Reference: **20220270-L02_flood study report [C].docx**

Date: July 2, 2024

Arben Management
Attn: Martin Waters
PO Box 1291
Rozelle NSW 2039

Dear Sir,

RE: PLANNING PROPOSAL AT 34 QUEEN STREET, CAMPBELLTOWN – FLOOD IMPACT & RISK ASSESSMENT

INTRODUCTION

A rezoning is proposed at the subject site to deliver a mixed-use development. The site is marked as flood liable Blacktown City Council requires a flood study to be undertaken to determine if the proposal has any adverse impacts on the flooding regime in the vicinity of the site.

This report is amended to address the request for information letter received from the Department of Planning and Environment (DP&E) included in Appendix 4.

REFERENCE DOCUMENTS

The following documents have been referenced in this report:-

1. Site survey prepared by Hill & Blume Consulting Surveyors ID number. 757 revision A dated 05/10/2022;
2. Architectural drawings prepared by Architectus;
3. Flood letters received from Campbelltown City Council for dated 16 March 2023;
4. NSW Government “The Floodplain Development Manual – The management of Flood Liable Land” (2005);
5. Engineers Australia, Australian Rainfall & Runoff;
6. Campbelltown City Council DCP 2015 including Engineering Design for Development – June 2009;
7. DP&E letter reference DOC23/901362 dated 27/10/2023; and
8. Flood Risk Management Manual 2023.

NATURAL & BUILT ENVIRONMENT

The site is made of one existing commercial lot and currently has three retail tenancies and its associated ancillaries. The site falls in the Local Government Area of the Campbelltown City Council.

The site is bounded by Queen Street to the North and adjoining properties in all other directions.

The site has a rectangular shape and is characterised by a sloping natural gradient from South to North towards Queen Street.

Figure 1 shows the location of the site.

Figure 1 Locality Plan

The site is affected by local flooding from the local upstream catchment. Queen Street is also affected by flooding from a larger catchment area. Whilst the overland flow from the upstream catchment to the south is variable and follows the slope of the land, the Queen Street flooding is stagnant and is dammed by the elevated railway lines to the north.

PROPOSED DEVELOPMENT

The planning proposal involves the construction of a new precinct including residential and mixed-use buildings as depicted on the architectural plans by Architectus. Figure 2 below shows an extract of the site plan from the architectural drawings.

Figure 2 Architectus Ground Floor Plan

FLOOD STUDY

Campbelltown City Council

Council advised that a flood study is required to determine how the proposed development can be built without any significant adverse impacts on the flood behaviour in the floodplain and specifically in the vicinity of the site.

The flood levels and hazard classification across the site have been provided by Council at the request of the client. The issued flood letter and the details are included in Appendix 3.

Campbelltown City Council requirements for flooding are detailed in Campbelltown City Council Engineering Design for Development – June 2009.

Department of Planning and Environment

The requirements of the DP&E are detailed in their letter included in Appendix 4. The main concerns raised in the letter are addressed in the following sections of this report.

Objectives

The purpose of this flood study is to establish the Flood Planning Levels for the proposed development. It also provides a comparison of pre vs post flood results and determines measures that need to be implemented for the development not to have any significant adverse impacts on the flooding characteristics.

In summary, the objectives are as follows:-

- Prepare a dynamic 1D/2D computer model based on existing site conditions for 1% AEP;
- Define design flood levels, depths and hazards for the catchment for the existing site conditions;
- Modify the site conditions to post-development to predict the new flood levels, depths and hazards for 20%, 5% and 1% AEP and also for the PMF event;
- Determine if the proposed development has any adverse impact on flooding;
- Propose mitigation measures;
- Adopt these measures in the architectural plans to future details at DA stage;
- Prepare a preliminary flood risk management plan to be developed in future stages; and
- Demonstrate consistency with the Ministerial Direction Clause 3.

Modelling

SGC approached council to obtain a copy of the TUFLOW model for the area. A copy of the model has been made available and is used in this study.

The following modifications to the modelling approach have been made:

- The model is run with the latest TUFLOW engine;
- The model is modified to use HPC solver for faster run times; and
- The existing buildings on site are raised to the floor levels shown on the survey plan.

Proposed Buildings

The proposed buildings on site were modelled as full blockage to the flooding. The proposed buildings are assumed to be raised to the Flood Planning Level (FPL) and will fully block the flows and reduce the flood conveyance and storage areas on the site.

Design Flood Modelling Results

Design flood modelling was undertaken for the 20%, 5% and 1% AEP design flood event. The PMF event is also simulated as requested by DP&E. The results are presented in Appendix 1 of this report.

The flood levels vary between the rear and the front of the site. The flood levels are summarised in the table below.

Table 1 Flood Level Summary

Location	1% AEP Flood Level (m AHD)	5% AEP Flood Level (m AHD)	20% AEP Flood Level (m AHD)	PMF Flood Level (m AHD)
Rear Corner – South West	63.0	62.7	62.5	63.2
Rear Corner – South East	61.2	61.0	60.9	62.0
Rear Boundary – Middle	62.1	62.1	61.9	63.0

Location	1% AEP Flood Level (m AHD)	5% AEP Flood Level (m AHD)	20% AEP Flood Level (m AHD)	PMF Flood Level (m AHD)
Front Boundary – Middle	59.2	59.1	59.0	59.7
Front Corner – North West	59.5	59.4	59.3	59.8
Front Corner – North East	59.1	59.8	58.8	59.6

DISCUSSION

This section of the report provides a review of the results and discusses Council's requirements as stated in the DCP.

1. The proposed development does not have a major adverse impact on the flooding elsewhere in the floodplain. This can be seen in the flood impact map (difference between post and pre site conditions) which shows that the proposed development does not increase the flood levels and hazards elsewhere in the floodplain. There is a minor spill on Queen Street which is below 0.025m in height difference which can be absorbed on site once more details are available. This minor spill can be addressed at DA stage once the ground floor level is detailed further and levels across the development have been established;
2. The flooding across the site is classified as between low risk H1 category where the buildings and the open spaces are proposed. The proposed development is suitable as per the DCP;
3. The western side of Queen Street is low hazard for storm events up to the 1% AEP and is within H1 hazard which still allows off site evacuation to occur if needed. This scenario provides a manageable flood risk as it allows for emergency vehicles to reach the site if there is an emergency during a large event;
4. Queen Street is not cut off in more frequent storm events such as 5% and 20% AEP storm events. Although the street is flooded, the depth of water is below 300mm and the flood hazard is LOW (H1 category);
5. Queen Street is a floodway in the PMF event and will be cut off. As such, the shelter in place strategy is adequate for this type of flooding in extreme storm events;
6. The proposed habitable areas are to be raised at or above the Flood Planning Level (FPL). These levels will be detailed at DA stage once the architectural plans are more developed. However, the following table provides the proposed Flood Planning Levels for the proposed building footprints. It should be noted that because the flooding is overland flooding, the levels vary significantly across the site, so a range is provided in the table below for each building; and
7. The fencing along the rear and side perimeters of the site will be open style up to 300mm above the 1% AEP flood level from the ground.

Table 2 Flood Planning Level

Building Footprint	1% AEP Flood Level (m AHD)	Flood Planning Level (m AHD)
1 (2)	61.5-62.5 (1)	62.5-63.5
2	60.2-61.2(1)	60.7-61.7
3	59.5-60.3 (1)	60.0-60.8

Building Footprint	1% AEP Flood Level (m AHD)	Flood Planning Level (m AHD)
4	60.5-61.1 (1)	61.0-61.6
5	59.5-59.8 (1)	60.0-60.3

1) Levels denoted are front to rear of building footprint.
2) Building numbers are shown in figure below.

Figure 3 Plan Showing Building Numbers

In our opinion, the footprint of the proposal does not displace the floodwaters in such a manner to impact on the flooding behaviour in terms of loss of flood storage, increase in velocity and risk.

Maintain Flood Function

The proposed roads specifically at the rear of the site and through the middle of the site provide uninterrupted overland flowpaths that capture and convey overland flows from the upstream areas and channel it across the site in a similar manner to the existing site conditions.

The flows are conveyed through the site from the rear boundary with the Performing Arts School towards Queen Street similarly to the existing scenario with no impact upstream of the site.

There is an insignificant impact on Queen Street which is between 0.01 to 0.025m and is considered acceptable as it does not impact on private properties.

Access and Egress

As previously mentioned in the “Discussion” section above, access and egress to and from the site is available via the south side of Queen Street which is not a high hazard for all frequent storms and

also for less frequent storms up to the 5% AEP (20-YR ARI). With the vehicular site entry being proposed along the southern boundary, this also makes it more appropriate for emergency vehicles to reach the southern end of the site.

Below is a diagram of a possible evacuation route from the site for frequent storms and other larger storms up to the 5% AEP.

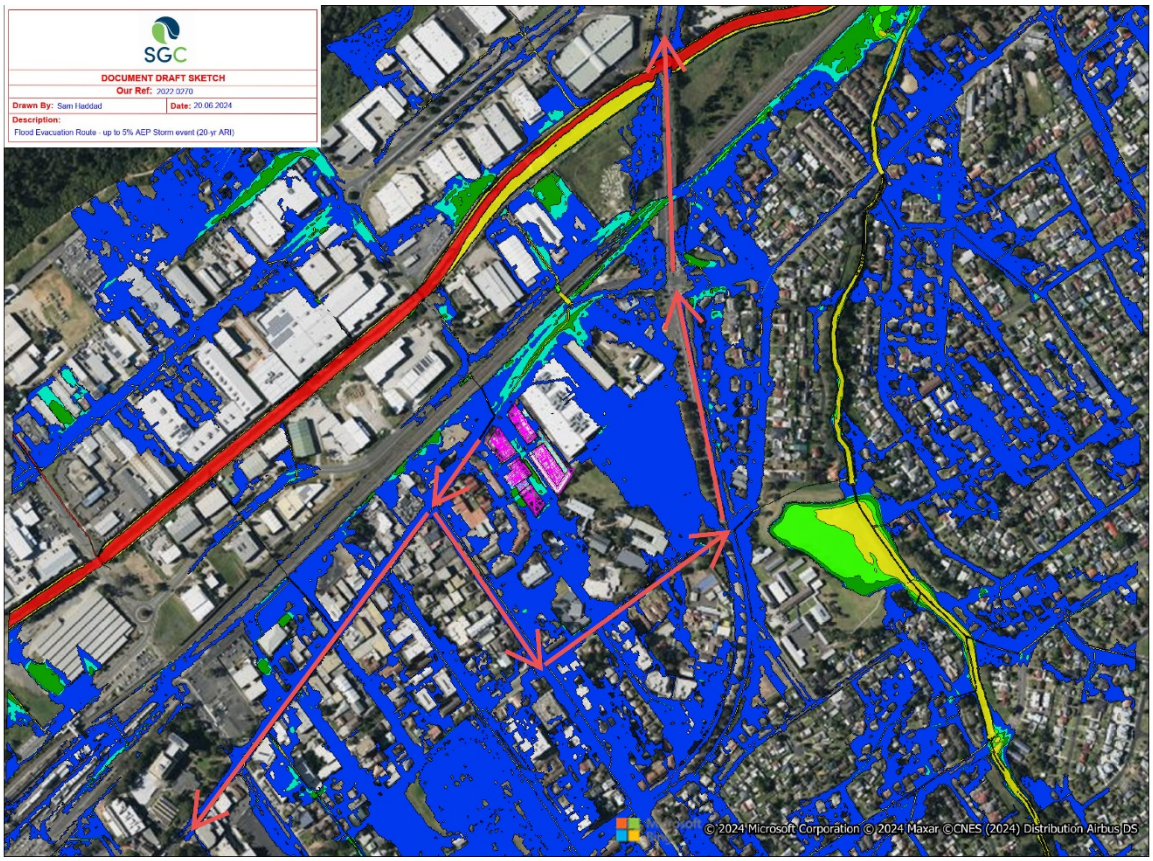


Figure 4 Flood Evacuation Route for Storms up to 5% AEP

Alternative Upgrade

The upgrade option of the infrastructure under Queen Street as proposed in the letter is quite a complicated procedure as it involves upgrade or duplication of the stormwater lines under the railway corridor and such mitigation proposals should be undertaken by the Local or State Government and should not be the responsibility of the developer of a residential site. To resolve an existing flooding issue on a public road should form part of an overall strategy to mitigate flooding in roads and private properties such as retarding basins along the catchment.

This alternative option should not be the responsibility of the developer of a residential site and as such is not considered.

FLOOD RISK & SAFETY

The flood hazard across the site is essentially H1 which is considered safe for vehicles and pedestrians. The flooding is associated with overland flows from the local catchment upstream of the site. These floods are shallow in depth but could have potentially high velocity. However, the product of depth and velocity appears to be safe in general for the intended use of the site.

Although the site is mapped as a low flood island in the Bow Bowing Curran Creek Floodplain Risk Management Study and Plan, the proposed floor levels of the buildings will be above at the FPL and as such will not be inundated in floods up to and including the 1% AEP floods. The upper levels of the development will be above the PMF flood level and as such the buildings will be considered as high flood islands that provide shelter to the occupants.

As the flooding across the site is considered flash flooding, it is fast moving and does not provide enough warning time for evacuation. These floods do not generally last for a long period of time (ie hours as opposed to days). Queen Street is also inundated in the 1% AEP event so off-site evacuation is not considered appropriate in this situation.

A shelter in place strategy would be more appropriate for this site based on the above. Section A2.5.2 of the “flood risk management guideline EM01” provides a framework to adopting a shelter-in-place strategy because of the flooding in Queen Street.

It should be noted that evacuation off site in storms up to and including the 5% AEP event can be made in a southerly direction along Queen Street where the flooding hazard is low. So in the event of a medical or fire emergency during a large storm event, access to the site is still available in a large vehicle similar to an SES truck that is able to drive through flood waters in Queen Street up to the site frontage.

In light of the above, it is considered that the 7 principles of emergency management can be complied with. The increased risk to life created by the intensification of the site can be managed by implementing a site-specific flood risk management plan that details the flood emergency response including on and off site evacuation procedures, a warning system and community awareness.

CONCLUSION

A detailed investigation on the flooding behaviour has been undertaken in the vicinity of the proposed development at 34 Queen Street, Campbelltown.

Using the established model, the study determined the flood behaviour for the 20%, 5% & 1% AEP design floods. The PMF flood event is also simulated. The primary flood characteristics reported for the design events considered include depths, levels and velocities. The study has also defined the Provisional Flood Hazard for flood-affected areas.

The impact of the proposed development was assessed and was found to be negligible in the adjoining sites. The flood maps are included under Appendix 1. The study addressed Council’s requirements as per the DCP. In our opinion, Council should allow the development in its current proposal.

Should you have any further queries or questions, please do not hesitate to contact the undersigned.

Yours faithfully

S&G Consultants Pty Limited

Sam Haddad

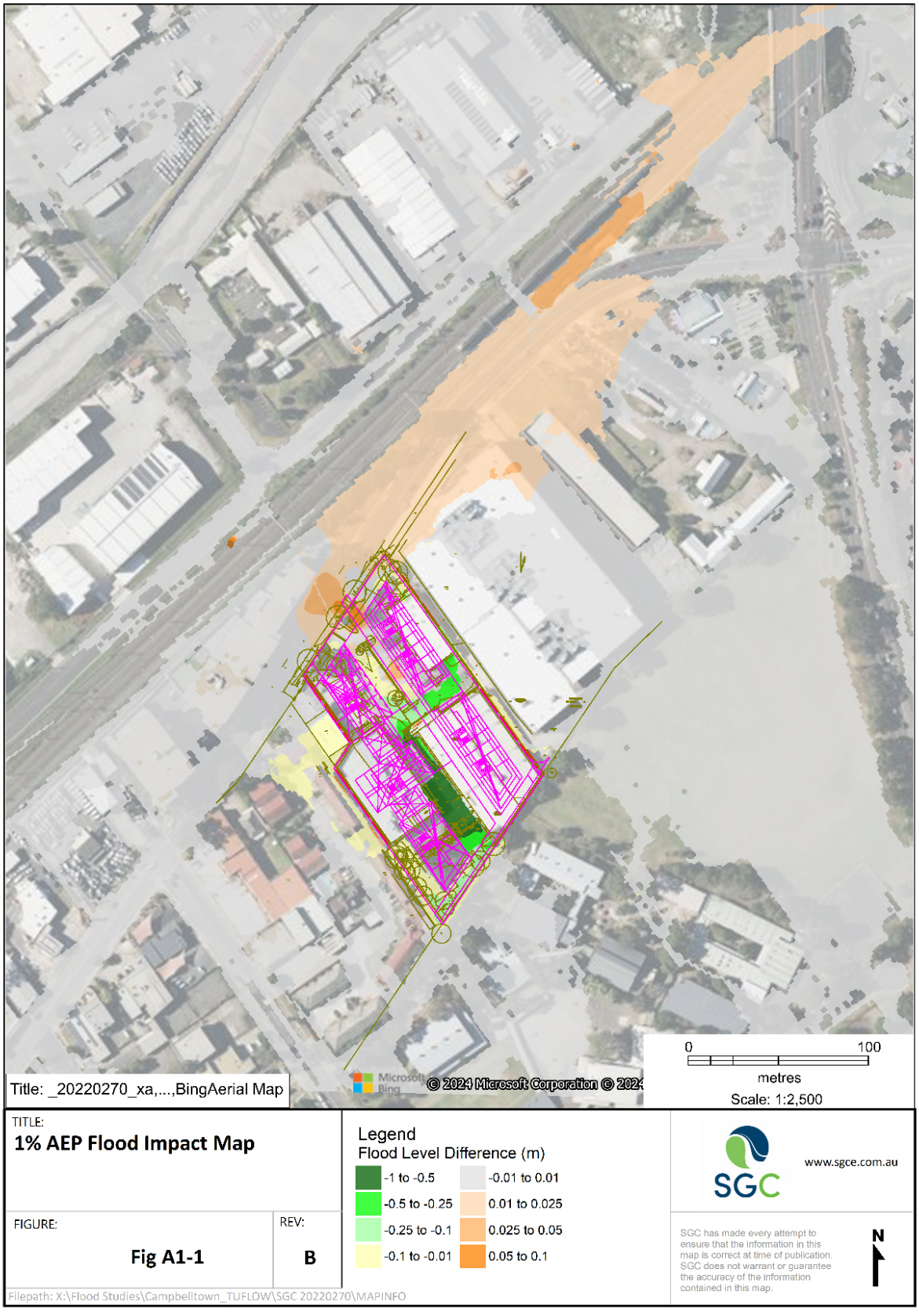
Director (Civil)

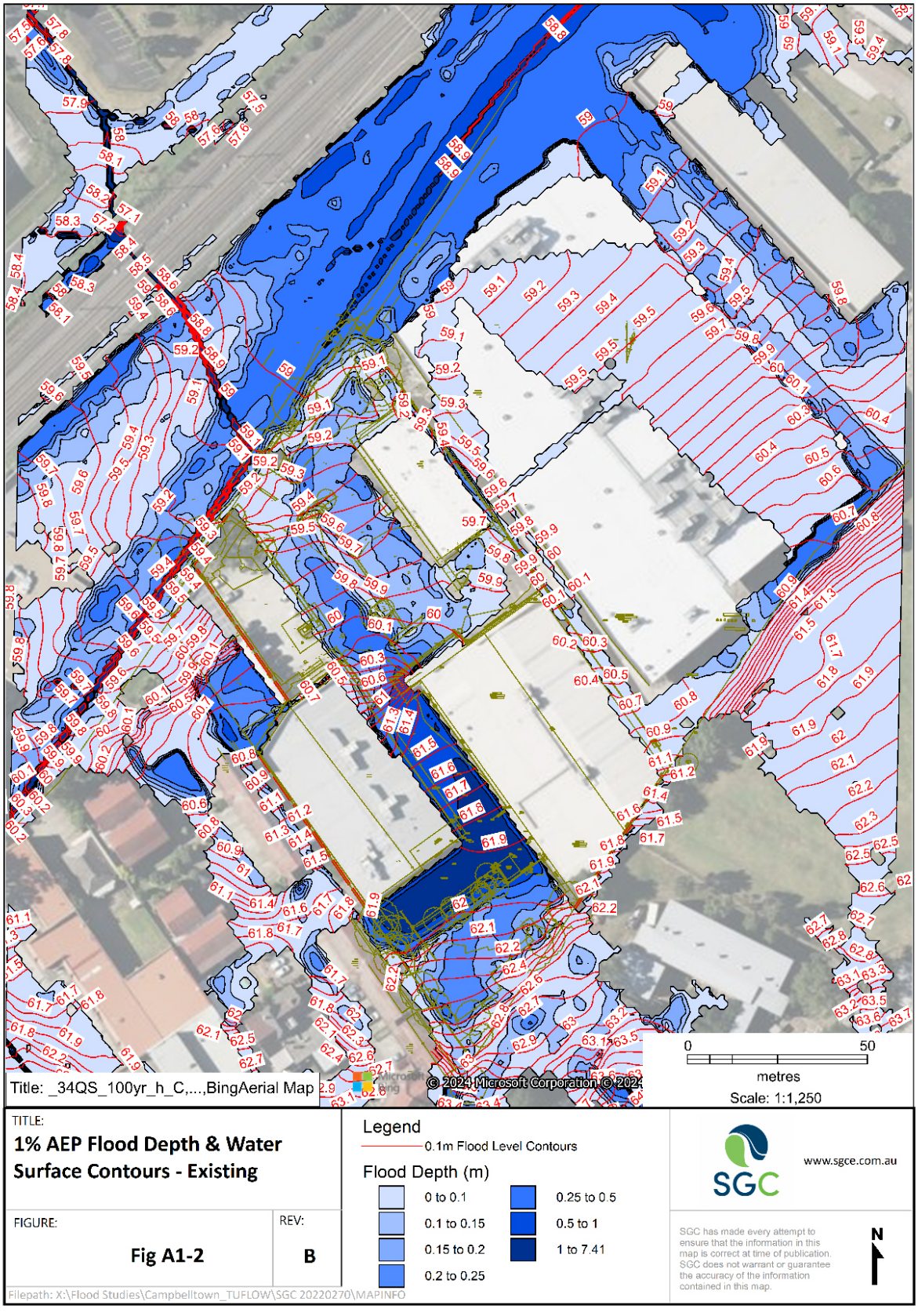
MIEAust CPEng NER

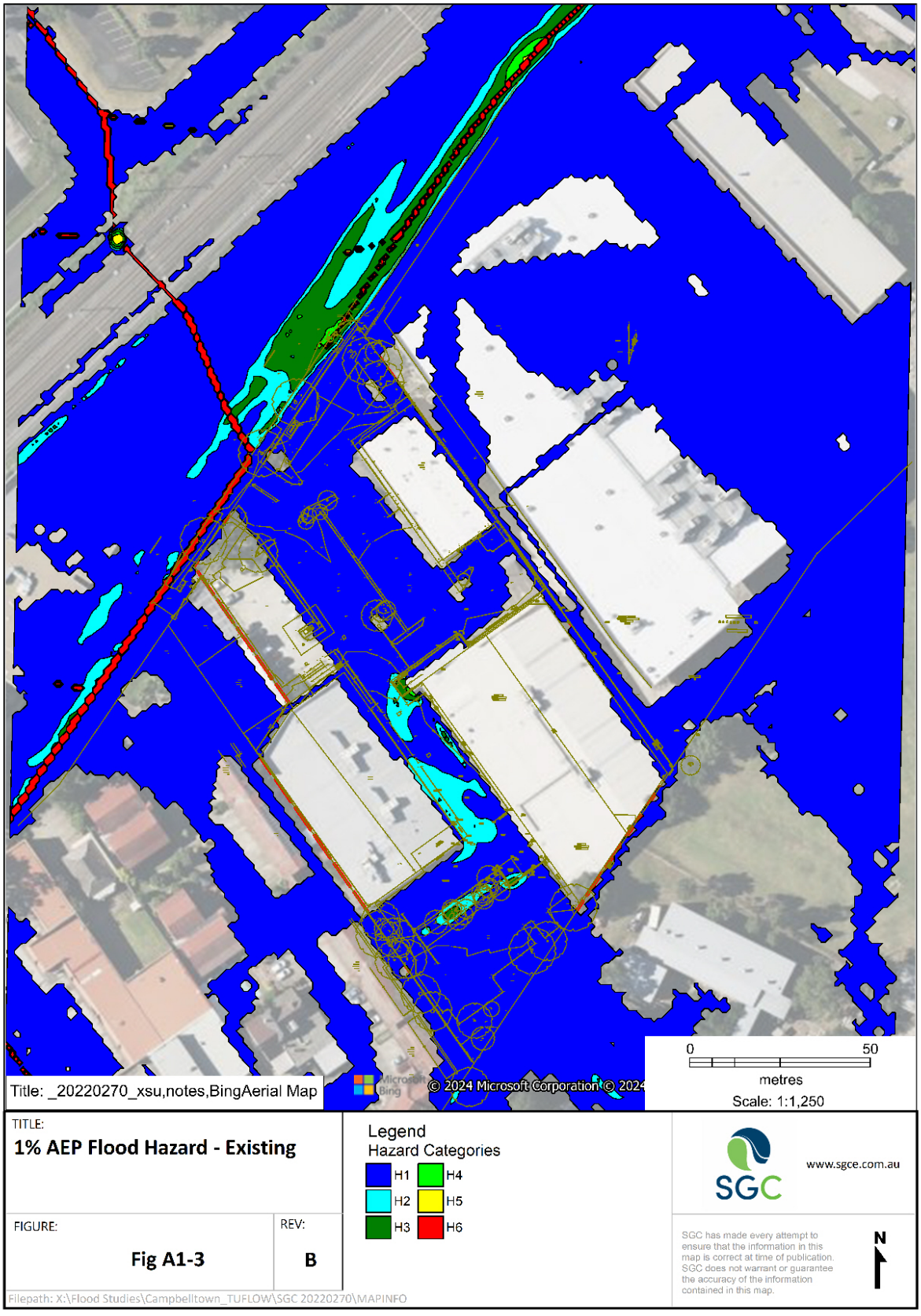
A1 Appendix 1

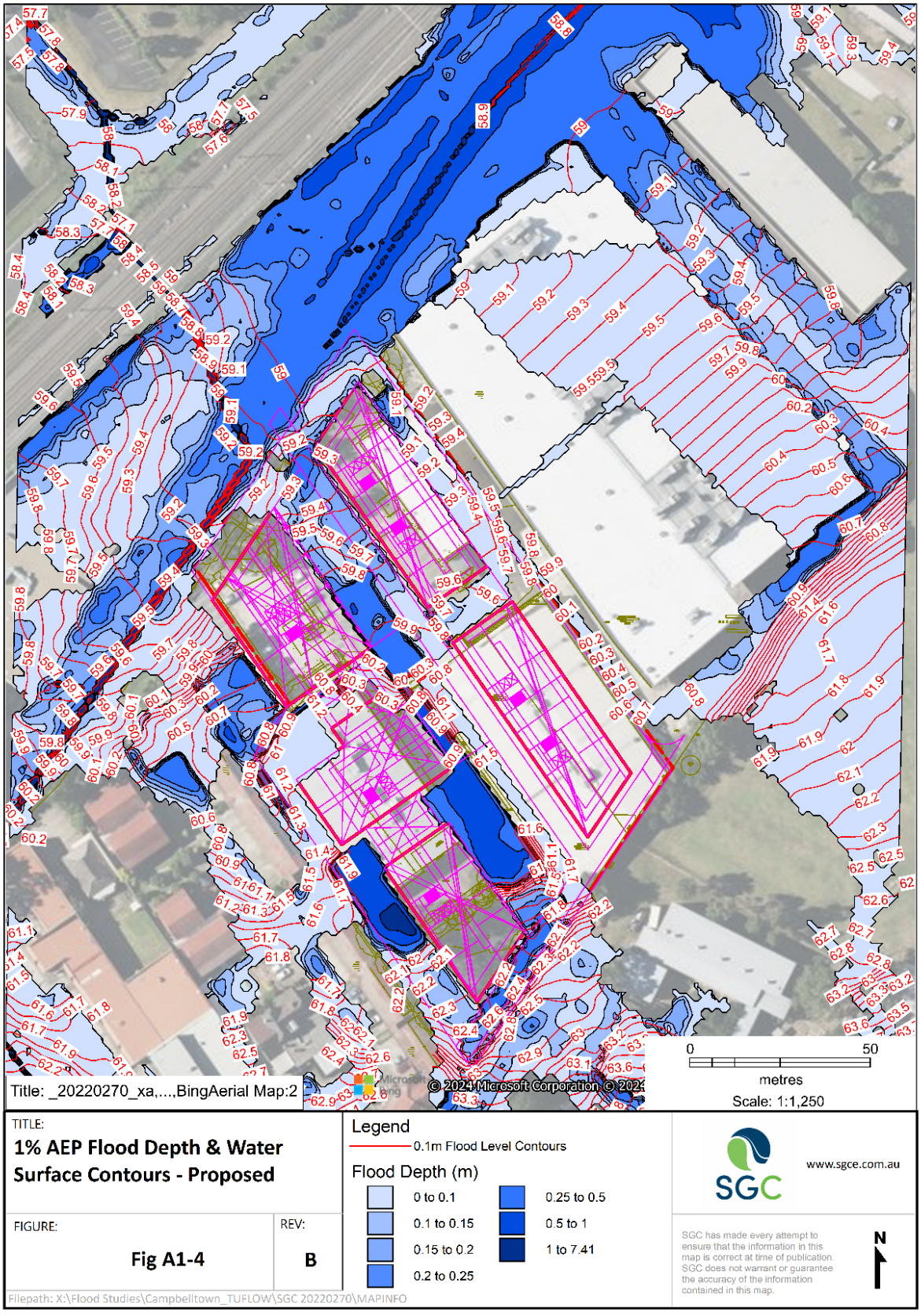
Flood Mapping

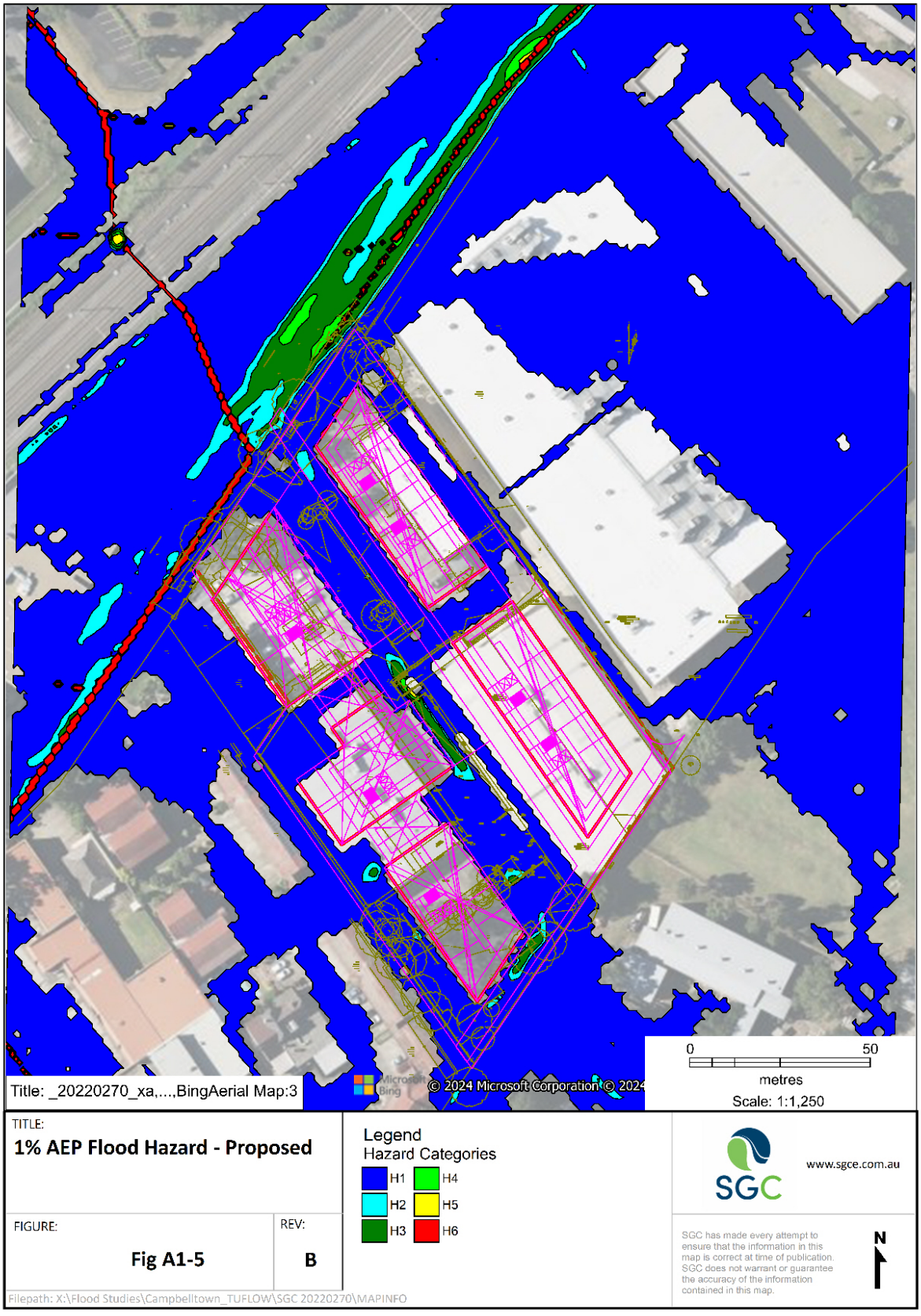
P: 02 8883 4239 W: www.sgce.com.au

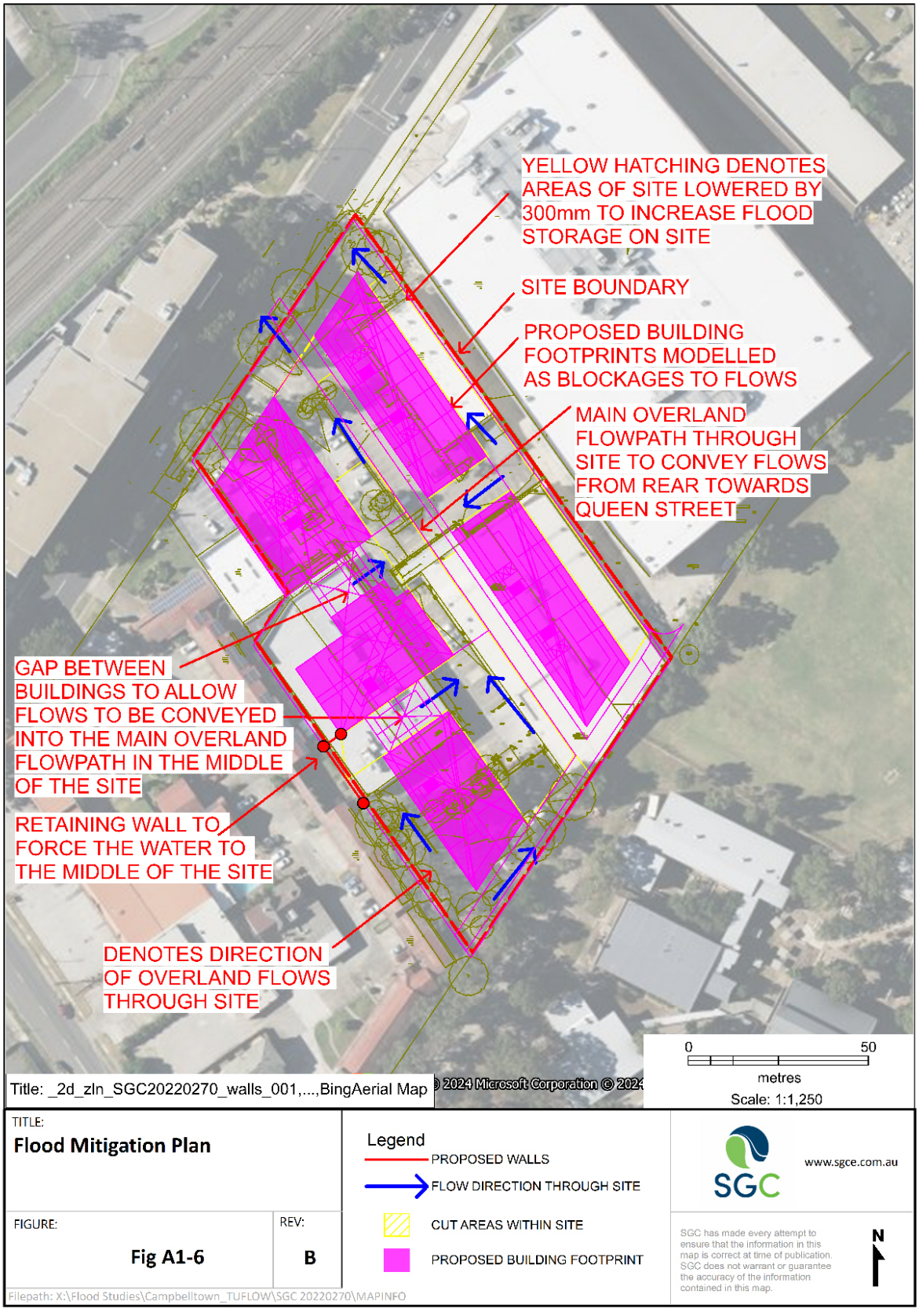

Title: _20220270_xa,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
100
metres
Scale: 1:2,500
TITLE:
1% AEP Flood Impact Map
FIGURE:
Fig A1-1
REV:
B
Legend
Flood Level Difference (m)
-1 to -0.5
-0.5 to -0.25
-0.25 to -0.1
-0.1 to -0.01
-0.01 to 0.01
0.01 to 0.025
0.025 to 0.05
0.05 to 0.1
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

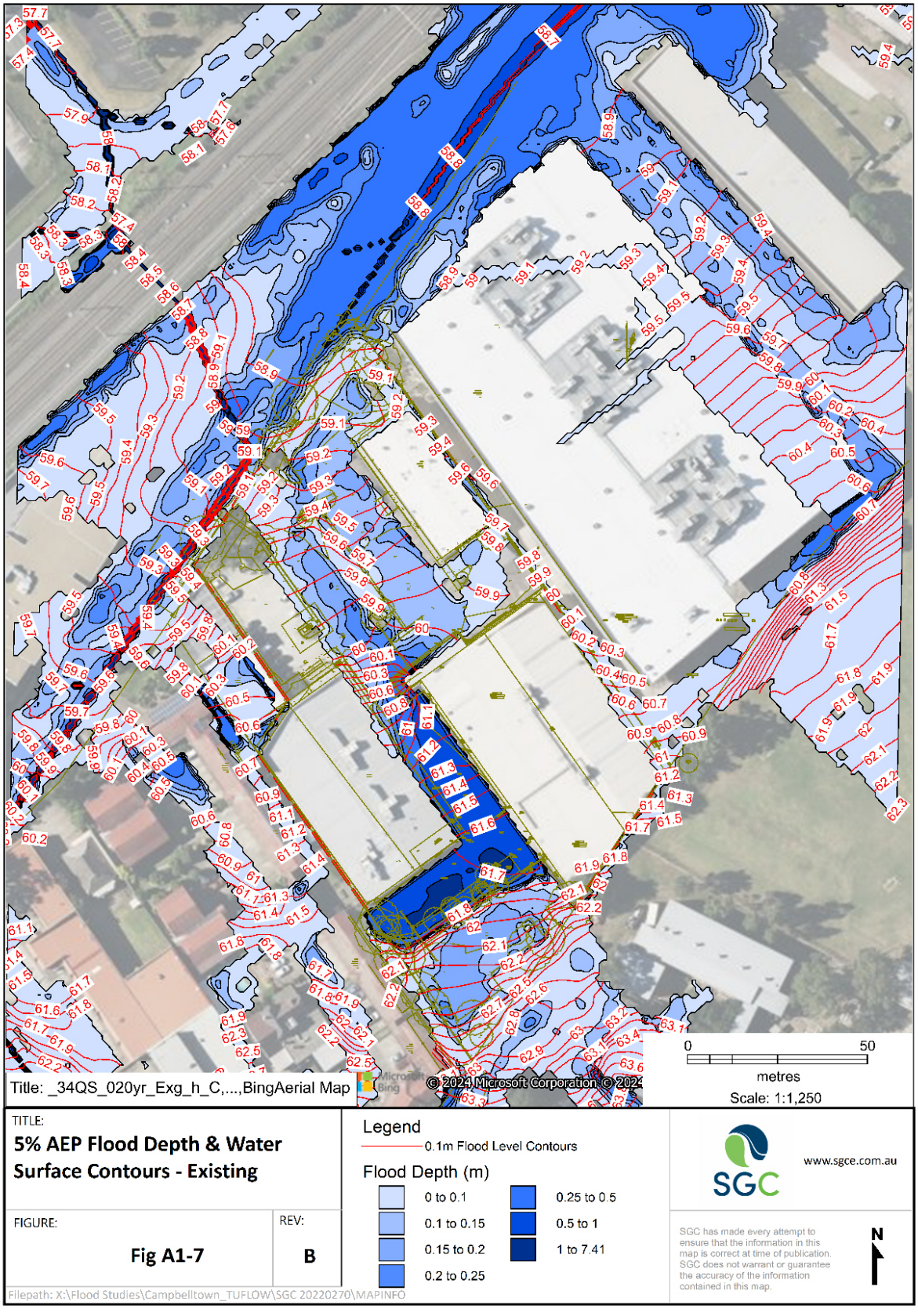

Title: _34QS_100yr_h_C,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
1% AEP Flood Depth & Water Surface Contours - Existing
FIGURE:
Fig A1-2
REV:
B
Legend
0.1m Flood Level Contours
Flood Depth (m)
0 to 0.1
0.1 to 0.15
0.15 to 0.2
0.2 to 0.25
0.25 to 0.5
0.5 to 1
1 to 7.41
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

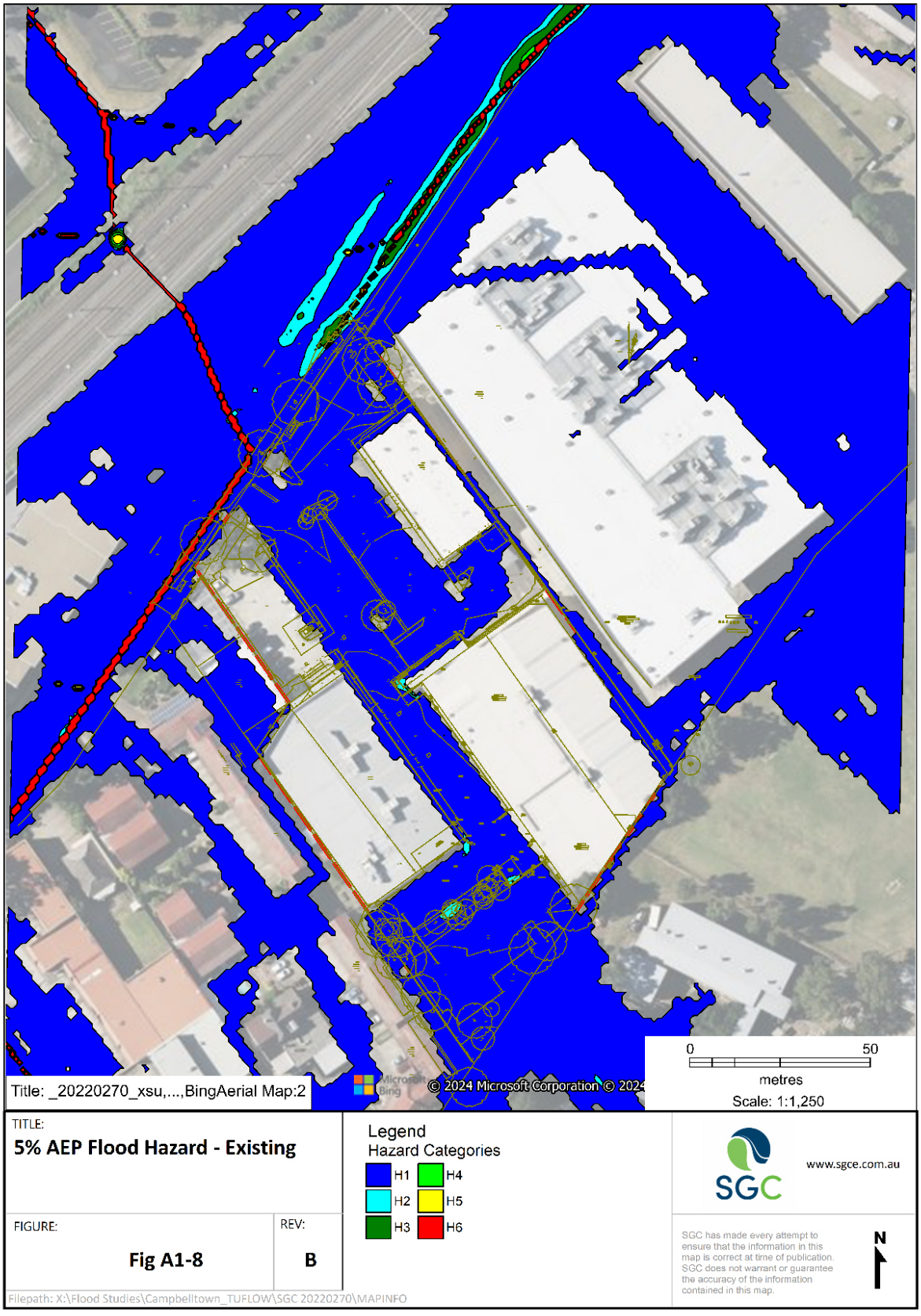

Title: _20220270_xsu,notes,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
1% AEP Flood Hazard - Existing
FIGURE:
Fig A1-3
REV:
B
Legend
Hazard Categories
H1
H2
H3
H4
H5
H6
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

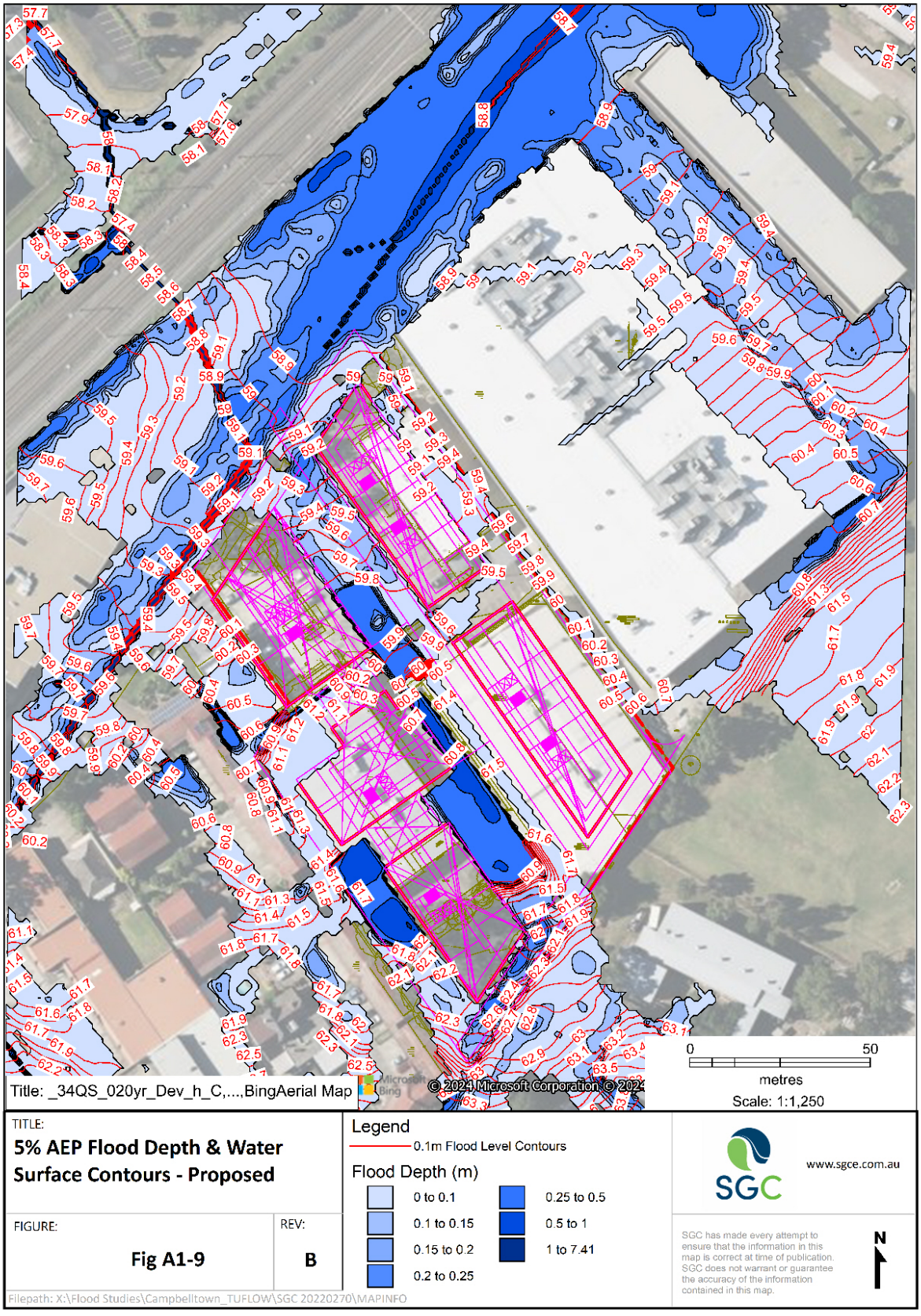

Title: _20220270_xa,...,BingAerial Map:2
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
1% AEP Flood Depth & Water Surface Contours - Proposed
FIGURE:
Fig A1-4
REV:
B
Legend
0.1m Flood Level Contours
Flood Depth (m)
0 to 0.1
0.1 to 0.15
0.15 to 0.2
0.2 to 0.25
0.25 to 0.5
0.5 to 1
1 to 7.41
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

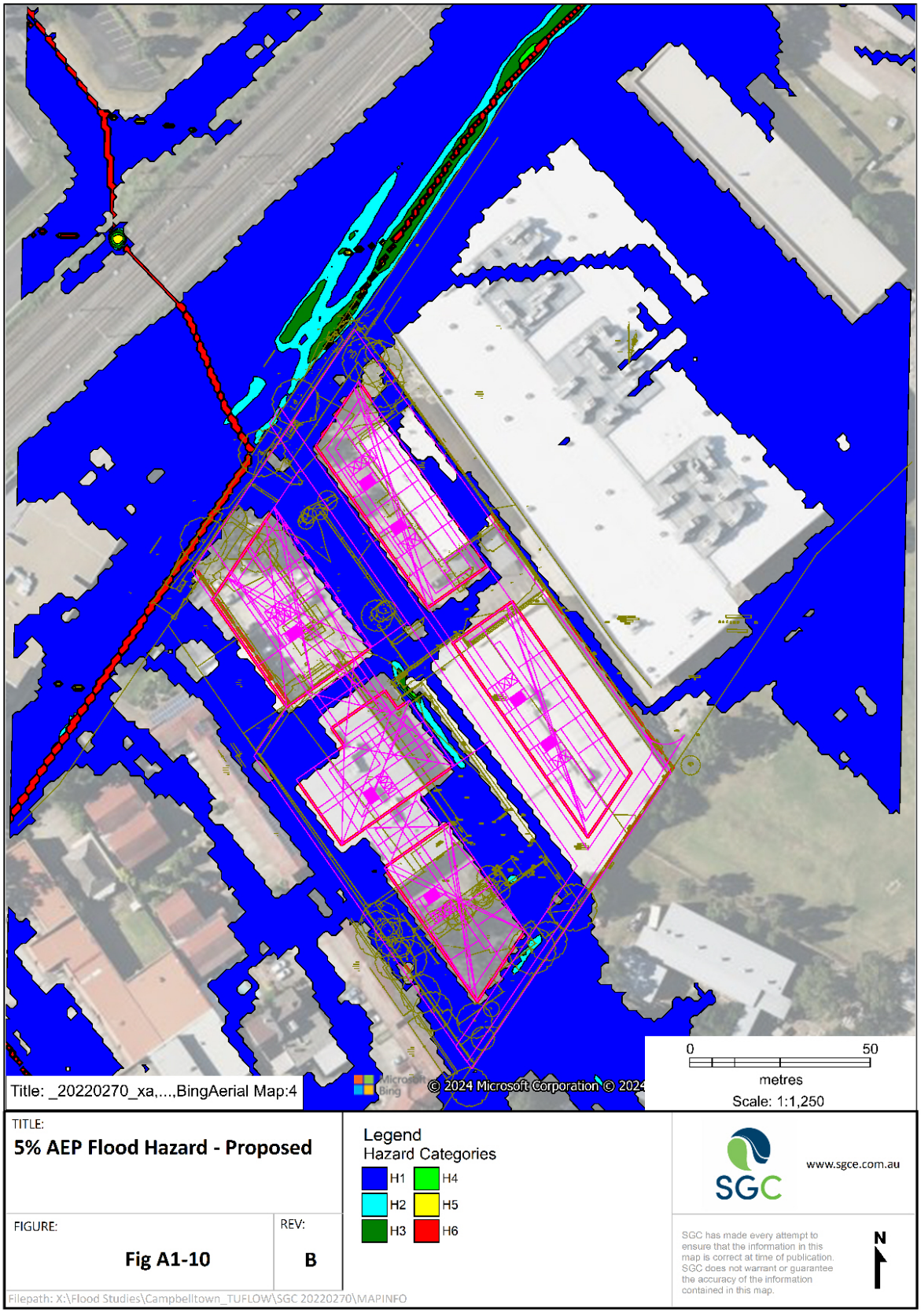

Title: _20220270_xa,...,BingAerial Map:3
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
1% AEP Flood Hazard - Proposed
FIGURE:
Fig A1-5
REV:
B
Legend
Hazard Categories
H1
H2
H3
H4
H5
H6
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

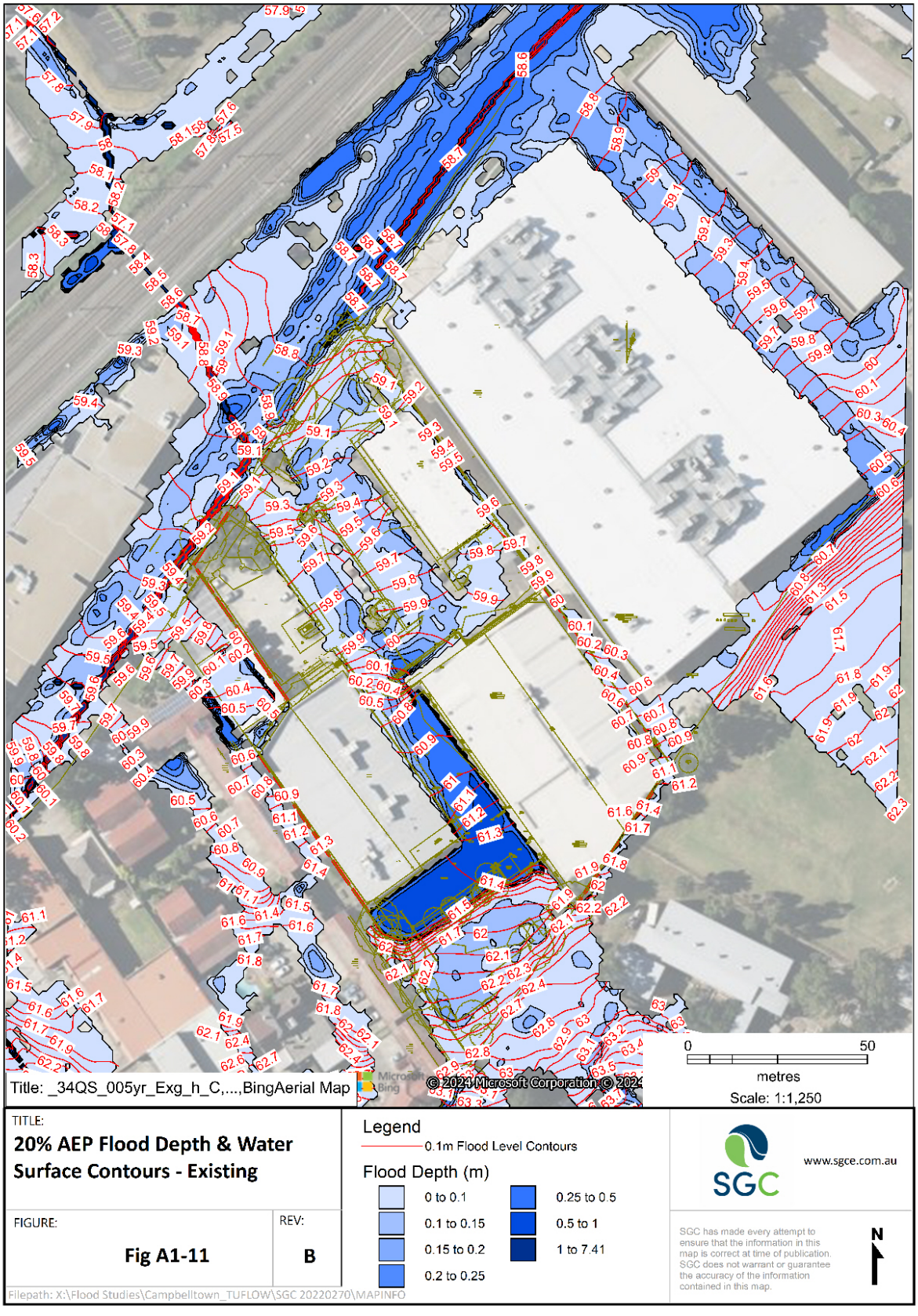

YELLOW HATCHING DENOTES AREAS OF SITE LOWERED BY 300mm TO INCREASE FLOOD STORAGE ON SITE
SITE BOUNDARY
PROPOSED BUILDING FOOTPRINTS MODELLED AS BLOCKAGES TO FLOWS
MAIN OVERLAND FLOWPATH THROUGH SITE TO CONVEY FLOWS FROM REAR TOWARDS QUEEN STREET
GAP BETWEEN BUILDINGS TO ALLOW FLOWS TO BE CONVEYED INTO THE MAIN OVERLAND FLOWPATH IN THE MIDDLE OF THE SITE
RETAINING WALL TO FORCE THE WATER TO THE MIDDLE OF THE SITE
DENOTES DIRECTION OF OVERLAND FLOWS THROUGH SITE
0
50
metres
Scale: 1:1,250
Title: _2d_zln_SGC20220270_walls_001,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
TITLE:
Flood Mitigation Plan
FIGURE:
Fig A1-6
REV:
B
Legend
PROPOSED WALLS
FLOW DIRECTION THROUGH SITE
CUT AREAS WITHIN SITE
PROPOSED BUILDING FOOTPRINT
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

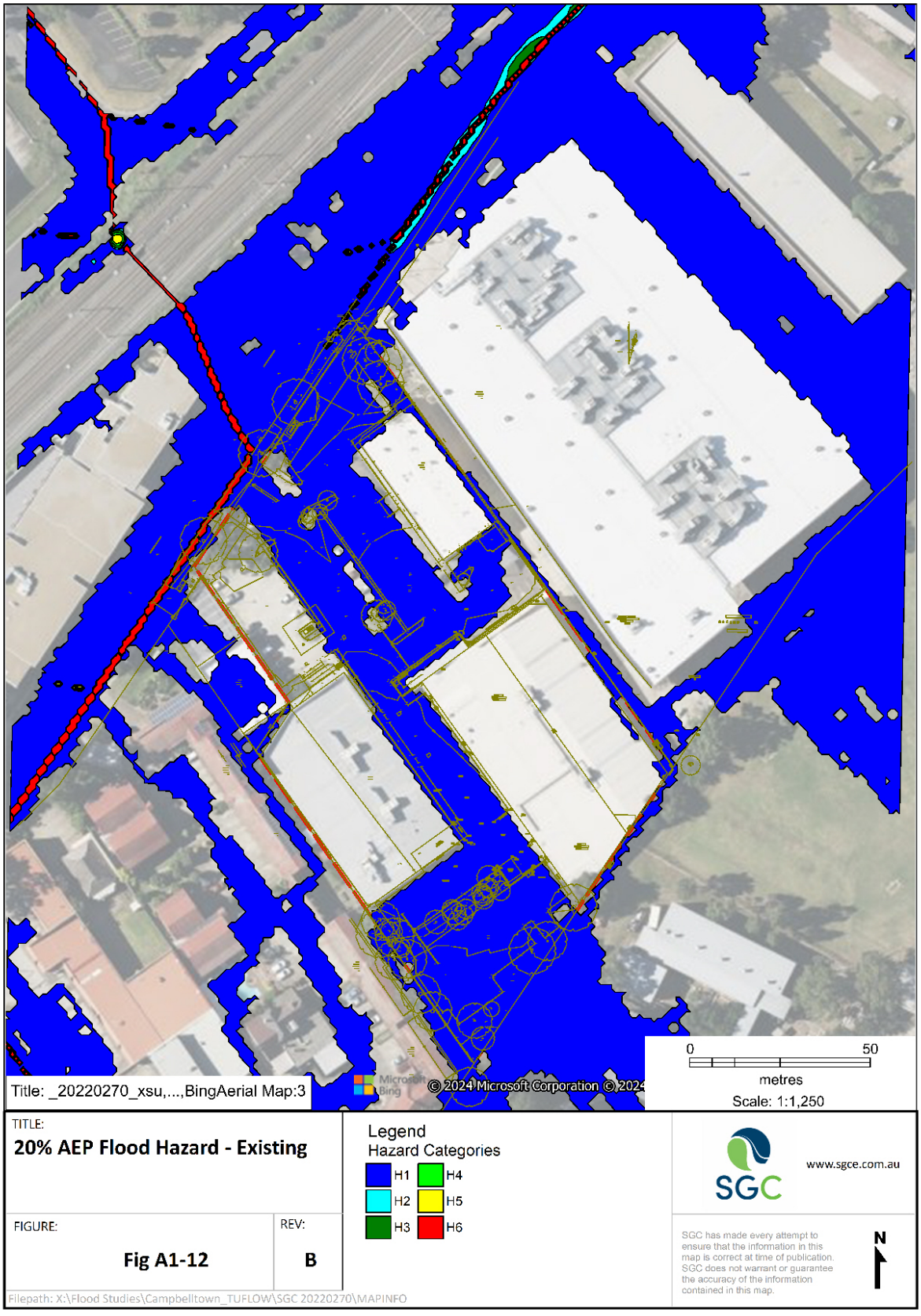

Title: _34QS_020yr_Exg_h_C,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
5% AEP Flood Depth & Water Surface Contours - Existing
FIGURE:
Fig A1-7
REV:
B
Legend
0.1m Flood Level Contours
Flood Depth (m)
0 to 0.1
0.1 to 0.15
0.15 to 0.2
0.2 to 0.25
0.25 to 0.5
0.5 to 1
1 to 7.41
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

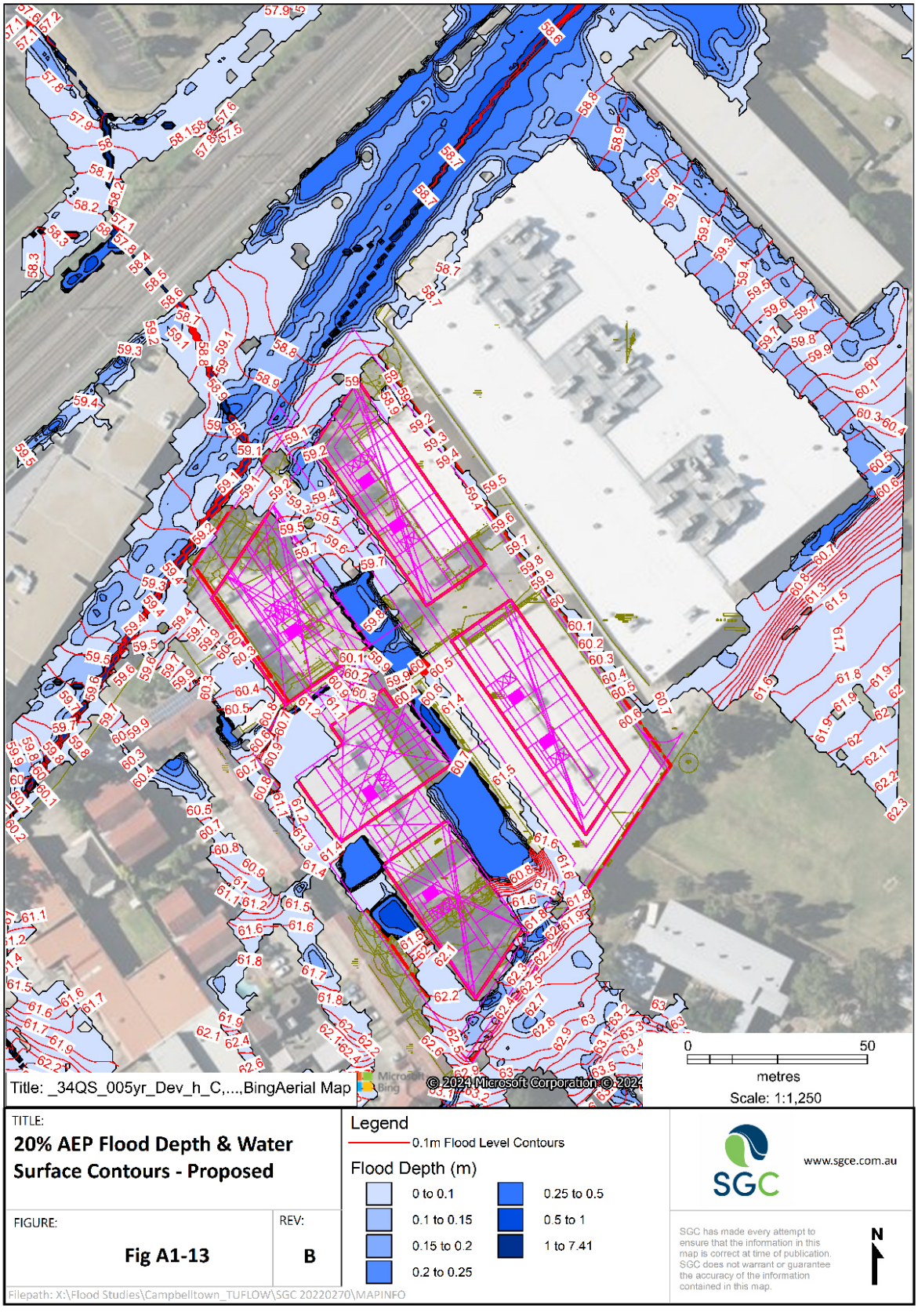

Title: _20220270_xsu,...,BingAerial Map:2
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
5% AEP Flood Hazard - Existing
FIGURE:
Fig A1-8
REV:
B
Legend
Hazard Categories
H1
H2
H3
H4
H5
H6
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

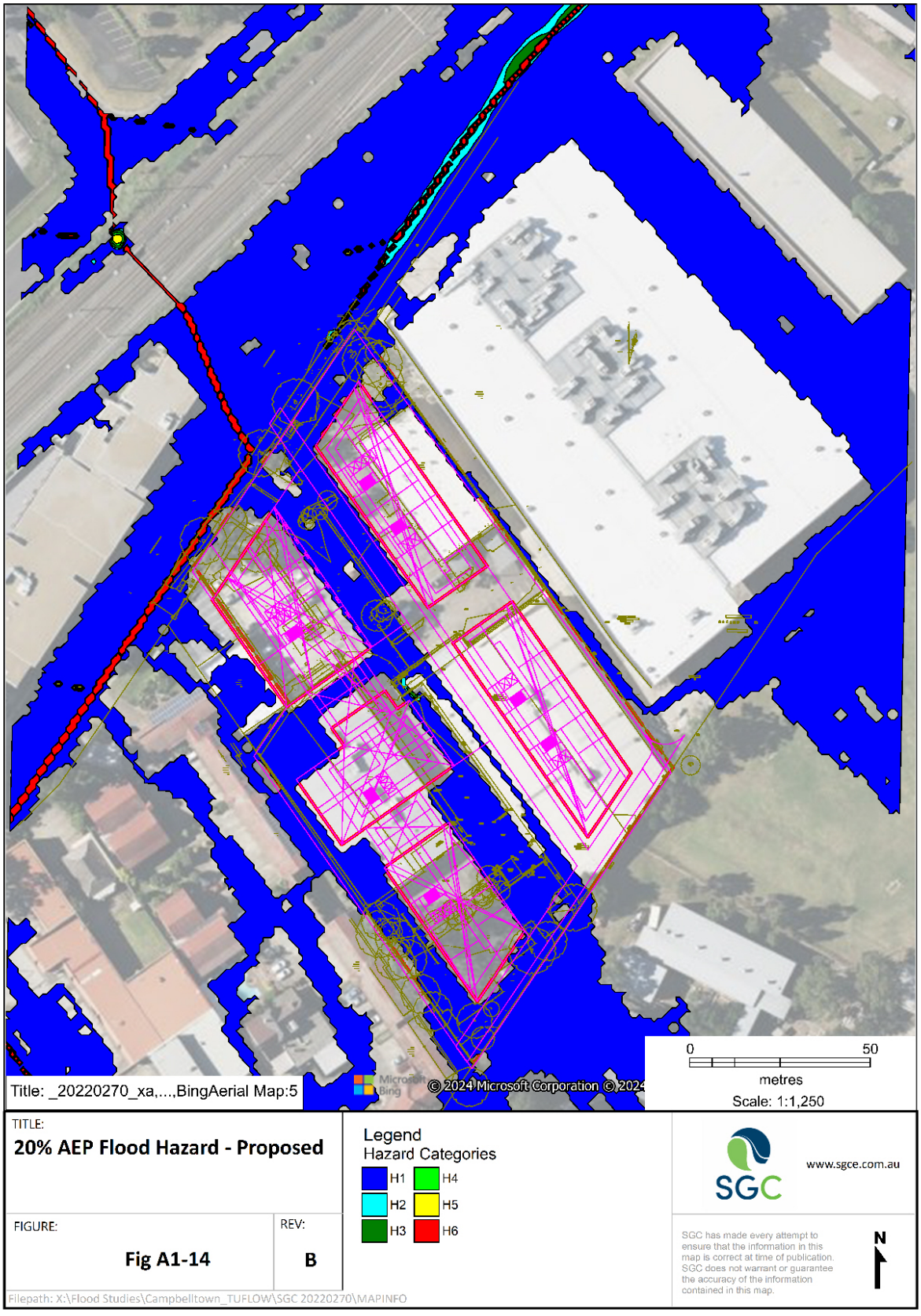

Title: _34QS_020yr_Dev_h_C,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
5% AEP Flood Depth & Water Surface Contours - Proposed
FIGURE:
Fig A1-9
REV:
B
Legend
0.1m Flood Level Contours
Flood Depth (m)
0 to 0.1
0.1 to 0.15
0.15 to 0.2
0.2 to 0.25
0.25 to 0.5
0.5 to 1
1 to 7.41
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

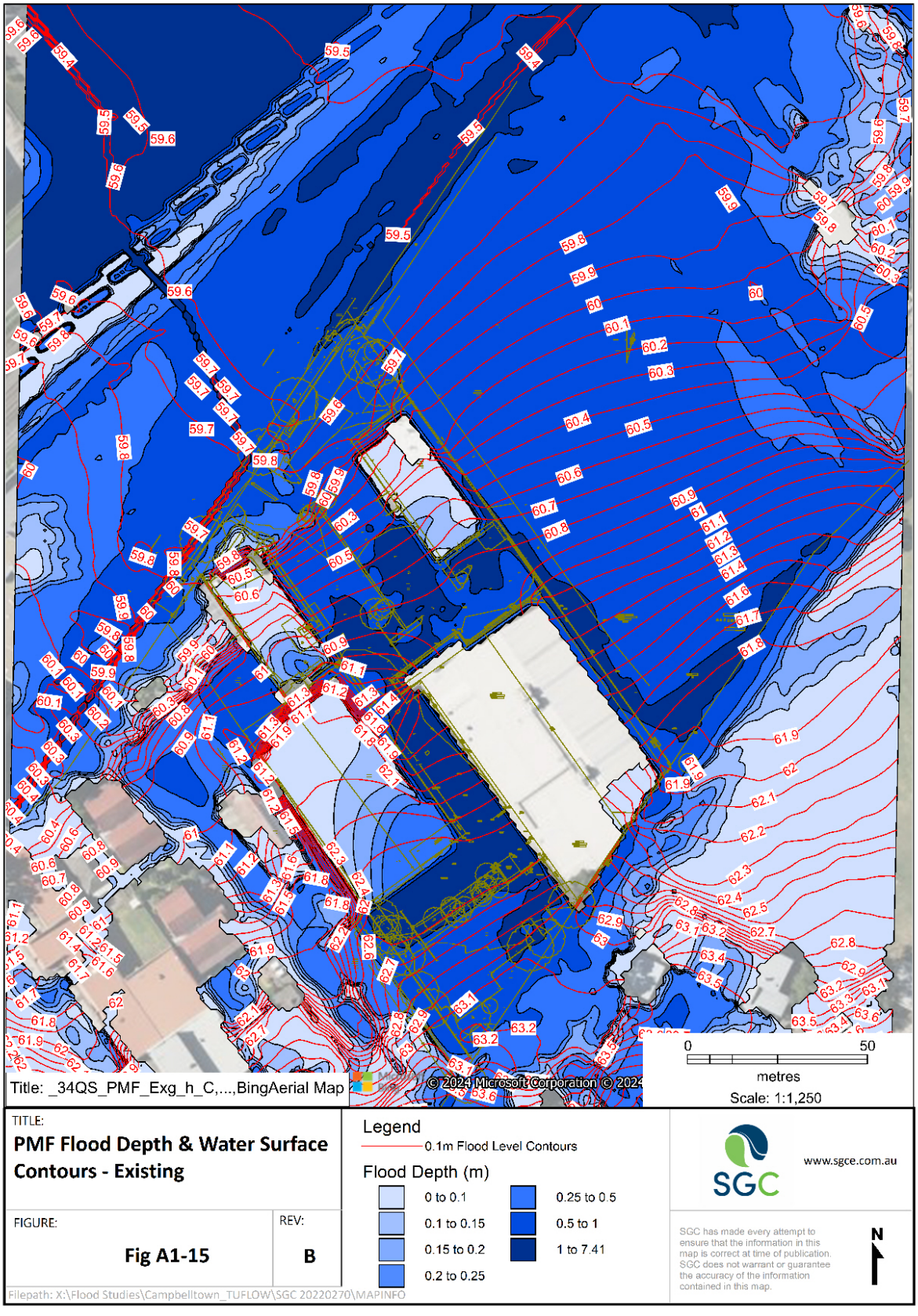

Title: _20220270_xa,...,BingAerial Map:4
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
5% AEP Flood Hazard - Proposed
FIGURE:
Fig A1-10
REV:
B
Legend
Hazard Categories
H1
H2
H3
H4
H5
H6
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

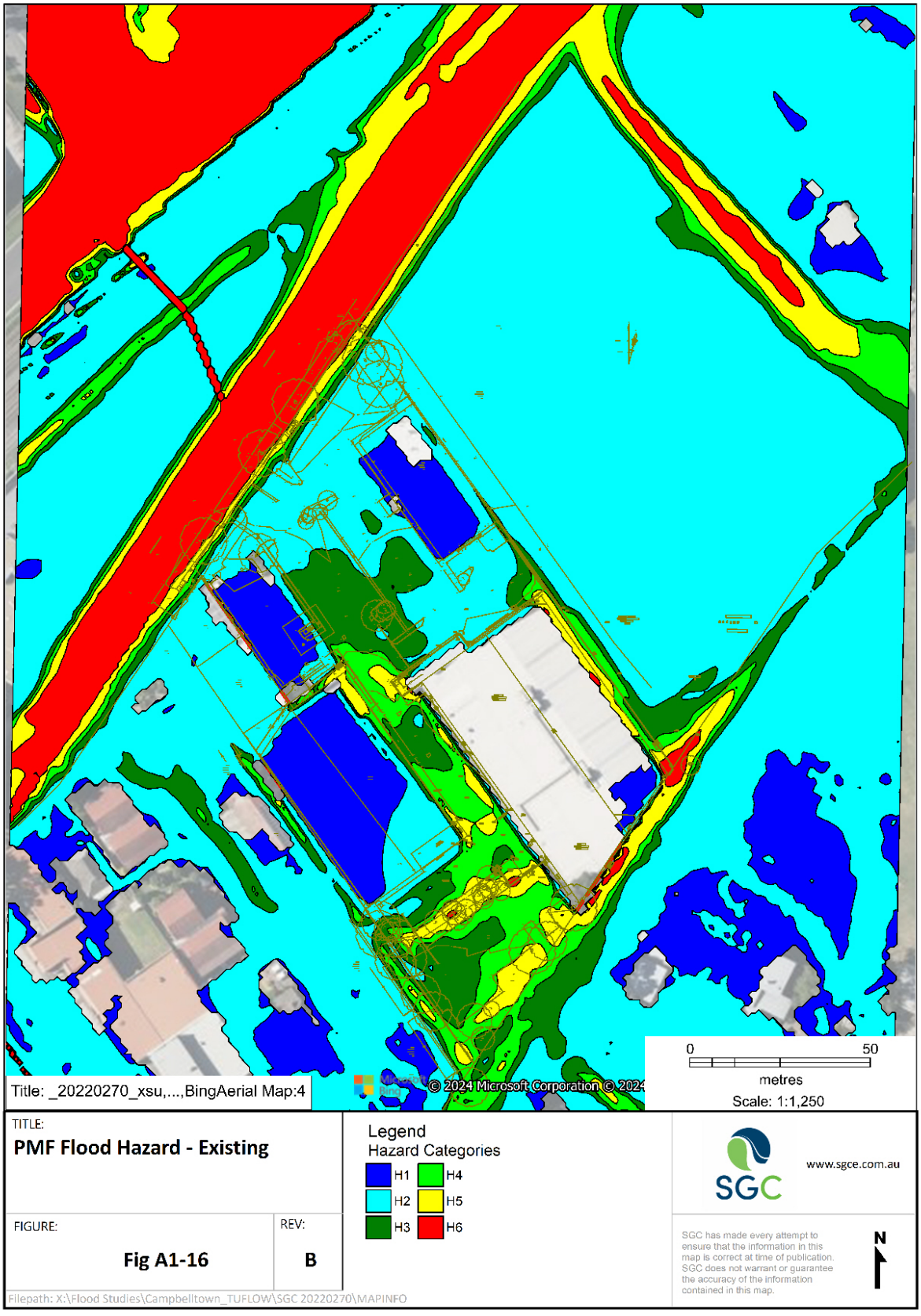

Title: _34QS_005yr_Exg_h_C,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
20% AEP Flood Depth & Water Surface Contours - Existing
FIGURE:
Fig A1-11
REV:
B
Legend
0.1m Flood Level Contours
Flood Depth (m)
0 to 0.1
0.1 to 0.15
0.15 to 0.2
0.2 to 0.25
0.25 to 0.5
0.5 to 1
1 to 7.41
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

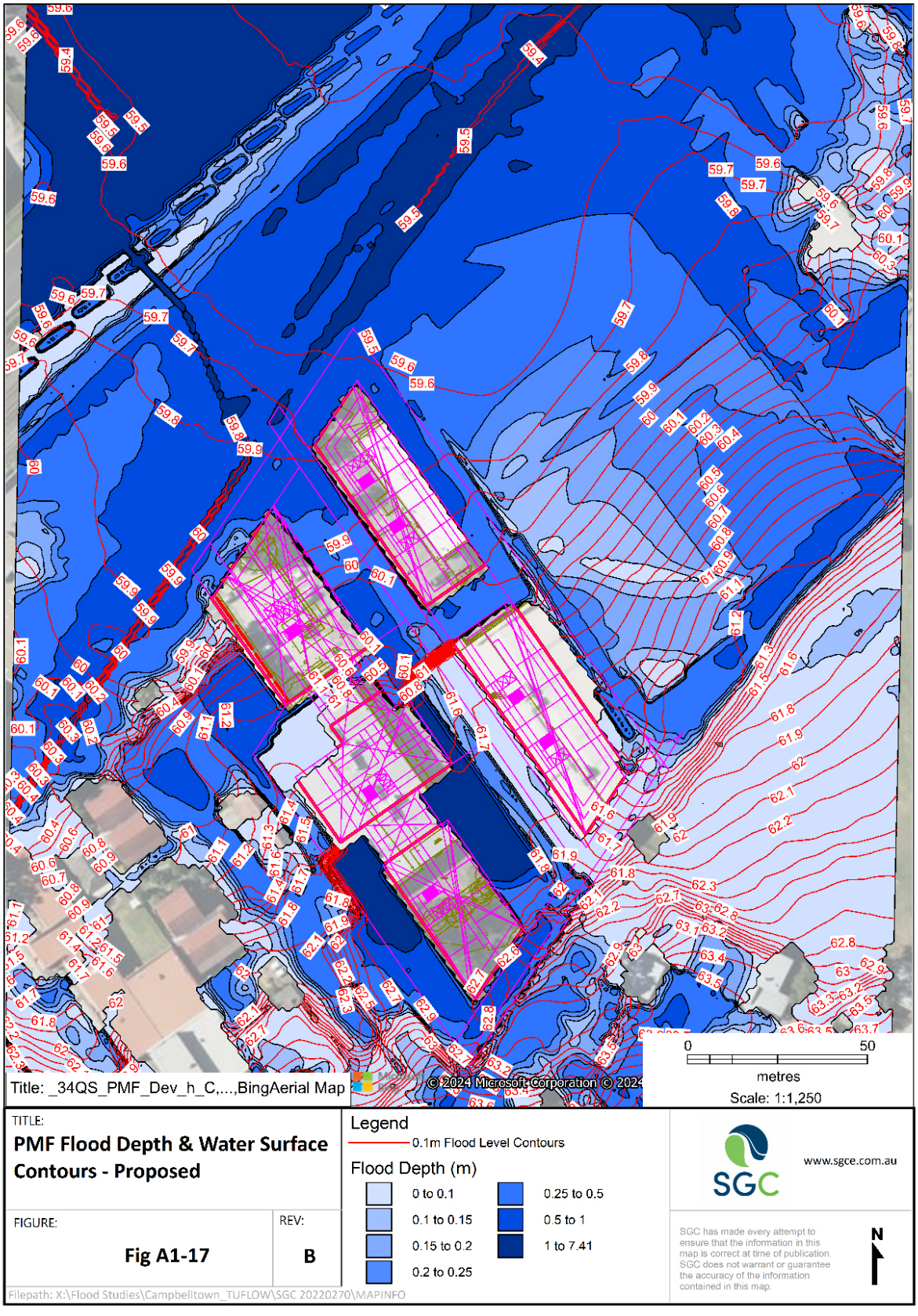

Title: _20220270_xsu,...,BingAerial Map:3
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
20% AEP Flood Hazard - Existing
FIGURE:
Fig A1-12
REV:
B
Legend
Hazard Categories
H1
H2
H3
H4
H5
H6
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

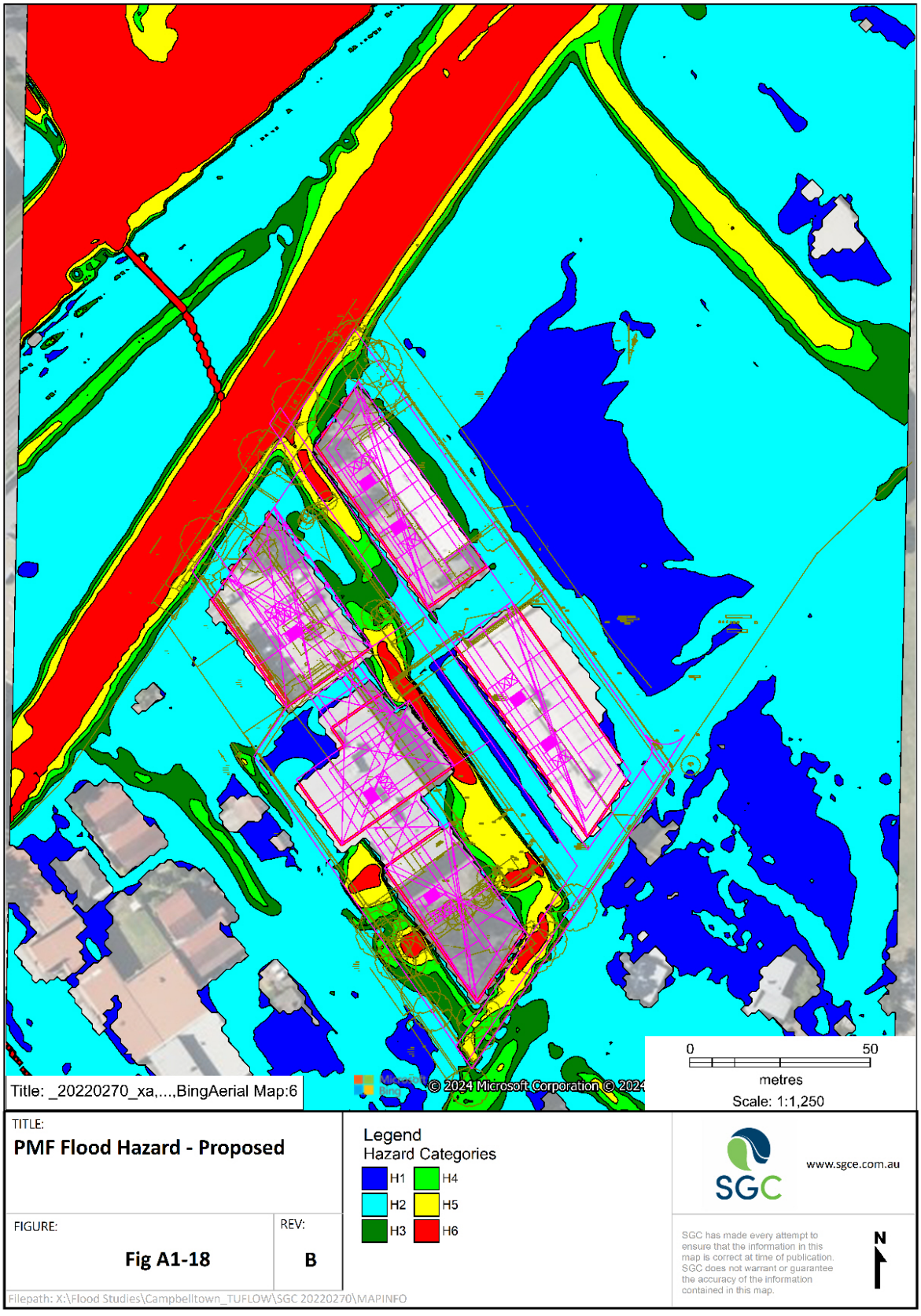

Title: _34QS_005yr_Dev_h_C,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
20% AEP Flood Depth & Water Surface Contours - Proposed
FIGURE:
Fig A1-13
REV:
B
Legend
0.1m Flood Level Contours
Flood Depth (m)
0 to 0.1
0.1 to 0.15
0.15 to 0.2
0.2 to 0.25
0.25 to 0.5
0.5 to 1
1 to 7.41
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO


Title: _20220270_xa,...,BingAerial Map:5
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
20% AEP Flood Hazard - Proposed
FIGURE:
Fig A1-14
REV:
B
Legend
Hazard Categories
H1
H2
H3
H4
H5
H6
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO


Title: _34QS_PMF_Exg_h_C,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
PMF Flood Depth & Water Surface Contours - Existing
FIGURE:
Fig A1-15
REV:
B
Legend
0.1m Flood Level Contours
Flood Depth (m)
0 to 0.1
0.1 to 0.15
0.15 to 0.2
0.2 to 0.25
0.25 to 0.5
0.5 to 1
1 to 7.41
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO


Title: _20220270_xsu,...,BingAerial Map:4
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
PMF Flood Hazard - Existing
Legend
Hazard Categories
H1
H2
H3
H4
H5
H6
www.sgce.com.au
FIGURE:
Fig A1-16
REV:
B
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO


Title: _34QS_PMF_Dev_h_C,...,BingAerial Map
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
PMF Flood Depth & Water Surface Contours - Proposed
FIGURE:
Fig A1-17
REV:
B
Legend
0.1m Flood Level Contours
Flood Depth (m)
0 to 0.1
0.1 to 0.15
0.15 to 0.2
0.2 to 0.25
0.25 to 0.5
0.5 to 1
1 to 7.41
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO


Title: _20220270_xa,...,BingAerial Map:6
© 2024 Microsoft Corporation © 2024
0
50
metres
Scale: 1:1,250
TITLE:
PMF Flood Hazard - Proposed
FIGURE:
Fig A1-18
REV:
B
Legend
Hazard Categories
H1
H2
H3
H4
H5
H6
SGC
www.sgce.com.au
SGC has made every attempt to ensure that the information in this map is correct at time of publication. SGC does not warrant or guarantee the accuracy of the information contained in this map.
N
Filepath: X:\Flood Studies\Campbelltown_TUFLOW\SGC 20220270\MAPINFO

A2 Appendix 2

Survey Plan

P: 02 8883 4239 W: www.sgce.com.au

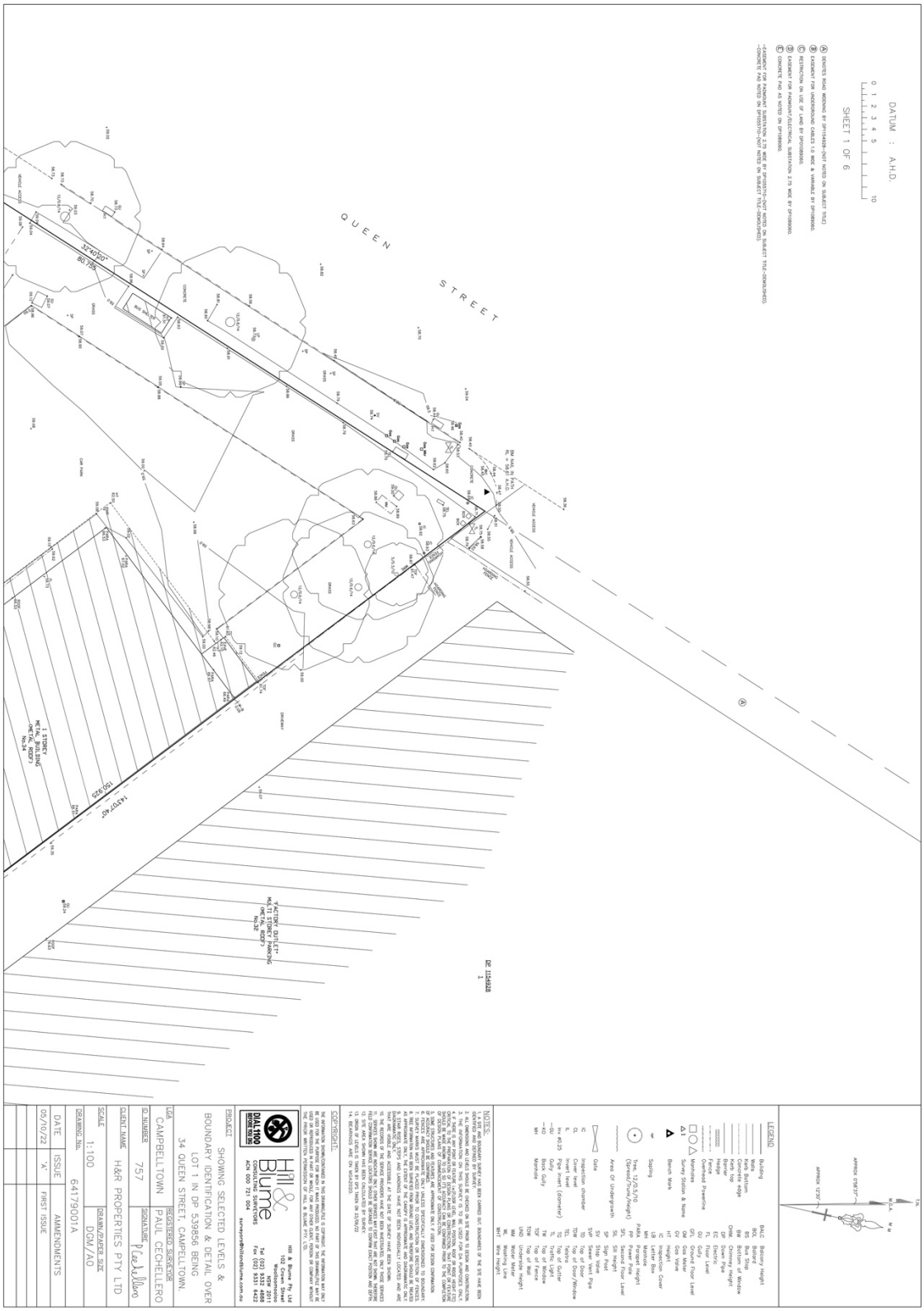


Figure A 2.1 Survey Plan – Sheet 1 of 6

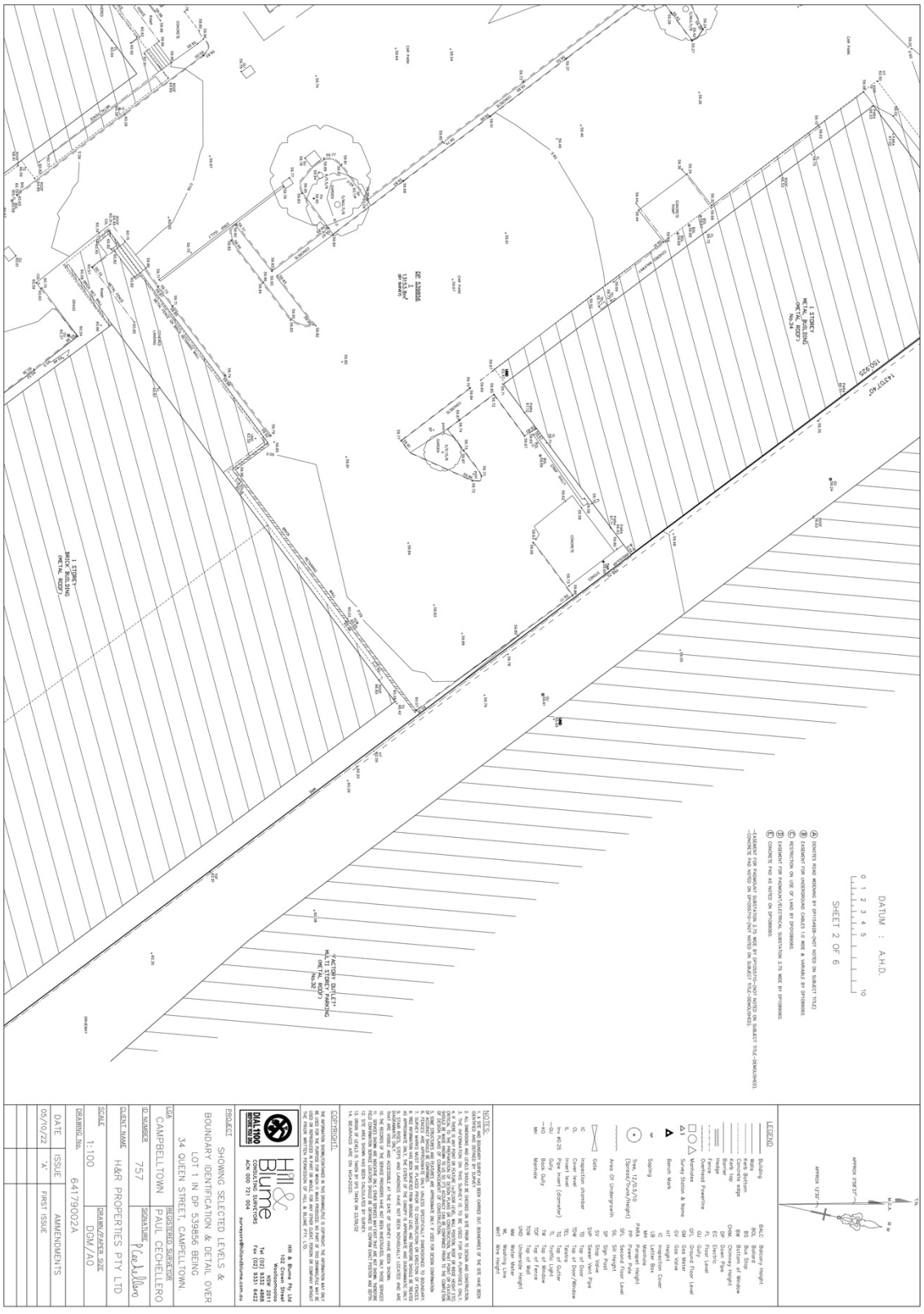


Figure A 2.2 Survey Plan – Sheet 2 of 6

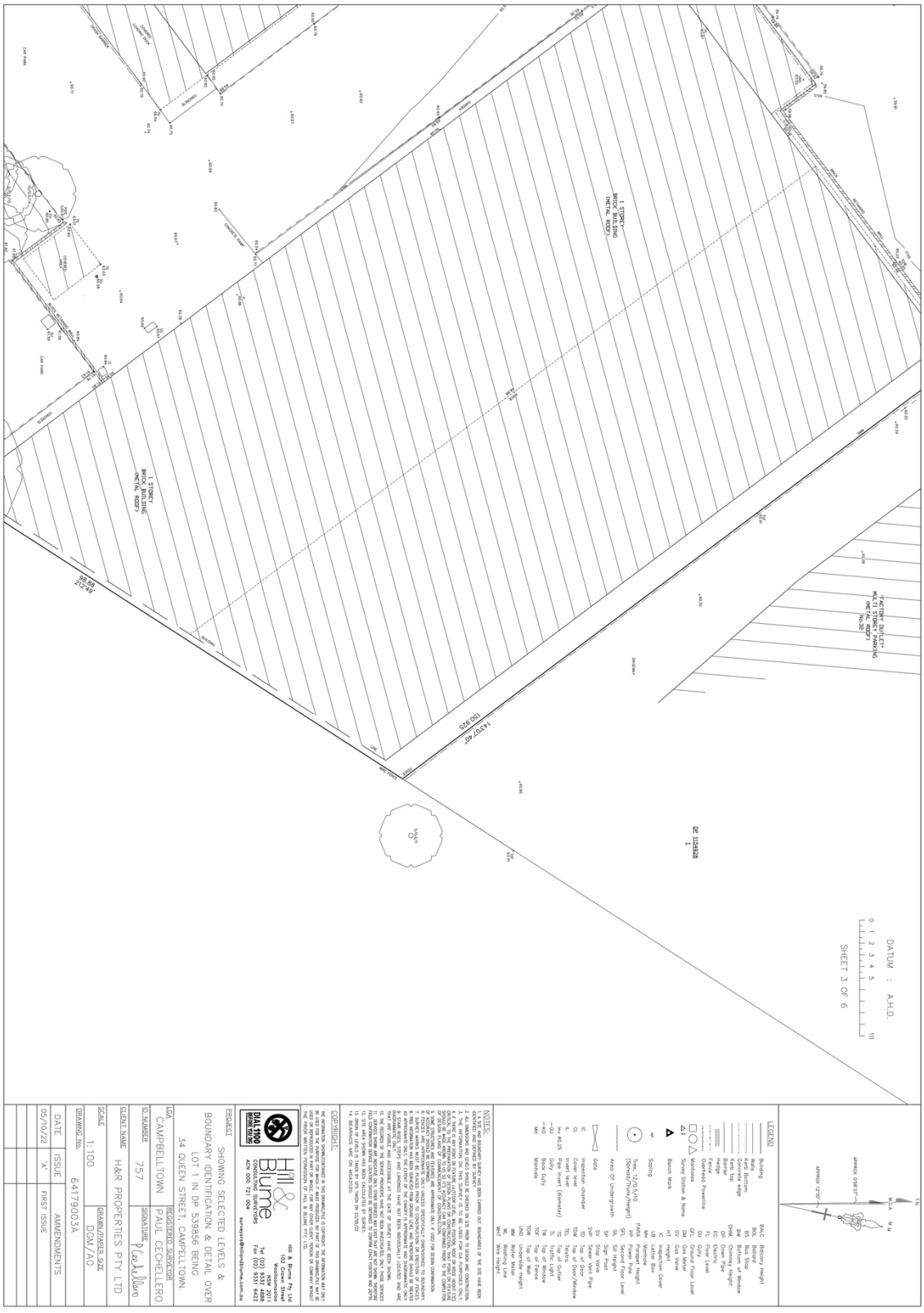


Figure A 2.3 Survey Plan – Sheet 3 of 6

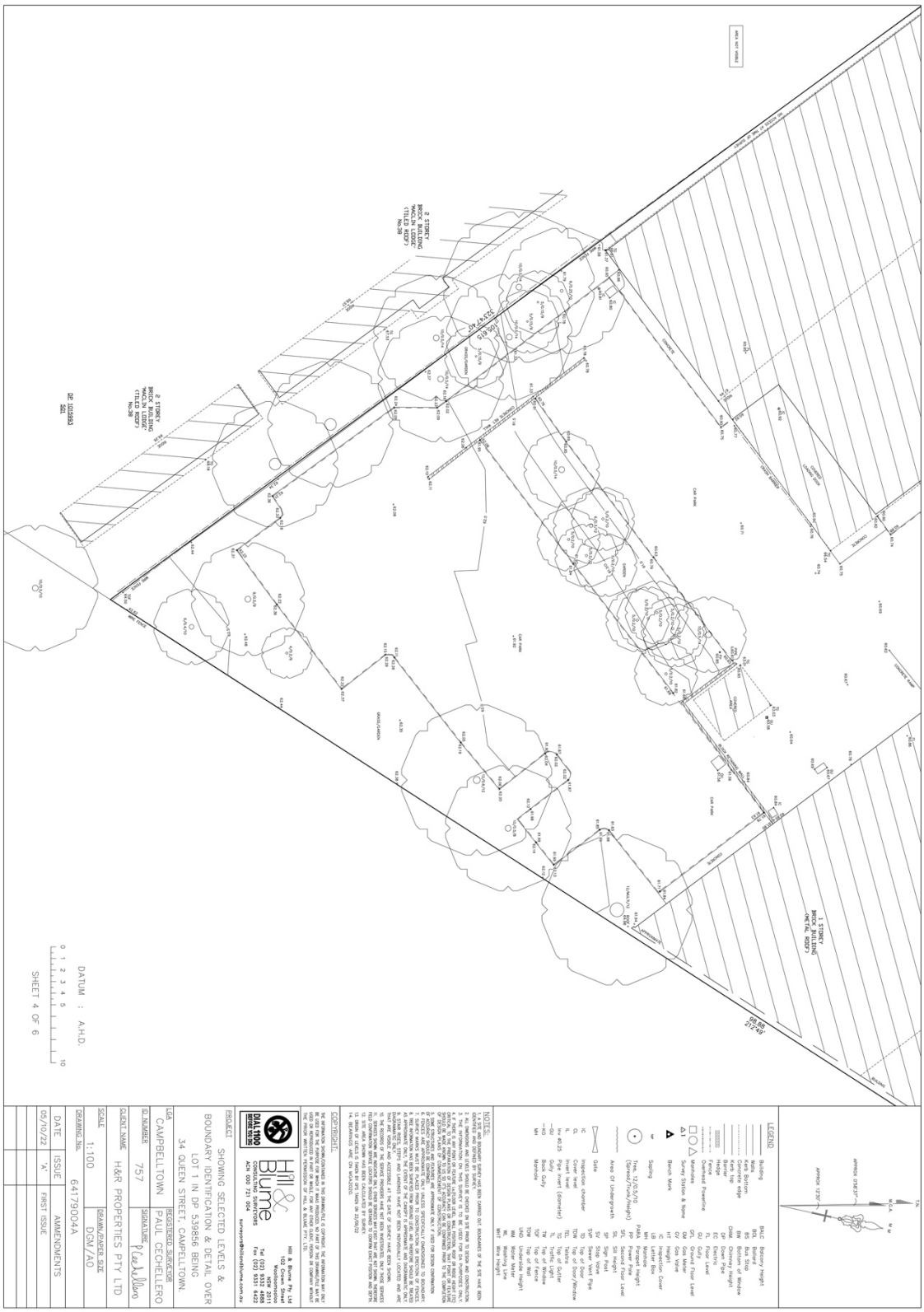


Figure A 2.4 Survey Plan – Sheet 4 of 6

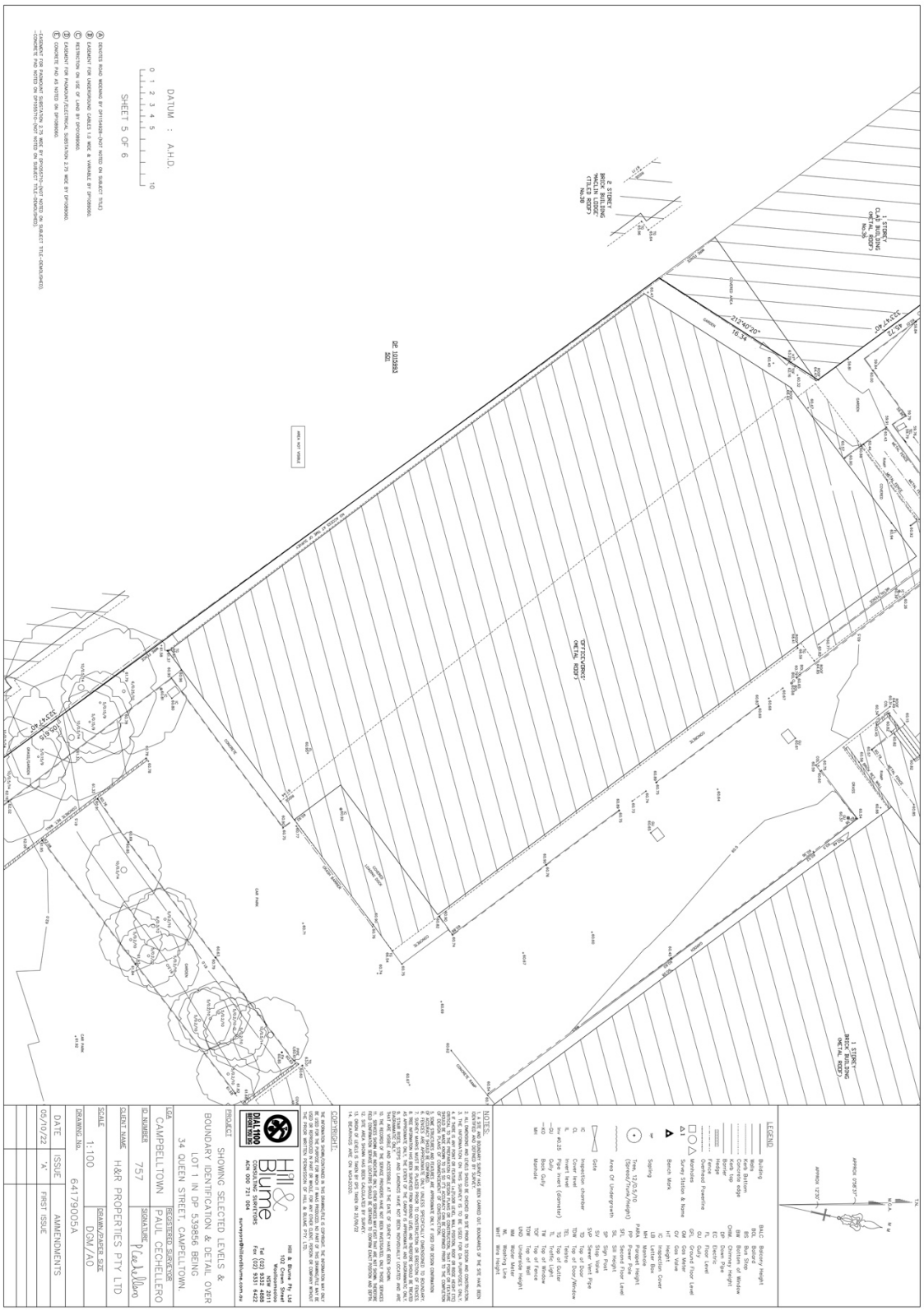


Figure A 2.5 Survey Plan – Sheet 5 of 6

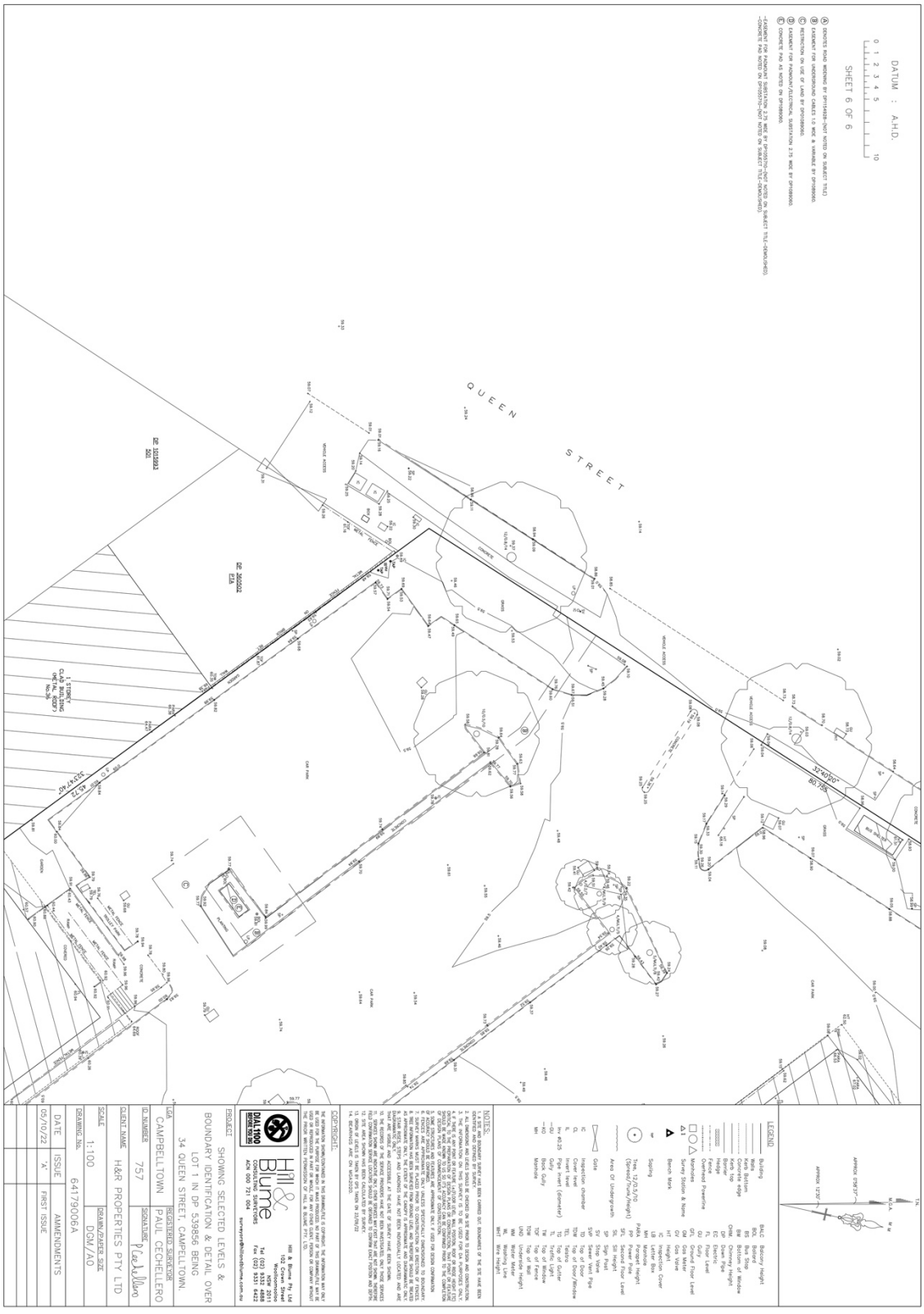


Figure A 2.6 Survey Plan – Sheet 6 of 6

A3 Appendix 3

Flood Information – Campbelltown City Council

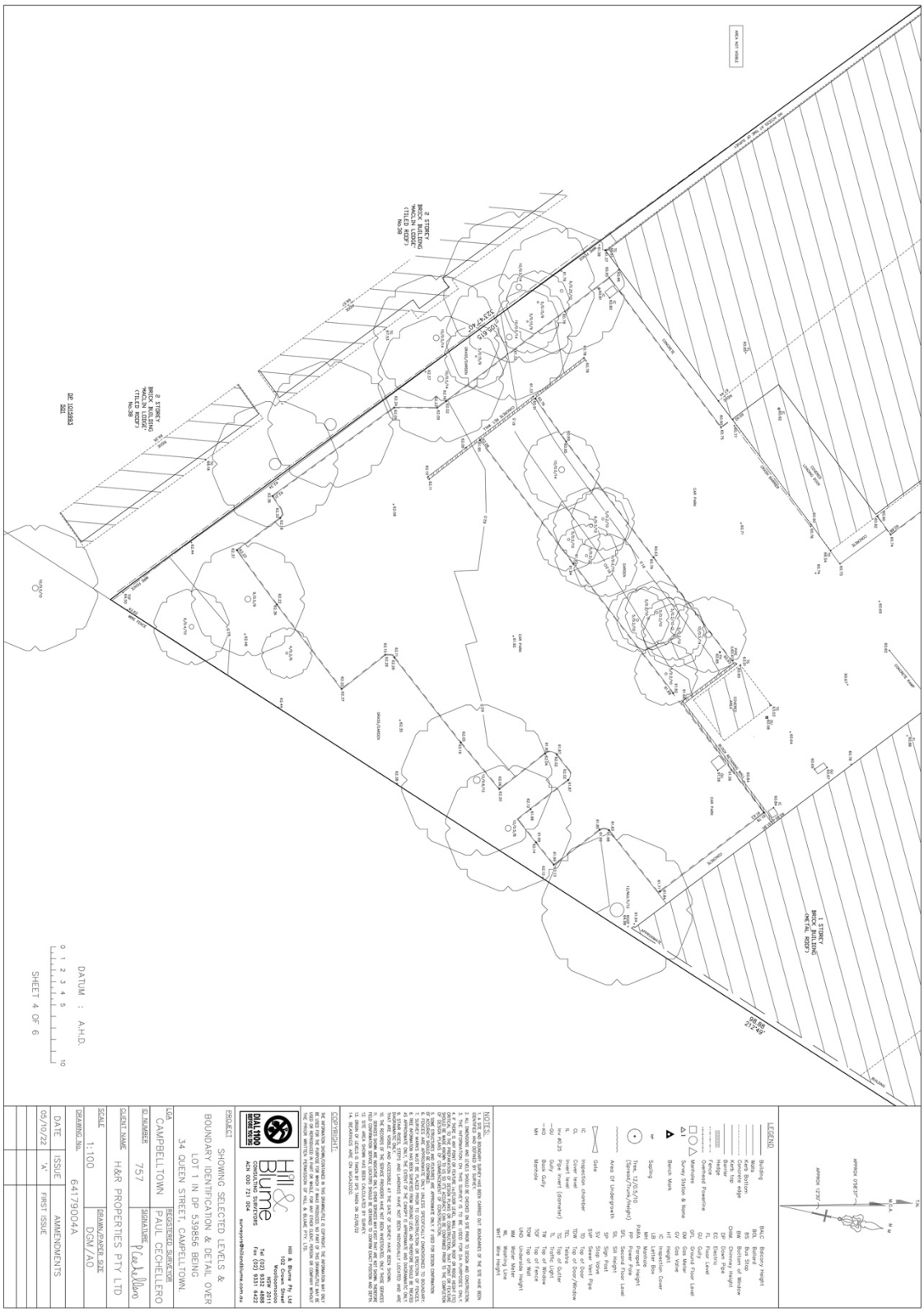


Figure A 2.4 Survey Plan – Sheet 4 of 6

16 March 2023

Sam Haddad
Suite 311, 480 Pacific Highway
St Leonards NSW 2065
office@sge.com.au

Dear Mr Haddad

Stormwater Advice – 34 Queen Street, Campbelltown

I refer to your stormwater advice request form dated 24 February 2023 for the above mentioned property.

Council advises as follows:

1. The abovementioned property **IS** a Flood Control Lot
2. The subject property is not flood affected with respect to main stream flooding
3. The subject property **IS** affected by overland flow.
4. A Flood Control Lot is defined in the State Environment Planning Policy (Exempt and Complying Development Codes) 2008 - REG 1.5 as "a lot to which flood related development controls apply in respect of development for the purposes of industrial buildings, commercial premises, dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (other than development for the purposes of group homes or seniors housing).
5. Council's flood model indicates that in a 1% Annual Exceedance Probability (AEP) event, the flood depth varies with in the property. The flood levels with minimum floor levels are provided in tabular format below across the site along with a site plan showing the locations. Intermediate floor levels may be interpolated. It should be noted that the control levels may change depending on any changes to development on the site. Council does not have any information regarding the floor levels of the existing development on the site.

Location	Min. Fill Level (m AHD)	Min. Floor Level (m AHD)
A	58.9	56.4
B	59.4	59.9
C	60.8	61.3
D	60.8	61.3
E	61.5	62
F	63.1	63.6

Campbelltown City Council
91 Queen Street, Campbelltown
PO Box 57, Campbelltown NSW 2560

campbelltown.nsw.gov.au
T 02 4645 4000
E council@campbelltown.nsw.gov.au

ABN: 31 459 914 087

Interpreter
131 450

Figure A 3.1 Flood Letter – Campbelltown City Council

6. In accordance with the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, I can confirm that the abovementioned property **IS** of the following:

- Flood storage area
- Floodway area
- Flow path

Campbelltown City Council
91 Queen Street, Campbelltown
PO Box 57, Campbelltown NSW 2560

campbelltown.nsw.gov.au
T 02 4645 4000
E council@campbelltown.nsw.gov.au

ABN: 31 459 914 087

Interpreter
131 450

7. In accordance with the State Environmental Planning Policy (Exempt and Complying Development Codes) 2008, I can confirm that the area within the 30m drainage easement (only) in the north east of the lot **IS**:
    - High hazard area
    - High risk area
8. Any development of this site will require drainage to be accommodated in accordance with the Campbelltown City Council Engineering Design for Development.
9. The floor level of the building must also comply with the requirements set out in Clause 3.1.2.3 of Volume 2 of National Construction Code 2019 and Section 4.5 of the Engineering Design Guide for Development. Further controls may be applied at development application stage if the site is affected by a Section 88B (Conveyancing Act) Restriction.
10. Development consent and/or construction consent may be required for any development of this property.
11. Should you need any additional information, please contact Sumedh Padmawar, Infrastructure Engineer at sumedh.padmawar@campbelltown.nsw.gov.au.

Yours sincerely

Peter Chudek
Executive Manager Infrastructure
SP

A4 Appendix 4

DP&E Letter

P: 02 8883 4239 W: www.sgce.com.au

Department of Planning and Environment

Our ref: DOC23/901362
Your Ref: 2287/2023/E-PP)

Ante Zekanovic
Senior Strategic Planner
Campbelltown Council
PO Box 57
Campbelltown NSW 2560

27 October 2023

Subject: Request for preliminary comments - Planning Proposal 34 Queen Street, Campbelltown (2287/2023/E-PP)

Dear Ante

Thank you for your email received 4 October 2023 requesting preliminary comments from the Environment and Heritage Group (EHG) in regard to the draft Planning Proposal at 34 Queen Street, Campbelltown.

EHG understands that the draft planning proposal seeks to amend the Campbelltown Local Environmental Plan 2015 by:

- rezoning a portion of the site from MU1 – Mixed Use to R4 – High Density Residential,
- increasing the maximum permissible building height from 26m (approximately 6 storeys) to 28m and 52m (approximately 15 storeys); and
- introducing a maximum floor space ratio for the site of 2.85:1.

EHG has reviewed the relevant information and provides comments in regard to flooding at Attachment 1.

Should you have any queries regarding this matter, please contact Marnie Stewart, Senior Project Officer Planning via Marnie.stewart@environment.nsw.gov.au.

Yours sincerely,

Susan Harrison
Senior Team Leader Planning
Greater Sydney Branch
Biodiversity and Conservation

Department of Planning and Environment

Attachment 1: Environment and Heritage Group (EHG) comment – Planning Proposal at 34 Queen Street, Campbelltown

Flood Risk Management

EHG has reviewed the following documents and provides advice below:
- 34 Queen Street, Campbelltown – Flood Study by SGC dated June 19, 2023
- Planning Proposal 34 Queen Street Campbelltown by FPD Planning dated June 13, 2023.

Summary
The planning proposal seeks to alter a provision that affects flood prone land and to significantly increase the maximum building height. It also seeks to permit a significant increase in the development of land within the flood planning area by introducing high density residential development to an area currently used for commercial purposes.

EHG has reviewed the flooding behaviour at the site and considers that the significant flood affectation has not been adequately considered in the proposal. Noting the intensification of development within the flood planning area, EHG advises Council to carefully consider the inconsistencies of the Planning Proposal with the requirements of Section 9.1 Direction 4.1 Flood Prone Land. EHG is unlikely to be supportive of this proposal unless significant emergency management constraints can be managed. EHG also advise that the NSW State Emergency Service should be consulted regarding its specific requirements for the planning proposal.

Ministerial Direction
The planning proposal report outlines consistency with the Ministerial Directions under Section 9.1 of the *Environmental Planning and Assessment Act 1979*. Regarding Direction 4.1 Flooding, the report provides comment on page 41. EHG is not satisfied that the commentary provided addresses all the requirements of the direction and therefore is inadequate to inform decisions on this planning proposal. In order to demonstrate consistency with the Ministerial Direction, the planning proposal would need to:

1. Meet the objectives of the Direction, including:
(a) ensure consistency with the NSW Government's Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005*.
(b) ensure that the provisions of an LEP that apply to flood prone land are commensurate with flood behaviour and includes consideration of the potential flood impacts both on and off the subject land.

* Noting that although the Floodplain Development Manual 2005 has been replaced by the Flood Risk Management Manual 2023, there is consistency between the 2005 and the 2023 manuals and their intent, and the concept of the principles is the same.

Neither of the above objectives have been addressed and therefore consistency with the Direction has not been demonstrated.

Below are some key principles that have not been considered for this planning proposal:

Understand flood behaviour and flood constraints
Understanding flood risk involves understanding the consequences of flooding on the community and the likelihood of these consequences occurring. Flood risk may also vary over time as flood behaviour changes with climate change, changes in the catchment and floodplain, and FRM measures.

The development should address existing flood behaviour and flood constraints considering the full range of flooding up to and including the Probable Maximum Flood (PMF). The report has a limited discussion about the 1% AEP flood extent and hazard. Further information on existing flood behaviour, flood constraints and flood risks would be required.

Understand flood risk and how it may change
Flood risk may also vary over time as flood behaviour changes with climate change, changes in the catchment and floodplain, and FRM measures.
The proposal should address existing flood risks and how they may change due to the development and climate change by undertaking a flood impact and risk assessment (FIRA) in accordance with the NSW Government's Guideline Flood Impact and Risk Assessment Guideline. The FIRA should be undertaken by qualified engineers who have experience and advanced skills in catchment hydrology and floodplain hydraulics and have a good working knowledge of FRM practices and guidance in New South Wales.

Maintain natural flood functions
Understanding the natural flow conveyance and storage function of the floodplain is important for effective flood risk management. If flowpaths are partially or fully blocked by development or fill, alternative flowpaths may form, with potentially detrimental impacts to the community.
As identified in Council's Stormwater Advice letter, the site is a floodway, flood storage and flowpath. The planning proposal should present this information and how these will be maintained.

Manage flood risk effectively
Management requires an understanding of the full range of flood behaviour and risk and how this may change.
The development is proposing to significantly increase the dwelling density of the land and result in increasing the exposure to flooding and consequently flood risk on the site. The post-development flood risk and constraints and the impact of flooding on the future users of the site have not been adequately assessed.

2. Demonstrate consistency with the Ministerial Direction clauses, particularly clause 3.
The proponent must refer to the abovementioned clause and address how the planning proposal satisfies its provisions. A FIRA would need to be prepared in accordance with the NSW Government's Guideline Flood Impact and Risk Assessment Guideline to support this planning proposal. The deliverables of the FIRA should be in general accordance with Table 6 of Attachment A of the guideline.

The assessment provided is based on Council's model, but only includes assessment for the 1% AEP flood event. The full range of flooding must be considered including lesser events, the 1% AEP event plus climate change and the PMF.

The post-development scenario must include the detail of the proposed development, including but not limited to the proposed buildings (including any required floor level raising which may obstruct existing flood flows), earthworks, landscaping and infrastructure. Impacts of the development must be assessed by mapping flood level differences greater than 0.01m. The letter only shows impacts greater than 0.025m. Significant impacts are shown external to the site, which would need to be mitigated.

The Bow Bowing Bunbury Curran Creek Strategic Floodplain Risk Management Study and Plan maps the site as a low flood island, which presents a significant constraint to flood emergency

management. The site is entirely inundated by the 1% AEP flood event and hazard conditions in the PMF have not been presented. The proposal should consider the flood risk management guideline EM01, Support for emergency management planning.

Access and Egress
According to the Bow Bowing Bunbury Curran Creek Strategic Floodplain Risk Management Study and Plan, the site access may be affected at least as frequently as in the 20% AEP event. It appears no attempt has been made to ascertain if the site would be isolated more frequently than that. With frequent isolation, EHG raises serious concerns for access and egress to the site.

Queen Street is flooded relatively frequently, which may mean there is no suitable site access. Day to day access should be considered separately to evacuation. Even if a shelter in place strategy were adopted, the frequency of loss of access remains a major concern. Access may be lost in events as small as the 20% AEP flood event, and possibly even more frequently, but EHG does not have access to data on more frequent events.

It appears that the capacity of existing stormwater infrastructure in Queen Street would not meet Council'standards. One option to provide suitable site access would be to upgrade stormwater drainage infrastructure to provide flood free access up to and including the 5% AEP storm event. If this option is considered the applicant should undertake an assessment to ensure no adverse impacts downstream of the site. Nevertheless, a greater standard of access may be desirable if a shelter in place strategy is to be adopted.

End of Submission