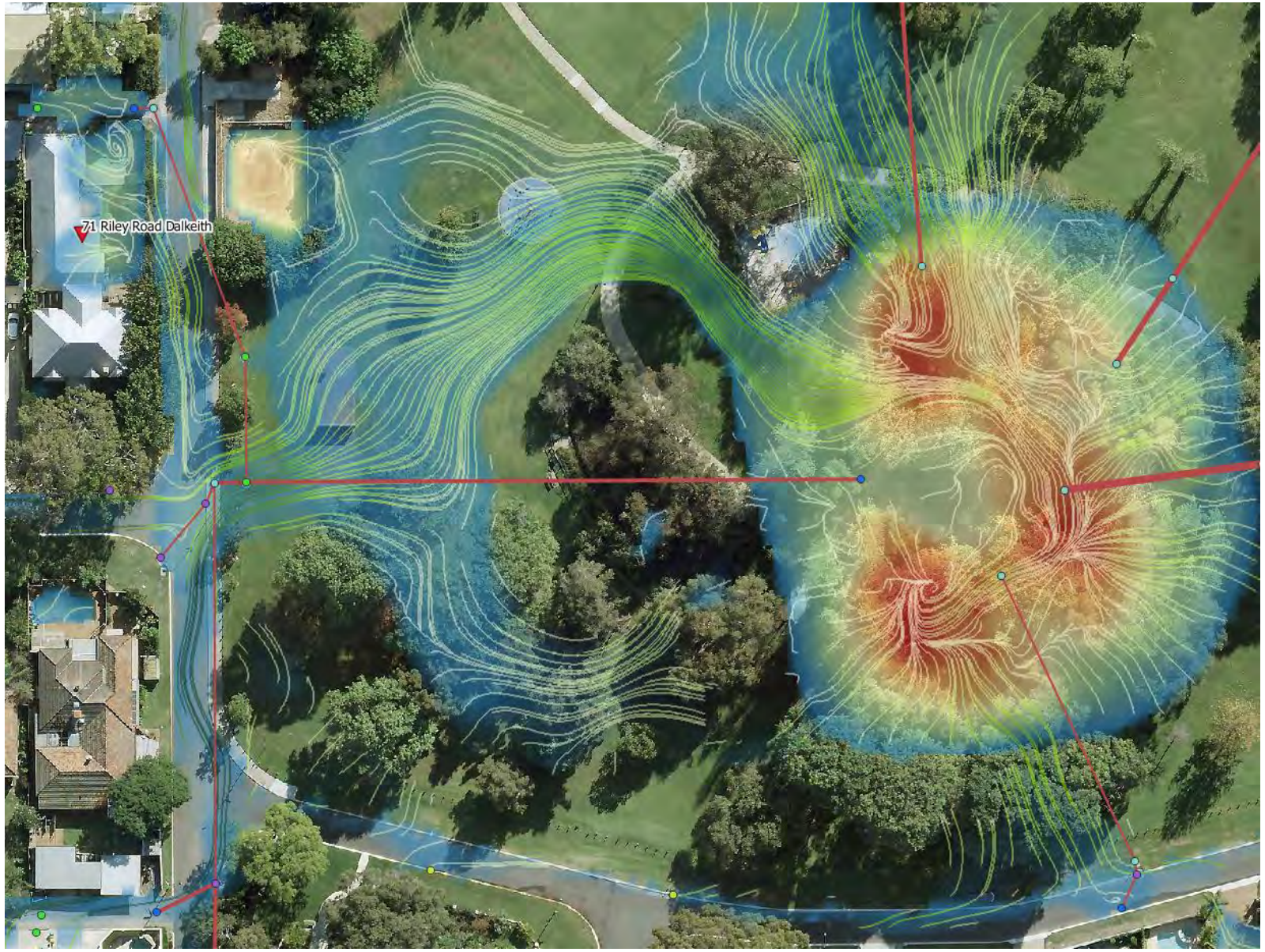
Stormwater network



Buildings

Model outputs

TS04.03.22 Attachment 1



Drainage improvements and costs

→ City of Nedlands

General recommendations

TS04.03.22 Attachment 1

Policy changes:

- Residential and commercial lots subject to development approval, where impervious area will be increased, are to retain 1% AEP event on-site
- Roads to be trafficable in 20% AEP storm
- Roads and drainage, in combination, to safely collect and convey 1% AEP storm

Maintenance:

- Prioritise cleaning and inspection of pits located in road sags

Engineering:

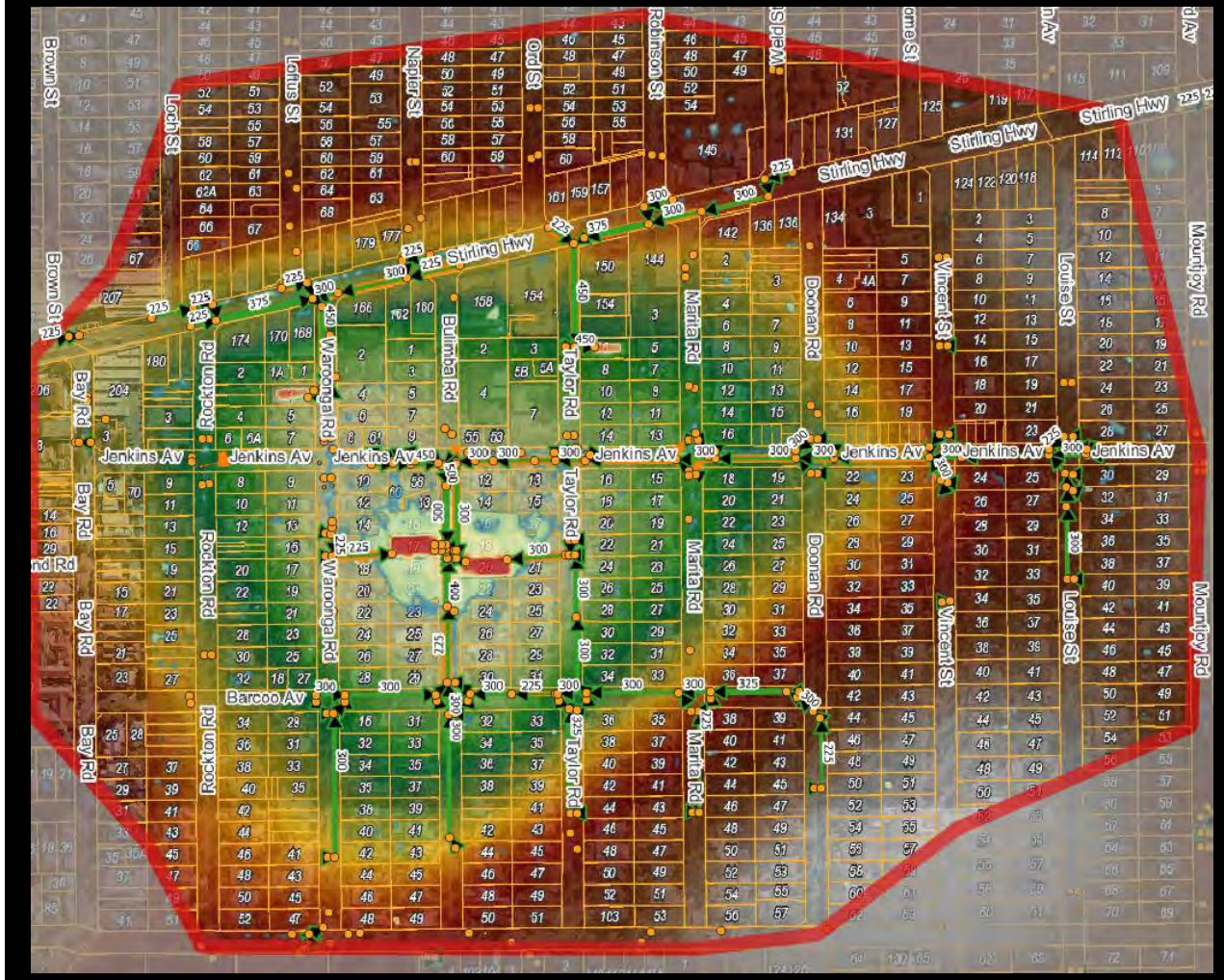
- Risk based asset upgrade and renewal program and/or asset inspection program

Bulimba sump catchment

Problem:

11 reports of flooding

Large catchment covering Bay, Rockton, Waroonga, Bulimba, Taylor, Marita, Doonan, Vincent, Louise, Taylor, Barcoo, Princess, Stirling Hwy and north of Hwy.



Bulimba sump catchment

TS04.03.22 Attachment 1

Problem:

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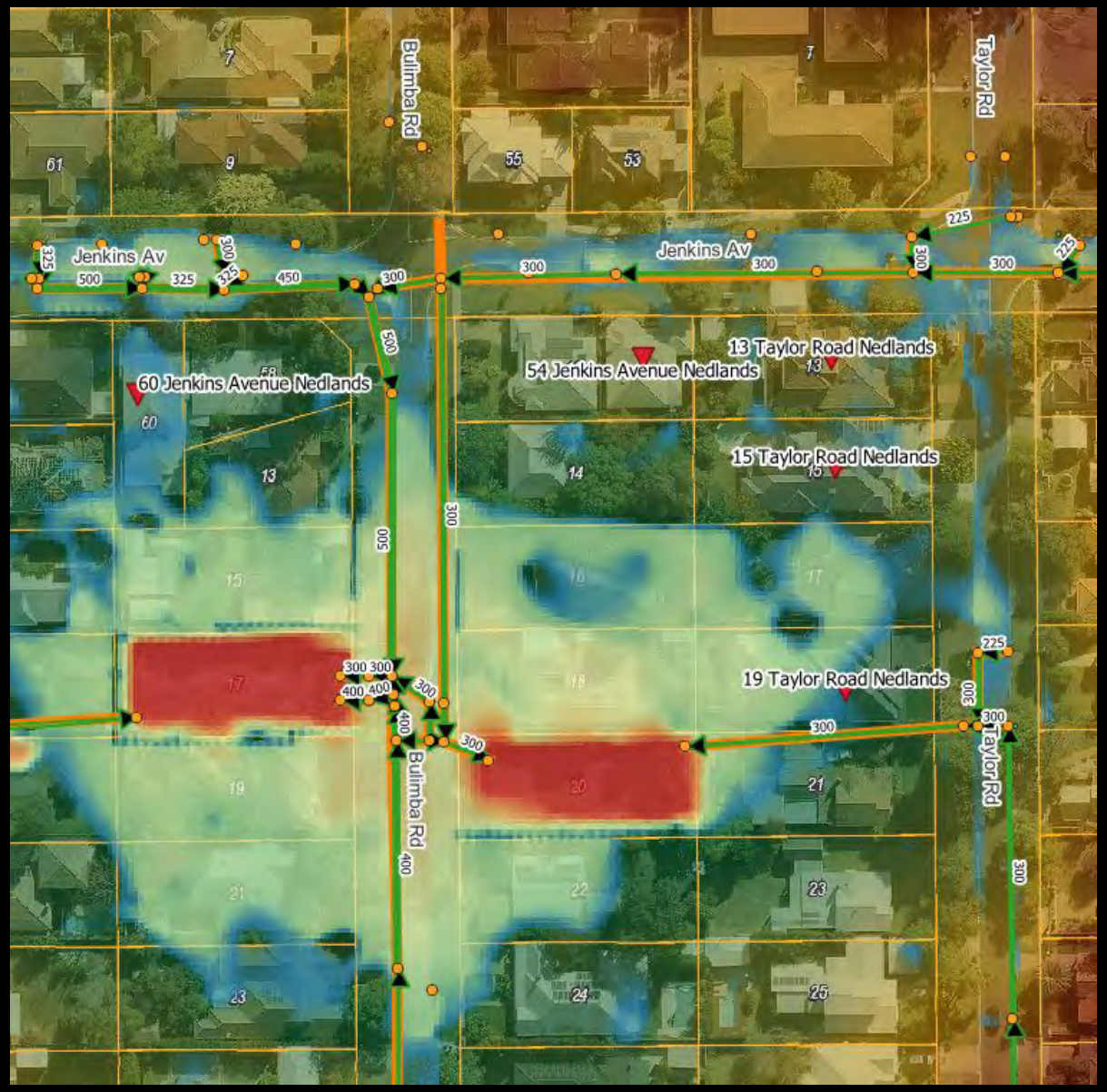
Large catchment covering Bay, Rockton, Waroonga, Bulimba, Taylor, Marita, Doonan, Vincent, Louise, Taylor, Barcoo, Princess, Stirling Hwy and north of Hwy.

No safe flood route to basins, either via overland or pipes. Trapped sag point in roads.



Bulimba sump catchment

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No safe flood route to basins, either via overland or pipes. Trapped sag point in roads.

Upstream basins ineffective.

TS04.03.22 Attachment 1

Bulimba sump catchment

Problem:

11 reports of flooding

Large catchment covering Bay, Rockton, Waroonga, Bulimba, Taylor, Marita, Doonan, Vincent, Louise, Taylor, Barcoo, Princess, Stirling Hwy and north of Hwy.

No safe flood route to basins, either via overland or pipes. Trapped sag point in roads.

Upstream basins ineffective.

Safe active streets upgrade causing localised problems

TS04.03.22 Attachment 1

Bulimba sump catchment

Solution:

1. Employ under-utilised upstream sumps in Waroonga and Taylor by creating an overland flow path from road (not just pipe)

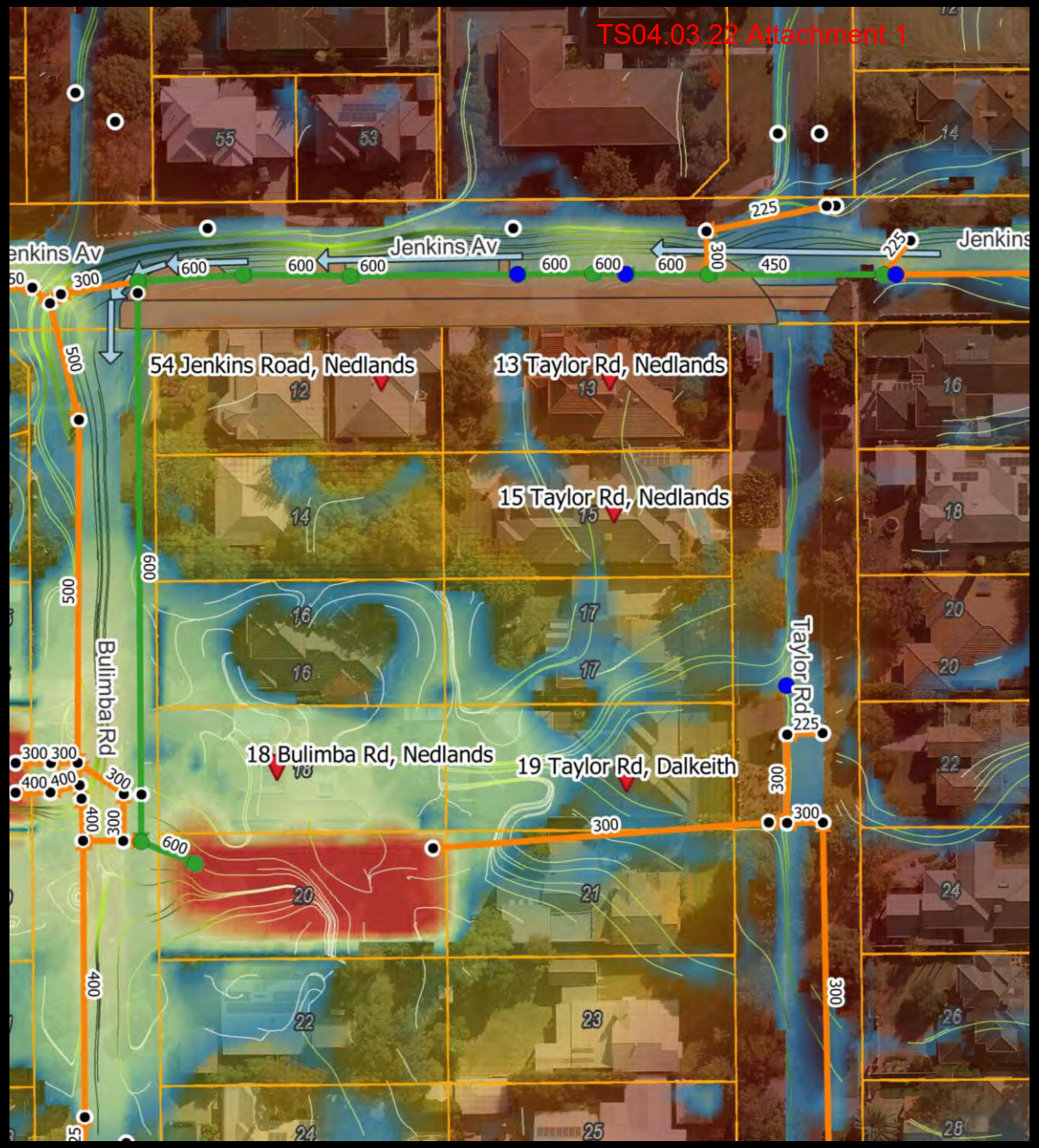
TS04.03.22 Attachment 1

Bulimba sump catchment

Solution:

1. Employ under-utilised upstream sumps in Waroonga and Taylor by creating an overland flow path from road (not just pipe)
2. Upgrade pipes from Jenkins into Bulimba then basin as shown.
3. Mountable speed hump preventing overland flow into Taylor Rd
4. Raised verge protecting Jenkins Rd lots
5. Additional inlets in Jenkins Rd

$381k



3 Sutcliffe St, Dalkeith

Problem:

Significant ground floor flooding. Large catchment approaching from south and east. Resident reported surcharging of junction pit in front of property, flooding of property.

The 600mm pipe has greater capacity than the combined inlet pipes. Surcharging can only be explained by transient blockage of 600mm pipe.

Overland flow catchment limited to Sutcliffe St only, between Melvista Av and Hotchin St, which isn't big enough to flood property, therefore flooding must be from stormwater system.

3 Sutcliffe St, Dalkeith

Solution:

1. To address stormwater system, add a 300mm surcharge pipe in Hotchin St, set higher than main outlet so that it will only activate when main outlet is full. Connect to downstream pit, which runoff will surcharge in a major event and has a safe overland flow path to Mason Gardens via Adelma Rd
2. With extra capacity available in the 600mm pipe, add additional inlets in Sutcliffe St to drain surface water before it enters lots

$94k

Model still shows some flooding due to survey problems

Doonan Rd, Nedlands

Problem:

Runoff appears to overtop kerb and/or crossover and drain down driveways, set much lower than road level. Catchment includes Stirling Hwy. Properties on western side of Doonan are low set, and there is no pit and pipe network, only soakwells.

Doonan Rd, Nedlands

Solution:

Add soakwells to seam of road to collect excess runoff from highway

Note: option of raising kerbs and piping down to Jenkins considered but works will be extensive and put greater pressure on Jenkins Rd flooding

$104k

3A Sayer St, Swanbourne

Problem:

Runoff entering verge at Jameson St, flowing down verge and flooding Sayer Street properties

Solution:

Upgrade pipe from 225mm to 375mm and add 2 extra inlets in Jameson St. Add 6 large soakwells to verge ($132k)

48 The Avenue, Nedlands

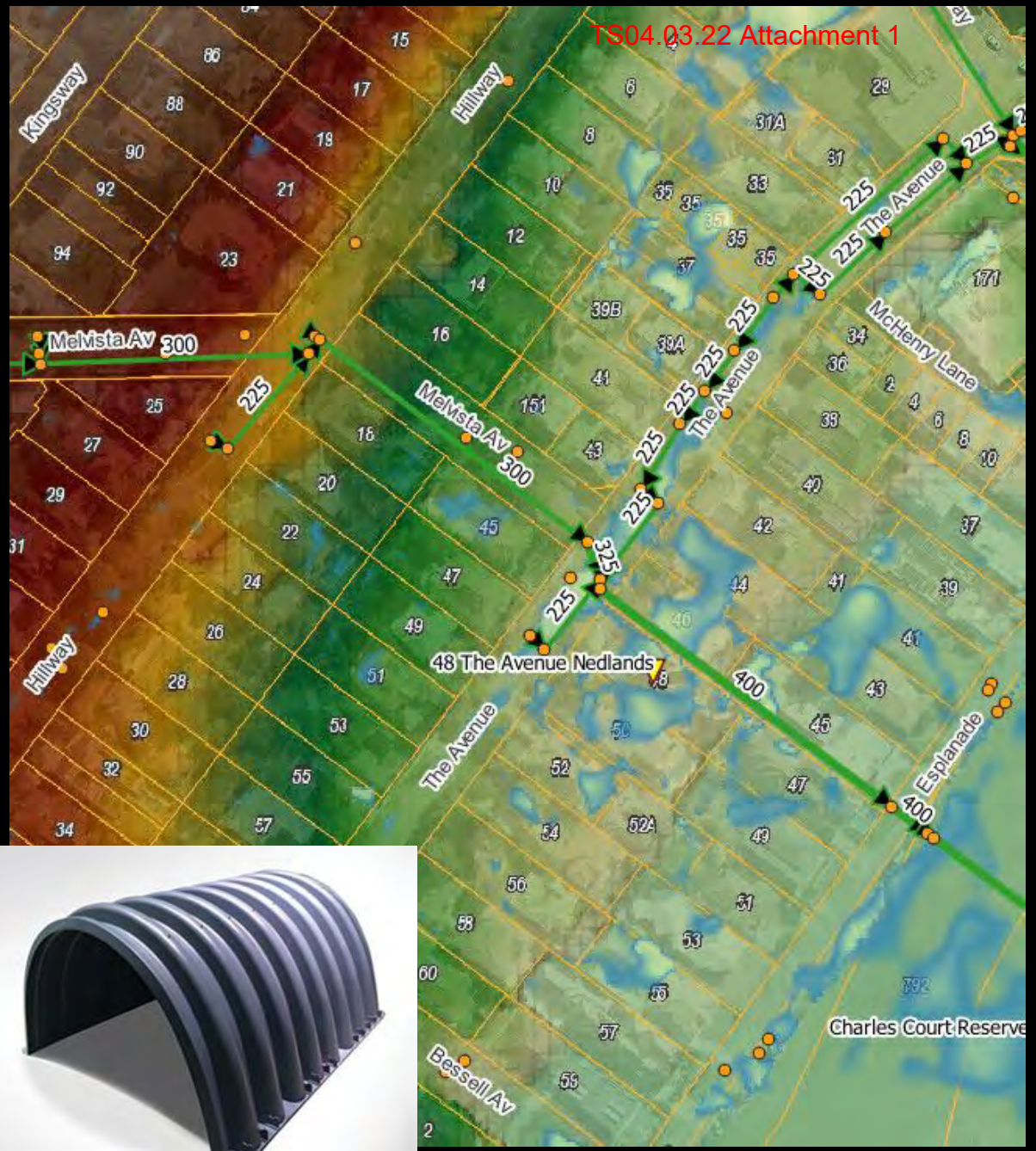
Problem:

Trapped low in The Avenue. Capacity of pit and 400mm pipe network exceeded. Flooding of garage via driveway.

Solution:

Upgrading pipe capacity will be effective but costly and risky due to proximity to buildings. Piping to Bessel Av or Broadway also costly and disruptive. As a cheaper alternative, raise the verge between 44-48 The Avenue, add new inlets, and 100m^3 underground storage chamber in The Avenue to attenuate flow rates, and a surcharge pit in Charles Court Reserve to improve pipe performance.

$142k



6 Joyce St, Dalkeith

Problem:

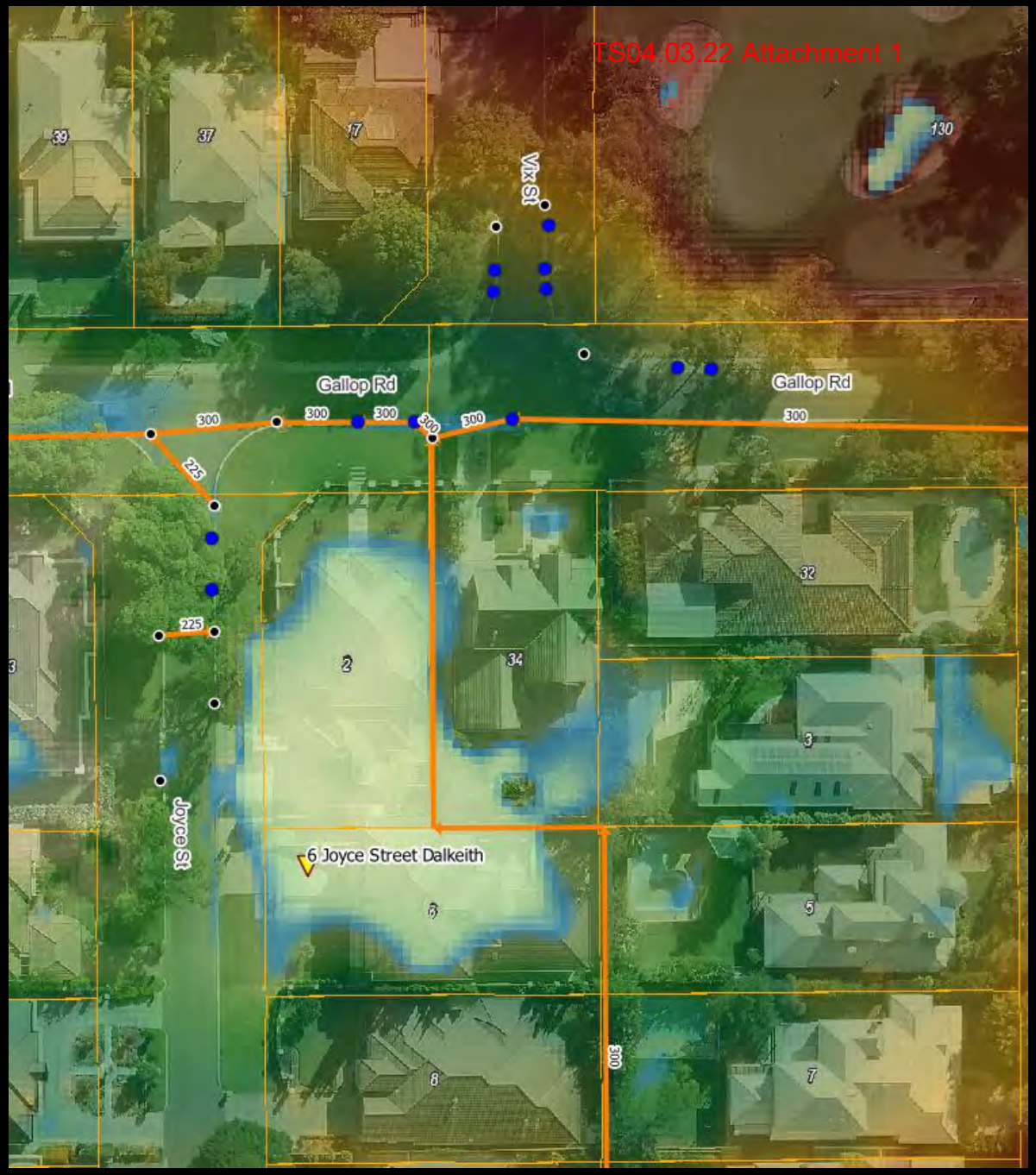
Runoff arriving from Gallop Rd (east) and Vix St, crossing into verge at 34 Gallop Rd, and following verge to basement garage in 6 Joyce St. Crossovers and kerbs in Gallop new and meet spec. Pipe system at capacity.

6 Joyce St, Dalkeith

Solution:

Due to known problems downstream of this site, and the fact that the kerbing and crossovers appear to meet spec, it is recommended to capture and infiltrate runoff before it arrives at 34 Gallop Rd rather than extend or upgrade the 800m downstream stormwater network. A combination of soakwells and new grated inlets at key locations.

$120k



27 Bedford St, Nedlands

Problem:

House flooded from floodwaters leaving road via crossover and driveway. This is a trapped low point in Bedford St, receiving runoff from Broome St, Martin Av, Baird Av, and Stirling Hwy. Pipe size drops from 375mm to 300mm, potentially causing system surcharge in some storms, however Bedford St pipe system generally has excess capacity. Other flooding problems known to occur downstream in Broome St

27 Bedford St, Nedlands

Solution:

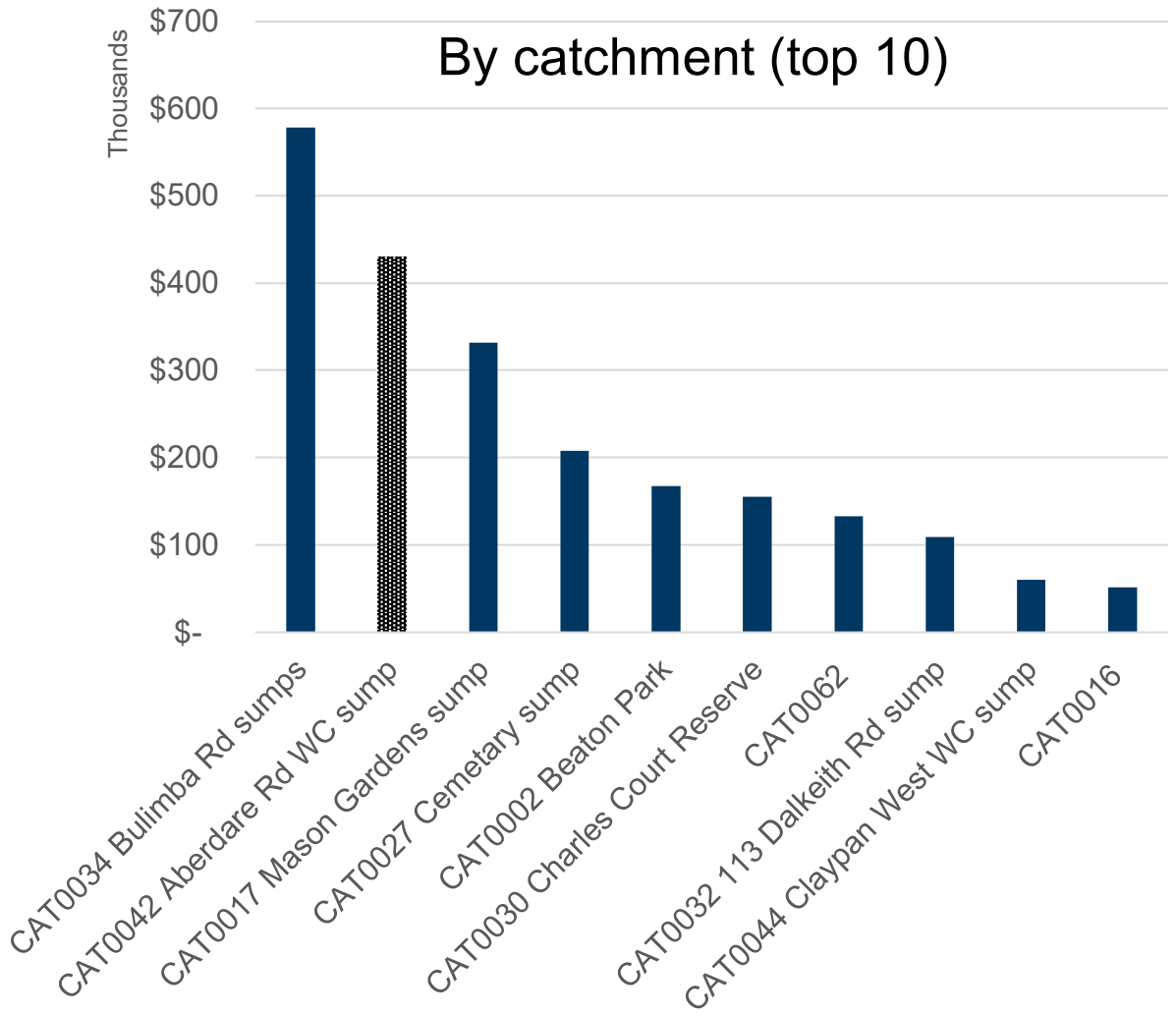
Upgrade PIP0249 from 300mm to 375mm. Provide 2 additional grated inlets in front of 21 Bedford St to get more runoff into pipe system. Provide 2 grated inlet soakwells on the western side of 30 Bedford to minimise runoff arriving from Broome St. Provide 4 non-grated soakwells along pipe alignment in Bedford St, at the front of 23 and 25 Bedford St. These upgrades will also assist with problems in Broome St

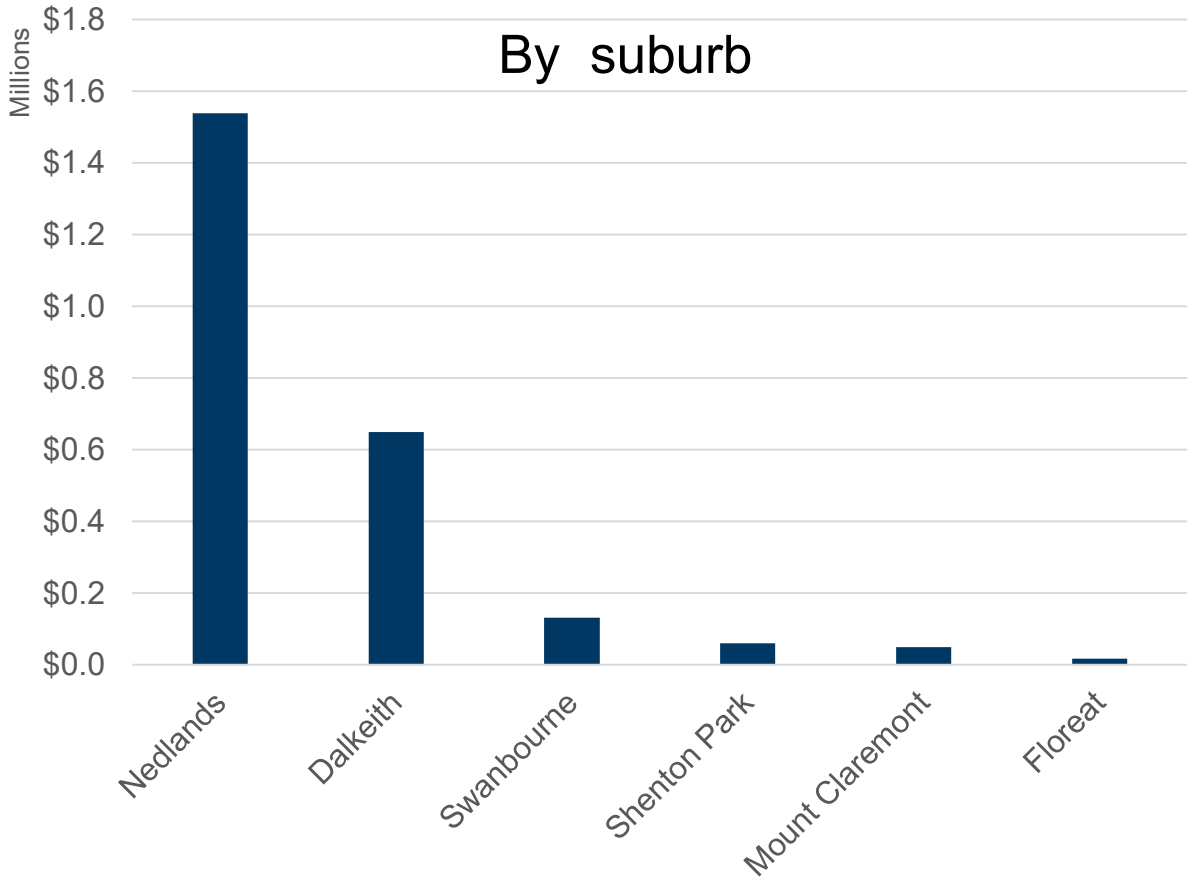
$156k

Construction cost estimate

- 41 Projects
- Costs range from $5,000 for a simple crossover upgrade, to $381,000 for the more complex Bulimba catchment works
- Combined cost of approximately $2.4m

TS04.03.22 Attachment 1





* Thank You

Appendix E

Digital deliverables

Pit performance database

ghd.com

The Power of Commitment

Project	Cost Estimate	Prioirity	Comments/Scope
Taylor Road Sump	$20,000	1	Works to direct road runoff water into sump (upstream of Jenkins Road)
Waroonga Road Sump	$20,000	2	Works to direct water into sump (upstream of Jenkins Road)
30 Bulimba Rd, Nedlands	$5,000	3	Raise crossover
55 Adderley St, Mount Claremont	$5,000	4	Raise crossover
57 Adderley St, Mount Claremont	$5,000	5	Raise crossover
54 Jenkins Road, Nedlands	$7,000	6	Raise crossover
3A Bulimba Rd, Nedlands	$35,000	7	Multiple crossovers raised, additional drainge inlet installisation.
12 Edwards Grn, Floreat	$17,000	8	Raise crossover and verge lowering
105 Broadway, Nedlands	$31,000	9	Install 3 grated inlets
1A Doonan Rd, Nedlands	$104,000	10	Install 8 soakwells with grated lids
Total	**$249,000**		

Flooding of City Buildings and Assets

The following City owned buildings were impacted by the flood event:

- Nedlands Community Centre – a down pipe was blocked by a plastic container, leading to overflow damaging the internal ceiling. Repairs have been made at a cost of $2,500.
- John Leckie Pavilion – water entered the building and flooded the lower floor, causing damage to walls and floor coverings. Repairs are estimated at $20,000 and are being staged to coincide with seasonal handover of the building.

Remediation works for the two items shown above have been planned and undertaken using the Building Maintenance operating budgets.

During the flood event, both the City and State Emergency Services (SES) received numerous requests for assistance. The City's rangers logged 30 out of hours callouts in relation to the storm, and Technical Services logged over 64 hours providing assessments, contractor management and sand bag assistance. Northshore SES received 37 requests for assistance during the 24-hour period of 09 July 2021 as follows:

- Dalkeith – 16
- Floreat – 4
- Mt Claremont – 4
- Swanbourne – 6
- Nedlands - 7

City of Nedlands | Council Policy

Stormwater

KFA	Natural and Built Environment
Status	Council
Responsible Division	Technical Services
Objective	To ensure stormwater is managed to protect environmental, social and economic values of the community.

Context

The City will manage stormwater to protect the community and environment from damage in accordance with engineering standards.

The City will achieve this in consideration of water sensitive urban design principles.

Statement

The City is committed to improving the built environment optimising the use and management of stormwater resources, consistent with current best management practice.

City operations should be consistent with the objectives and principles of the following documents:

- Local Government Act 1995 (s3.51, Schedule 3.2 and 9.1)
- State Planning Policy 2.9: Water Resources (Western Australian Planning Commission 2006)
- Better Urban Water Management (Western Australian Planning Commission 2008)
- Stormwater Management Manual for Western Australia (Department of Water 2007)
- IPWEA Guidelines for Subdivisional Development (v2.3 2017)

Wherever practicable, the City will manage stormwater resources in a manner that protects the local environment, enhances social values and protects the built environment.

Management of Stormwater Resources

The management of stormwater resources within the City will be in accordance with the following objectives outlined within the Stormwater Management Manual for Western Australia:

a. Maintain or improve water quality of surface and groundwater resources.
b. Maintain the total water cycle balance.
c. Retain, use and infiltrate stormwater at source (retrofit to achieve retention of one in five-year storm event at 2-minute interval as part of City's road rehabilitation and drainage Capital Works projects).
d. Conserve water through maximising the reuse of stormwater.
e. Integrate stormwater treatment into the landscape.
f. Retain natural drainage systems and protect ecosystem health.
g. Implement stormwater management systems that are economically viable in the long term.
h. Protect the built environment from flooding and water-logging (designed to protect up to one in hundred-year storm event).
i. Ensure that social, health, aesthetic and cultural values are recognised and maintained when managing stormwater.
j. Ensure the delivery of best practice stormwater management through planning and development.

Stormwater Drainage

The disposal of stormwater into natural areas can be detrimental to the environmental values of the City and therefore stormwater drainage will not be permitted in the following areas without appropriate flow and pollutant controls:

a. Wetlands classified within the Geomorphic Wetlands of the Swan Coastal Plain dataset, developed and updated by the Department of Parks and Wildlife.
b. Lands classified under the Metropolitan Region Scheme as "Parks and Recreation".
c. Coastal reserves and coastal foreshore.
d. Any other land which, in the opinion of the Chief Executive Officer, is likely to suffer adverse environmental impact from the effects of stormwater drainage.

Stormwater Management Planning

In order to ensure that development within the City integrates water cycle management and water sensitive urban design principles, planning and development should be in accordance with the principles of Better Urban Water Management.

No stormwater infiltration facilities are to be decommissioned unless alternative capacity is provided.

Related documentation

State Planning Policy 2.9: Water Resources (Western Australian Planning Commission 2006)
Better Urban Water Management (Western Australian Planning Commission 2008)
Stormwater Management Manual for Western Australia (Department of Water 2007)

IPWEA Guidelines for Subdivisional Development (v2.3 2017)

Related local law and legislation

Local Government Act 1995 (s3.51, Schedule 3.2 and Schedule 9.1)
Health Local Law 1997

Related delegation

Nil.

Review History

27 June 2017 (Report CPS16.17)

City of Nedlands

nedlands.wa.gov.au

Specification for the Construction of Crossovers

Please Note:

- Crossovers are NOT automatically approved with the Building License.
- For advice, level and inspections, please contact the City's Civil Compliance Officer on 9273 3500.

1. General

The separate approval of the City must be obtained prior to the construction of any crossover. Building Licenses are not an approval to construct a crossover. A Nature Strip Development Application must be submitted in order to gain approval for any works not on private property and located within the road reserve.

The owner and the builder are responsible for ensuring that a crossover complies with the specifications detailed below. The City shall retain the verge deposit until a crossover has been constructed according to the approved specification. If necessary, the City will use the deposit to pay for remedial works to the crossover and verge. If the cost of the remedial work exceeds the deposit then the City will recover the extra costs from the property owner.

The specifications have been developed to ensure that:

- The crossover is fit for its purpose.
- The crossover does not create any tripping hazards within the road reserve and that any footpaths remain fully accessible.
- Storm-water runoff from the property is prevented from draining onto the road reserve.
- Storm-water runoff from the road and footpath is prevented from draining in to private property.
- The crossover does not weaken the integrity of the adjacent road pavement.

2. Definitions

Civil Compliance Officer shall be the City Officer responsible for the supervision of the work.

The Contractor shall mean the person responsible for the construction of the crossover.

Crossover is that section of the “drive-in” that crosses from the property boundary to the kerbline and may in places cross or adjoin the footpath.

An Apron is that section of the crossover that provides an at-grade crossing of a non or semi-mountable kerbline. An apron must provide for the retention of storm water within the road channel, whether it is constructed of concrete or bitumen.

Sweep is that part of the approach which is the transition between the road kerb and the kerbing of the approach.

3. Procedure

3.1 Application

An owner of a property or their agent, wishing to construct their own vehicle crossover, is to apply in writing using the Nature Strip Development Application form and stating specific requirements relating to their proposed crossover. Applications should make consideration of this specification and the City's Nature Strip Development Guidelines. Approval, conditions and specifications to construct a crossover shall be issued by the City.

3.2 Assessment

Following receipt of an application to construct a crossover, the site may be inspected by the Civil Compliance Officer to determine any conditions, which will apply to the approval, at the request of the contractor.

3.3 Final Inspection

Final inspection will be made following advice from the applicant that construction is completed. The crossover shall be inspected and approved by the Civil Compliance Officer prior to payment of a subsidy, if applicable.

3.4 Crossovers may be constructed in in-situ concrete, bitumen and concrete or clay brick pavers.

3.5 The minimum width of any crossover is 3.0m and the maximum width of any crossover and/or adjoining crossover is to be 6.0m. Larger crossovers may be approved by the City only in special circumstances.

3.6 Crossovers are to be constructed perpendicular to the kerbline with a minimum clearance of 0.6m from a side boundary (Refer Drawing No. NED_XOVER_2007_02.pdf Page 03 and shall align with the internal access onto the property.

a. 3.7 The location of crossovers shall be no closer to an intersection (Refer Drawing No. NED_XOVER_2007_02.pdf Page 03) than 6.0 metres from the tangent point of the intersection radius with the street alignment. Where this is not achievable within the block limits it shall be as far from the intersection tangent point as possible.

3.8 Crossover levels at the property boundary are to be established by the contractor. At the request of the contractor, advice may be sought from the Civil Compliance Officer.

3.9 The minimum clearance of any existing pole in the verge is to be 0.6m, and 2.0m to any street tree. Where a tree is within 2.0 metres of an existing crossover, advice shall be obtained from Parks Services on the

future size of the tree and the advisability of the existing crossover location being retained.

3.10 Crossovers to be constructed within close proximity of a signalised intersection shall be individually assessed by the Civil Compliance Officer, in accordance with the requirements of Main Roads Western Australia.

3.11 Where a crossover connects the property boundary with a main road, approval for the crossover shall in the first instance, be sought from the Commissioner Main Roads Western Australia. Where a crossover connects a property with a blue road (as defined by the Metropolitan Region Plan) the City and the Department of Planning and Urban Development are to issue joint approval for the crossover**.**

3.12 The owner of the property to which the crossover is being constructed shall bear the cost of any public utility service adjustments required as a result of constructing the vehicle crossover. In this regard, the location of the crossover is subject to approval by the relevant authorities.

3.13 The location of any crossover may be subject to additional requirements where specific safety or operational reasons are evident.

4. Details

4.1 Specification and Drawings

All works associated with the construction of the crossover shall be carried out in accordance with the specification and drawings contained herewith and to the satisfaction of the Civil Compliance Officer.

4.2 Insurance

The works shall be covered by the contractor's insurance policies for worker's compensation and public risk (person and property). The latter policy shall provide sufficient cover for all claims arising from the construction of the crossover.

4.3 Obstruction and Safety Precautions

The work shall be carried out with minimum disruption to pedestrian and vehicular traffic. Every precaution shall be taken to ensure the safety of persons and property.
All excavations, materials, plant and equipment must be made safe, barricaded and to the satisfaction of the Civil Compliance Officer.
All work is to be carried out in accordance with the Occupational Health Safety and Welfare Act 1990 and Regulations as amended, and the Main Roads WA Code of Practice for Traffic Management for Work on Roads.

4.4 Testing

Testing shall be carried out in accordance with relevant Australian Standards.

4.5 Making Good

Any reinstatement necessary, caused as a result of the contractor's work, shall be carried out by the contractor, at the contractors cost.

4.6 Public Utilities

It is the responsibility of the owner or contractor to apply to the relevant public utility authorities for approval to alter any utility service that is in conflict with the proposed crossover. Any costs incurred in the alteration of any service and subsequent reinstatement of the verge to original shall be borne by the owner or contractor.

4.7 Verge Trees

Where verge trees or tree roots intrude into the proposed crossover works to the tree may only be completed by the City of Nedlands. The contractor will arrange for City to approve or otherwise, the removal of any trees or roots affected by the crossover via a Nature Strip Development Application. Any costs incurred in this regard will be the responsibility of the contractor or the applicant and will be carried out by the City of Nedlands**.**

4.8 Levels

It is necessary for the levels at the street alignment to comply with those of the existing footpath in grade and level. Where there is no footpath or any doubt as to the correct levels, the Civil Compliance Officer is to be notified at least 24 hours prior to the commencement of the works so that the levels can be established.

All kerbing at the junction of the crossing and road pavement must be removed. The crossing must be constructed so that the crossing rises from the gutter level to a height no less than 100mm above the gutter level or the top of the adjacent existing kerbing whichever is the greater, at a point 600mm behind the kerb line. If this is not done, the crossover may allow the entry of the road drainage runoff into ratepayer's private property.

4.9 Disposal of Unwanted Materials

Any surplus material arising from the construction of the crossover shall be removed or disposed of by the contractor. Pre-cast barrier kerbing and concrete footpaths which are affected by the crossover shall be neatly cut with a concrete saw and disposed of by the contractor

5. Materials

5.1 Limestone

Crushed limestone shall be free from all deleterious materials and graded to the following grading envelope:-

Passing 75.00mm	100%
Passing 19.50mm	50 – 75%
Passing 2.36mm	30 – 50%

Limestone / Sub-base to be placed to a depth of 100mm and to be compacted to 95% density.

5.2 Screed Sand

Screed sand shall be well graded, free from deleterious materials and organic matter and must not contain soluble salts that may cause efflorescence.

5.3 Jointing Sand

Jointing sand shall be well graded, pass a 2.36mm sieve and be free from deleterious materials likely to cause staining.

5.4 Expansion Joints

An expansion jointing strip shall be placed between the internal driveway and the crossover and mountable road kerbing and the crossover and the adjoining footpath as shown on Drawing No NED_XOVER_2007_02.pdf Page 02.

5.5 Control Cracking Joints

Control Cracking joints shall be made with an approved jointing tool as shown in Drawing No. NED_XOVER_2007_02.pdf Page 02. The edges of the concrete and joints shall be smooth trowelled in a 25mm band.

5.6 Redundant Crossovers

Vehicle crossovers that are no longer required or no longer connect with an internal driveway shall be removed at the cost of the property owner. The new kerb that is to go across this redundant crossover is to be done by a professional kerbing contractor to a standard equal to the existing kerb each side of the old crossover and the cost shall be borne by the property owner.

5.7 Final Inspection

The work shall be inspected after completion and any defects shall be made good by the contractor to the satisfaction of the Civil Compliance Officer.

6. CONSTRUCTION – CONCRETE CROSSOVER

6.1 Formation

The crossover formation shall be boxed out to a minimum depth of 100mm and constructed in accordance with the details shown on Drawing No. NED_XOVER_2007_02.pdf Page 02. Boxing out for the formation shall be carried out taking due care to protect the surrounding verge, road surface, public utility services, vegetation and footpath if applicable.

The subgrade generally consists of sand, which is adequately compacted provided it is compacted to a density of 7 blows per 300mm as determined by a standard penetrometer. Where the subgrade has been disturbed or has failed, the old material shall be removed and the contractor shall replace the defective material with suitable sand which is to be compacted to a minimum density of 7 blows per 300mm as determined by a standard penetrometer.

6.2 Concrete

All concrete used shall develop a minimum compressive strength of 20mpa and have a maximum slump of 90mm using 14mm aggregate. Additives shall be used in accordance with the manufacturer recommendations.

6.3 Surface Finish

The concrete shall be screeded to correct levels and finished with a float or broom to produce a non-slip dense fine textured surface free from defects such as depressions, honeycomb sections or the accumulation of fine dusty accretions.

6.4 Drainage

All new property development and crossovers require all stormwater to be retained on-site. Therefore if a driveway slopes towards the road then a suitable drainage system must be provided on site to prevent stormwater runoff flowing on to the verge, road or footpath.

This condition may be satisfied by installing a drainage channel across the driveway and within the property. This is then connected to a 900mm x 900mm deep soakwell via a 100mm diameter pvc pipe

7. CONSTRUCTION – BRICK CROSSOVER

7.1 Bricks

Bricks shall be new or second hand, solid, manufactured in clay or concrete and have sharp or true bevelled arises. They shall have an equivalent transverse strength of 25Mpa as determined by AS1226.3

The Civil Compliance Officer will only permit bricks with a lesser thickness of 60mm if it can be demonstrated that the transverse strength is not less than 25Mpa.

7.2 Brick Samples

The contractor shall supply the Civil Compliance Officer if requested, with manufacturer specifications at least 24 hours before the commencement of work. This requirement will only apply if the Civil Compliance Officer is not satisfied with the proposed brick to be used for the crossover.

7.3 Concrete

All concrete used shall be pre-mixed with a minimum compressive strength of 25mpa at 28 days and a maximum slump of 90mm using 20mm aggregate. Additives if approved shall be used in accordance with the manufacturer's

7.4 Formation

The crossover formation shall be constructed in accordance with the details indicated in Drawing No. NED_XOVER_2007_02.pdf Page 01. Boxing out for the formation of the crossover shall be to a minimum depth of 180mm and compacted, taking due care to protect the surrounding verge, road surface, utility services, vegetation and footpath (if applicable).

The subgrade generally consists of a sand base. The contractor must ensure that compaction of subgrade and base is in accordance with specifications listed below. Where the subgrade has failed the contractor shall replace the defective material with suitable sand, which is to be compacted to a minimum density of 7 blows per 300mm as determined by a standard depth penetrometer.

7.5 Base Construction

The base material (limestone) shall be placed at optimum moisture content and spread such that the final compacted thickness is a minimum of 100mm. The materials shall be worked to the correct lines and levels and thoroughly compacted. Alternative base materials such as rock base and cement stabilised sand may be permitted, subject to approval by the Civil Compliance Officer.

7.6 Bedding Sand Placement

Bedding sand shall be placed screeded at optimum moisture content. The finished thickness of the sand shall be 30mm ±5.

7.7 Placement of Bricks

Brick crossovers shall be constructed in accordance with the details indicated on Drawings No. NED_XOVER_2007_02.pdf Page 04. Bricks shall be laid in either a 45º or 90º herringbone pattern, leaving a space of 2 – 3mm between each brick.

Immediately after the laying of the bricks, a minimum of three passes shall be made over the surface with a suitable vibrating plate compactor. During compaction, the paving shall be protected from damage by utilising a suitable protective medium between the surface of the plate compactor and the paving units.

As soon as practicable after compaction, the bricks shall be set by brooming the jointing sand into the joints. To ensure that the joints are completely filled, the pavement shall receive one or more passes of the plate compactor and the joints refilled.

7.8 Edge Restraints

The edges of the crossover are to be restrained as shown on Drawing No NED_XOVER_2007_02.pdf Page 03. A single row of header bricks shall be set on the beam using a mortar mix of four parts bricklayer's sand and one part cement.

7.9 Concrete Apron

All brick-paved crossovers are required to have constructed a concrete beam / apron as per Drawing No. NED_XOVER_2007_02.pdf Pages 01 & 04 where they meet the kerbline. Aprons are not to reduce available footpath width to less than 1.2m to ensure accessible access is retained along the footpath.

7.10 Redundant Crossovers

Vehicle crossovers that are no longer required or no longer connect with an internal driveway shall be removed at the cost of the property owner.

7.11 Jointing Sand

Jointing sand shall be well graded, pass a 2.36 mm sieve and be free from deleterious materials likely to cause staining.

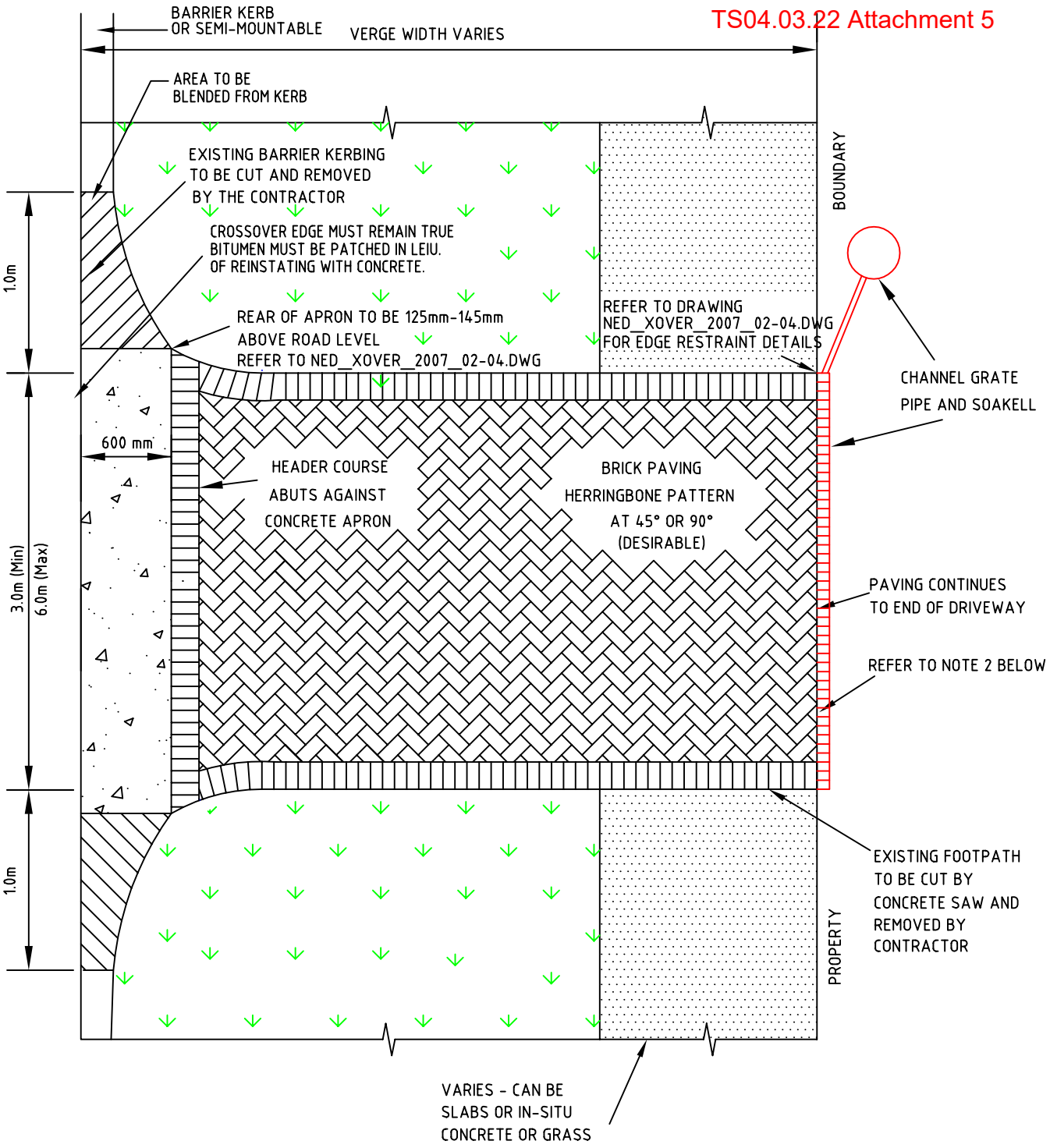
7.12 Final Inspection

The work shall be inspected after completion and any defects shall be made good by the contractor to the satisfaction of the Civil Compliance Officer.

7.13 Drainage

All new property development and crossovers require all stormwater to be retained on-site. Therefore if a driveway slopes towards the road then a suitable drainage system must be provided on site to prevent stormwater runoff flowing on to the verge, road or footpath.

This condition may be satisfied by installing a drainage channel across the driveway and within the property. This is then connected to a 900mm x 900mm (Diameter x Depth) minimum size soakwell via a 100mm minimum diameter pvc pipe.



NOTE:

1. REFER TO A4 NED_XOVER_2007_02-04.DWG FOR BRICK-PAVING DETAILS
2. LEVELS AT BOUNDARY SHALL MATCH THE EXISTING FOOTPATH OR VERGE LEVELS WHICH EVER IS APPLICABLE. REFER TO MAINTAINANCE SUPERVISOR IF ANY QUERIES.

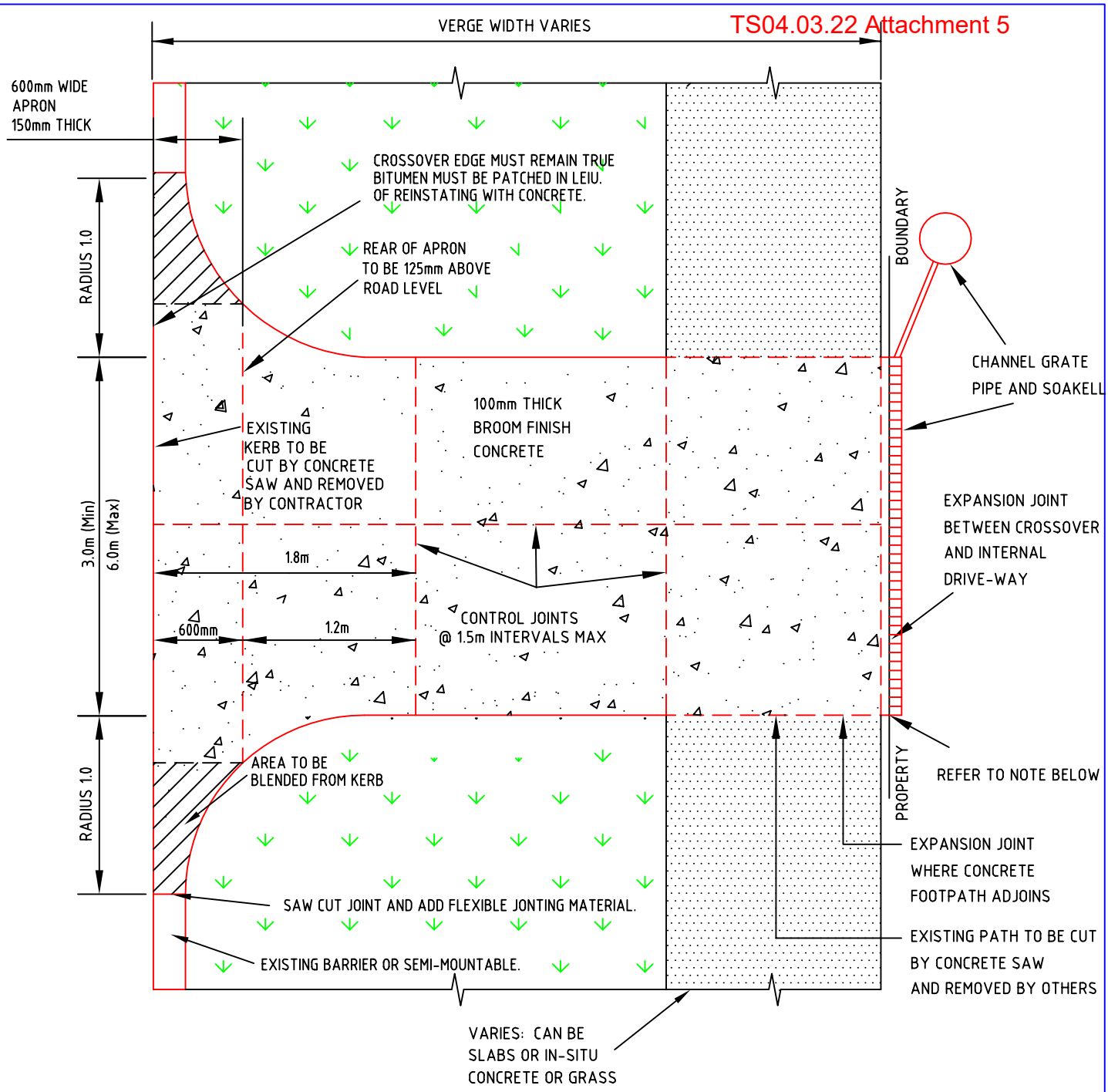
STANDARD BRICK-PAVED CROSSOVER WITH A COCNRETE APRON

CITY OF NEDLANDS

TECHNICAL SERVICES

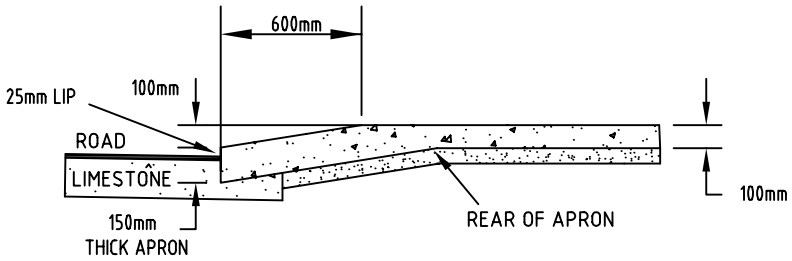
SCALE: N.T.S.	DRAWN: L.P.	DRAWING NO: NED_XOVER_2007_02-01.DWG SHEET 1 of 4
DATE: 01/02/07	CHECKED: A.V.	A4

TS04.03.22 Attachment 5



NOTE

LEVELS AT BOUNDARY SHALL MATCH THE EXISTING FOOTPATH OR VERGE LEVELS WHICH EVER IS APPLICABLE.
REFER TO MAINTAINANCE SUPERVISOR IF ANY QUERIES.



TYPICAL CROSSOVER SECTION

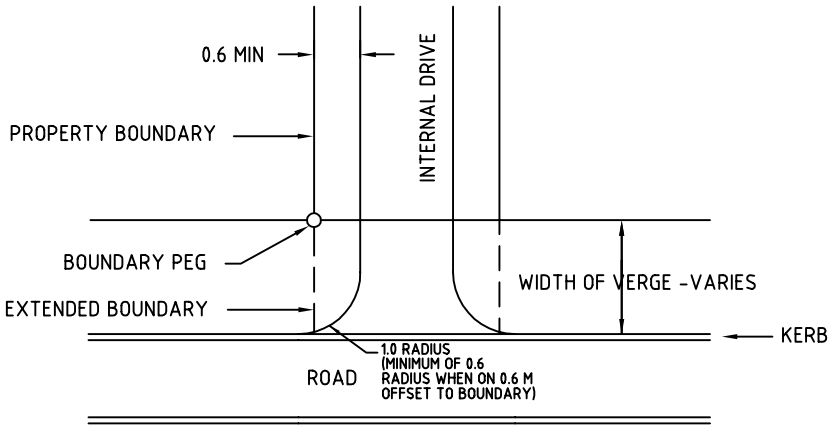
STANDARD CONCRETE CROSSOVER

CITY OF NEDLANDS

TECHNICAL SERVICES

SCALE: N.T.S.	DRAWN: L.P.	DRAWING NO: NED_XOVER_2007_02-02.DWG SHEET 2 of 4
DATE: 01/02/07	CHECKED: A.V.	A4

TS04.03.22 Attachment 5

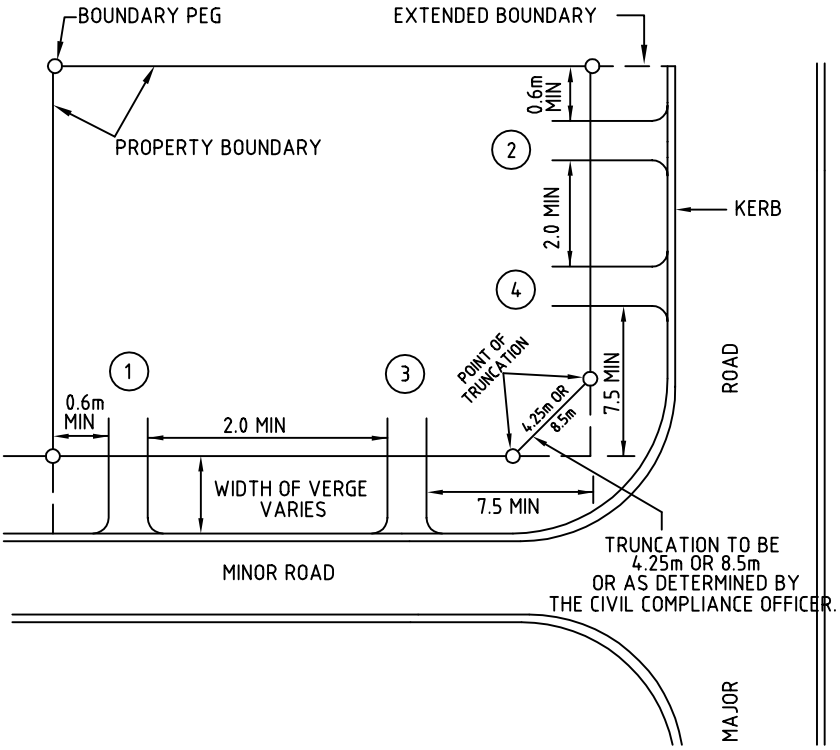


TYPICAL CASE 1

NOTE 1:

WIDTH OF CROSSOVER ALLOWED IS BETWEEN 3.0m - 6.0m FOR RESIDENTIAL

(NOT TO SCALE)

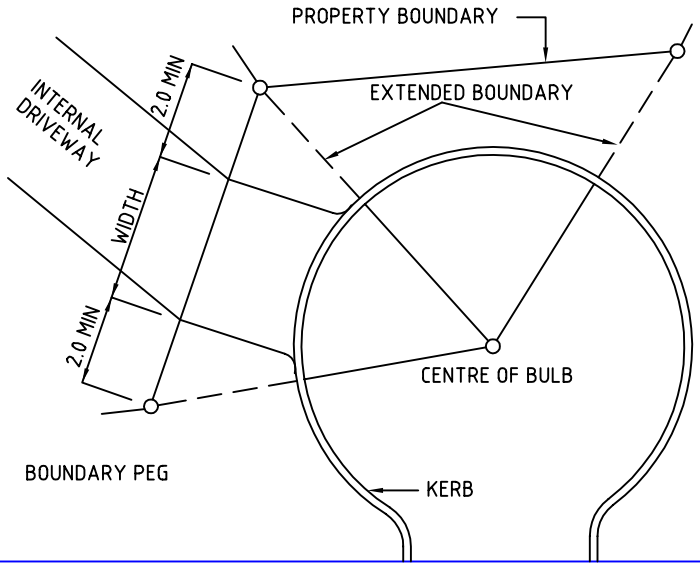


TYPICAL CASE 2

NOTE 2:

NUMBERS IN CIRCLE SHOW PREFERENCE OF LOCATIONS OF CROSSOVER.

(NOT TO SCALE)



TYPICAL CASE 3

NOTE 3:

CROSSOVERS TO BE LOCATED WITHIN THE AREA CREATED BY JOINING THE BOUNDARY PEGS TO THE CENTRE OF THE CUL-DE-SAC BULB.
ANY DIFFICULTIES IN LOCATING THE CROSSOVER OR OTHER QUERIES, PLEASE CONTACT THE CIVIL COMPLIANCE OFFICER.

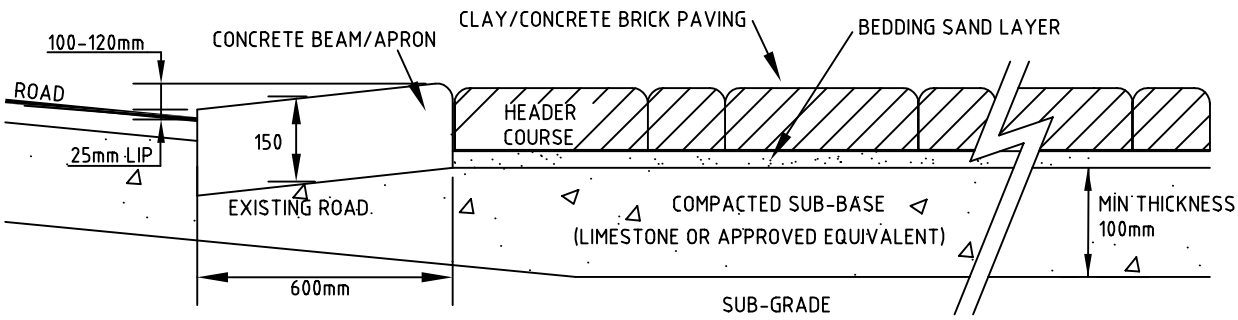
(NOT TO SCALE)

STANDARD CROSSOVER LOCATIONS

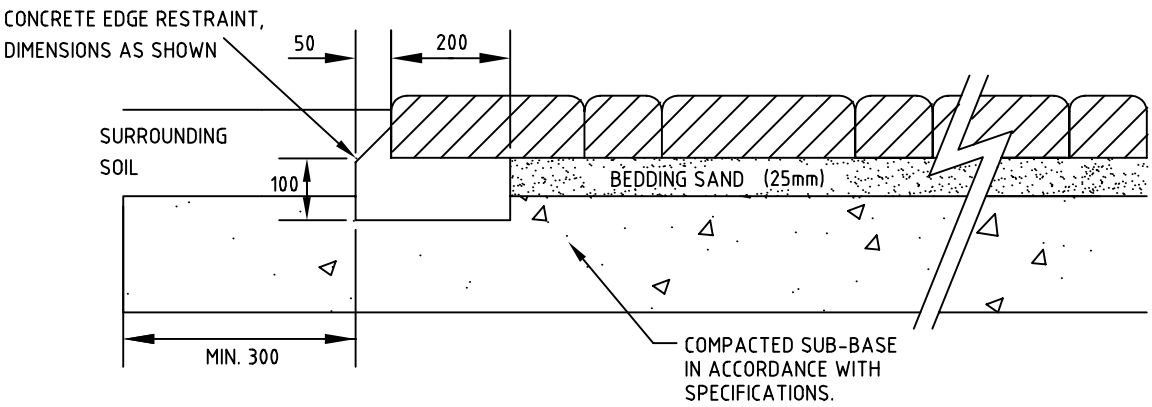
CITY OF NEDLANDS

CITY ASSETS

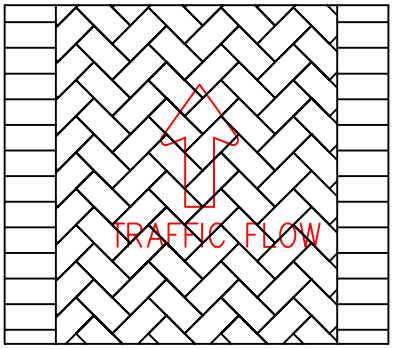
SCALE: N.T.S.	DRAWN: L.P.	DRAWING NO: NED_XOVER_2007_02-03.DWG SHEET 3 of 4
DATE: 01/02/07	CHECKED: A.V.	A4



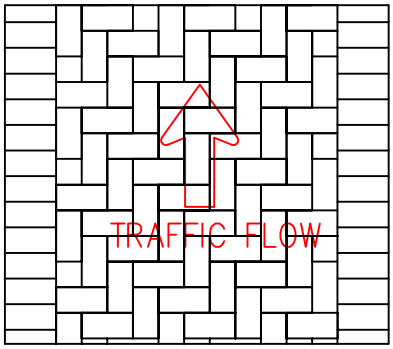
BRICK CROSSOVER ABUTTING A CONCRETE APRON.



EDGE RESTRAINT DETAIL - BRICK PAVED CROSSOVER



45° HERRINGBONE
(230mm x 115mm STANDARD & 230mm x 152mm PAVERS)



90° HERRINGBONE
(230mm x 115mm STANDARD & 230mm x 152mm PAVERS)

CROSSOVERS
RESIDENTIAL BRICK PAVING PATTERNS
APPROVED LAYING PATTERNS AND CROSSOVER EDGE RESTRAINTS

CITY OF NEDLANDS
TECHNICAL SERVICES

SCALE: N.T.S.	DRAWN: L.P.	DRAWING NO: NED_XOVER_2007_02-04.DWG SHEET 4 of 4
DATE: 01/02/07	CHECKED: A.V.	A4

18. Divisional Reports - Community Services & Development Report No CSD02.03.22

18.1 CSD02.03.22 CSRFF Application Allen Park Tennis Club

Meeting & Date	Council Meeting - 22 March 2022
Applicant	City of Nedlands
Employee Disclosure under section 5.70 *Local Government Act 1995*	Nil.
Report Author	Marion Granich – Manager Community Development
Director/CEO	Bill Parker – Chief Executive Officer
Attachments	Nil

Purpose

This item seeks Council's endorsement of a grant application to the Department of Local Government, Sport and Cultural Industries (DLGSCI) for the Community Sport and Recreation Facilities Fund (CSRFF) Small Grant Round.

Recommendation

Council:

1. **advises Department of Local Government, Sport and Cultural Industries (DLGSCI) that it has ranked and rated the application to the Community Sport and Recreation Facilities Fund Small Grant Round as follows:**

    a. **Allen Park Tennis Club – Tennis Court Fence Replacement: Well planned and needed by the applicant (B Rating);**

2. **endorses the above application to DLGSCI on the condition that all necessary statutory approvals are obtained by the applicant; and**

3. **includes an amount of $37,516 (ex GST) for Allen Park Tennis Club for consideration in the 2022/2023 budget process, conditional on the project receiving DLGSCI funding.**

Voting Requirement

Simple Majority.

Background

Community Sporting and Recreation Facilities Fund

The Department of Local Government, Sport & Cultural Industries administers the CSRFF. The purpose of the fund is to provide financial assistance to sporting clubs and local government authorities to develop basic infrastructure for sport and recreation. The program aims to increase participation in sport and recreation, with an emphasis on physical activity, through rational development of sustainable, good quality, well designed and well utilised facilities. This fund has three categories, shown below:

Table 1: CSRFF Grant Categories

Grant Category	Total Project Cost Range	Standard DLGCSI Contribution	Frequency
Small Grant	≤ $300,000	$2,500 – $100,000	Bi-annual
Annual Grant	$300,001 - $500,000	$100,001 - $166,666	Annual
Forward Planning Grant	≥ $500,000	$166,667 - $1,000,000	Annual

For applications to be supported by Department of Local Government, Sport and Cultural Industries, they must firstly be endorsed by the relevant Local Government Authority. For approved projects, DLGSCI will provide a grant of a maximum of 1/3 of the total project costs.

Ranking: The City is required by Department of Local Government, Sport and Cultural Industries to rank in priority order the applications received for each CSRFF round.

Rating: The City is required by Department of Local Government, Sport and Cultural Industries to rate each application against the categories below:

A - Well planned and needed by municipality
B - Well planned and needed by applicant
C - Needed by municipality, more planning required
D - Needed by applicant, more planning required
E - Idea has merit, more preliminary work needed
F - Not recommended

Key Relevant Previous Council Decisions:

- CM05.20 – 28 July 2020 – Community Sport and Recreation Facilities Fund Application – Dalkeith Tennis Club and Allen Park Tennis Club.

- CSD01.21 – 23 March 2021 – Community Sport and Recreation Facilities Fund Applications – Various Clubs

On both occasions, Council endorsed the APTC application and approved a Council grant of $27,324 towards the fencing project. However, the project did not receive DLGSCI funding, so did not proceed.

Discussion

There is only one application to this CSRFF round, with an overview of it provided in Table 2 below.

Table 2: CSRFF Small Grant Application 2022/23 Round

Applicant	Project	Total Project Cost (EX GST)	Club Contribution	Grant Amount Requested of State Govt.	Grant Amount Requested of Council
Allen Park Tennis Club	Tennis Court Fence Replacement	$112,549	$37,517	$37,516	$37,516

Allen Park Tennis Club (APTC)

Total Membership	230
No. of City of Nedlands Members	148

APTC was founded in 1929 and is located on Allen Park, Swanbourne. It leases this building and the surrounding fenced tennis court area from the City. APTC has 7 grass courts and 4 hard courts. The Club and its facilities are used all year round. APTC has a membership of 230 with 148 (64%) being City of Nedlands residents. As well as coaching and competitions, the hard courts are available to hire by members of the public through an online booking system. Many of these casual bookers are City of Nedlands residents.

APTC is seeking a CSRFF small grant to assist with funding the replacement of tennis court fencing. The fencing has reached the end of its life. Many of the existing posts are rusted through at the base and in these sections, a large length of fence could be blown over in windy conditions. The Club has patched the fences numerous times; however, the fencing is now becoming unsafe.

APTC is requesting a Council grant of $37,516 towards this project, which will cost $112,549 in total. The Club will contribute $37,517. This fits with the standard approach to funding such projects, which is that the Club, Council and State Government each contribute 1/3 of the total project cost.

The project will have a high level of community benefit as 64% of members are City residents. Additionally, other members of the community who hire the courts will benefit. The club also provides other community events and activities, which are attended by community members who are not necessarily club members, and these people will also benefit by the

Club's ongoing viability. Therefore, it is recommended that Council supports this much-needed project that will have significant community benefits.

Consultation

The applicant has completed a formal application to submit to DLGSCI for this grant round. The application is available to Councillors on request from the CEO's office.

Strategic Implications

Values **Great Communities**

We enjoy places, events and facilities that bring people together. We are inclusive and connected, caring and support volunteers. We are strong for culture, arts, sport and recreation. We have protected amenity, respect our history and have strong community leadership.

Priority Area

- Renewal of community infrastructure such as roads, footpaths, community and sports facilities
- Providing for sport and recreation

The application is consistent with Council's strategic priorities being renewal of community infrastructure and providing for sport and recreation. The project will benefit the club members as well as members of the wider community who use the facilities.

Budget/Financial Implications

APTC is requesting a grant of $37,516 from Council, the same from DLGSCI with the Club providing the remaining 1/3. The overall cost of the project is $112,549. The proposed works are in the Club's leased area.

If the application is supported by Council, this amount will be included in the funds allocated for CSRFF grants to sporting clubs, in the draft 2022/2023 Council budget.

Legislative and Policy Implications

Council Policy

Council's Capital Grants to Sporting Clubs Policy states that:

"To ensure the financial support it provides to sporting clubs is effectively targeted to achieve maximum community benefit, Council will consider the following key priorities:

1. Multi-use: priority will be given to developing facilities that will be used by more than one sporting club or type, particularly where such clubs are not yet sharing facilities. This is to facilitate the intent of maximising efficiencies and encouraging clubs to share some facilities while still retaining each club's separate management and identity.

2. Recreation Plan rating: priority will be given to supporting sports identified as a high priority in the City's Strategic Recreation Plan. The Strategic Recreation Plan provides a rating for each sport type, based on two factors: the demand to play that sport type and the facilities already provided for that sport type. These two factors result in a rating for each sport type as high, medium or low priority for facility development. Sport types with a high level of demand (growing membership) and a low level of existing facilities receive the highest rating.

3. Other funding: priority will be given to projects that are eligible for funding for other government bodies such as the Department of Recreation's Community Sport and Recreation Development Fund (CSRFF) or Lotterywest funding. This is to facilitate the overall financial viability of the project and contribute most effectively to the upgrade of community facilities.

4. Level of community benefit: priority will be given to projects that demonstrate a high level of benefit to the local City of Nedlands community. This will include, but is not limited to, City of Nedlands resident membership of the applicant sporting club (total and proportional), support for junior sport and the level of community access (i.e., by non-club members and by community groups and organisations)".

This application is consistent with the policy referred to above, with the following exceptions:

- Multi-use: APTC is not a shared facility because of the nature of tennis as a sport, which requires sports-specific courts, unlike sports such as football which can share ovals with other sports). Therefore, this criterion is not relevant to this application.
- Recreation Plan rating: the City currently has no Recreation Plan in place, so there is no such rating currently available. Therefore, this criterion is not relevant to this application.

This application fulfils all other the requirements of the policy, including:

- Other funding: the applicant is applying for state government funding for 1/3 of the cost of the project and meets the eligibility criteria for funding through DLGSCI's CSRFF program.
- Community benefit: The project will have a high level of local community benefit, with 64% of the Club's members being City of Nedlands residents. Additionally, many of those who hire courts casually without being Club members, are City of Nedlands residents.

Decision Implications

Council is required to make a decision on the Club's application by the grant round closing date of 31 March 2022. If Council endorses the application, it will be submitted to DLGSCI for consideration. If Council does not endorse the Club's application, the Club cannot proceed with their application to DLGSCI.

Conclusion

It is recommended that Council endorses this CSRFF application for funding to Department of Local Government Sport & Cultural Industries and provides a grant of $37,516 to Allen Park Tennis Club, on the conditions they receive state government support for this project and meet all necessary statutory approvals. Council's support for the application will strengthen the Club's ability to receive funding from the state government; and is consistent with Council's strategic aim of providing sport and recreation infrastructure as essential for healthy communities.

Further Information

N/A

19. Divisional Reports - Corporate & Strategy Report No's CPS09.03.22 to CPS11.03.22

19.1 CPS09.03.22 List of Accounts – February 2022

This item will be dealt with at the Ordinary Council Meeting.

19.2 CPS10.03.22 Monthly Financial Reports – February 2022

This item will be dealt with at the Ordinary Council Meeting.

19.3 CPS11.03.22 Monthly Investment Report – February 2022

This item will be dealt with at the Ordinary Council Meeting.

20. Divisional Reports – Reports from the Audit & Risk Committee Report No's AR01.03.22

20.1 AR01.03.22 Annual Compliance Return 2021

This item will be dealt with at the Ordinary Council Meeting.

21. Divisional Reports – Report form the Public Art Committee Meeting No's PAC01.02.22

21.1 PAC 01.02.22 Commissioning Health Workers Tribute Public Art Project

Meeting & Date	Public Art Committee Meeting – 7 February 2022 Council Meeting – 22 March 2022
Applicant	City of Nedlands
Employee Disclosure under section 5.70 *Local Government Act 1995*	Nil.
Report Author	Marion Granich – Manager Community Development
Director/CEO	Bill Parker – Chief Executive Officer
Attachments	1. Confidential Attachment - Health Workers Project – Proposal 2

Purpose

This report seeks Council's approval of the Public Art Committee's recommendation of an artwork to be commissioned as the Health Workers Tribute Project. The Public Art Committee has been working towards this project since May 2020. After an extensive advertising, selection and shortlisting process, the Committee has now selected its preferred proposed artwork and seeks Council approval of that selection.

Recommendation

That Council approves the commissioning of Proposal 2 (as at Confidential Attachment – Health Workers Project – Proposal 2) for the Health Workers Tribute public artwork.

Voting Requirement

Simple Majority.

Background

The Health Workers' Tribute Project was initiated by the Public Art Committee in May 2020. Initially, the idea of purchasing an existing artwork that would fit this purpose was explored. However, Council decided that an artwork was to be commissioned, rather than purchased.

On 25 May 2021 Council approved the expenditure of $20,000 on a consultant to co-ordinate the project; expenditure of $50,000 on the artwork itself; and approved Dot Bennett Reserve as the site for the artwork. The City then advertised for EOIs from experienced public artists interested in creating an artwork expressing the Health Workers' Tribute brief. The City received 5 submissions.

On 6 December 2021, the Public Art Committee considered the 5 submissions received; and short-listed to 3. The 3 shortlisted artists were each paid $1,500 to prepare more detailed proposals and present on them in person to the Public Art Committee. All 3 detailed proposals were received by the deadline of 27 January 2022.

Discussion

On 7 February 2022, the Public Art Committee met and considered the 3 shortlisted proposals, with each artist (or team of artists) addressing the Committee in person on their proposal. After detailed consideration of the 3 proposals, the Public Art Committee selected their preferred submission and made the following recommendation to Council:

“That the Public Art Committee recommends to Council the commissioning of Proposal 2 (as at Confidential Attachment 2 – Health Workers Project – Proposal 2) for the Health Workers Tribute public artwork.”

Having undertaken a thorough advertising, shortlisting and presentation process, meeting the shortlisted artist and asking questions about their proposals, the Public Art Committee now provides their choice to Council for approval.

Confidentiality

The proposals are treated confidentially at this stage as a courtesy to the artists and to protect their intellectual property rights. If the proposals were to be made public at this stage, there would be a risk of the material being exploited by another party before the artist has been commissioned and the work fabricated and installed. The time between concept and installation is longer for projects commissioned by government than for privately commissioned pieces, so care needs to be taken not to publish the artists’ concepts at this stage. It is also a courtesy to only announce the winning artist, rather than name all applicants publicly. Treating applicants confidentially will also make it easier for the City to attract applications in future.

The Selected Work

The proposal for the work that has been selected by the Public Art Committee for commissioning, and which is now recommended to Council, can be seen at Confidential Attachment – Health Workers Project – Proposal 2. The artwork consists of two sculptural works separated by the safe physical distance of 1.5 metres. The two works are of stylized human figures, fabricated in molded satin Perspex. Each of the two separate works is displayed on a Corten steel plinth. The top of each plinth, and the side facing inwards, is clad with mirror polished, marine grade, stainless steel.

The first plinth displays a 1 metre tall figure surrounded by a cloak, which represents the personal protective equipment of a health care worker. The cloak will display the medically-associated symbol of the cross, using a laser cut pattern onto the cloak. The figure sits on top of a 1.5 metre high plinth, making a total height of 2.5 metres of figure plus plinth.

The second plinth features a cluster of 4 figures of different sizes and colours, representing members of the community affected by the pandemic, from children to the elderly. These community figures range from 40 – 80 centimeters high and stand on a 1.5 metre high plinth, making a total height of 2.3 metres of figures plus plinth.

Both works combined create a footprint of 1.1 metres wide x 3.2 metres in length x 2.5 metres high, including the plinth bases. The figures will have integrated lighting to create a soft glow from the inside the figures. The lights will be on a timer for limited night-time viewing. All materials used in the work have been used in both architectural and public art fabrications and are suited to permanent outdoor installation with minimal maintenance.

This artwork is a unique and significant response to the brief of creating a tribute to the role of health workers during the COVID-19 pandemic. In their consideration and assessment of the 3 shortlisted proposals, members of the Public Art Committee noted that this was the only proposal that put emphasis on the health workers and illustrated their connection with, and service of, the community. The work is materially engaging, uplifting and encourages inquisitiveness. The artwork will be an exciting new addition to the City's public art collection, being both topically important and conceived in an upbeat and contemporary manner.

Once there is a formal Council decision commissioning the work, the artist can commence design development, followed by fabrication. It is expected that the work will be installed in approximately September 2022.

Consultation

No consultation has been undertaken on the proposals submitted by the artists as they are confidential at this stage, to protect the intellectual property rights of the artists. However, once there is a Council decision commissioning the work, the Public Art Consultant co-ordinating the project will undertake consultation with major health providers in the area.

Strategic Implications

This item relates to the following elements from the City's Strategic Community Plan.

Vision Our City will be an environmentally-sensitive, beautiful and inclusive place.

Great Communities
We are strong for culture, arts, sport and recreation.

Reflects Identities
We value our precinct character and charm. Our neighbourhoods are family-friendly with a strong sense of place.

Great Communities

We enjoy places, events and facilities that bring people together. We are inclusive and connected, caring and support volunteers. We are strong for culture, arts, sport and recreation.

Reflects Identities
We value our precinct character and charm. Our neighbourhoods are family-friendly with a strong sense of place.

Budget/Financial Implications

Table 1: Total Health Workers Tribute Project Budget

Public Art Consultant	$ 5,500
Development of detailed proposals by shortlisted artists (payment of 3 x $1,500 to each artist)	$ 4,500
Commissioned artwork (including artists fee, fabrication & installation of work)	$50,000
Contingency (traffic management etc.)	$10,000
Total Cost of Artwork	**$70,000**

The total cost of the Health Workers Tribute public art project is $70,000. This will be spread across two financial years, with approximately $25,000 expenditure expected in the 2021/22 financial year and $45,000 in the 2022/23 financial year. This is because the artist, once commissioned, will be paid in stages at specific milestones; and installation of the work, with its associated costs, is not expected to take place until the 2022/23 financial year.

Legislative and Policy Implications

There are no legislative or policy implications.

Decision Implications

If Council approves the Public Art Committee's recommendation to commission this work, the project will proceed, with the work expecting to be implemented early in the 2022/23 financial year. A formal opening event will take place, with senior health dignitaries invite to attend. The work will be visible from the high-traffic artery of Smyth Road and will represent the City's acknowledgement of the role of health workers.

If Council does not approve the Public Art Committee's recommendation, the project will be further delayed.

Conclusion

The City has been working towards this Public Health Workers Tribute project since May 2020. It has been a protracted process, with the project initially being approached as an artwork purchase, rather than a commission. This approach was later changed to commissioning a work. The commissioning process is necessarily more complex than purchasing an existing artwork and has involved:

- appointing a consultant to co-ordinate the project
- calling publicly for submissions from suitably experienced public artists
- receiving and considering 5 submissions
- shortlisting those 5 submissions to 3
- paying the shortlisted artists to develop more detailed proposals and present them, in person, to the Public Art Committee
- the Public Art Committee's consideration of those 3 shortlisted submissions and its recommendation to Council of the work to be commissioned.

A Council decision supporting the Public Art Committee's recommendation will allow the project to be implemented. The artwork selected by the Committee effectively expresses the artist brief, while doing so in an innovative, contemporary and positive way. It pays tribute to the health workers themselves while also representing the community which has been protected and supported by them. The work will be a fitting and visible expression of the City's acknowledgement of the health profession, particularly with the City's proximity to so many major health facilities. The formal artwork launch event will be held at the site of the new work, on Dot Bennett Reserve and is expected to be officiated by the Mayor, with high profile health representatives and media invited. It is recommended that Council endorses the Public Art Committee's recommendation and commissions the work as proposed at Confidential Attachment – Health Workers Project – Proposal 2.

Further Information

N/A

22. Council Members Notice of Motions of Which Previous Notice Has Been Given

This item will be dealt with at the Ordinary Council Meeting.

23. Urgent Business Approved By the Presiding Member or By Decision

This item will be dealt with at the Ordinary Council Meeting.

24. Confidential Items

Confidential items to be discussed at this point.

25. Declaration of Closure

There being no further business, the Presiding Member will declare the meeting closed.