



NL150032_E11_A

2nd June 2017

Level 1, 215 Pacific Highway Charlestown NSW 2290
PO Box 180 Charlestown NSW 2290
T (02) 4943 1777 F (02) 4943 1577
E newcastle@northrop.com.au

Fairfield City Council
PO Box 21
Fairfield NSW 1860

Dear Sir/Madam,

**Re: No. 449 Victoria Street, Lot 304, Wetherill Park DP1098762
Flood Risk Management**

Introduction

Northrop has prepared the following Flood Risk Management report in accordance with:

- Fairfield City Council's – Chapter 11: *Flood Risk Management (Amendment 13)*.
- Fairfield City Council's – Chapter 9.8: Industrial development (amendment No. 7): *Development Guidelines for 449 Victoria Street and 96 Newtown road Wetherill Park*.
- Cardno's Modelling and Recommendations: *Supplementary Flood Risk Assessment for 449 Victoria Street, Wetherill Park (4 August 2011)*.
- Cardno's Modelling and Recommendations: *Addendum Flood Risk Assessment for 449 Victoria Street, Wetherill Park (5 July 2011)*.
- Site Specific Development Control Plan – *Intersection of Victoria Street & Newton Road, Wetherill Park (Amendment 13)*.

This report shall be read in conjunction with Northrop's NL150032_E10: *Flood Impact Assessment*. The flood assessment has been coordinated with *Cardno*, who undertook the flood modelling and representation of results as per the requirement of *Fairfield City Council*. Subsequently, this report discusses the results obtained from *Cardno* and the comparison between pre/post flood risk impacts. The modelling methodology and parameters are at the discretion and responsibility of *Cardno* and as we understand are regarded to be acceptable methods by *Fairfield City Council*.

Flood Impact Assessment

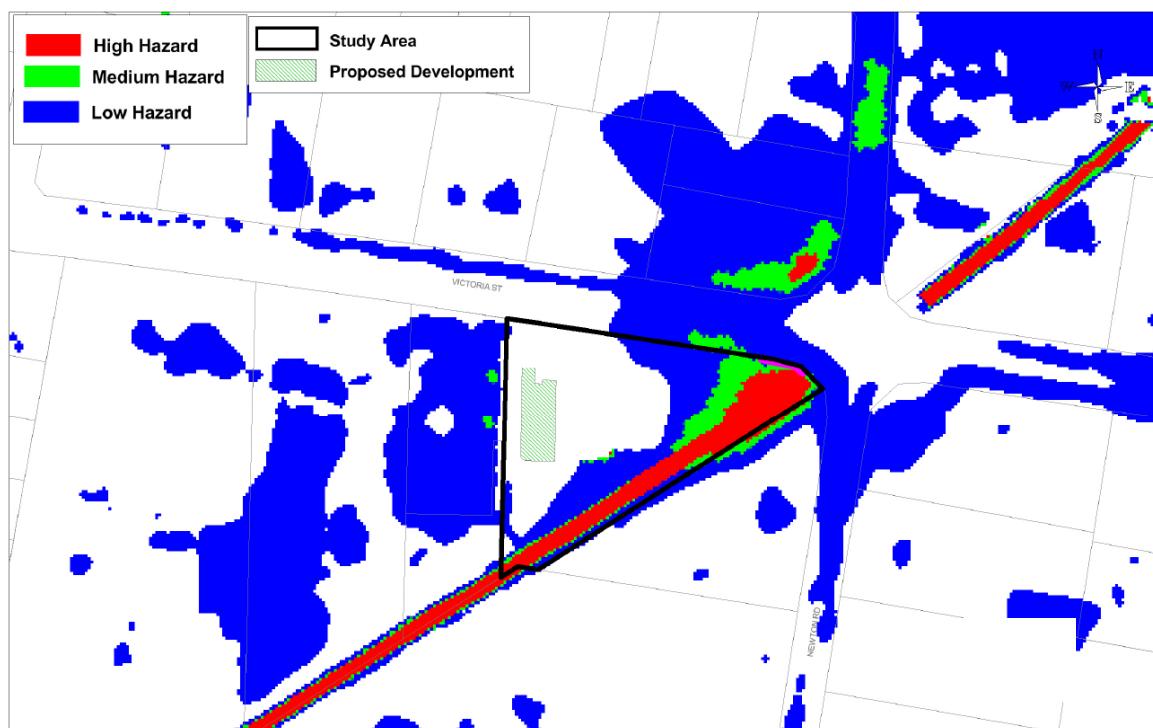
The proposed development consists of the construction of a new hotel with associated retail outlet, medical centre, driveway, forecourt and carparking areas. The proposed developments *Land-Use-Category* is defined as *Commercial/Industrial* as described in FFCC's Chapter 11 - Schedule 2.

The existing site hazard conditions is based on *Cardno's* hazard plan produced for the development of Lot 304(2) – Service Station. As this has since been constructed, the hazard analysis is now considered the 'pre-developed' scenario, in which this development is to be compared to. For additional information regarding the Lot 304(2) development, please refer to Northrop's report *NL150032 E03 D*, previously submitted to FFCC.



Figure 1 Pre-Developed 100year ARI Flood Risk

For the purpose of this assessment the proposed development, including the building itself, is located primarily within areas which are not flooded. A small portion of car parking is located in a Low Hazard category. The proposed development shall fill the site above the 100 year flood level and have a minimum FFL of 44.00 as specified in FFCC's Site Specific DCP, which is a minimum 500mm above the 1% AEP flood level. The post developed flood risk hazard results prepared by *Cardno* are presented in figure 2 (below).



**Figure D7 100Year ARI Flood Hazard
Proposed Development (v8)**

Figure 2 : Post-Developed 100year ARI Flood Risk

The resulting flood impacts for the 100 year ARI event are minimal/none, with no increase in flood hazards or flood levels on surrounding properties (including the recently subdivided Lot 304(2)). The pre/post-developed flood risk precinct classification is presented in table 2 (below).

Location	Pre Developed Flood Risk	Post Developed Flood Risk
Main Channel	High	High
Entire Site	Low/none	Low/none
Newton Road	Medium	Low
Victoria Street	Medium	Medium/Low

Table 1: Pre-developed Flood Risk Precinct

Table 1 indicates that the flood risk for the site and surrounding roads decreases or remains the same. The performance criteria outlined in FFCC's 11.8.2 was found to comply with the proposed development. Further discussions regarding flood levels and their relative impacts on this area and other developments are discussed in NL150032 E10 – Flood Impact Assessment report.

Additionally, it shall be noted that the results of the flood study indicate that no section of the proposed building will be in contact with flood waters for the 100 year storm event (plus freeboard). This addresses section 11.11 f) in Chapter 11 of the DCP, which is considered to be non-applicable.

Schedule 6 Compliance

The following subsections address the site specific requirements as outlined in Schedule 6 of Chapter 11 of the DCP.

Floor Levels (5, 6 and 7)

Sections 5, 6 and 7: as both habitable and non habitable floors are above the 100 year storm event plus freeboard level, and no section of a habitable floor level is 1.5m above the natural surface, the Floor Levels section is considered to be satisfactory.

Building Components and Methods (1)

Section 1: The pavement of the carpark is raised such that there is adequate clearance between the minimum base of the building (i.e. toe of building structure) being set at 43.80m AHD), with the highest flood level being 43.75m AHD (including freeboard) based off Cardno's flood modelling Data files.

Note: Finer detail is not shown on the PDF plans provided by Cardno. Data files can be provided upon request to assess flood levels in finer detail. As no sections of building are below the 100 year ARI (plus freeboard level) this section is deemed non-applicable, as all building materials will be clear of the 100 year flood event plus freeboard.

Structural Soundness (2)

Section 2: Similarly, as stated above, as the no building sections are within the 100 year storm event plus freeboard, this section is deemed non-applicable.

Flood Effects (2)

Section 2: The proposed development does not cause an increase in flood depth, velocity or hazard downstream or on any surrounding properties. Therefore, the flood effects are considered to be satisfactory.

Carparking and Driveway Access (1, 3, 5, 6 and 7)

Section 1: As shown in *Cardno's* Figure D16 (v8) and additionally Northrop's Stormwater Management Plan C303 (Rev A), the 1 in 20 year storm event flood levels are lower than the carpark levels, and flood water does not encroach the carpark. Consequently, the carpark levels are deemed to be satisfactory.

Section 3: There are no garaged or enclosed car parking sections proposed for this site, therefore this section is deemed non-applicable.

Section 5: No section of the driveway access is below the 100 year storm event as shown on Northrop's Stormwater Management Plan C303 (Rev A), therefore this section is deemed non-applicable.

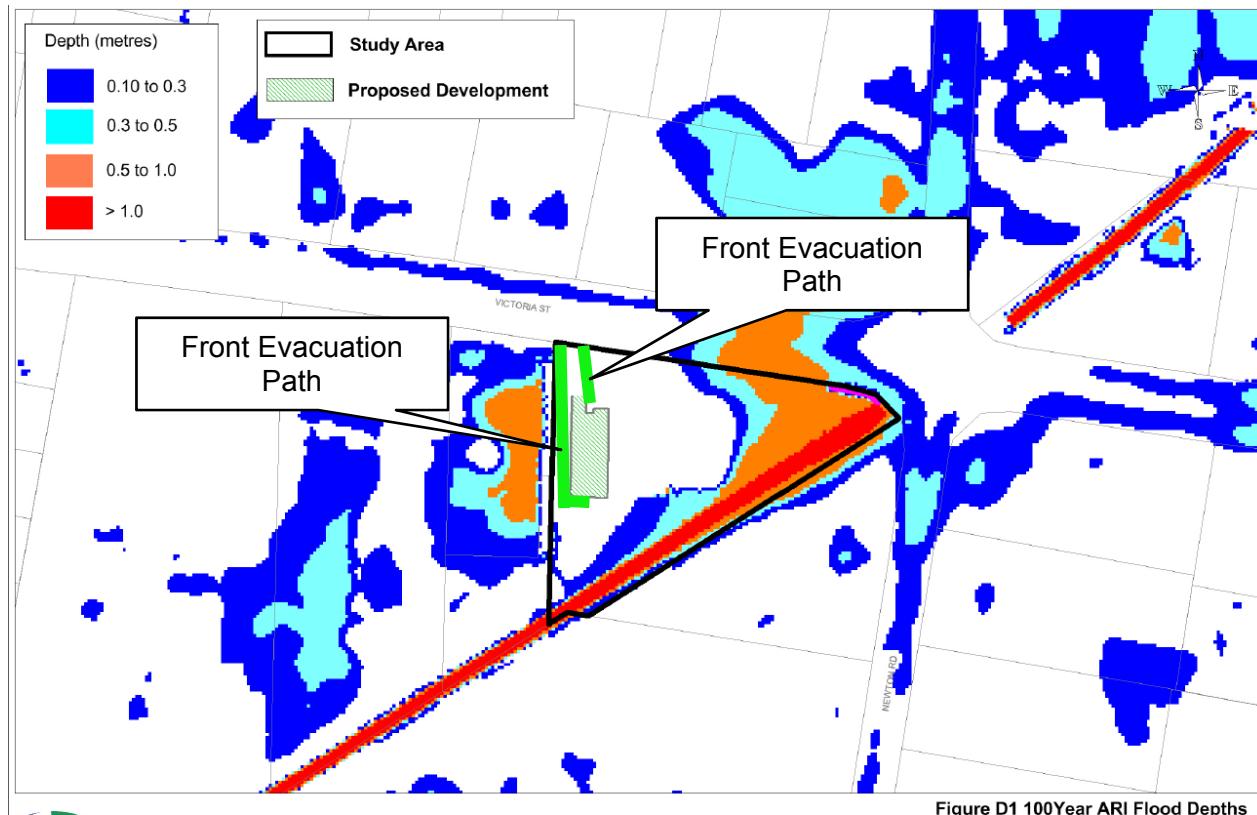
Section 6: The car parking area levels are not below the 1 in 20 year event, nor 0.8m below the 100 year storm event. The maximum depth over the entire site is approximately 0.5m and 0.22 in vehicular accessible areas as shown on *Cardno's Figure D1 (v8)*. Therefore, flood warning signage is not required.

Section 7: Bollards have been proposed to be provided in the carpark area (between the interface of the carpark and the channel), around the vicinity affected by the 100 year storm event, as indicated on Northrop's Stormwater Management Plan C303 (Rev A). The bollards are to be spaced 1.3m apart and be designed to withstand the expected forces of floating cars during the 100 year storm event.

Evacuation (1)

An evacuation route between the building and north-western driveway access has been determined to be a reliable and safe evacuation path. *Cardno's* Figure D1 indicates a clear path free of 100 year flood levels for both front and rear exits. Additionally, it can be seen in figure 3 (below) that the depth of inundation on the driveway during a 100 year flood is no greater than:

- i) The Depth at the road; and,
- ii) The depth at the car parking space.



**Figure D1 100Year ARI Flood Depths
Proposed Development (v8)**

A more detailed evacuation plan, NL150032-FE10, prepared by Northrop Engineers is attached in Appendix A.

Management and Design (2, 3 and 5)

The proposed hotel's lowest floor is to be the main floor which will be at the minimum FFL 44.00, which is above the 100 year flood (plus 500mm freeboard) level. There are no floors below this level. As such, it is considered appropriate to store goods within the proposed building. Furthermore, as no goods can be stored below the design floor level, no stored materials are at risk of causing pollution or be potentially hazardous during a 100 year flood. Therefore this section is deemed non-applicable.

Conclusion

Based on the above assessments, it was concluded that the proposed development at 449 Victoria Street (Lot 304 (1)), Wetherill Park, will have minimal to no impacts on the site and other surrounding developments. The proposed development will ultimately reduce the flood risk hazard for the site, with no increase of risk for Victoria Street and Newton Road, and their adjoining properties.

We trust this meets your requirements, however should you require anything further, please do not hesitate to contact the undersigned.

Yours sincerely



Ryan Diercke
Civil Engineer
BE (Civil Hons1)

LEGEND

- ← DENOTES EVACUATION PATH
-  DENOTES 100 YEAR ARI FLOOD DEPTHS BETWEEN 0.1 - 0.3m.
-  DENOTES 100 YEAR ARI FLOOD DEPTHS BETWEEN 0.3 - 0.5m.
-  DENOTES 100 YEAR ARI FLOOD DEPTHS BETWEEN 0.5 - 1.0m.
-  DENOTES 100 YEAR ARI FLOOD DEPTHS GREATER THAN 1.0m
-  DENOTES EXTENT OF EXISTING 100 YEAR ARI FLOOD EVENT

NOTE:
 1. FLOOD EXTENTS HAVE BEEN ASSESSED AND PRODUCED BY CARDNO
 ENGINEERS.
 2. AN EVACUATION ROUTE BETWEEN THE BUILDING AND NORTH-WESTERN
 DRIVEWAY ACCESS HAS BEEN DETERMINED TO BE A RELIABLE AND SAFE
 EVACUATION PATH. CARDNO'S FIGURE D1 INDICATES A CLEAR PATH FREE
 OF 100 YEAR FLOOD LEVELS. ADDITIONALLY, THE DEPTH OF INUNDATION
 ON THE DRIVEWAY DURING A 100 YEAR FLOOD IS NO GREATER THAN:
 2.1. THE DEPTH AT THE ROAD; AND,
 2.2. THE DEPTH AT THE CAR PARKING SPACE.

DESIGNED: R.DIERCKE (B.E. CIVIL) JOB MANAGER: A.BROWN

DRAWN: R.DIERCKE

VERIFIER: A.BROWN



NOT FOR CONSTRUCTION

REVISION

DESCRIPTION

ISSUED

VER'D

APP'D

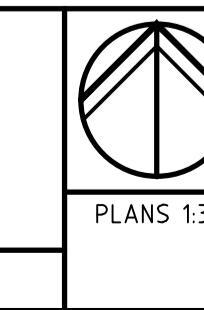
DATE

CLIENT

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PLANS 1:300

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NORTHROP
 Newcastle
 Suite 4, 215 Pacific Hwy, Charlestown NSW 2290
 P.O. Box 180, Charlestown NSW 2290
 Ph (02) 4943 1777 Fax (02) 4943 1577
 Email: newcastle@northrop.com.au ABN 81 094 433 100

PROJECT
 449 VICTORIA ST, WETHILL PARK
 LOT 304 DP 1098762
 PROPOSED SUBDIVISION

DRAWING TITLE
 FLOOD EVACUATION
 PLAN

JOB NUMBER
NL150032

DRAWING NUMBER
FE10

REVISION
A

DRAWING SHEET SIZE = A1