

Sarina Drainage Study

Volume 1 Report

Sarina Drainage Study

Volume 1 Report

Client: Mackay Regional Council

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Table of Contents

Executive Summary	i
1.0 Introduction	1
1.1 Project Background	1
1.2 Study Objectives	1
1.3 Methodology	2
1.4 Notes on Flood Frequency	2
1.5 Limitations and Exclusions	3
1.5.1 Interpretation of Results	4
1.6 Report Structure	4
2.0 Study Area and Key Characteristics	5
2.1 Study Area	5
2.2 Catchment Characteristics	5
2.3 Climate Characteristics	8
2.3.1 Rainfall Regime	8
3.0 Available Data	9
3.1 General	9
3.2 Previous Reports	9
3.2.1 Sarina Northern Access Hydraulic Analysis Report (AECOM, March 2018);	9
3.2.2 Sarina Drainage Study (Cardno, 2013)	10
3.2.3 11-13 Sarina Beach Road, Stormwater Quantity and Culvert Analysis (McVeigh, November 2012);	10
3.2.4 Lot 15 RP746237 & Lot 76 RP74493 Sarina (Cardno, December 2006);	10
3.2.5 Lot 10 on RP866583 Cemetery Road/Arthur Street. Sarina MCU (Pacific Place Property Trust, June 2006)	11
3.2.6 Sarina Industrial Subdivision Lot 4 on SP117897 (Qantec McWilliam. November 2006);	11
3.2.7 Broad Street / Beach Road Drainage Study (Ullman & Nolan, 2002)	11
3.2.8 Assessment of Catchment runoff Upstream of Sammuts Property (Ullman & Nolan, March 2000);	11
3.3 Rainfall Data	12
3.4 Tidal Data	12
3.5 Topographical Data	12
3.5.1 Survey Data	13
3.5.2 Aerial Photography	13
3.6 Event Recorded Data	13
3.6.1 Anecdotal Information	13
3.7 Existing Stormwater Drainage Infrastructure	13
3.7.1 Pipe and Pit Network Details	13
3.7.2 Culverts	13
3.8 GIS Data	13
4.0 Hydrologic Assessment	14
4.1 Overview	14
4.2 Adopted Methodology	14
4.2.1 Runoff Routing Modelling Approach	14
4.2.2 Direct Rainfall Modelling	17
4.2.3 Design Rainfall Intensity-Frequency Duration (IFD) Data	17
4.2.4 Temporal Patterns	17
4.2.5 Areal Reduction Factors	18
4.2.6 Probable Maximum Precipitation Event	18
4.3 Hydrologic Model Validation	18
5.0 Hydraulic Model Development	19
5.1 Overview	19
5.2 Adopted Methodology	19

	5.2.1	Modelling Cross Drainage Structures	21
	5.2.2	2D Modelling Roughness	21
	5.2.3	Adopted Blockage	21
	5.3	Critical Duration Assessment	21
	5.4	Coincident Events	24
	5.5	Calibration and Validation	26
	5.5.1	Comparison of Results to 2013 Study	26
	5.5.2	Comparison of Results to Anecdotal Information	26
6.0		Basecase Hydraulic Modelling	26
	6.1	Overview	26
	6.2	Basecase Peak Flood Depths, Extents and Velocities	26
	6.2.1	Basecase Peak Water Surface Levels	29
	6.2.2	Basecase Peak Discharges	31
	6.2.3	Basecase Underground Network Capacity	33
	6.2.4	Basecase Property Impacts	33
	6.3	Brewers Park Sports Fields	36
	6.4	Sensitivity Analysis	38
	6.4.1	Hydraulic Roughness	38
7.0		Effects of Climate Change	39
	7.1	General	39
	7.2	Adopted Approach	40
	7.3	Hydraulic Model Results	40
8.0		Floodplain Management Principles	40
	8.1	Framework	40
	8.2	Floodplain Mitigation Measures	42
9.0		Non-Structural Flood Mitigation Measures	43
	9.1	Overview	43
	9.2	Community Awareness	43
	9.3	Land Use Planning Development Control	43
	9.3.1	Habitable Floor Level	45
	9.4	Emergency Management Planning	46
	9.4.1	Flood Emergency Plan	46
	9.4.2	Assessment of Critical Infrastructure	46
	9.5	Summary of Non-Structural Flood Mitigation Measures	46
10.0		Structural Mitigation Options	50
	10.1	Overview	50
	10.2	Design Peak Flood Depths, Extents and Velocities	56
	10.2.1	Mitigated Case Peak Water Surface Levels	56
	10.2.2	Mitigated Peak Discharges	57
	10.3	Difference in Peak Water Surface Elevation	59
	10.4	Brewers Park Mitigated Case Drain	61
	10.5	Mitigated Property Impacts	62
11.0		Tangible Flood Damages Assessment	64
	11.1	Objectives	64
	11.2	Estimating Flood Damages	64
	11.3	General Methodology	65
	11.3.1	Council 2018 Stage-Damage Curves	65
	11.3.2	Alternative Approaches	66
	11.3.3	Actual and Potential Damages	67
	11.4	Building Digitisation and Classification	67
	11.4.1	Building Footprint Digitisation	67
	11.4.2	Classification	67
	11.5	Terrestrial LiDAR Data	68
	11.5.1	Ground Levels	71
	11.6	Survey Data	71
	11.7	Consumer Price Index Adjustment	71
	11.8	Damage Categories	73
	11.9	Classifications and Damage Curves	73

	11.9.1 Residential	73
	11.9.2 Commercial	73
	11.10 Infrastructure Damages	73
	11.11 Average Annual Damages (AAD)	73
12.0	Flood Damages Assessment Results	74
	12.1 Present Case – Flood Damages Estimate	75
	12.2 Mitigation Case - Flood Damages Estimate	76
	12.3 Comparison	77
	12.4 Mitigation Case - Other Improvements	79
13.0	Indicative Mitigation Infrastructure Costs	80
	13.1 Structural Mitigation Costs	80
14.0	Sequencing of Mitigation Options	81
	14.1.1 Discussion of benefit cost ratios	82
15.0	Conclusion and Recommendations	84
	15.1 Key Findings	84
16.0	References	85
Appendix A		
	Hydraulic Model Development	A
	Model Setup Parameters	A-1
	One Dimensional Model Development	A-1
	Blockage Assessment	A-1
	Model Topography	A-4
	Hydraulic Roughness and Losses	A-4
	Initial Conditions	A-5
Appendix B		
	Anecdotal Flooding Information	B
Appendix C		
	Damage Categories and Curves	C
	Residential Property Sub-Categories	C-1
	Commercial Categories	C-1
	Building Footprint Size	C-3
	Fully Detached Residential Damages	C-3
	Indirect Fully Detached Residential Damages	C-6
	Multi-Unit Residential Damages	C-6
	Indirect Multi-Unit Residential Damages	C-8
	Commercial Damages	C-8
	Indirect Commercial Damages	C-10
Appendix D		
	Property Impacts Assessment	D
	Property Floor Levels and Classification	D-2

Figures

Figure 1	Study Methodology	2
Figure 2	Catchment Characteristics and Topography – Catchment Extent	6
Figure 3	Catchment Characteristics and Topography – Sarina Township	7
Figure 4	Plane Creek Sugar Mill Meteorological Office Rainfall Statistics (BoM, 2017)	8
Figure 5	WBNM Subcatchment Delineation	16
Figure 6	Model Setup and 1D Network Map	20
Figure 7	Hydraulic Roughness Delineation	22
Figure 8	Baseline Critical Duration Map	23
Figure 9	Coincident Event – Quick IFD Method Chart	25
Figure 10	Model Key Points of Interest – Lines	27
Figure 11	Model Key Points of Interest – Points	28
Figure 12	Basecase 1D Pipe Network Capacity	34
Figure 13	Base Case Building Inundation Location Summary	35
Figure 14	Brewers Park Drain Basecase HGL	37
Figure 15	Floodplain Specific Management Process	41
Figure 16	Overview of Structural Mitigation Options	52
Figure 17	Proposed Culverts Upgrades – Bruce Highway & Sarina Beach Road	53
Figure 18	Proposed Culverts Upgrades – Hans Christian Street & Range Road	54
Figure 19	Proposed Culverts Upgrades – Hoey Street	55
Figure 20	Brewers Park Drain Mitigated Case HGL	61
Figure 21	Breakdown of Flood Damage Categories (DNRM, 2002)	64
Figure 22	Visualisation of the Council Terrestrial LiDAR Database	68
Figure 23	Total Damages and Impacted Properties Plot (1EY to 1% AEP)	78
Figure 24	Total Damages and Impacted Properties Plot (1% AEP to PMF)	78
Figure 25	2% AEP Base Case Sarina Beach Road and Property Flooding	79
Figure 26	2% AEP Mitigated Case Sarina Beach Road and Property Flooding	79
Figure 27	Sarina Beach Road / Brooks Road Intersection	B-1
Figure 28	2% AEP (50 year ARI) Peak Flood Depth at Sarina Beach Road / Brooks Road Intersection	B-2
Figure 29	Bruce Highway (looking south) at Phillips Street Intersection	B-2
Figure 30	2% AEP (50 year ARI) Peak Flood Depth at Bruce Highway / Phillips Street Intersection	B-3
Figure 31	ANUFLOOD Commercial Damage Value Classes (DNRM, 2002)	C-2
Figure 32	Fully Detached Residential Building Classification Flowchart	C-4
Figure 33	Combined Stage-Damage Curves: FDSS-SOG	C-4
Figure 34	Combined Stage-Damage Curves: FDSS-Stumps	C-5
Figure 35	Combined Stage-Damage Curves: FDDS	C-5
Figure 36	Combined Stage-Damage Curves: FDHS	C-6
Figure 37	Multi-Unit Residential Building Classification Flowchart	C-7
Figure 38	Combined Stage-Damage Curves: MUSS	C-7
Figure 39	Combined Stage-Damage Curves: MUDS	C-8
Figure 40	Commercial Building Classification Flowchart	C-9
Figure 41	Total Stage-Damage Curve: Small Commercial	C-9
Figure 42	Total Stage-Damage Curve: Medium Commercial	C-10
Figure 43	Total Stage-Damage Curve: Large Commercial	C-10

Executive Summary

Sarina is located approximately 35 km south of Mackay and 300 km north of Rockhampton. The town of Sarina is located on Plane and Bells Creeks with a majority of the urban development between the two creeks. The project focuses on addressing flooding within the township and potential mitigations options to help alleviate flooding.

AECOM Australia Pty Ltd (AECOM) has undertaken hydrologic and hydraulic investigations as commissioned by Mackay Regional Council (MRC). The primary objectives of the Sarina Drainage Study develop 'best practice' hydrologic and hydraulic models capable of adequately simulating existing local catchment and watercourse flood characteristics, assessing the existing flood risk in a urbanised area and develop flood mitigation recommendations in consultation with Council. Another key objective for the study is to complete a flood damages assessment for the base and mitigated flood conditions to assist in determining the potential economic benefits of the proposed flood mitigation options to the Sarina area during flood events.

Mackay Regional Council main focus point of this flood study was the low lying areas within Sarina, particular around the Sarina Beach Road and Bruce Highway intersection, there is only limited opportunity to improve the capacity of the underground network for a majority of the study area. Improvements to existing open channels, including regrading and widening was investigated for a majority of the drains around the Sarina Township. Incorporation of additional pipework was also investigated if drain improvements did not provide the necessary mitigation.

Structural mitigations options were focused on constrained areas within the Sarina Township. These included; Bruce Highway and Sarina Beach Road; Anzac Street; Phillip Street and Hoey Street. Indicative structural mitigation costing was completed for 9 separate portions of works around the Sarina Township to improve flooding. Total indicative costs are \$20,815,000 (excl. GST);

Structural mitigation options that are considered trunk drainage includes; northern drainage path, Broad Street – Bruce Highway, Hoey Street and Sarina Beach Road. These options are considered to provide the most benefit in the way of reducing flooding to surrounding areas. Improvement in serviceability of the Sarina Beach Road due to an increase in immunity from 10% to near 1% AEP and matches the immunity of bridge over Bells Creek approximately 2 kilometres northeast. A change in Average Annual Time of Submergence (AATOS) from 0.3hours/yr. to 0.01hrs/yr. of Sarina Beach Road is also evident.

As an alternative to stormwater infrastructure upgrades the acquisition of properties that are currently recognised as flood prone is to purchase these properties outright. Approximately 14 individual properties in Dawson Street and Biloft Street meet this criterion. Assuming an indicative house and land price of \$300,000 per lot then the total purchase price may be in the order of \$4,200,000. Acquisition of the impacted lots and houses would leave a few remaining houses somewhat isolated. If Council were to consider land acquisition and adding the lots to Brewers Park then it may be appropriate to acquire additional lots to provide usable area. This may require an additional 7 lots. The total acquisition costs then may be in the order of \$6,000,000 to \$9,000,000. Indicative BCR from purchasing all lots compared to a reduction in damages over 50 years may range from 0.20 to 0.32.

Commercial and residential flood damages assessment was undertaken for a range of design flood events using the Council 2018 stage-damage curves. The mitigated case saw a reduction in residential and commercial properties flooding and reduction in both external and internal damages. A reduction of 5.6% in Average Annual Damages is experienced, of the 5.6% reduction in AAD, 4.8% reduction is experienced in the frequent, low order events (<5% AEP).

Improvement in average annual damages costs are vital in determining whether mitigation options will be further investigated; other improvements are difficult to determine a specific dollar value. These improvements include reduction in road closures during flood events and clean-up costs due to flooding in public areas (such as parks) and increased positive public perception due to flood improvement works.

1.0 Introduction

Sarina is located approximately 35 km south of Mackay and 300 km north of Rockhampton. The town of Sarina is located on Plane and Bells Creek with a majority of the urban development between the two creeks. The Bruce Highway and the North Coast Railway pass through the centre of Sarina.

1.1 Project Background

The Sarina Township was developed on a riverine flood plain and areas of the community are exposed to flooding from creek flooding (Plane Creek and Bells Creek) and urban stormwater flooding with urban stormwater flooding being the main contributor to nuisance flooding in the township. Urban stormwater flooding may also be contributing to discharges from the sewer system.

A steady pace of residential, commercial and industrial development is expected to continue for as long as the demand remains for new and infill housing by people drawn to Mackay and surrounding areas (including Sarina) for work. Generally this work is related to the mining expansions in the Bowen Basin and coal port expansions between Sarina and Mackay.

To potentially reduce future flood risk, Mackay Regional Council is seeking to understand flood behaviour occurring in Sarina, in particular sensitivity areas include Anzac Street, Sarina Beach Road, Dawson Street and Brewers Park Sports field.

1.2 Study Objectives

The study objective of the Sarina Drainage Study includes the following:

- Develop 'best practice' hydrologic and hydraulic models capable of adequately simulating existing local catchment and watercourse flood characteristics, assessing the existing flood risk in a urbanised area.
- Develop clear and achievable flood mitigation recommendations in consultation with Council staff – to reduce direct and indirect losses associated with future flooding.
- Prepare a preliminary costing of possible mitigation options.
- Prepare a preliminary evaluation of the cost / benefit of mitigation options including tangible cost damage assessments of existing and mitigated options.
- Provide Council with data to inform floodplain management and planning, using outputs from the hydraulic modelling – giving more certainty to Council's engineering and planning staff by incorporating the outputs into Council's updated planning scheme and capital works budgeting.
- Inform decision making for flood emergency management – resulting in timely, focused, targeted and reliable information being provided to the Sarina community.
- Inform potential flood impacts within the broader community – changing community understanding and expectations to enable a more resilient community.
- Minimise potential flood damage through more informed and reliable planning, appropriate mitigation, education, and disaster response
- Minimise potential loss, disruption and social anxiety; for both existing and future floodplain occupants, helping develop a more resilient community.
- Undertake assessments of proposed structural mitigation options performance against a range of agreed criteria. We propose the performance to be measured by the safety, floor inundation and afflux of each of the mitigation options against immunity.
- Prepare reporting and mapping.

1.3 Methodology

This study has assessed the existing flow patterns and performance of existing stormwater trunk infrastructure whilst conceptualising the future development, proposing drainage structures and drainage paths to cater for existing and future development.

The study methodology is summarised in Figure 1.



Figure 1 Study Methodology

1.4 Notes on Flood Frequency

The frequency of flood events is generally referred to in terms of their Annual Exceedance Probability (AEP) or Average Recurrence Interval (ARI). For example, for a flood magnitude having 5% AEP, there is a 5% probability that there will be floods of equal or greater magnitude each year. As another example, for a flood having 5 year ARI, there will be floods of equal or greater magnitude of once in 5 years on average.

The correspondence between the two systems is shown in Table 1.

Table 1 Flood Frequency Classification

Annual Exceedance Probability (AEP) %	Average Recurrence Interval (ARI) Years
1EY	1
39	2
18	5
10	10
5	20

Annual Exceedance Probability (AEP) %	Average Recurrence Interval (ARI) Years
2	50
1	100
0.5	200
0.2	500

In this report, the AEP terminology has been adopted to describe the frequency of flooding.

1.5 Limitations and Exclusions

The following limitations and exclusions apply to the Sarina Drainage Study:

- Design flood events have been assessed for a single critical duration, based on an analysis of multiple durations for the 1% Annual Exceedance Probability (AEP) event.
- Aerial survey data (in the form of LiDAR) used to develop the topography for the hydraulic model has a vertical accuracy of ± 0.15 m on clear, hard surfaces and a horizontal accuracy of ± 0.45 m (described in Section 3.5).
- Where information gaps existed in the Council underground drainage network, assumptions were made to fill these gaps using desktop assessment methods (described in Section 3.7).
- AECOM conducted a site visit in Sarina to inspect culverts that had missing information. Upon inspection many of the outlets/inlets were too overgrown to safely inspect the culvert. These culverts sizes have been assumed based on old aerial imagery and sizes of surrounding upstream or downstream culverts.
- Gaps are evident for bridge and causeway across Plane Creek, Bells Creek and other locations. This included Rail Bridges, Bruce Highway Bridge, Sarina Beach Road Bells Creek Bridge and the causeway on Pirie Street. These structures have been removed from the model.
- Hydrologic and hydraulic modelling is based on methods and data outlined in Australian Rainfall and Runoff (AR&R) 2016.
- The hydraulic models have not been calibrated to any historical events due to unavailability of measured or observed flood records. Instead, anecdotal information from Council staff was used to assess the performance of the model against historical events.
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Australian Rainfall and Runoff (AR&R) Revision Project 15 outlines several fundamental themes which are also particularly relevant:

- All models are coarse simplifications of very complex processes. No model can therefore be perfect, and no model can represent all of the important processes accurately.
- Model accuracy and reliability will always be limited by the accuracy of the terrain and other input data.
- Model accuracy and reliability will always be limited by the reliability / uncertainty of the inflow data.
- A poorly constructed model can usually be calibrated to the observed data but will perform poorly in events both larger and smaller than the calibration data set.
- No model is 'correct' therefore the results require interpretation.

- A model developed for a specific purpose is probably unsuitable for another purpose without modification, adjustment, and recalibration. The responsibility must always remain with the modeller to determine whether the model is suitable for a given problem.
- Recognition that no two flood events behave in exactly the same manner.
- Design floods are a best estimate of an “average” flood for their probability of occurrence.

1.5.1 Interpretation of Results

The interpretation of results and other presentations in this report requires an appreciation of the limitations in accuracy, as noted above.

Unless otherwise stated, presentations in this report are based on peak values of water surface level, flow, depth and velocity. Using flood levels as an example, the peak level does not occur everywhere at the same time and, therefore, the values presented are based on taking the maximum value which occurred at each computational point in the model during the entire flood.

Hence, a presentation of peak levels does not represent an instantaneous point in time, but rather an envelope of the maximum values that occurred at each computational point over the duration of the flood event.

1.6 Report Structure

The Sarina Flood Study Report has been split into 2 volumes:

- Volume 1 → Study methodology, results, findings and recommendations.
- Volume 2 → A3 GIS results mapping associated with the Volume 1 report.

The structure of this Volume 1 report is as follows:

- Section 2.0 describes the characteristics of the local catchments including typical land use, rainfall characteristics and a summary of historical flood events.
- Section 3.0 describes the data available for the development of the hydrologic and hydraulic models.
- Section 4.0 outlines the hydrologic assessment approach.
- Section 5.0 outlines the hydraulic modelling approach and presents the results of the modelling.
- Section 6.0 presents the basecase design flood depths, levels and extents for the study area.
- Section 7.0 presents the results of the investigation with the effects of climate change on discharges and modelled flood extents.
- Section 7.1 summarises the mitigation strategy options development.
- Section 9.0 provides recommendations and non-structural mitigation measures.
- Section 10.0 provides a summary of the preliminary structural mitigation options.
- Section 11.0 outlines the results of the tangible flood damages assessment undertaken.
- Section 12.0 contains base and mitigated case flood damages results.
- Section 13.0 summaries structural mitigation costs.
- Section 14.0 identifies the sequencing of mitigation options
- Section 15.0 summarises the key finding of the study.

2.0 Study Area and Key Characteristics

2.1 Study Area

The Sarina Priority Infrastructure Area (PIA) from the Mackay Region Planning Scheme consists of the area along the Bruce Highway between Armstrong Beach Road and Home Bush Road, along Marlborough Sarina Road between Bruce Highway and up to Mount Blarney Road and from Sarina Beach Road from Bruce Highway to Patch Street. The Sarina PIA is approximately 549 ha and is shown in Figure 2.

2.2 Catchment Characteristics

The Sarina Township catchment is approximately 13,000ha bounded by Plane Creek to the south, Bells Creek to the north and east and topographic ridges within agricultural lands to the north and west. The catchment boundary and topography is shown in Figure 2 and Figure 3.

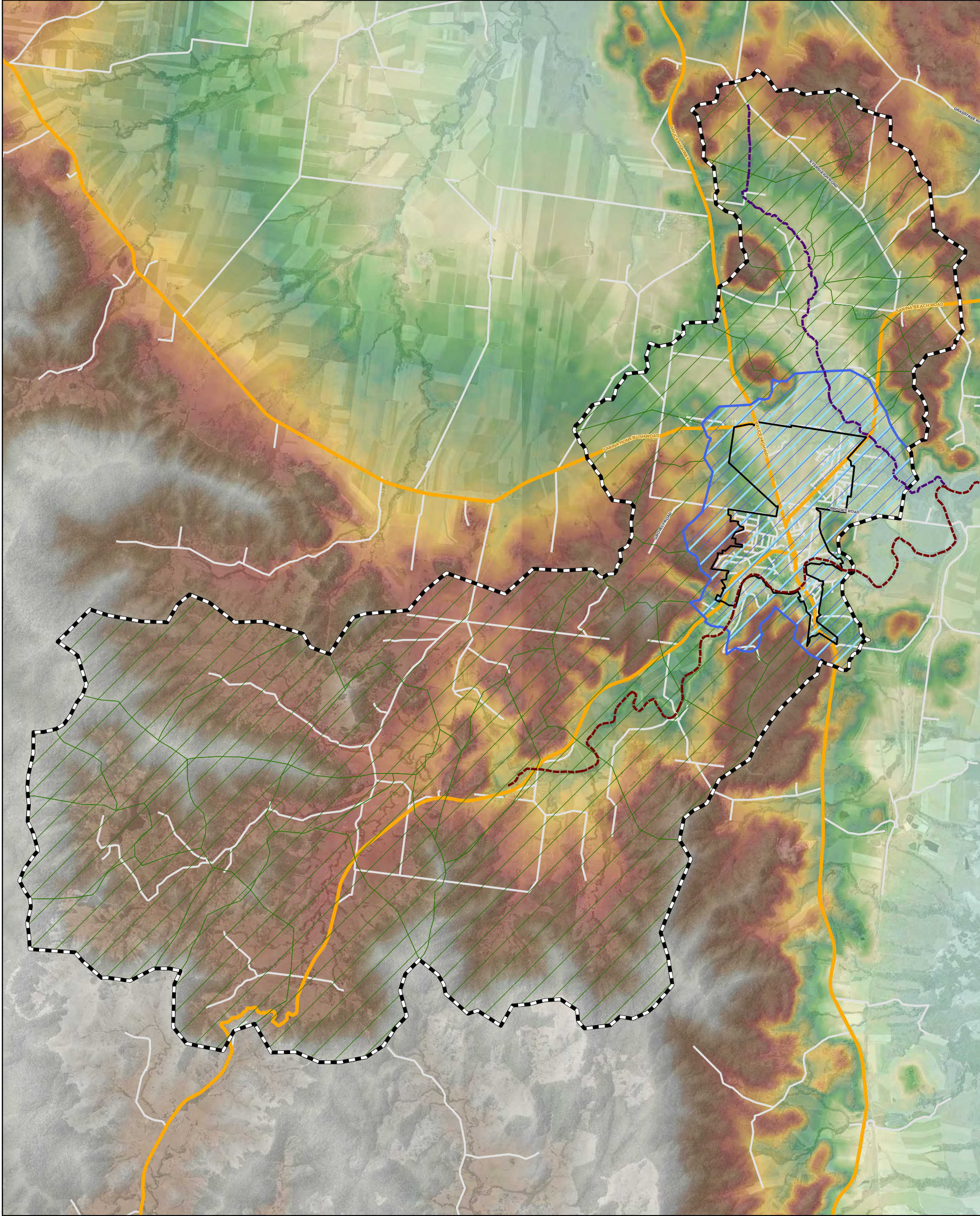
The broader catchment extends north and south to the peak of Bells and Plane Creeks. Bells Creek catchment extends approximately 9 km north of the Sarina Township which comprises of gentle sloping land with hills on the edge of the catchment. Planes Creek catchment, significantly larger than Bells Creek extends approximately 14 km south-west of the Sarina Township which comprises of hilly areas with peak elevations exceeding 560m AHD. Plane creek passes through the southern area of Sarina south of Range Road. Both areas consist of open spaces consisting of farmland for crops or cattle.

The Sarina Township is located on the northern bank of Plane Creek with elevations varying between 76 and 5 mAHd over the residential areas. The slope of the land within the township is generally flat although the topography rises significantly in several hilly areas that form the boundary of the catchment of interest. Elevations in these hilly areas exceed 150mAHd.

The area to the west of the Bruce Highway is mostly urbanised with a mix of housing either of low level construction (i.e. slab-on-ground) or high level construction with living or storage areas at ground level. An industrial precinct, including the Plane Creek Sugar Mill, exists to the south. The area to the west is typically well drained with four overland flow locations into Plane Creek to the south and another four connections to the east across the Bruce Highway.

The area to the east of the Bruce Highway and south of Brooks Road has elevations ranging between 20m AHD (west) and 13.2m AHD (north near Brookes Road). The lower elevations exist at the southern end of the open drain adjacent to the shopping centre on Sarina Beach Road. This area consists of urban residential developments and major recreational facilities located between Biltoft Street and Hoey Street. The drain north of Brooks Road has been subject to a number of previous drainage investigations undertaken by Mackay Regional Council (Council).

Areas to the east of the Bruce Highway and north of Brooks Road primarily discharge to Bell's Creek via overland flow paths.





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GDA 1994 MGA Zone 55

0 500 1,000 2,000 3,000

metres

1:62,000 (when printed at A3)

LEGEND

- Bells Creek
- Plane Creek
- Wider Sarina Catchment Boundary
- Priority Infrastructure Area
- TUFLOW Hydraulic Model Extent
- WBNM Runoff Routing Model Extent

Topography (SRTM) (mAHD)

High : 579.201

Low : -5.42282

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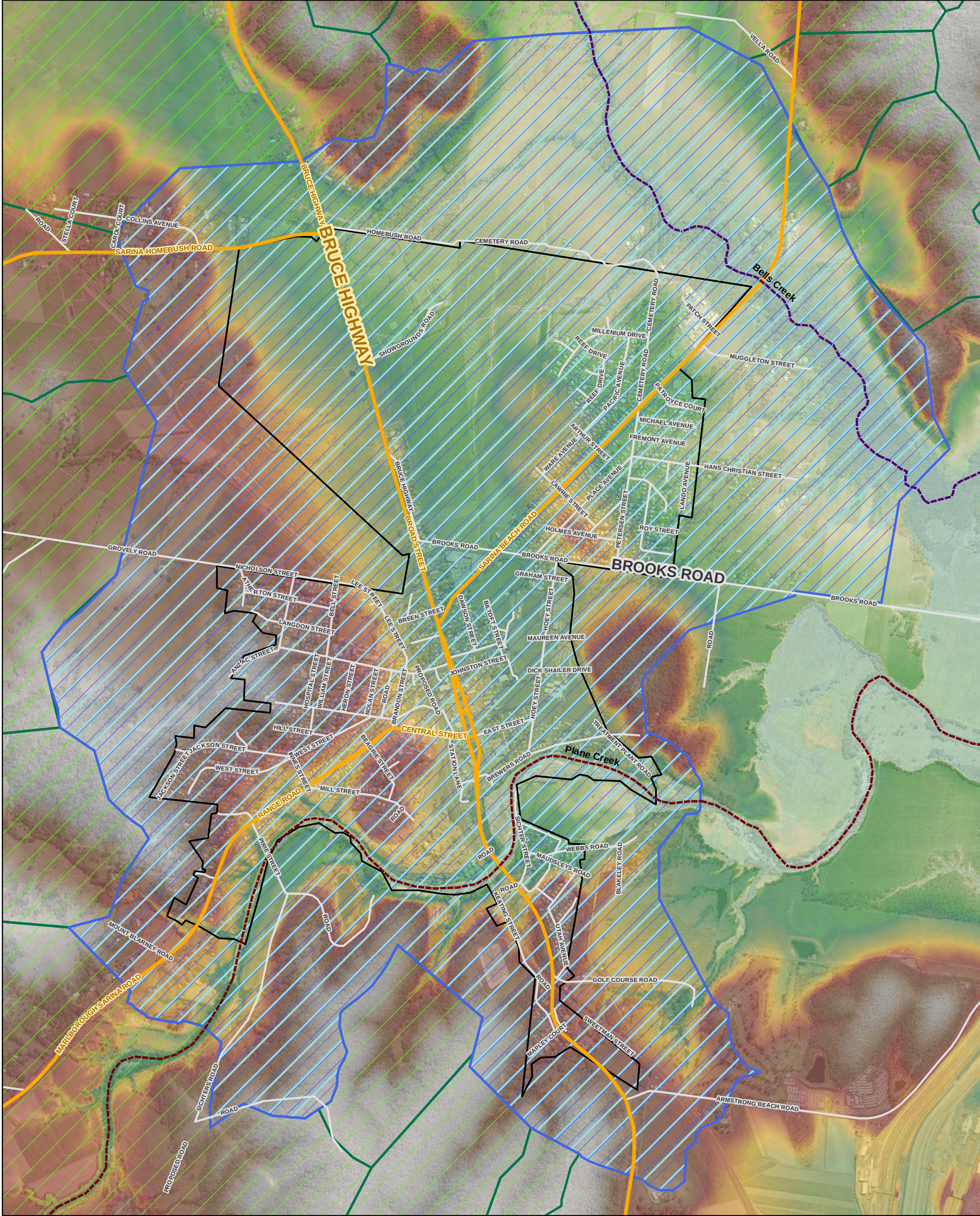
Sarina Drainage Study

Catchment Characteristics and Topography - Catchment Extent

PROJECT ID	60567081
CREATED BY	reitanod
LAST MODIFIED	29/08/2018
VERSION:	v01

Figure

02





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GDA 1994 MGA Zone 55

0 380 760

metres

1:16,000 (when printed at A3)

LEGEND

- Bells Creek
- Plane Creek
- Priority Infrastructure Area
- TUFLOW Hydraulic Model Extent
- WBNM Runoff Routing Model Extent

Topography (SRTM) (mAHD)

Value

High : 270.604

Low : -1.9

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Sarina Drainage Study

Catchment Characteristics and Topography - Catchment Extent

PROJECT ID	60567081
CREATED BY	reitanod
LAST MODIFIED	29/08/2018
VERSION:	v01

Data sources:
Base Data: (c) 2017 Qld Gov

Figure

03

2.3 Climate Characteristics

The study area is situated on latitude of 21° South, approximately 220 km north of the Tropic of Capricorn within 6 km of the coast. As a result, the catchment experiences a tropical coastal climate.

The climate is dominated by summer rainfalls with heavy falls likely from severe thunderstorms and occasionally from tropical cyclones. Heavy rainfall is most likely to occur between November and April with most of the flood events occurring in the months of December to March.

2.3.1 Rainfall Regime

Sarina has a mean annual rainfall between 1750mm – 1800mm. The highest mean monthly rainfall of 380mm occurs in February. The highest and lowest annual rainfall totals recorded at the Plane Creek Sugar Mill Meteorological Station are 3535.8 mm (in 1979) and 739.5 mm (in 1923) which shows a significant variation in annual rainfall from year to year.

The highest monthly rainfall of 2027.6 mm was recorded in January 1918. Highest daily rainfall of 704mm was recorded on 26 February 1913. The following graph (Figure 4) shows the distribution of the mean monthly rainfall throughout the year at the Plane Creek Sugar Mill Meteorological Station.

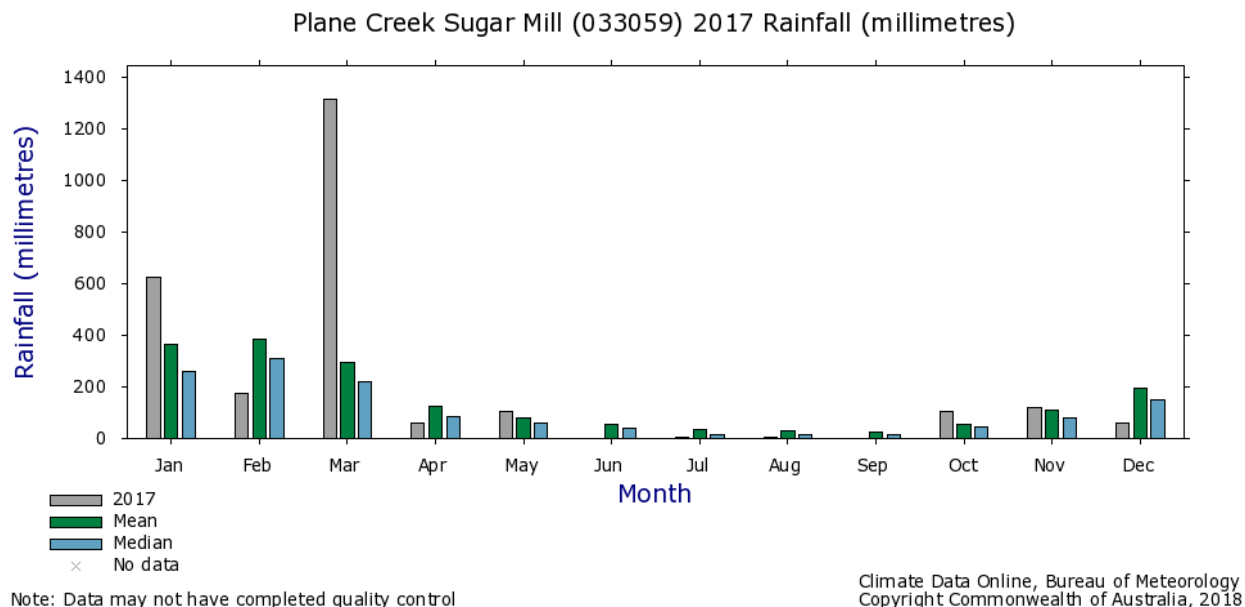


Figure 4 Plane Creek Sugar Mill Meteorological Office Rainfall Statistics (BoM, 2017)

3.0 Available Data

3.1 General

Available data relevant to the drainage analysis and design consisted of:

- Previous drainage studies within the area (reports only) from Council including:
 - Sarina Northern Access Hydraulic Analysis Report (AECOM, March 2018);
 - Sarina Drainage Study (Cardno, August 2013);
 - 11-13 Sarina Beach Road, Stormwater Quantity and Culvert Analysis (McVeigh, November 2012);
 - Lot 15 RP746237 & Lot 76 RP74493 Sarina (Cardno, December 2006);
 - Lot 10 on RP866583 Cemetery Road/Arthur Street. Sarina MCU;
 - Sarina Industrial Subdivision Lot 4 on SP117897 (Qantec McWilliam. November 2006);
 - Broad Street / Beach Road Drainage Study (Ullman & Nolan, September 2002);
 - Assessment of Catchment runoff Upstream of Sammut's Property (Ullman & Nolan, March 2000).
- Topographical data in the form of LiDAR (Council, August 2015);
- Shuttle Radar Topography Mission (SRTM) (2000);
- Transport and Main Roads (TMR) road corridor survey for Sarina Northern Access Project (July 2016);
- Council Terrestrial LiDAR;
- Aerial photography (Council, 2015);
- Stormwater network survey (Council, 2017);
- GIS land use and boundaries dataset (Council, 2017);

Each of these is described in more detail in the subsequent sections.

3.2 Previous Reports

3.2.1 Sarina Northern Access Hydraulic Analysis Report (AECOM, March 2018)

The Sarina Northern Access (SNA) project is located on the Bruce Highway approximately 0.3 km north of the Sarina town centre. The project involves construction of a new roundabout at the Bruce Highway Sarina Beach Road intersection. At the time of writing this report the works have not been completed.

Hydrologic and hydraulic investigations were undertaken to investigate improving the drainage functionality while maintaining the existing flow path while seeking to flood immunity for the Bruce Highway. Another key design criterion was to demonstrate that there is no worsening to present flood conditions for properties adjacent to the intersection and road corridor.

The key issues addressed in the SNA hydraulic analysis report were as follows:

The Bruce Highway / Sarina Beach Road intersection has cross culverts with low hydraulic capacity (< 39% AEP). This is due to a variety of factors – i.e. downstream network constraints, inadequate catchment outlet, cross catchment surcharge reporting to the site and storage within the current road and drain geometry.

Due to existing site constraints culvert sizes modelled were maximised where possible to provide improved flow conditions along Sarina Beach Road. Extensive upgrades to the Sarina catchment, both downstream of the intersection and upstream of major flowpaths are required to the intersection site to provide free flowing conditions. These upgrades were beyond the scope of TMR upgrades and were not investigated in the report.

As the scope and extent of future Council upgrades to the Sarina catchment are unknown to TMR, modelling of an 'ultimate developed case' was not completed. However, assuming that all of the issues mentioned above were resolved, a high level assessment of the performance of the drainage network shown that designed network has capacity to perform in high order events (greater than 20 years ARI) in an 'ultimate developed case'.

In summary, the report concludes that 6 dwelling experience floor level flooding in events up to and including the 1% AEP event. The assessment shows no new instances of floor level flooding in the 1% AEP design event as a result of the road upgrade with impacts to dwellings currently inundated to be only minor ($< \approx 10\text{mm}$).

3.2.2 Sarina Drainage Study (Cardno, 2013)

The Sarina Drainage Study was undertaken by Cardno for Council in 2013 to provide an overall 2D analysis. The study was an overall catchment based investigation that collated and reviewed the capacities and impacts of all current stormwater infrastructure and road construction, within the catchment. Key emphasis was put on the analysis of cross catchment flows, particularly in low order events due to generally flat topography within the urban areas as well as the impacts of climate change on the existing drainage infrastructure, examining the flooding impacts on existing development extents.

Through the development of an XP-SWMM model, the study concluded that more recently developed urban areas to the north have more modern hydraulic design such that major flows are typically carried within the street system to the eventual discharge location. However, unacceptable inundation was identified in the area south of Brooks Road and Sarina Beach Road and at other specific areas. The study also found that key areas within Sarina do not have adequate minor drainage systems or infrastructure to cater for the 2 year ARI discharges. It was concluded that inundation extents are exacerbated in response to the increase of rainfall intensities associated with climate change.

The study suggested an augmented drainage configuration north from Sarina Beach Road and Brooks Road to reduce the impacts of stormwater inundation across Sarina. The mitigated scenario identified significant reduction to the inundation depths and hazard areas for the area near Biltoft Street and Dawson Street. At the time of writing this report the works have not been completed.

The study identified the existing topography within the area north of Brooks Road as the primary constraint causing the existing drainage deficiency as well as the restrictions imposed by the cross road drainage infrastructure.

The XP-SWMM model associated with the Sarina Drainage Study (Cardno, 2013) was not able to be sourced by Council at the time of the Sarina Northern Access project.

3.2.3 11-13 Sarina Beach Road, Stormwater Quantity and Culvert Analysis (McVeigh, November 2012)

The letter was prepared for 11-13 Sarina Beach Road (Shopping centre) to demonstrate that construction of the carpark and narrowed culvert does not have adverse impacts upstream or downstream of the site. A XP-Storm model completed identified the storage within the carpark and tank can mitigate all storm events.

3.2.4 Lot 15 RP746237 & Lot 76 RP74493 Sarina (Cardno, December 2006)

Report investigates the development of a residential estate at a site located at the corner of Bruce Highway and Brooks Road, Sarina. Flood study was completed to determine the flood levels corresponding to the 100 and 2 year ARI event across the proposed site.

The report concluded that to reduce the inundation area, it was proposed to replace the existing open drains with two new open channels.

The combination of channels and consequent landfill reduce the inundation area and contains the flood waters within the channel under developed conditions.

3.2.5 Lot 10 on RP866583 Cemetery Road/Arthur Street. Sarina MCU (Pacific Place Property Trust, June 2006)

The Lot 10 on RP866583 Cemetery Road/Arthur Street MCU was provided to Sarina Shire Council including a hydraulic investigation for the above mentioned lot. The Hydraulic investigation completed by Cardno Ullman & Nolan showed an increase the flood height for a Q100 flood event by 100mm. It was proposed that the site be filled to RL12 and with a 300mm freeboard allowance for the proposed development area.

Plans identifying the proposed open channel to be constructed within the development area were provided.

3.2.6 Sarina Industrial Subdivision Lot 4 on SP117897 (Qantec McWilliam. November 2006)

The report investigates the development of an Industrial Subdivision at Lot 4 on SP117897 located on the eastern side of the Bruce Highway, south of Sarina Homebush Road. There are two drains located in the site, one to the north and one to the south. The south drain leads to the Bruce Highway cross drainage.

The Bruce Highway cross drainage adjacent to the southern drain has been identified to have insufficient capacity for the 50 year (ARI) storm event.

The proposed development included construction of an internal stormwater pipe system to convey the minor stormwater runoff for a 1 in 2 year ARI storm event. The pipe system was proposed to discharge into the southern open drain. Major flows were proposed to be conveyed on the internal road carriageway and discharge to the existing cross drainage under the Bruce Highway.

The proposed configuration was shown to result in an increase catchment area to the southern drain, that lead to the cross drainage under the Bruce Highway. The proposed development proposed construction of a new 1500 x 900 mm RCBC adjacent to the Bruce Highway cross drainage at the southern open drain. The culvert upgrade proposed capacity for the increase in site runoff from the developed site and to ensure that the water surface level and stormwater bypass were not increased as a result of the proposed works.

3.2.7 Broad Street / Beach Road Drainage Study (Ullman & Nolan, 2002)

The Broad Street / Beach Road Drainage Study was undertaken by Ullman & Nolan Consulting Engineers in 2002 following widespread flooding over the Sarina Township in late 2000 and concern particularly around the intersection site to be upgraded as part of the Sarina Northern Access project.

The report quantified the catchment discharges for varying return periods examined the adequacy of the drainage infrastructure, identified possible mitigation options and determined what additional works were required to achieve nominated levels of flood immunity. The report outlined that runoff was conveyed by a street piped system, kerb and channelling, overland flow paths and a series of open drains, discharging to the major trunk drain through Sammut's farm and ultimately to Bells Creek. It was identified that the street drainage was not well developed and, in the event of major storms, there can be significant surcharging of the piped system.

The report concluded that flooding of the Bruce Highway was known to occur adjacent to the intersection with Sarina Beach Road and also within the residential areas east of the Highway in and around Dawson Street and Biltoft Street. The principal cause of flooding in this area was due to flow diversions between various sub catchments and system capacity deficiencies particularly downstream of the Bruce Highway.

3.2.8 Assessment of Catchment runoff Upstream of Sammut's Property (Ullman & Nolan, March 2000)

Ullman and Nolan adopted the Watershed Bounded Network Model (WBNM) computer modelling program to determine the catchment peak flows. The WBNM model was used to assess the run-off from partially urbanised catchments discharging into Sammut's Property (located north of Brooks Road, opposite the shopping centre),

Stormwater runoffs were estimated for three cases of differing catchment characteristics shown below:

1. Natural conditions, prior to development in Sarina;
2. Existing development in Sarina;

3. Existing development in Sarina with the addition of a proposed industrial estate at Hartes Dairy (western side of the Bruce Highway).

Each case run-off was calculated at the following three points:

Point A – Downstream of junction of drains for Beach Road.

Point B – Downstream of the drain under the Bruce Highway.

Point C – Downstream of the drains from Points A & B.

An increase of up to 12% in the runoff entering Sammuts property for Case 2 at Point A, with an increase of up to 3.95% at Point B.

Case 3 resulted in a further increase in runoff flow into the Sammuts property of up to 4% at Point B. Runoff at Point A was not affected by the proposed industrial estate due to its location.

3.3 Rainfall Data

Rainfall data was extracted from the Bureau of Meteorology (BoM). The 2016 Intensity-Frequency-Duration (IFD) design rainfalls were used as they are the most up to date information available as at 27/04/2018 as shown in Table 2.

Table 2 BOM 2016 IFD Design Rainfall Depth (mm)

Annual Exceedance Probability (AEP)							
Duration	63.2% AEP	50% AEP	20% AEP	10% AEP	5% AEP	2% AEP	1% AEP
5 min	10.7	11.9	15.7	18.1	20.4	23.2	25.3
10 min	17.5	19.5	25.4	29.2	32.6	37.1	40.3
30 min	32.7	36.4	47.6	54.8	61.5	69.9	76.1
1 hour	45.3	50.6	67.0	77.6	87.7	101	110
2 hour	60.8	68.6	92.6	109	124	143	158
3 hour	71.8	81.6	112	132	152	177	196
6 hour	95.3	110	155	186	216	256	287
12 hour	126	147	215	262	309	375	427
18 hour	149	175	259	319	380	469	541
24 hour	167	196	294	366	440	548	638

3.4 Tidal Data

Tide data was extracted from Maritime Safety Queensland, 2018 Semidiurnal and diurnal tidal planes (see Appendix A).

3.5 Topographical Data

The topographical information used for the Sarina Drainage Study project was provided by Council in the form of LiDAR survey, which was undertaken between 5th and 20th August 2015 by the Department of Natural Resources and Mines (DNRM).

The LiDAR points were used to generate a base Digital Elevation Model (DEM) with a grid spacing of 1 m. It is stated in the metadata provided by DNRM that the vertical accuracy is ± 0.15 m on clear, hard surfaces and the horizontal accuracy is ± 0.45 m.

3.5.1 Survey Data

TMR conducted a corridor survey of Bruce Highway and Sarina Beach Road intersection (July 2016) and made the data available for use in the hydraulic analysis. The following data was provided:

- Terrain data including spot heights and break lines.
- Culvert dimensions including size, invert levels and length.
- Culvert headwall measurements and levels.

All existing cross drainage sizing, invert levels and lengths were sourced from the drainage survey.

Comparison between the survey DEM and LiDAR heights were undertaken throughout the road corridor and it was concluded that two datasets compared well.

The surveyed data represents drainage structures more accurately and hence the surveyed DEM was overlayed on the LiDAR DEM to represent existing drainage features more accurately within the road reserve.

3.5.2 Aerial Photography

Aerial photography of the Sarina Township and surrounding region was supplied by Council. The dataset was supplied as a single mosaic image which covers the extents of the study area. The imagery was captured in March 2015 at a resolution of 10 cm pixels.

3.6 Event Recorded Data

3.6.1 Anecdotal Information

Anecdotal flood observations are outlined in Appendix B.

3.7 Existing Stormwater Drainage Infrastructure

3.7.1 Pipe and Pit Network Details

Council provided a stormwater survey of the network within the Sarina study area. This consisted of pit and pipe sizes and invert levels in the form of a csv database.

This information was digitised using ArcGIS for application to the TUFLOW hydraulic model. Where invert level, slope, pit types or pipe diameter was missing, the following assumptions were made:

- All upstream invert levels are higher than downstream invert levels (i.e. no pipes flowing in the wrong direction) with no fall across pits.
- Minimum cover of 600mm, where practical.
- Upstream pipe diameter or size was matched to downstream pipe diameter.
- Pit types not provided was used based on aerial imagery or street photo where available, if no imagery was available pit types was assumed based on surrounding pit types.

3.7.2 Culverts

Council provided culvert information within the Sarina study area. This consisted of culvert sizes and invert levels in the form of a .csv database.

This information was digitised using ArcGIS for application to the TUFLOW hydraulic model. Where invert level, slope, pipe diameter or inlet and outlet information was missing, the following assumptions were made:

- Inlet and outlet levels and locations based on LiDAR information;
- Minimum cover of 600mm, where practical;
- Culvert sizes based on surrounding culverts of similar open channel size.

3.8 GIS Data

GIS data provided by Council included cadastral boundaries, road lines, railway lines, aerial imagery and planning zones. This information was provided in December 2017.

4.0 Hydrologic Assessment

4.1 Overview

In order to estimate peak flood levels, flood extents and flood risk across the study area, a hydrologic assessment was undertaken to estimate flood flows resulting from local catchment design rainfall events.

4.2 Adopted Methodology

Hydrologic inputs to hydraulic models have been applied through a combination of inflow hydrographs developed using the Watershed Bound Network Model (WBNM) and direct rainfall over the 2D grid within the TUFLOW model.

Runoff routing models convert the rainfall for a sub-catchment into a flow hydrograph, which is routed within the model. This flow hydrograph is then applied to the hydraulic model as an inflow point, and used to estimate flood behaviour across the study area.

The direct rainfall method involves the application of rainfall directly to the 2D model domain with TUFLOW. The rainfall depth in a particular timestep is applied to each individual hydraulic model grid cell, and the 2D model calculates the runoff from this particular cell.

Detailed application of runoff routing modelling and direct rainfall approach is discussed below.

4.2.1 Runoff Routing Modelling Approach

For this study a runoff routing model was developed using the Watershed Bound Network Model (WBNM) with catchments derived using topography data from the Shuttle Radar Topography Mission (SRTM) (2000). SRTM was used for this exercise as the LiDAR tiles did not cover the full extent of upstream influencing catchments. This hydrologic model was then used to estimate upstream inflows to the TUFLOW hydraulic model.

WBNM 2012 version was used for assessment of runoff from the catchment upstream of the TUFLOW model. WBNM is a runoff-routing model which is used to simulate catchment and channel routing behaviour in response to rainfall. It has been developed for use and application in both urban and rural catchments and includes the ability to model natural and artificial storages as well as channel and river storage throughout the catchment.

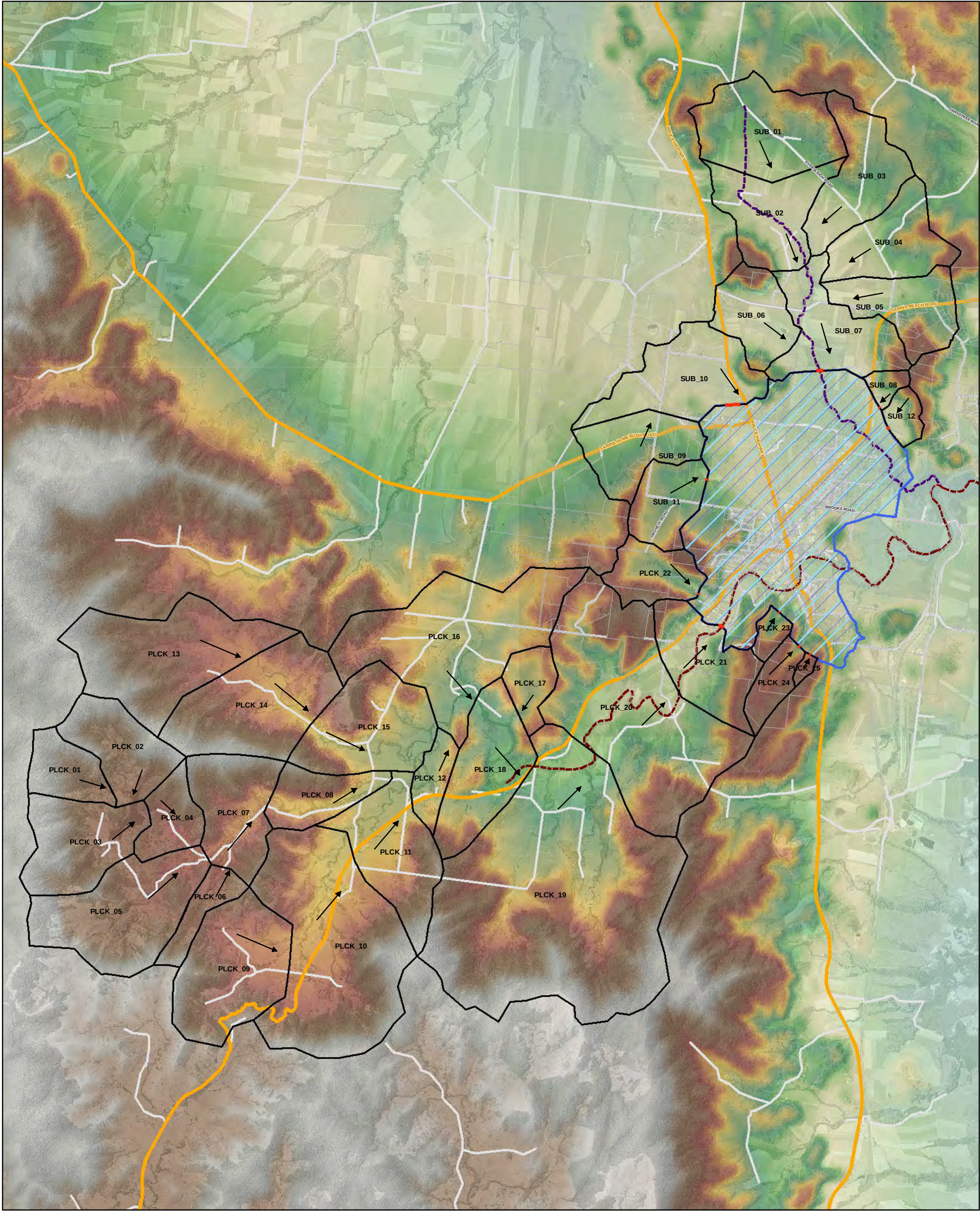
The following steps were taken in the development of the WBNM model during this study to estimate external catchment inflows at the upstream boundary of the TUFLOW 2D hydraulic model domain.

- Delineation of sub catchments upstream to align with the TUFLOW 2D hydraulic model boundary.
- Digitisation of sub catchments using the WBNM model parameters such as catchment area, centroid, fraction impervious, lag parameters and runoff coefficients.
- Estimation of initial and continuing rainfall losses using standardised values (ARR 2016) and the fraction impervious for each sub catchment.
- Apply design IFD rainfall (Section 4.2.3) to determine the WBNM storm data for a single storm.
- Run all design events and export flows to inflow hydrographs for TUFLOW modelling. Sub catchment delineation aligning with the 2D model boundary is shown in Figure 5.

The peak flow results for each event at the outflow locations that enter the TUFLOW Hydraulic Model Extent shown in Figure 5 have been extracted from the WBNM model and are listed in Table 3.

Table 3 Sarina WBNM Peak Inflows

Location	Peak Inflow (m ³ /s)						
	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP	0.5% AEP
SUB_07	116.0	184.8	233.7	299.2	349.0	421.5	501.3
SUB_08	3.9	5.8	7.2	8.9	10.0	11.9	13.8
SUB_10	36.7	58.6	74.2	94.9	109.9	132.7	157.8
SUB_11	14.7	22.7	28.3	35.6	40.6	48.4	56.9
SUB_12	5.6	8.5	10.5	13.1	14.8	17.5	20.5
PLCK_21	245.0	409.3	528.9	690.6	857.8	1047.4	1256.0
PLCK_22	13.5	20.8	25.9	32.6	37.2	44.3	52.1
PLCK_23	4.4	6.6	8.2	10.2	11.6	13.7	15.9
PLCK_24	8.6	13.2	16.3	20.5	23.3	27.7	32.5
PLCK_25	1.5	2.3	2.8	3.5	3.9	4.6	5.3





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0 250 500 1,000 1,500 2,000 2,500 3,000

metres

1:62,000 (when printed at A3)

LEGEND

- TUFLOW Inflow Boundary
- WBNM Runoff Routing Model Subcatchment
- TUFLOW Hydraulic Model Extent
- Bells Creek
- Plane Creek

Topography (SRTM) (mAHD)

High : 579.201

Low : -5.56121

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Sarina Drainage Study

WBNM Subcatchment Delineation

PROJECT ID	60567081
CREATED BY	reitanod
LAST MODIFIED	29/08/2018
VERSION:	v01

Base Data: (c) 2017 Qld Gov

Figure
05

AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.

4.2.2 Direct Rainfall Modelling

Rainfall total hyetograph time series for each design storm were created to represent the local rainfall for the study area from 2016 BOM IFD data. This rainfall excess was calculated by applying initial and continuing losses to the total hyetograph to represent infiltration and storage of runoff in surface depressions.

The time series rainfall hydrographs were developed for a range of design events for magnitudes of 63% AEP up to the 0.2% AEP (total of nine events).

4.2.3 Design Rainfall Intensity-Frequency Duration (IFD) Data

Design rainfall data was sourced from the Bureau of Meteorology (BoM) online AR&R 2016 IFD tool (<http://www.bom.gov.au/water/designRainfalls/revised-ifd/?year=2016>). The IFD parameters required to determine rainfall for the WBNM model was sourced using a single set of parameters, derived at the location (-21.425S, 149.225E). The average regional skewness, geographic F2 and F50 were determined using the BoM 1987 IFD tool, these factors were used to determine inflows from external catchment using WBNM model. The IFD input data set utilised by the WBNM model obtained is shown in Table 4.

Table 4 Adopted IFD Input Parameters

Parameter	Value
1 hour, 2 year intensity (1I_2) (mm/hr)	53.62
12 hour, 2 year intensity ($^{12}I_2$) (mm/hr)	13.33
72 hour, 2 year intensity ($^{72}I_2$) (mm/hr)	4.45
1 hour, 50 year intensity ($^1I_{50}$) (mm/hr)	101
12 hour, 50 year intensity ($^{12}I_{50}$) (mm/hr)	31.2
72 hour, 50 year intensity ($^{72}I_{50}$) (mm/hr)	12.9
Average Regional Skewness	0.17
Geographic Factor, F2	4.1
Geographic Factor, F50	17.69

Rainfall intensities up to the 24 hour duration for the 50%, 20%, 10%, 5%, 2%, 1% and 0.5% AEP events was sourced from BoM. The IFD data is shown in Table 5 below.

Table 5 Intensity Frequency Duration (IFD) Data for Sarina (BOM, 2016)

Duration (hr)	Intensity (mm/hr)					
	50% AEP	20% AEP	10% AEP	5% AEP	2% AEP	1% AEP
1	50.6	67.0	77.6	87.7	101.0	110.0
1.5	40.4	54.0	63.0	71.6	82.5	90.5
2	34.3	46.3	54.3	61.9	71.7	79.0
3	27.2	37.3	44.0	50.5	59.0	65.3
4.5	21.6	30.1	35.8	41.4	48.7	54.3
6	18.3	25.8	30.9	35.9	42.7	47.8
12	12.3	17.9	21.8	25.7	31.2	35.6
24	8.2	12.3	15.2	18.3	22.8	26.6

4.2.4 Temporal Patterns

Temporal patterns for Wet Tropics were adopted for events up to the 0.2% AEP using the standard methodology outlined in AR&R 2016. Temporal patterns for the Probable Maximum Precipitation (PMP) event were sourced from data provided with the Generalised Short Duration Method (GSDM) guidebook and Generalised Tropical Storm Method (GTSMR) (refer to Section 4.2.6).

4.2.5 Areal Reduction Factors

Areal reduction factors were not applied to the point rainfall sourced in Section 4.2.3. This provides both a conservative estimate of the design rainfall as well as a consistent approach to previous modelling undertaken in the area.

4.2.6 Probable Maximum Precipitation Event

The Probable Maximum Precipitation (PMP) has been defined by the World Meteorological Organisation (2009) as ‘the greatest depth of precipitation for a given duration, meteorologically possible for a given size storm area at a particular location at a particular time of year.

The PMP event results in a Probable Maximum Flood (PMF) event. This is a theoretical event which is very unlikely to ever occur within any given catchment. The PMF event is typically used in design of hydraulic structures, such as dams.

Its most common use is in design of dam spillways to minimise the risk of overtopping of a dam and minimise the likelihood of dam failure. Other than this practical use, it is also used to provide an indication of the largest floodplain extents expected within any given catchment. This data can be used by emergency management agencies in their understanding of and planning for flood events and the residual risk beyond the Defined Flood Event.

The GSDM, as revised in 2003, was applied to derive estimates of PMP for short duration storms. The GSDM applies to catchment up to 1,000 km² in area and durations up to 6 hours, which makes the method applicable to the Sarina Flood Study which has a catchment area of approximately 14 km² and a critical duration of 6 hours. Due to the mass volume of rainfall for the PMP storm the critical duration for PMP was found to be lower duration than what was identified for the other storm rainfall events.

Using the methodology set out in the GSDM Guidebook (BOM, 2003) the following data for the PMP was determined:

- The coastal GSDM Method is applicable as the catchment lies on the Queensland coast.
- The Roughness (R), Elevation Adjustment Factor (EAF) and Moisture Adjustment Factor (MAF) were calculated as 1.0, 1.0 and 0.98 respectively.
- PMP parameters were calculated as shown in Table 6.

Table 6 Adopted PMP Parameters

Duration (hrs)	Rainfall Total (mm)	Rainfall Intensity (mm/hr)
3	780	260
6	1,030	171

The ARI of the PMP event was calculated as recommended in AR&R (Pilgrim, et al, 1987). For a catchment area of 14 km², the PMP event is approximately a 1 in 10,000,000 ARI event.

4.3 Hydrologic Model Validation

Traditional model calibration and validation was not completed for the Sarina Drainage Study model due to the absence of recorded or observed flood records within the study area.

Model results were compared to previous modelling work within the area as well as anecdotal levels provided by Council. The outcomes of these comparisons are provided in the subsequent sections.

5.0 Hydraulic Model Development

5.1 Overview

An integrated one-dimensional (1D) / two-dimensional (2D) hydraulic model has been developed to simulate flood behaviour within the study area, by solving of the depth averaged two-dimensional momentum and continuity equations for free-surface flow. TUFLOW software (version Build 2017-09-AC) has been used for model simulations consistent with other drainage studies undertaken for Council.

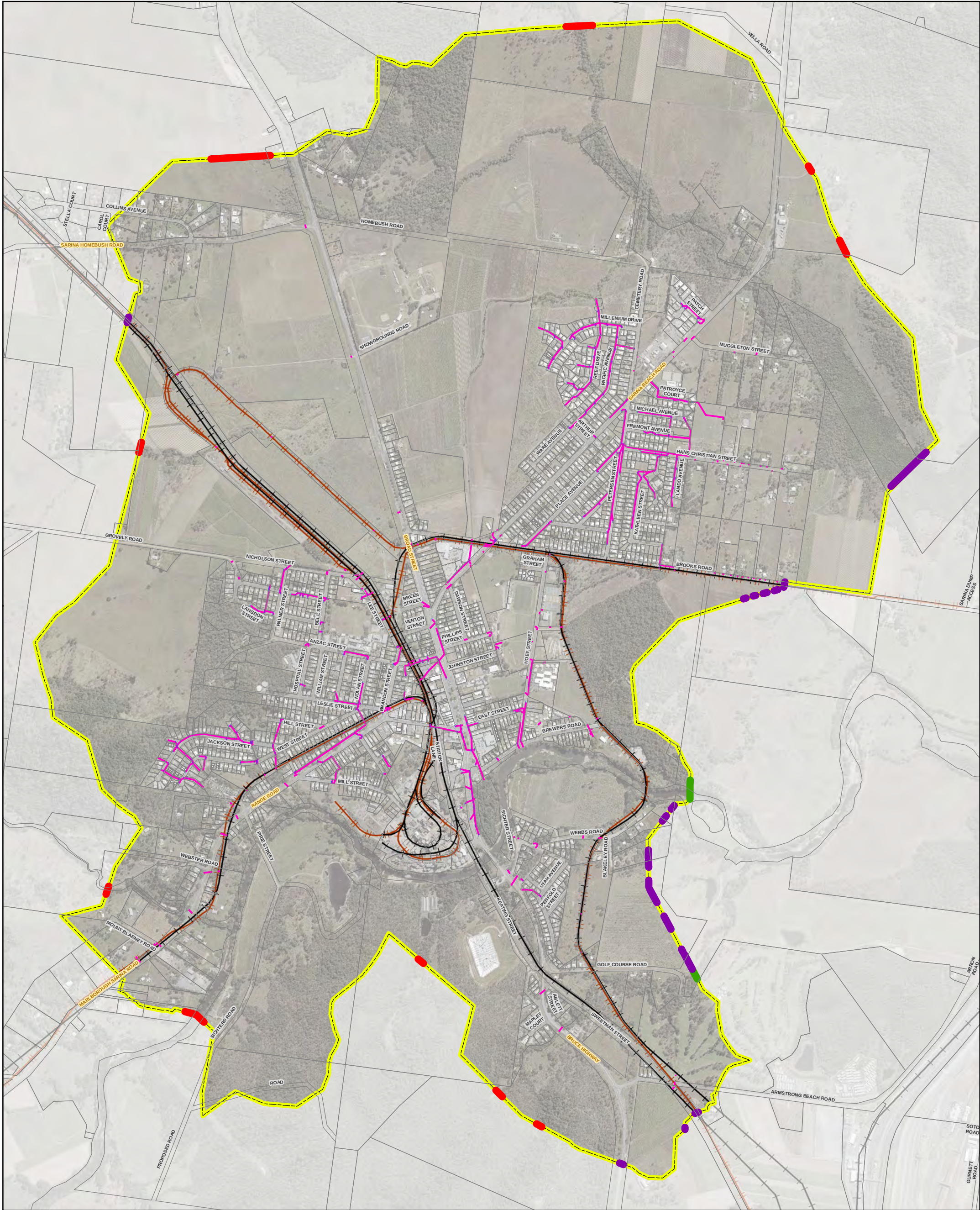
5.2 Adopted Methodology

This section of the report documents the development of the hydraulic model used to simulate piped drainage and overland flows within the catchment. A TUFLOW hydraulic model was produced with parameters as per Table 7.

Table 7 TUFLOW model Parameters

Parameter	Sarina TUFLOW Hydraulic Model
Completion Date	August 2018
AEP's Assessed	39%, 18%, 10%, 5%, 2%, 1%, 0.5% AEP
Hydrologic Modelling	WBNM runoff routed inflows and direct rainfall on 2D grid
IFD Input Parameters	ARR 2016, Refer Section 4.2.3
Hydraulic Model Software	TUFLOW Version 2017-09-AC-iSP-w64
Grid Size	3m
DEM (year captured)	LiDAR (2015) & Survey (2016)
Roughness	Spatially varying and depth varying standard values (Refer to Table 39)
Eddy Viscosity	Smagorinsky
Model Calibration	No measured or observed flood records available for model calibration or validation, anecdotal flooding information from Council used to confirm model accuracy. Refer to Appendix B.
Downstream Model Boundary	Plane Creek boundary, head versus time (HT) based on catchment slope is 5.86m for the duration of the model. This was shown to have no adverse impact on the accuracy of flood levels within the key parts of the study area. Other boundary conditions were height varying discharge based on catchment slope (Manning's equation based rating curves). Refer to Appendix A
Timesteps	1 second (2D) and 0.5 seconds (1D)
Wetting and Drying Depths	Cell centre 0.0002 m
Sensitivity Testing	Manning's Roughness $\pm$ 20% (Refer Section 6.4) Climate Change to year 2100 (Refer Section 7.0)

A visual representation of the model setup including the 2D model extent, hydrograph inflow locations, downstream model boundaries and 1D network is shown in Figure 6. Direct rainfall was applied over the entire model boundary of the 2D model domain.



LEGEND

TUFLOW Boundary Condition

HQ

HT

QT

Model Boundary

1D Pit

1D Pipe

QLD Rail Line

Sarina Cane Rail

Cadastre

0 100 200 400 600 800

metres

1:16,000 (when printed at A3)

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Sarina Drainage Study

Model Setup and 1D Network Map

PROJECT ID 60567081
CREATED BY reitanod
LAST MODIFIED 30/08/2018
VERSION: v01

Data sources:
Base Data: (c) 2017 Qld Gov

Figure

06

A3 size

5.2.1 Modelling Cross Drainage Structures

Modelling parameters associated with the 1D network is consistent with the recommended energy loss values in the TUFLOW reference manual. Manning's roughness values applied to the cross drainage infrastructure is consistent with aged concrete and applies the same assumptions for developed case models. Roughness values used in existing models are listed in Appendix A.

5.2.2 2D Modelling Roughness

Roughness values within the road reserve (including grass strips, shoulders, kerb channels and footpaths) are assigned with default road reserve roughness value, consistent with those used in previous modelling within the area.

Roughness Delineation is shown on Figure 7 and roughness values used in existing models are presented in Table 39.

5.2.3 Adopted Blockage

Assessment of culvert blockage was undertaken in accordance with ARR 2009 Project 11, Blockage of Hydraulic Structures and Chapter 6 Blockage of Hydraulic Structures ARR2016 and QUDM 4th Edition 2017 (Table 10.4.1).

5.3 Critical Duration Assessment

The critical storm duration for the study area was assessed by simulating the 60, 90, 120, 180, 270, 360 and 720, 1440, 2880 minute durations for the 1% AEP event in the baseline hydraulic model. Figure 8 shows the 1% AEP critical duration map.

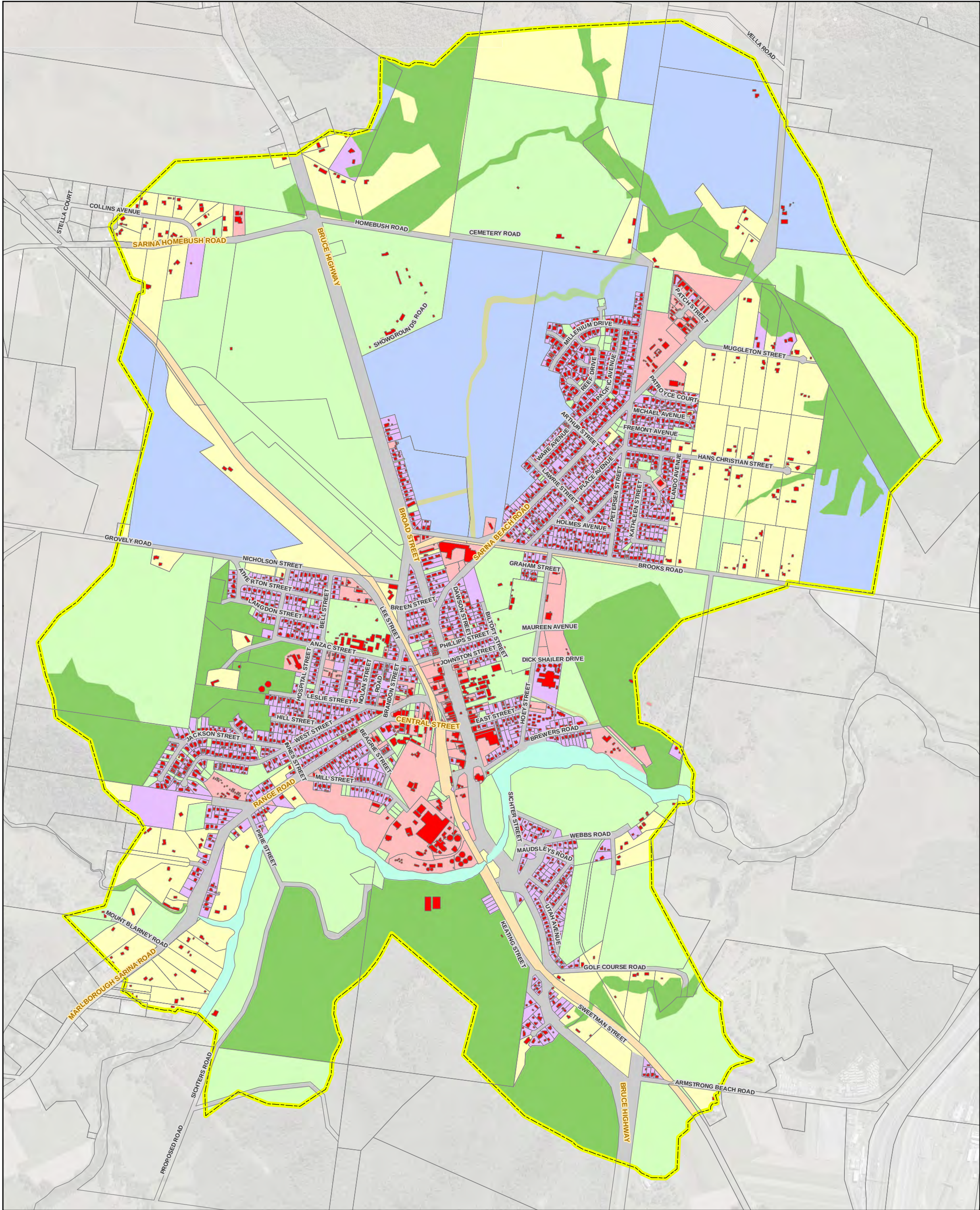
The critical duration map shows that the 1440 minute storm to be critical across the broader floodplain area and key locations in Sarina.

The 60, 720 and 1440 minute storm durations were found to be critical across different areas of Sarina.

The difference between critical water depths for the 720 minutes and the 1440 minute depths at the locations where 720 minute is critical showed varies of under <100mm, whereas areas where 1440 min was the critical storm varied by >100mm. 1440 minute storm was taken as the critical duration.

As the 1440 minute storm was found to be critical across private property adjacent to the intersection it was selected as the critical duration for the Sarina Drainage Study.

The critical duration was applied to the 39%, 18%, 10%, 5%, 2%, 1% and 0.5% AEP events.



LEGEND

Cadastre

Model Boundary

Buildings

Residential

Open Space and Recreational Areas

Road Reserve

Rural Residential

Commercial / Manufacturing

Open Water

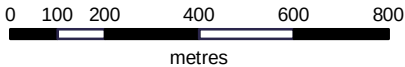
Railway

Sugar Cane

Long Grass Channel

Medium Vegetation

Dense Vegetation



1:16,000 (when printed at A3)

MACKAY REGIONAL COUNCIL
Sarina Drainage Study

Hydraulic Roughness Delineation

PROJECT ID 60567081
CREATED BY reitanod
LAST MODIFIED 30/08/2018
VERSION: v01

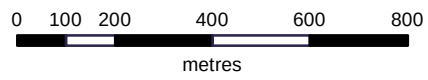
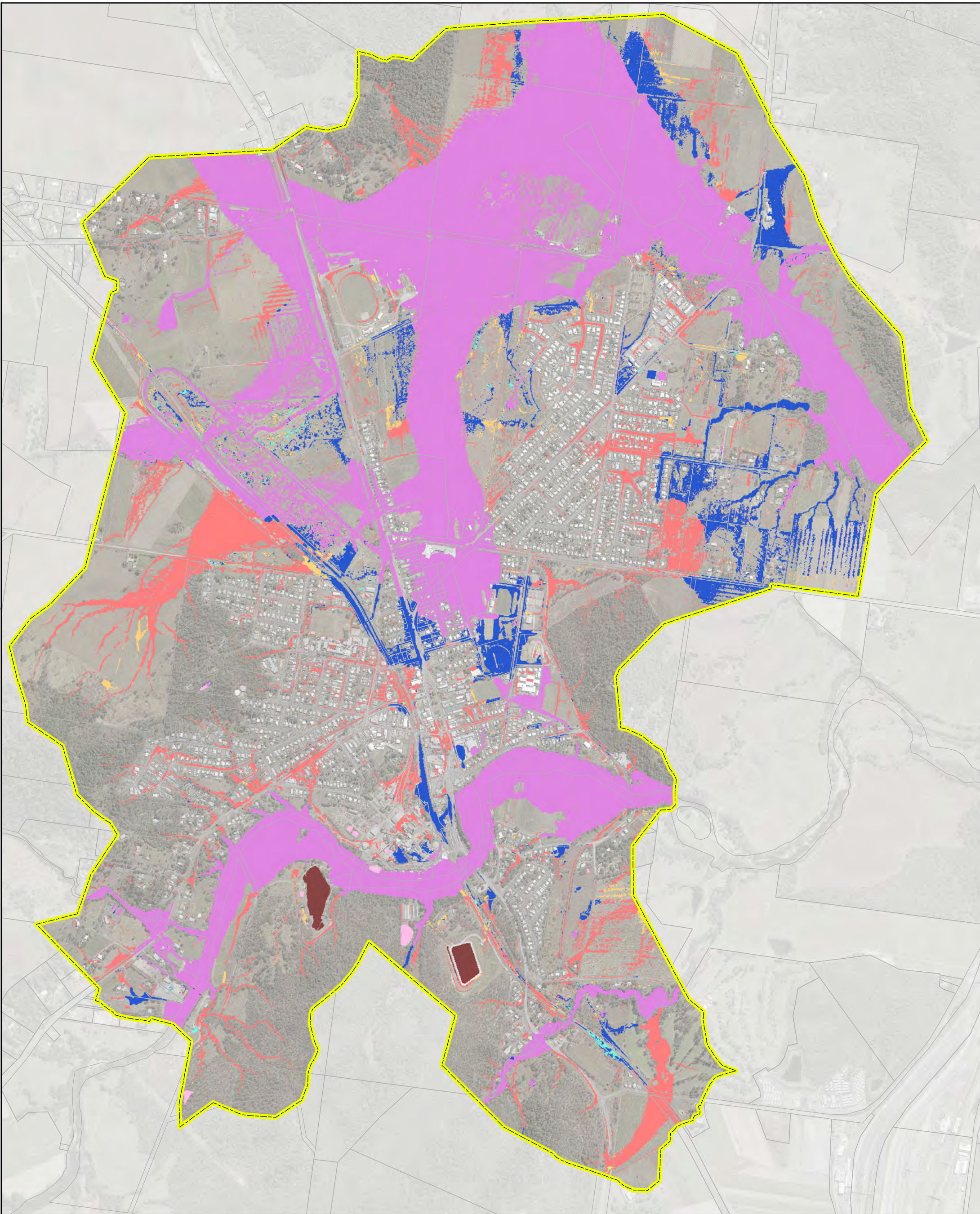
Data sources:
Base Data: (c) 2017 Qld Gov

Figure

07

A3 size

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LEGEND

	Model Boundary		90 min Storm		1440 min Storm
	Cadastre		120 min Storm		2880 min Storm
Extract_High8					
Value					
	60 min Storm		180 min Storm		360 min Storm
	1080 min Storm		720 min Storm		

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Sarina Drainage Study

Baseline Critical
Duration Map

PROJECT ID	60567081
CREATED BY	reitanod
LAST MODIFIED	15/08/2018
VERSION:	v01

Data sources:
Base Data: (c) 2017 Qld Gov

Figure
08

A3 size

5.4 Coincident Events

A coincident assessment between the local catchment event and Bells Creek event was undertaken to estimate the probability of both events peaking simultaneously. Based on guidance within QUDM the severity of coincident flooding will depend principally on the ratio of the time concentration of the drain or sub-channel relative to that of the receiving waterway.

For the Sarina investigation the quick IFD method was undertaken to compare the time of concentration of each catchment (Carroll, 1990). This method is useful in providing a quick result and an indication of the ARI of the corresponding events. It is recommended that the results below be taken further into a more detailed coincident event investigation as the design progresses.

The time of concentration for each catchment was estimated using the Bransby-Williams formula:

$$t_c = \frac{F \times L}{A^{0.1} \times S_e^{0.2}}$$

Where t_c = time of concentration (min)

F = a conversion factor. $F = 58.5$ where A is in km^2

L = length of mainstream (km) from the outlet to the catchment divide

A = area of catchment (km^2)

S_e = equal area slope (m/km)

The time of concentration estimated for each catchment is shown in Table 8.

Table 8 Time of Concentration Estimation

Local Catchment (Sarina Township)	Main Channel (Bells Creek)
104 minutes (1.74 hours)	190 mins (3.18 hours)

The calculations undertaken for the assessment are shown in Table 9 and Figure 9. These results should be taken as a guide only and a more rigorous investigation method is recommended in future works.

Table 9 Coincident Event – Quick IFD Method Calculations

Calculation 1	Calculation 2
Local Catchment ARI = 100 years $t_{c \text{ local}} = 104$ minutes $I_{\text{local}} = 87.1$ mm/hr Rainfall Depth = 151 mm $t_{c \text{ Bells}} = 190$ minutes $I_{\text{Bells}} = 47.7$ mm/hr Bells ARI = 20 year	Bells ARI = 50 years $I_{\text{Bells}} = 58.1$ mm/hr Local Catchment ARI = 10 years

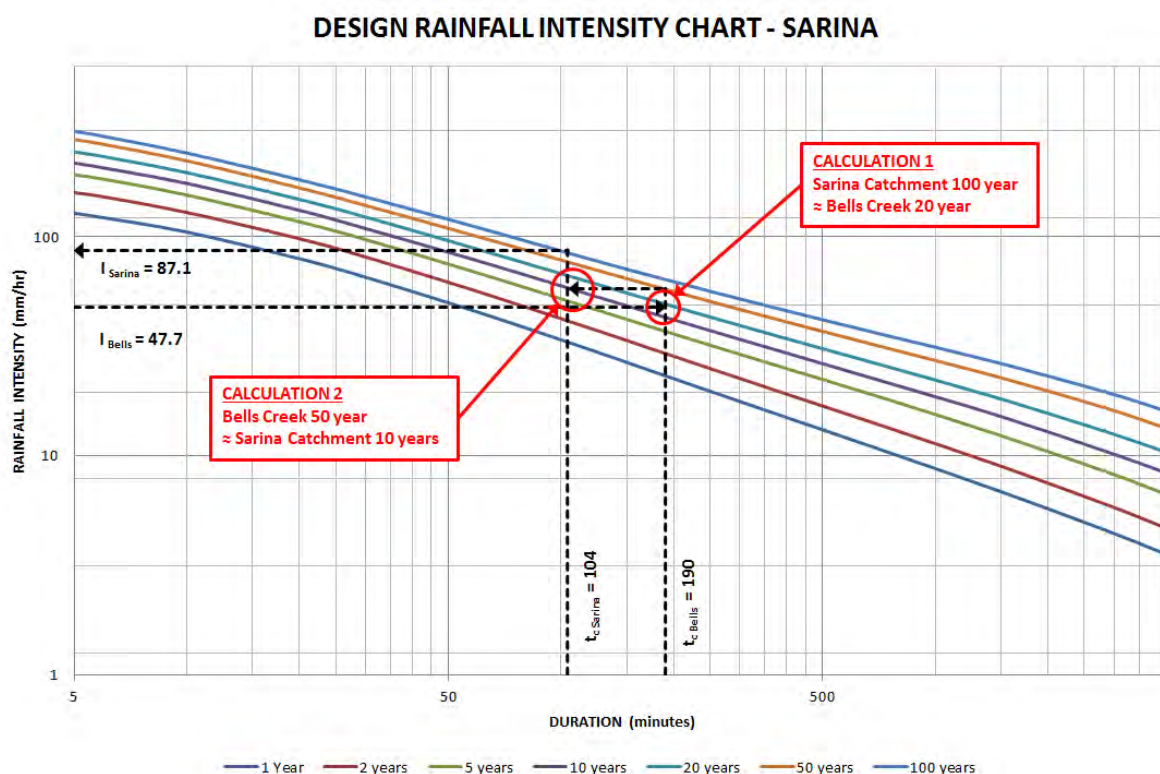


Figure 9 Coincident Event – Quick IFD Method Chart

The comparison between the Bells Creek Catchment and the local catchment to the Bells Creek connection are as follows:

Table 10 Bells Creek Catchment and Subject Catchment Characteristics

Description	Local Catchment	Bells Creek Catchment
Catchment area (ha)	2.31 km ²	30.6 km ²
Estimated length of catchment (km)	2.8	6.81
Estimated time of peak flow (min)	104	190

The quick IFD method demonstrates that there is a difference in the peak flow response times for the adjacent catchments as a result of the larger and longer Bells Creek catchment.

Although a more robust assessment of coincident events as discussed in the publication “Coincident Flooding in Queensland: Joint probability and dependence methodologies (October 2012)” should be part of any further assessment.

For the purposes of this flood study the Local Catchment was assessed against the following Bells Creek event.

Table 11 Coincident Rainfall Events

Local Catchment (Sarina)	Bells Creek Catchment
Corresponding Rainfall Event (AEP)	
PMF	PMF
0.2%	0.2%
0.5%	0.5%
1%	5%
2%	5%
5%	5%

Local Catchment (Sarina)	Bells Creek Catchment
Corresponding Rainfall Event (AEP)	
10%	10%
18%	18%
39%	39%
1EY	1EY

5.5 Calibration and Validation

Traditional model calibration and validation was not possible for the Sarina Drainage Study TUFLOW hydraulic model due to the absence of recorded or observed flood records within the study area.

Model results were compared to previous modelling work within the area as well as anecdotal levels provided by Council. The outcomes of these comparisons are provided in the subsequent sections.

5.5.1 Comparison of Results to 2013 Study

The GIS results layers from the TUFLOW modelling were compared to the mapping presented as part of the Sarina Drainage Study (Cardno, 2013). Overall the peak flood depths and extents for each event visually compared well. It is noted that digital files from the 2013 study were not available and therefore a detailed comparison of levels could not be undertaken.

5.5.2 Comparison of Results to Anecdotal Information

During a site visit with Council staff, anecdotal flood levels from the rainfall event associated with Tropical Cyclone Debbie were attained and compared to an approximately equivalent modelled design event. This provided a degree of confidence in the model's operation.

A detailed comparison of the modelled results to the anecdotal information is provided in Appendix B.

6.0 Basecase Hydraulic Modelling

6.1 Overview

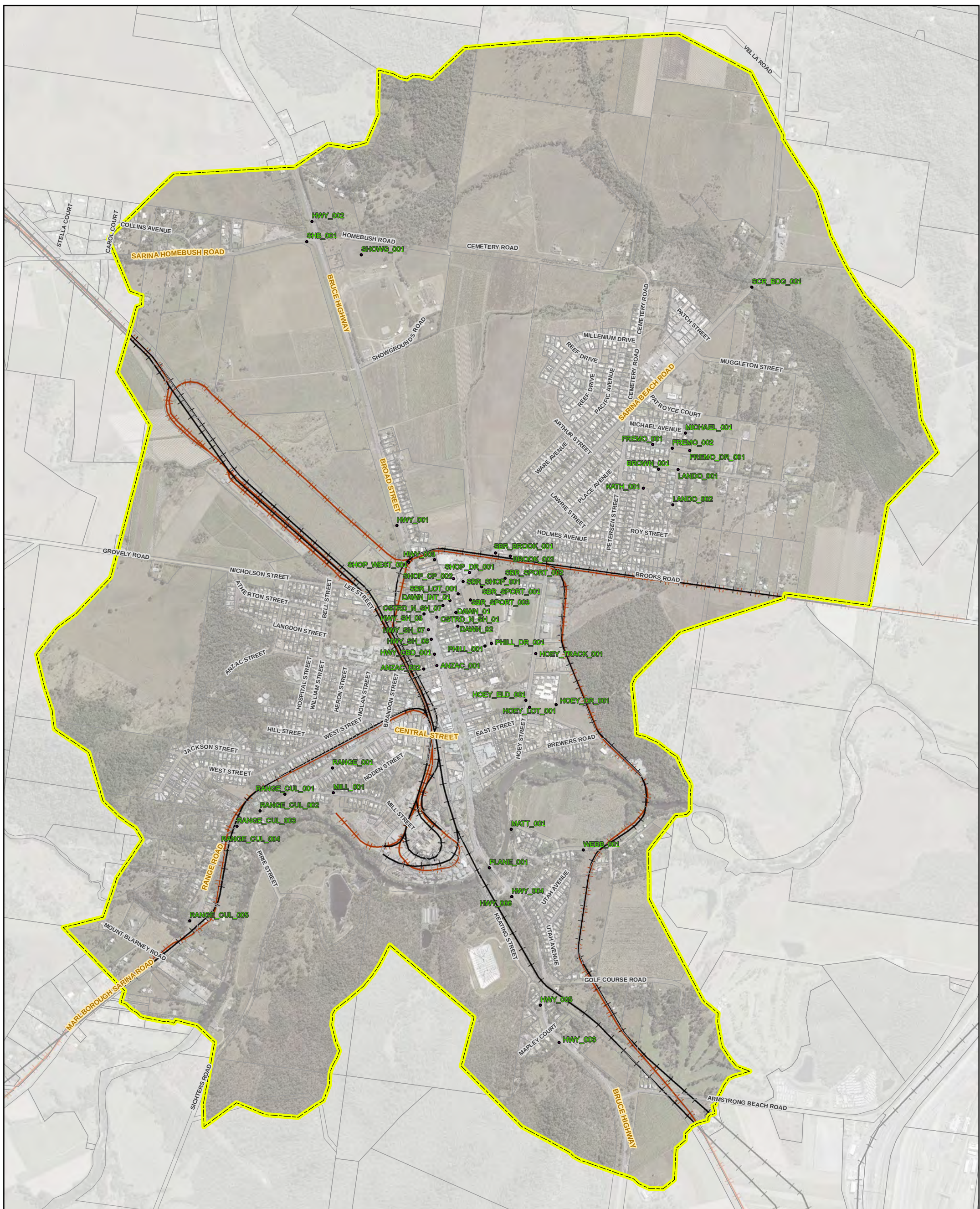
Direct rainfall modelling uses a process whereby rainfall is applied to every model cell. Mapping of these results in their raw form would show that the entire model extent was flooded. For this reason, areas where the flow depth is less than 100 mm were removed from the mapping, as is standard practice. Note that these depths are not excluded in the computational scheme. Furthermore, areas where the flood extent was less than 100m² (25 grid cells), were removed from the result mapping for the modelling undertaken. Both these processes are in accordance with guidance from AR&R Project 15 (Engineers Australia, 2012).

GIS results mapping includes peak flood elevations, depths and velocities and can be found in the Sarina Drainage Study – Hydraulic Analysis Report (Volume 2).

The following sections present peak water surface elevations and peak flows at key points of interest within the TUFLOW hydraulic model boundary. Figure 10 identifies the cross-sections that read the peak flows that pass through the lines. These key points which identify peak water surface elevations are shown graphically in Figure 11.

6.2 Basecase Peak Flood Depths, Extents and Velocities

Maps 1 to 30 within Volume 2 shows the flood depth, extents and velocities for the 63% AEP, 39% AEP, 18% AEP, 5% AEP, 1% AEP, 0.5% AEP, 0.2% AEP and PMF basecase events respectively. The observed results for each of these scenarios are described further in the following sections.



6.2.1 Basecase Peak Water Surface Levels

Table 12 provides a summary of the baseline peak water surface levels at key interest points (refer to Figure 11) for 39%, 18%, 10%, 5%, 2% and 1% AEP events.

GIS results maps of the baseline peak water surface levels across the entire model extent and intersection site are available in the Sarina Drainage Study – Hydraulic Analysis Report (Volume 2).

Table 12 Summary of Baseline Peak Water Surface Levels

Location	Natural Surface	Peak Water Surface Level (mAHD)						
		1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
ANZAC_001	16.69	16.97	16.98	17.07	17.11	17.20	17.22	17.25
ANZAC_002	17.41	17.50	17.52	17.54	17.55	17.59	17.61	17.62
BROOK_002	15.32	15.44	15.46	15.48	15.48	15.68	15.71	15.75
BROWN_001	11.92	-	11.97	12.18	12.20	12.25	12.26	12.28
CSTRD_N_SH_01	16.00	-	-	-	-	16.06	16.10	16.15
CSTRD_N_SH_07	15.71	15.72	15.72	15.77	15.79	15.90	15.95	16.01
DAWN_01	15.29	15.47	15.54	15.64	15.68	15.83	15.89	15.96
DAWN_02	15.55	15.64	15.65	15.68	15.70	15.85	15.91	15.99
DAWN_INT_01	15.28	15.46	15.53	15.64	15.67	15.82	15.88	15.95
FREMO_001	11.64	11.75	11.76	11.84	11.86	11.92	11.94	11.97
FREMO_002	11.62	-	-	-	11.63	11.67	11.68	11.71
FREMO_DR_001	11.11	11.24	11.27	11.37	11.41	11.51	11.55	11.60
HOEY_DR_001	16.21	16.77	16.87	17.01	17.05	17.15	17.18	17.22
HOEY_ELD_001	16.45	16.86	16.91	17.01	17.03	17.07	17.09	17.12
HOEY_LOT_001	16.47	16.86	16.92	17.02	17.06	17.16	17.19	17.24
HOEY_TRACK_001	16.29	16.77	16.85	16.95	16.96	16.99	17.00	17.01
HWY_001	15.88	16.77	17.12	17.36	17.43	17.53	17.56	17.61
HWY_002	10.78	12.90	13.08	13.26	13.37	13.50	13.56	13.65
HWY_003	15.60	16.05	16.19	16.75	17.02	17.24	17.28	17.32
HWY_004	18.11	18.64	18.79	18.99	19.05	19.26	19.38	19.54
HWY_005	27.93	28.29	28.34	28.42	28.45	28.55	28.59	28.66
HWY_006	18.11	18.64	18.79	18.99	19.05	19.26	19.38	19.54
HWY_CBD_001	16.16	16.51	16.53	16.61	16.65	16.76	16.80	16.84
HWY_SH_03	16.46	-	-	16.47	16.56	16.66	16.68	16.71
HWY_SH_07	16.32	-	-	16.48	16.56	16.65	16.67	16.70
HWY_SH_09	16.46	-	-	16.48	16.56	16.65	16.67	16.70
KATH_001	12.30	12.47	12.53	12.60	12.61	12.64	12.66	12.67
LANDO_001	11.62	-	-	11.79	11.86	11.93	11.95	11.97
LANDO_002	11.60	11.64	11.66	11.79	11.86	11.94	11.96	11.98
MATT_001	13.77	13.90	13.91	13.91	13.91	13.92	13.92	14.18
MICHAEL_001	11.59	11.77	11.79	11.86	11.93	12.02	12.03	12.05
MILL_001	19.67	19.72	19.74	19.77	19.78	19.80	19.81	19.83

Location	Natural Surface	Peak Water Surface Level (mAHD)						
		1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
PHILL_001	15.78	15.97	15.99	16.08	16.10	16.15	16.16	16.18
PHILL_DR_001	15.05	15.72	15.75	15.82	15.84	15.88	15.93	15.95
PLANE_001	8.60	11.84	12.40	13.35	13.96	14.67	15.31	15.99
RANGE_001	20.74	20.99	21.00	21.03	21.04	21.06	21.07	21.09
RANGE_CUL_001	16.55	17.47	17.61	17.85	17.95	18.22	18.43	18.84
RANGE_CUL_002	19.42	20.12	20.24	20.43	20.49	20.71	20.75	20.80
RANGE_CUL_003	19.68	21.20	21.30	21.46	21.53	21.69	21.76	21.87
RANGE_CUL_004	24.54	25.06	25.14	25.30	25.36	25.53	25.60	25.66
RANGE_CUL_005	19.36	21.97	23.04	24.84	24.95	25.01	25.04	25.08
SBR_BROOK_001	14.90	15.03	15.04	15.22	15.29	15.68	15.71	15.75
SBR_LOT_001	15.50	15.51	15.51	15.54	15.62	15.78	15.84	15.90
SBR_SHOP_001	15.66	-	-	-	-	15.78	15.84	15.90
SBR_SPORT_001	15.02	15.34	15.44	15.54	15.62	15.78	15.84	15.90
SBR_SPORT_002	15.25	15.34	15.44	15.55	15.62	15.78	15.84	15.90
SBR_SPORT_003	15.16	15.34	15.44	15.55	15.62	15.78	15.84	15.90
SCR_BDG_001	4.10	6.92	7.22	7.71	7.99	8.37	8.48	8.62
SHB_001	12.49	13.96	14.05	14.35	14.45	14.62	14.72	14.83
SHOP_CP_002	15.30	15.48	15.50	15.56	15.58	15.78	15.84	15.91
SHOP_DR_001	15.35	15.42	15.43	15.49	15.50	15.73	15.78	15.83
SHOP_WEST_001	15.21	15.25	15.25	15.39	15.49	15.81	15.89	15.97
SHOWG_001	12.11	-	12.16	12.37	12.46	12.57	12.63	12.73
WEBB_001	11.73	12.49	12.62	12.75	12.78	13.02	13.09	13.21

6.2.2 Basecase Peak Discharges

The peak flow rates for the flow paths at key locations within the study area were extracted for each of the Basecase events modelled, with the results summarised in Table 13 provides a summary of the baseline provides a summary of the baseline peak discharges at key cross-sections (refer to Figure 10) for 39%, 18%, 10%, 5%, 2% and 1% AEP events.

GIS results maps of the baseline peak water surface levels across the entire model extent and intersection site are available in the Sarina Drainage Study – Hydraulic Analysis Report (Volume 2).

Table 13 Peak Discharges at Select Locations for Basecase Design Events

Location	Peak Discharges (m ³ /s)						
	1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
L_BELL_CHAL_001	14.3	16.0	20.7	24.6	30.2	33.1	36.4
L_BELL_CHAL_002	39.0	46.1	58.3	66.8	78.7	86.2	95.6
L_BELL_OB_001	11.3	20.2	36.0	48.3	65.0	76.4	89.5
L_BELL_OB_002	2.1	4.1	8.2	11.2	16.0	18.3	20.9
L_BELL_OB_003	3.9	12.5	24.8	32.7	44.8	52.2	62.9
L_BELL_OB_004	0.5	3.1	9.0	13.2	19.6	25.6	39.5
L_BELLS_CHAL_001	46.6	65.6	97.8	118.7	155.2	179.6	215.3
L_BELLS_CHAL_002	155.0	220.3	338.4	411.0	530.7	574.2	638.0
L_BELLS_CHAL_003	160.9	227.3	348.2	421.9	545.2	592.4	659.6
L_BELLS_OB_001	0.5	0.8	1.8	3.1	7.3	11.0	19.9
L_BELLS_OB_002	0.2	0.3	0.5	0.5	0.8	2.4	7.7
L_BREW_001	1.0	1.2	1.5	1.6	1.7	1.7	1.7
L_FRE_DR_001	0.2	0.4	1.0	1.4	2.7	3.3	4.3
L_HANS_DR_001	3.3	4.2	5.5	5.8	6.8	7.2	8.0
L_HWY_BELL_001	42.9	61.3	91.4	111.3	139.1	154.1	170.2
L_HWY_BELL_002	42.9	61.3	91.5	112.0	141.7	158.0	176.3
L_HWY_CANE_001	12.2	16.0	20.7	22.4	24.5	25.3	26.9
L_HWY_CROSS_001	0.1	0.1	0.1	0.8	2.6	3.9	6.0
L_HWY_CROSS_002	8.5	11.8	15.3	16.3	18.8	20.0	21.8
L_HWY_CROSS_003	1.7	2.3	5.0	6.3	10.4	12.5	14.4
L_HWY_CROSS_004	1.1	1.5	4.1	5.3	7.4	8.6	9.9
L_HWY_CROSS_005	0.1	0.2	0.9	1.9	3.4	3.7	4.5
L_PHIL_001	0.7	0.9	1.2	1.3	1.6	2.3	2.0
L_PLANE_CK_001	163.1	245.2	409.4	529.2	691.2	858.5	1047.9
L_PLANE_CK_002	164.4	246.8	412.5	534.2	703.0	873.5	1066.5
L_PLANE_CK_003	164.8	247.5	413.1	535.2	704.3	882.4	1078.6
L_PLANE_CK_004	164.9	247.3	413.1	535.2	704.5	879.6	1071.6
L_PLANE_CK_005	165.0	247.7	413.4	535.7	705.3	880.1	1068.4
L_PLANE_CK_006	165.3	247.9	414.0	536.6	705.6	877.7	1071.0
L_PLANE_CK_007	165.3	248.0	414.0	536.2	705.5	878.4	1071.0
L_PLANE_IN_001	4.3	6.0	8.7	9.7	12.8	14.2	16.5

Location	Peak Discharges (m ³ /s)						
	1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
L_PLANE_IN_002	5.3	7.3	10.6	12.1	16.2	18.1	21.1
L_PLANE_SUB_001	10.1	14.0	19.3	27.2	34.3	39.3	47.1
L_PLANE_SUB_002	0.9	1.1	1.6	1.7	2.2	2.5	2.8
L_PLANE_SUB_003	1.4	1.8	2.4	2.7	3.3	3.5	3.9
L_PLANE_SUB_004	1.8	2.3	3.4	3.9	5.3	6.0	7.2
L_PLANE_SUB_005	2.5	3.2	4.7	5.2	7.0	7.9	9.4
L_PLANE_SUB_006	8.4	11.5	17.5	21.4	27.1	31.1	36.3
L_PLANE_SUB_007	9.7	13.3	19.5	22.5	30.9	34.9	41.4
L_PLANE_SUB_008	0.5	0.7	1.3	1.6	5.6	39.4	42.3
L_PLANE_SUB_009	10.3	14.0	20.5	23.6	32.1	36.6	43.4
L_PLANE_SUB_010	12.9	17.6	26.6	31.1	44.3	83.8	95.2
L_RAIL_001	7.9	11.4	15.7	18.4	21.0	21.8	22.4
L_RAIL_002	7.6	10.2	12.8	13.8	16.3	18.5	20.0
L_RAIL_003	0.1	0.1	0.1	0.1	0.1	0.3	0.4
L_RAIL_004	12.2	16.9	25.2	29.2	33.4	35.7	38.9
L_SBR_CROSS_001	149.9	213.2	328.3	399.3	516.0	556.6	617.0
L_SBR_CROSS_002	151.1	214.6	330.1	402.2	518.4	559.4	620.2
L_SBR_NEW_DR	0.0	0.1	0.4	0.5	2.1	3.6	5.0
L_SHOP_CHAL_001	7.8	10.8	21.1	24.9	38.6	47.5	61.0
L_SHOP_CHAL_003	17.5	24.7	39.6	45.4	63.3	76.2	97.7
L_SHOP_CHAL_005	17.9	25.6	38.8	42.7	52.6	59.3	69.3
L_SHOP_CUL_002	0.7	0.9	1.3	1.4	1.6	1.7	1.7
L_SHOP_CUL_003	0.0	0.0	0.0	0.0	0.8	1.3	1.9
L_SHOP_CUL_004	0.3	0.5	0.8	0.9	4.3	5.8	6.9
L_SHOP_DRAIN_002	16.5	23.3	37.4	42.7	60.2	72.4	92.7
L_SHOP_DRAIN_004	17.4	25.3	40.6	46.6	65.1	78.1	100.1
L_SHOP_DRAIN_006	18.8	26.7	40.3	44.3	54.2	60.8	70.4

6.2.3 Basecase Underground Network Capacity

A summary of the basecase trunk network capacity identifying the capacity of the network within Sarina during the design storm for each event as provided in Table 14 and Figure 12 below.

Table 14 Modelling Scenario – Basecase 1d Network Capacity

ARI Event	Total Length (m)	Pipes Flowing Full (m)		
		39% AEP	18% AEP	1% AEP
Basecase 1D network	15891	5265	7205	9914

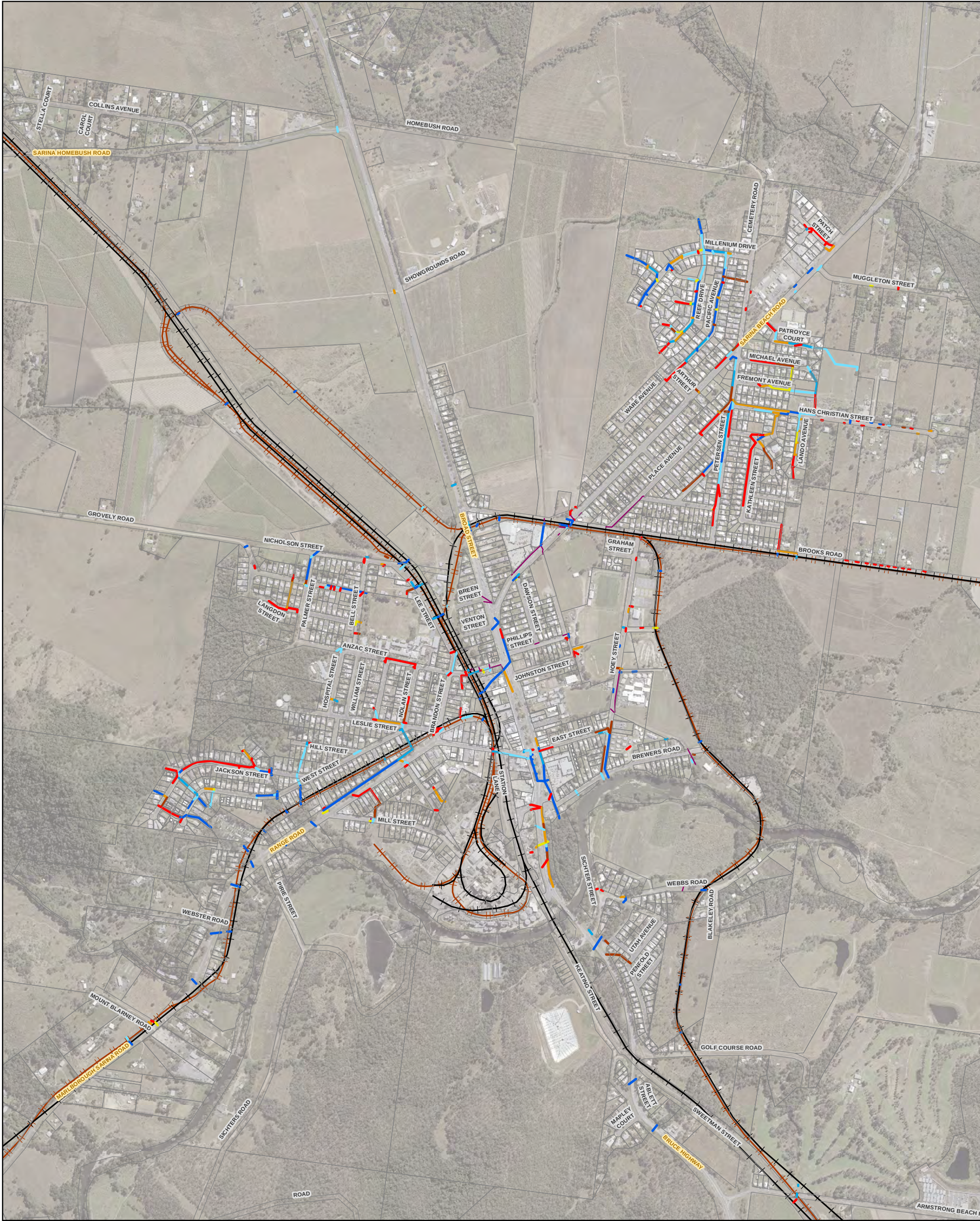
6.2.4 Basecase Property Impacts

A summary of the basecase property inundation analysis for the Sarina Drainage Study is provided in Table 15 below. Residential buildings and commercial buildings are considered impacted if flood waters encroach above the floor levels. Floor levels were provided by Mackay Regional Council from survey and Mobile Laser Scanning in the form of the Terrestrial Lidar Dataset, refer to Section 11.5 for information and Appendix D for building floor levels utilised in the model.

Table 15 Modelling Scenario – Basecase Building Inundation Numbers

ARI Event	No. Residential Buildings Impacted	No. Commercial Buildings Impacted	Total No. Buildings Impacted
2 year	-	3	3
5 year	-	4	4
10 year	-	5	5
20 year	2	8	10
50 year	3	9	12
100 year	7	14	21

It can be seen that building inundation numbers progressively increase as the flood magnitude increases. A diagram indicating the buildings inundated (water over habitable floor level) for each of the analysed local catchment events for this scenario are shown in Figure 13.





0 100 200 400 600
metres

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LEGEND

— Cadastre

— Bells Creek

— Plane Creek

1D Pipe

— <all other values>

Capacity

— 1EY

— 39% AEP

— 18% AEP

— 10% AEP

— 5% AEP

— 2% AEP

— 1% AEP

— >1% AEP

— QLD Rail Line

— Sarina Cane Rail

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Sarina Drainage Study

Basecase 1D Pipe Network Capacity

PROJECT ID: 60567081

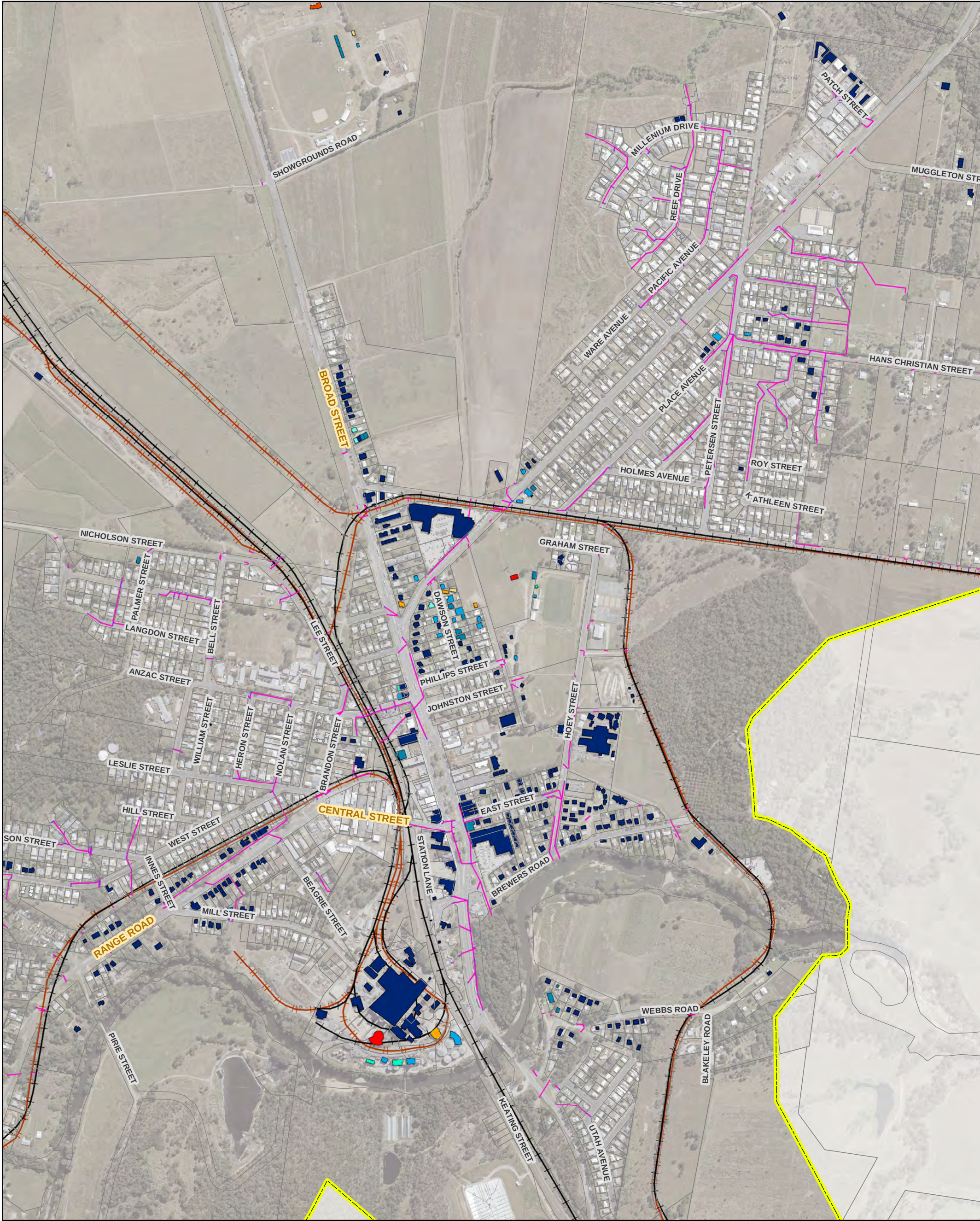
CREATED BY: reitanod

LAST MODIFIED: 5/09/2018

VERSION: v01

Figure
12

Data sources:
Base Data: (c) 2017 Qld Gov





0 100 200 400
metres

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LEGEND

- Model Boundary
- Cadastre
- Bells Creek
- Plane Creek
- 2yr | Properties Impacted
- 5yr | Properties Impacted
- 10yr | Properties Impacted
- 20yr | Properties Impacted
- 50yr | Properties Impacted
- 100yr | Properties Impacted
- 200yr | Properties Impacted
- 500yr | Properties Impacted
- PMF | Properties Impacted
- Existing Pit
- Existing Pipe
- QLD Rail Line
- Sarina Cane Rail

Data sources:
Base Data: (c) 2017 Qld Gov

MACKAY REGIONAL COUNCIL
Sarina Drainage Study

Base Case
Building Inundation Locations

PROJECT ID	60567081
CREATED BY	reitanod
LAST MODIFIED	5/09/2018
VERSION:	v01

Figure
13

6.3 Brewers Park Sports Fields

Mackay Regional Council has expressed concern for the Brewers Park Sports field as it is located within the low lying areas of Sarina and is the subject to development discussion. Brewers Park Sports field was examined to determine drainage area in further detail.

The sports fields are located within the broad triangle of Sarina Beach Road, Hoey Street, Biltoft Street and Dawson Street. Topographically the sports fields are within a shallow bowl that receives stormwater from the reporting catchments and directs stormwater to the north across Sarina Beach Road.

The main drainage features within and adjacent to the sports fields are shown on Figure 14 and as follows:

- The sports field forms a detention basin to the south of Sarina Beach Road. The catchment contributing to the sports fields is approximately 45 ha.
- An elevated footpath and cycleway on the southern side of the Sarina Beach Road carriageway with a crest elevation of 15.40m AHD. The footpath impounds catchment discharges to an approximately immunity of 39% AEP.
- A small drainage channel from Phillips Street to the existing 2/750 RCP.
- Low flow discharge from the sports fields is via 2/750 RCP discharging to Sarina Beach Road table drain.
- High flow discharge is by means of overtopping the footpath.
- The sport fields are shaped to discharge to perimeter drains that report to the 2/750 RCP. The lowest elevation of the main sports field (adjacent to the existing internal drain) is approximately 14.95 m AHD. This field is inundated by flows less than 1EY.



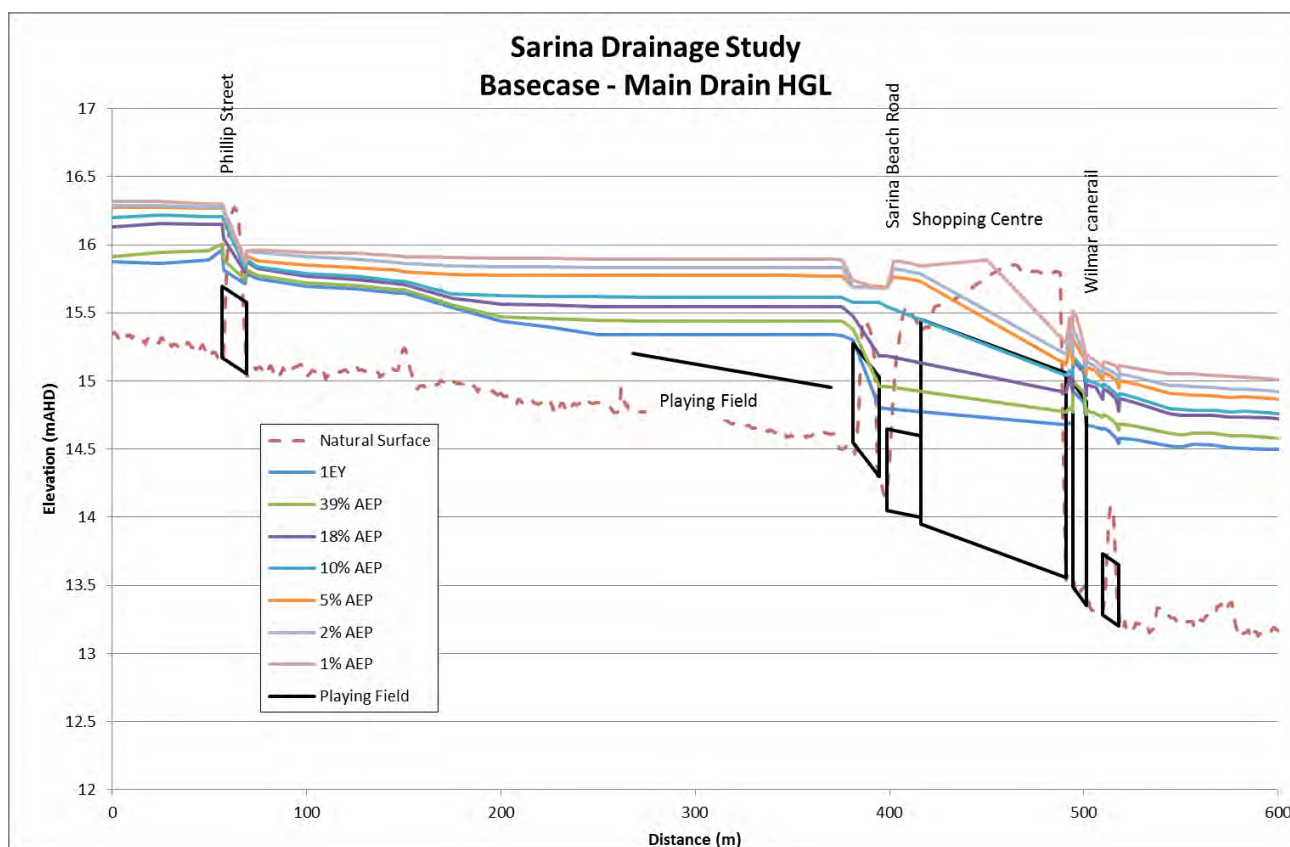
Figure 14 Brewers Park Features

The capacity of the drainage structures that receive flows from the sports field and adjacent catchments is listed in Table 16.

Table 16 Drainage Structure Capacity

Structure	Structure Location	Inlet/outlet Elevation (mAHD)	Capacity (assumed flowing full) (m3/s)	Indicative Immunity	Controlling elevation (mAHD)	Controlling elevation location
2/750 RCP	Discharge from sports field	14.55/14.30	1.50	18% AEP	15.40	Concrete footpath
6/900x600 RCBC	Sarina Beach Road	14.05/14.0	4.10	1EY	15.66	Road crown
6.4 x 1.5 RCC	Under Shopping Centre	13.95/13.56	24.0	1% AEP	15.65	carpark
5/1800x1500 RCBC	Under cane rail alignment	13.49/13.35	23.4	1% AEP	15.46	Can rail formation
900x450 RCBC	Access along Brooks Street	13.28/13.20	0.9	<1EY	14.10	Road formation

Figure 15 shows the base case hydraulic grade line for a range of design AEP events along the drain within the sports field from Phillips Street to Broad Street. Of note is the main north south sport field is well below the 1EY event indication which indicates that the field may be inundated in reasonably low volume rain events.

**Figure 15 Brewers Park Drain Basecase HGL**

Options to reduce inundation in the sports field may include:

- Reduce the contributing catchment. This is not practicable solution. Indeed one of the options from a previous study is to direct additional flows from the Anzac Street area to the sports field by underground drainage along Phillips Street.
- Augment the discharge capacity from the sports field. This would require substantial drainage works as follows:
 - Increase capacity across the bunding footpath.
 - Increase the main internal drain capacity from Phillips Street to Sarina Beach Road.
 - Increase the capacity across Sarina Beach Road.
 - Possibly providing an alternate discharge path around the shopping centre culvert.
 - Remove the restricting Brooks Street informal road access culvert and formation.
 - Increasing the capacity of the drain north from Brooks Street (unformed) to Bells Creek.
- Raising the elevation of the sports field. This is a sensitive option as this will reduce the potential available storage volume without undertaking compensatory works (improved discharge capacity) may increase the inundation potential for the Dawson Street allotments.

Considering the potential options to relieve inundation of the sports field the following mitigation options are included into the structural mitigation options:

- Removal of the Brooks Street (unformed) culvert and access.
- Increase conveyance of the channel north from the Shopping Centre to Bells Creek.
- Increase conveyance along and across Sarina Beach Road – multiple locations.
- Increase conveyance from sports fields and internal drainage augmentation.
- Catchment bypass along Phillips Street.

6.4 Sensitivity Analysis

6.4.1 Hydraulic Roughness

As the roughness values applied to the hydraulic model were based on previous studies and recommendations from AR&R, two sensitivities were run to simulate both a 20% increase and decrease to the roughness values adopted for the study. These results were used to check if differences in the Manning's 'n' values would have significant effects on stormwater runoff across the study area.

The sensitivity modelling was undertaken for the 1% AEP events, in the baseline and developed case scenarios. The GIS results maps of the hydraulic roughness sensitivity are available in the Sarina Drainage Study – Hydraulic Analysis Report (Volume 2).

In summary, the mapping shows that the results are sensitive to the hydraulic roughness change over the properties between the Bruce Highway and Dawson Street, as well as some properties north of Anzac Street. However, the changes are minimal (maximum 90mm PWSE increase for 1% AEP +20% Manning's 'n'), providing confidence in the results published as part of the study.

7.0 Effects of Climate Change

7.1 General

A suite of climate change literature is available, covering global, national and more localised state based climate change discussion and analysis. Whilst much of the literature states that, for Queensland, total annual rainfall is decreasing and rainfall intensity during rainfall events is increasing, there is comparatively little literature recommending actual values to adopt for these changes.

The Queensland Climate Change Strategy (QLD Government, 2007) indicated that cyclone intensity is expected to increase by 2050 with cyclone associated rainfall expected to increase by up to 20-30%. The other recently published document which provides guidance on the adoption of climate change values, and also provides guidance on the use of these scenarios in development planning is the Increasing Queensland's resilience to inland flooding in a changing climate: Final report on the Inland Flooding Study published by DERM, The Department of Infrastructure and Planning (DIP) and the Local Government Association of Queensland (LGAQ) in 2010.

The DERM, DIP and LGAQ Inland Flooding Study (2010) were specifically aimed at providing a benchmark for climate change impacts on inland flood risk. Whilst Mackay is not considered to be an inland area, this document does provide guidance on the adoption of climate change scenarios for development planning. The study recommends a 'climate change factor' be included into flood studies in the form of a 5% increase in rainfall intensity per degree of global warming. For the purposes of applying the climate change factor, the study outlines the following temperature increases and planning horizons:

- 2°Celsius by 2050;
- 3°Celsius by 2070; and
- 4°Celsius by 2100.

These increases in temperature equate to a 10% increase in rainfall intensity by 2050, a 15% increase in rainfall intensity by 2070 and a 20% increase in rainfall intensity by 2100.

In addition to impacts on rainfall, sea level rises are also commonly discussed in climate change literature. The most recent publication that relates to Queensland is the Queensland Coastal Plan (and more specifically the State Planning Policy Coastal Protection).

The second document outlines sea level rises that should be considered when planning for development in coastal areas of Queensland. Table 17 details the projected sea level rise up to 2100.

Table 17 Projected Sea Level Rise (SPP 3/11, 2012)

Year of Planning Period	Projected Sea Level Rise (m)
2050	0.3
2060	0.4
2070	0.5
2080	0.6
2090	0.7
2100	0.8

In addition to the Coastal Plan, the Australian Government Department of Climate Change and Energy Efficiency report Climate Change Risks to Australia's Coast – A First Pass National Assessment for Australia (2009) identified that 1.1 m sea level rise by 2100 is a plausible value to adopt. Whilst this document is not a policy document, its recommendations should be considered.

7.2 Adopted Approach

Given the uncertainty in climate change and sea level rise projections, particularly with respect to changes in rainfall intensity, climate change sensitivity has been undertaken as part of this study. The hydrologic and hydraulic models have been used to assess the impact of climate change that would be expected to occur in 2100 for the 1% AEP design event.

In addition to increased rainfall, climate change has the potential to increase sea levels. A sea level rise of 0.8m is expected by 2100. The MHWS level at the downstream boundary has been increased by 0.8m to 3.26m AHD for the design event incorporating climate change effects. Due to the topography across the study area, this only had an influence in the lower reaches of Bells Creek, and did not impact the PIA area.

7.3 Hydraulic Model Results

The sensitivity result maps are available in the Sarina Drainage Study – Hydraulic Analysis Report (Volume 2). However the increase in rainfall in turn causes an increase in peak water surface levels (maximum 120mm PWSE increase for 1% AEP) across the Sarina, in particular to the east down Sarina Beach Road and along Anzac Street. An increase in flooding of properties is seen along Dawson Street.

8.0 Floodplain Management Principles

8.1 Framework

This study aligns to current best practice guidelines, including the Australia Disaster Resilience Handbook Collection, Handbook 7 – Managing the Floodplain: a Guide to Best Practice in Flood Risk Management in Australia (Commonwealth of Australia, 2017).

For a government agency with primary responsibility for managing flood risk in their area, the flood risk management framework provides a basis to improve management of flood risk for their community. The purpose of the framework is to assist Flood Management Agencies (FMA), like Council, to:

- Understand roles and responsibilities related to flood risk management.
- Identify and engage with relevant stakeholders and agencies.
- Identify and understand relevant legislation, policies, regulations and guidelines.
- Identify vulnerable and high risk areas of the community.
- Collate the best available information and use it appropriately.
- Identify knowledge gaps and risks, to inform the decision making process related to these issues.
- Develop plans to improve knowledge and manage flood risk, including implementation guidance.
- Make informed development decisions related to flood prone areas.
- Conduct community and stakeholder engagement related to flood risk and management.

A well formulated floodplain management plan enables informed communities, flood risk managers, land-use planners and emergency managers to make sound floodplain management decisions. The full range of potential flood risk treatment options must be carefully considered, in relation to the specific flood risk associated with the area, to ensure suitability and resilience.

Figure 10.1 (reproduced as Figure 16 below) of Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia (Commonwealth of Australia, 2017), illustrates the current best practice floodplain management process. Figure 16 demonstrates how this report fits within the overall process.

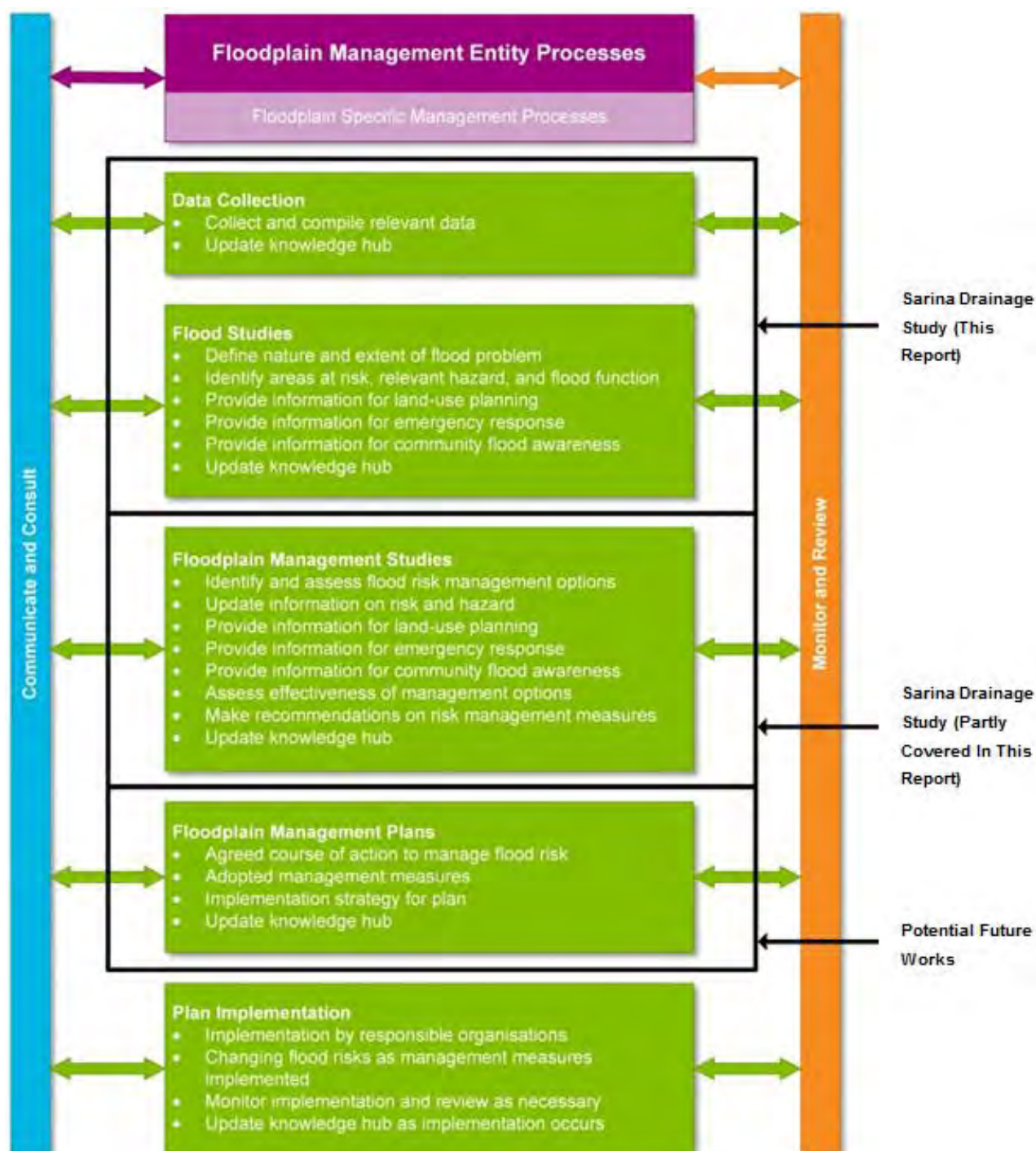


Figure 16 Floodplain Specific Management Process

Reproduction of Figure 10.1 from Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia (Commonwealth of Australia, 2017).

8.2 Floodplain Mitigation Measures

Floodplain management measures can be broadly grouped into Non Structural and Structural options, as follows:

- Non Structural (refer Section 9.0):
 - Community awareness.
 - Land use planning and development control.
 - Emergency management planning.
- Structural (refer Section 10.0):
 - Property buyback.
 - Levees (both permanent and temporary).
 - Detention basins.
 - Improved conveyance through channel works and culverts.
 - Development planning – Raising of dwellings.
 - Development planning – Flood proofing of dwellings.
 - Backflow prevention devices.
 - Diversion channels.

Non-structural flood mitigation measures relate to the management of current, potential and residual flood risks, whereas structural measures targets the partial or complete elimination of flood risk.

Whilst sound floodplain management is preferably achieved through land use and development planning this is not always feasible where development has already occurred within the floodplain.

Where development has occurred within flood prone areas, a reduction in flood risk can be achieved through the application of structural measures.

9.0 Non-Structural Flood Mitigation Measures

9.1 Overview

A summary of non-structural flood mitigation measures are outlined below for Council's consideration.

9.2 Community Awareness

It is critical that community living in the flood-prone areas of Sarina be made aware – and remains aware – of their role in the overall floodplain management strategy for the region, including defence of their communities and their personal evacuation. Sustaining an appropriate level of flood awareness involves continuous effort by Council and the emergency services which can significantly increase the community's resilience to future flood events.

Irrespective of flood warnings, there can be widespread variation in flood awareness in a community which can result in a high degree of variation in flood damages. Within the Sarina area, more recent flood events (i.e. 2008 event) have raised flood awareness in the community. However, as time passes, this awareness will reduce.

Council can enhance flood awareness through, for example, regular public education programs via newspaper, videos, pamphlets, meetings, community events and other media outlets. Community awareness brochures have been widely adopted and many followed the successful implementation of NSW SES's 'Flood Safe' brochures.

These brochures can include material specific to the local region and provide the following information:

- What floods are and the history on flooding in Sarina.
- Flood behaviour in Sarina.
- Flood warnings.
- What to do before, during and after a flood.
- Preparation of a household emergency plan.

It is recommended that Council develop a communications plan to explain existing flood risk to the Sarina community using outputs from this report. This should be incorporated into Council's current Coastal and Inland Flood Hazards Adaption Study (CIFHAS) community awareness campaign.

9.3 Land Use Planning Development Control

Through suitable land use planning, the likelihood and consequence of flooding can be managed by guiding appropriate future development, removing existing inappropriate development and selecting land use zoning which is flood compatible. Sound land use planning goes hand in hand with sound development planning.

Appropriate development and building controls can significantly reduce flood risk and the amount of damage to flood prone properties when a flood occurs. The level of protection provided by the Planning Scheme should be a consequence of an analysis of the risks and consequences of flooding and the opportunities provided by sustainable land uses.

An underlying factor of community vulnerability is the degree of exposure to flooding. Where people have chosen to live is their own decision however, they may not be aware of the flood risk and hazard to which they are exposed.

Planning schemes are a key element to prevent increasing the number of people, business and assets exposed to flooding from events less than the Defined Flood Event (DFE). It is therefore fundamental that future development is guided so that people and their property have limited exposure to flood hazard and/or the development uses flood resilient building material and practices and adopts/accepts a flood impact philosophy of shelter in place.

Several broad recommendations are provided below for further consideration by Council's Planning and Development officers:

- This study has assessed existing flood risk for local and Bells and Plane Creek catchment events. Storm surge events should be considered in conjunction with the results of this study, when undertaking development planning and assessments.
- Council needs to have regard to the cumulative impacts of developments, i.e. the consideration of the impacts of a development in combination with other developments.
- A key component of land use planning is the adoption of a DFE. This has traditionally been adopted as the 1% AEP flood however there is considerable evidence that rainfall intensity will increase during current planning horizons.
 - In application, a DFE being the 1% AEP flood with an allowance for the adverse impacts of climate change as represented by an increase in design rainfall intensities of 20% (being a 5% per degree Celsius rise in mean global temperature of 4°C to the year 2100) is recommended.
- In consideration of the results of the sensitivity tests, and minimal data on which to base model calibration, it is recommended that a freeboard of 0.3m be applied to the model results from this report, when using them for development control purposes.
- Council should ensure the key overland flow paths identified are considered as part of future capital works to promote preferred overland conveyance routes.
- A comprehensive suite of development assessment measures is recommended, that not only includes the direct impact of development, but also the indirect impacts regarding flood warning and evacuation.
- Relevant Council staff should be appropriately trained in assessing flood study reports with respect to the development control measures selected.

The aim of land use planning and development control is to:

- Not unnecessarily sterilising land on the floodplain.
- Manage future development.
- Be ecologically, socially and culturally sustainable.
- Provide a balanced and integrated mix of management measures.
- Obtain best value.
- Provide direction for implementation.
- Promote community awareness, seek and take into account public comment.
- Meet legislative requirements and act in good faith.

There are a range of methods that can also be considered for future development and or future planning scheme controls. Methods include:

- Internal Council Policy to guide development assessments including draft conditions for stormwater flooding prevention and control.
- Preparing more up to date *Flood Hazard Overlay Mapping*, using the flood maps prepared for this study.
- Planning maps easily accessible by the public to find out if Council has planning controls for flooding on the subject property.
- Ensuring in development control provisions that any portion of a structure below flood planning levels will be built from materials that minimise potential damage due to inundation and impact from flood velocities.

Planning scheme controls can also provide Performance Criteria & Acceptable Solutions that seek to achieve the following objectives:

- Habitable floor areas for residential developments to be above the defined flood event plus freeboard.
- Commercial buildings all habitable flooring to be above the ground floor for multi-story buildings.
- Increase housing density that makes use of prefabricated or tilt up concrete panels.
- Basement car parks prohibited in areas where the 1% (or lower) AEP event extends above to top of existing kerb and channel flood areas.
- Major electrical equipment (switchboard, lift controls, etc.) for the buildings to be above the defined flood event.
- Major plumbing and house drainage equipment (switchboard, pump controls, etc.) for the buildings to be above the defined flood event.
- Maximum site discharge to be no greater than 39% AEP - to be triggered by development application.
- Avoid filling to minimise cumulative impacts on flood plains.
- Maximise use of non-stud frame dwellings to reduce contents damage.
- Place electrical outlets approximately 1m minimum above floor height.
- Build all external wall and load bearing internal walls below the DFE plus freeboard of masonry construction e.g. double brick, concrete block, concrete panel rather than brick veneer or framed walls.
- Use timber framed walls with sheet cladding only for non-load-bearing internal partitions.
- Building foundations to be flood impact and inundation resilient.
- For structural purposes use materials that are dimensionally stable and not weakened by immersion.
- Use of water resistant bracing materials – e.g. steel straps, fibre cement or waterproof plywood sheets.
- Ignore bracing contribution from plasterboard wall lining.
- Use medium or heavy-duty side fixed brick ties.
- Use insulation with minimal absorption that dries- e.g. polystyrene panels.
- Ensure adequate ventilation to cavities.
- Staircases should be designed to facilitate the relocation of contents from the ground floor to the upper floor.

9.3.1 Habitable Floor Level

Council currently set habitable floor levels based on the highest of:

- 300mm above the 1% AEP (annual likelihood) flood level or defined storm tide event.
- 225mm above natural ground level;
- 300mm above the greater of top of the kerb level or the crown of the adjacent bitumen road.

9.4 Emergency Management Planning

Council's Local Disaster Management Group (LDMG) is responsible for coordinating local planning and response for flood events. A lack of available data can be a limiting factor for a LDMG's ability to plan for the event and to communicate the expected impacts to local residents / media.

9.4.1 Flood Emergency Plan

It is recommended that Council further develop or amend their existing Flood Emergency Plan (FEP) following the completion of this study. The FEP should be a detailed document containing an agreed set of roles, responsibilities, functions, actions and management arrangements to deal with flood events of all sizes.

The primary aim of the FEP is to reduce hazard during an actual flood. Essential issues addressed in the plan are flood forecasting, flood warning, location of vulnerable people/communities and evacuation and initial recovery. A local FEP forms an essential component of a floodplain management plan and requires close liaison between emergency management staff.

Typically, a FEP has several trigger points that result in the activation and implementation of the plan as the actual flood event develops. The flood emergency plan should include activities to protect and reinstate essential infrastructure services required during clean-up and in the recovery phase.

9.4.2 Assessment of Critical Infrastructure

A list of critical infrastructure should be prepared. This could include infrastructure such as:

- Emergency services facilities (e.g. ambulance, police, fire, hospital).
- Facilities for evacuation of vulnerable groups (e.g. child care, education, retirement, nursing care, caravan parks).
- Key evacuation routes.
- Key water and sewerage infrastructure.
- Roads / bridges.
- Airport facilities.

9.5 Summary of Non-Structural Flood Mitigation Measures

A summary of non-structural flood mitigation measures is shown in Table 18, with a brief discussion on the various types of mitigation measures also provided.

Table 18 Non-Structural Flood Mitigation Options Summary

Measure	Mitigation Option	Description	Advantages / Disadvantages
Community awareness	Community and Stakeholder consultation	Engagement throughout the floodplain management process, to inform the community on flood risk and develop flood resilience within the community.	<u>Advantages</u> - Creates a flood resilient community. - Gives the community a sense of 'buy in' related to flood risk. - Allows for informed debate regarding flood mitigation strategies. - Consequence of flooding may be reduced. <u>Disadvantages</u> - May result in negative community feelings towards flood prone areas. - Likelihood of flooding remains the same.
Land use planning	Zoning	Appropriate land use zoning to guide future development away from flood prone areas. Re-zoning of existing developments within flood prone areas, to flood compatible land uses (e.g. parks and open spaces).	<u>Advantages</u> - Eliminates future development in areas affected by flooding. - Reduces future flood risk. <u>Disadvantages</u> - Re-zoning of existing developed areas may take time to have an effect on flood risk, as existing residents may not move on for some time. - May reduce land values, particularly on the flood fringe areas.
	Buyback / Purchase	Voluntary or forced purchase of existing buildings within high hazard flood areas, to eliminate the flood risk.	<u>Advantages</u> - Eliminates flood risk. - Links with re-zoning. <u>Disadvantages</u> - Costly. - May cause distress if residents resist the purchase. - Could take a long time, particularly if there is isolated resistance within a larger group of buybacks.

Measure	Mitigation Option	Description	Advantages / Disadvantages
Development planning and building controls	Planning Scheme	An overarching plan for the city / region to guide areas of development outside flood prone areas.	<u>Advantages</u> - Provides a clear picture of areas where development should not take place, due to flood risk. <u>Disadvantages</u> - Could sterilise areas on the flood fringe.
Development planning and building controls	Minimum floor levels	Habitable floor levels are set based on a minimum height (freeboard) above the DFE.	<u>Advantages</u> - Provides a level of flood resilience, up to the DFE. <u>Disadvantages</u> - Residual risk remains for flooding in events larger the DFE. - There may be issues with flood free access / egress to buildings.
	Raising of dwellings	Lifting of the habitable floor level of an existing dwelling, based on a minimum height (freeboard) above the DFE.	<u>Advantages</u> - Provides a level of flood resilience, up to the DFE. - May prove to be cost effective, when compared to other building controls. <u>Disadvantages</u> - Not possible for all types of buildings. - Residual risk remains for flooding in events larger the DFE. - There may remain issues with flood free access to the building.
	Flood proofing of dwellings	Improving the flood resistance of a building to inundation and velocities, through the use of appropriate materials. This is done by retrofitting to existing buildings or designing into new buildings.	<u>Advantages</u> - Structural damage is reduced during flooding. <u>Disadvantages</u> - Other detrimental effects of flooding remain, including access, clean up, etc.
	Raising of services – electrical and plumbing	Improved flood resilience of building to loss of services if major electrical equipment (lifts and switchboards) and major plumbing items (pumps) are above the DFE	<u>Advantages</u> - Loss of service is reduced during flooding. <u>Disadvantages</u> - Other detrimental effects of flooding remain, including access, clean up, etc.

Measure	Mitigation Option	Description	Advantages / Disadvantages
Emergency management planning	Response planning	Planning associated with managing flood forecasting, flood preparedness, emergency response and flood recovery.	<u>Advantages</u> - Provides clear details on the responsibilities and actions to be taken prior to, during and after a flood event. - Identifies areas that require improvement, in relation to flood response. <u>Disadvantages</u> - Flood risk remains.
	Forecasting and warning	Relates to the prediction of flood severity, flood extent and flood timing for a specific area, and the methods by which affected persons are informed.	<u>Advantages</u> - Provides advanced warning of a flood event, which allows for flood preparedness and flood response. <u>Disadvantages</u> - Flood risk remains.
	Flood preparedness	Refers to the awareness of affected parties (community and agency alike) of what they need to do prior to the arrival of a flood. This will include items such as agency staff training and individual resident's actions taken to prevent loss.	<u>Advantages</u> - Reduces incidental flood damage. - Reduces social impacts. - Allows for effective flood response. <u>Disadvantages</u> - Flood risk remains.
	Flood Response	Refers to the response by agencies and individuals affected by the flood, to reduce the hazard. This could include road closures, evacuations and rescue.	<u>Advantages</u> - May reduce the consequences of flooding. <u>Disadvantages</u> - Flood risk remains.
	Recovery	Once flood waters recede, the recovery process includes clean-up, services restoration, financial assistance and other activities to ensure safe access is available to flood affected areas.	<u>Advantages</u> - Good planning will accelerate the recovery process. - Clearly defines the roles and responsibilities related to flood recovery. <u>Disadvantages</u> - Flood risk remains.

10.0 Structural Mitigation Options

10.1 Overview

Due to low lying areas within Sarina, particular around the Sarina Beach Road and Bruce Highway intersection, there is only limited opportunity to improve the capacity of the underground network for a majority of the study area, as discussed below.

The following broad principles were applied when developing preliminary structural mitigation options.

- Improvements to existing open channels, including regrading and widening;
- Incorporation of additional stormwater pipework, where possible.

Upgrade of existing stormwater pipework, where grades permit; Figure 17 provides an overview of the structural mitigation options assessed during this study.

The assessed structural mitigation options include:

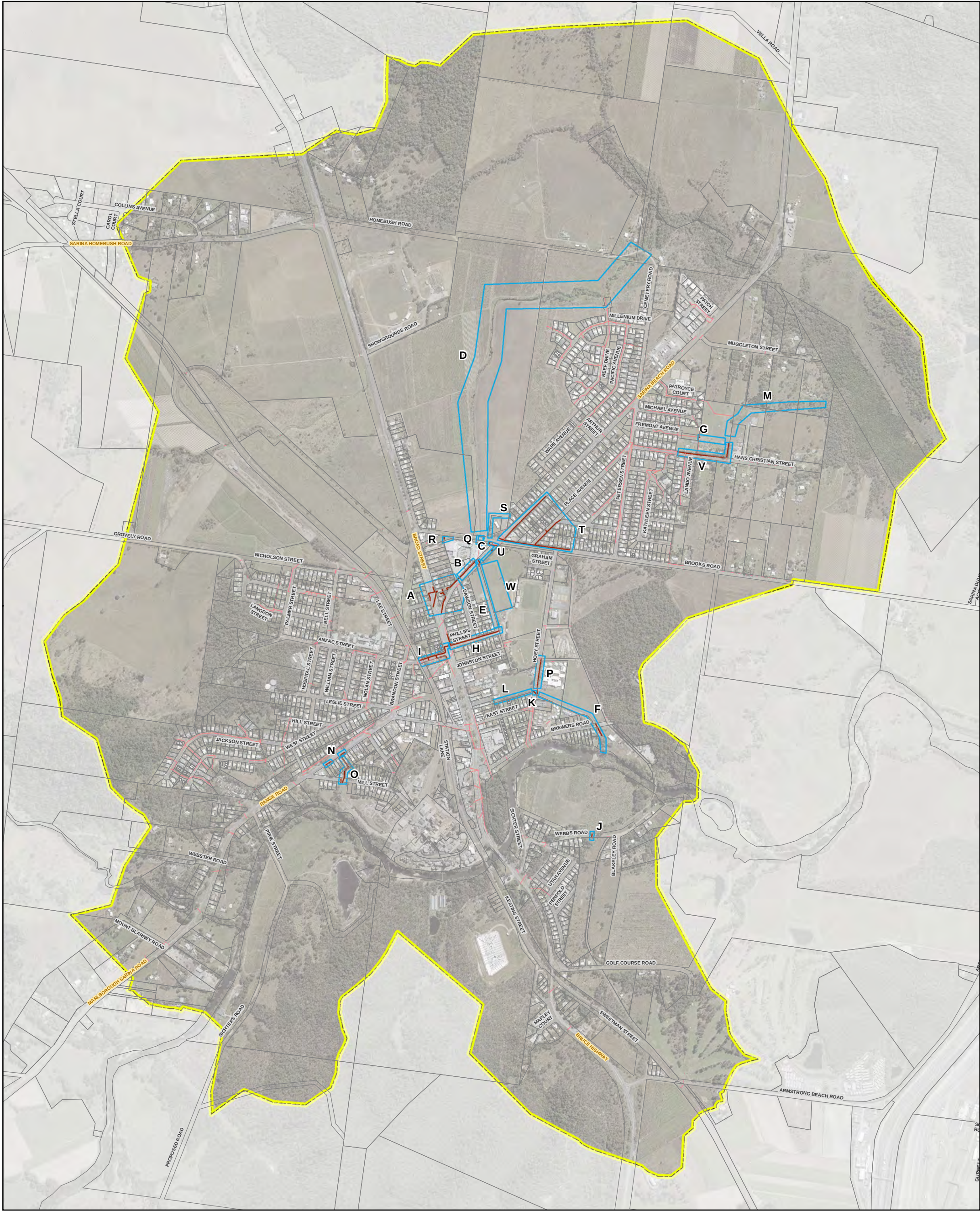
- A. Construction of the Sarina Beach Road and Bruce Highway roundabout (SNA) – Works include new pipe work up to the shopping centre completed by TMR;
- B. Sarina Beach Road Stormwater Upgrade – replace existing pipes (currently made from concrete blocks) with 3/1200x600 RCBCs or greater to match proposed upgrade at SNA, approximately 145 metres;
- C. Brooks Road Culvert – Remove culvert north of the shopping centre and widen channel to match upstream rail culverts;
- D. North shopping centre open channel upgrade – Widening of drains located in Lot 503 SP249142 and Lot 901 SP236211 (north of Sarina shopping centre);
- E. Sarina Beach Road Brewers Park drain and culverts – replace existing 2/750 RCPs under footpath with 5/2400x900 RCBC and replace existing 7/600x900 under road with 5/2400x900 RCBCs. Brewers Park drain upgraded to 6 metre base with 1:4 sides.
- F. Brewer Road, Open Channel and outlet upgrade – Lower the channel by approximately 1 metre and widen with 3 metre base and 1:4 sides. Existing 900 RCP increased to 3/1500 RCPs under Brewers Road and lowered, outlet and drain to Plane Creek regraded.
- G. Fremont Avenue Open channel – Lower and formalise open channel match downstream drain level. Outlet pipe systems from Fremont and Michael Avenue to open channel via a new 900mm RCP and disconnect existing southern pipe connection.
- H. Phillip Street Stormwater upgrade – Install new stormwater infrastructure along Phillip Street and remove existing pit and pipes. New 4/1200x900 RCBC to Brewers Park drain outlet. Install 3 new small grated kerb lintels along the road.
- I. Anzac Street Stormwater upgrade – Upgrade small pit into large grated lintels (2) and install 3 additional large grated lintels. Install additional pipe work to convey flows from the rail culverts. Install 4/1200x300 under kerb and connect to Phillip Street Culverts (H).
- J. Webb Road Stormwater upgrade – Existing 1350 RCP increased to 2/1350 RCP under Webb Road, drain outlet and inlet regraded.
- K. Hoey Street Stormwater Upgrade Cross-over – Duplicate culverts, 1200x300 increased to 3/1200x300 under Hoey Street.
- L. Drain regrading to Hoey Street Stormwater Upgrade (L) – Regrade, remove silt build-up and extend drain to edge of boundary.
- M. Hans Christian Street Channel – Regrade/expand out channel to approximately 8 metres wide base.
- N. Range Road new Stormwater – New pit and 400 RCP on either side of existing stormwater network.
- O. Range Road and Mill Street internal drainage – Install additional field inlet pits within Lot 16/RP705862 and 1/RP724553, and duplicate install pipe network.

- P. Hoey Street Stormwater Upgrade – Upgrade stormwater line adjacent to Hoey Street that enters in open channel (F). Existing 2/750 RCP upgrade to 3/1500x750 RCBC and 4/1500x750 RCBC for the last section of culvert.
- Q. Downstream shopping centre culverts – Remove excess silt and debris build up in culverts and drains behind the shopping centre and adjacent to the rail lines.
- R. Lot 1/RP715055 Railway outlet upgrade – Existing 1200x300 RCBC increased to 5/1200x300 RCBC and excess soil remove from behind shopping centre.
- S. Drain formulisation around 75/RP744493 – Drainage channel formulisation approximately 6 metres wide around Lot 75/RP744493.
- T. Brooks Road Stormwater Upgrade – Install addition pipe work and pits along Brooks Road Sarina Beach Road and Place Avenue.
- U. Sarina Beach Road Open Drain and Pipework – Expand the drain adjacent to Sarina Beach Road to approximately 6 metres wide with 3 metre wide concrete base. Remove existing access off Sarina Beach Road. New culvert under Sarina Beach Road, 3/2100x900 RCBC and new culvert under the railway, 3/2100x900 RCBC.
- V. Hans Christian Street Pipe and drain upgrade – Increase pipe capacity by increasing number of pipes, existing 2/1050 RCP increased to 3/1050 RCP and existing 2/1350 increased to 3/1350 RCP. Install 2/2400x900 along the drain and connect existing pits into new culverts. Fill culverts and construct small open channel above culverts.
- W. Brewers Park Sports Fields – Sports fields raised to increase flood immunity

The undeveloped parcel of land to the immediate north of the Sarina Shopping Centre (corresponding to Mitigation Option D) through which the outfall for the majority of the urban catchment drains has been modelled in the mitigated case as follows:

- Channel profile to fit within the existing drainage easement to cater for the 1% AEP event.
- Fill profile sloping from the existing urban footprint (Bruce Highway and Pacific Palms Estate) towards the proposed drain with the generic fill platform above the 1% AEP event.

The mitigation mapping (Maps 33-64) shows portion of the undeveloped land fill profile as experiencing inundation. These areas of apparent inundation are representative of pods or low areas within the modelled ultimate developed profile but areas of temporary storage (indicative of temporary storage within a street system) while awaiting for flows to report to the main drain.



LEGEND

- Cadastre
- Mitigation Options
- Proposed Pipe/Culvert Upgrades
- Pipes/Culverts with No Upgrades
- Model Boundary

0 100 200 400 600 800
metres

1:16,000 (when printed at A3)

MACKAY REGIONAL COUNCIL
Sarina Drainage Study

Overview
Structural Mitigation Options

PROJECT ID 60567081
CREATED BY reitanod
LAST MODIFIED 30/08/2018
VERSION: v01

Data sources:
Base Data: (c) 2017 Qld Gov

Figure
17

A3 size



AECOM does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. AECOM shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.



0 25 50 100
metres

1:2,500 (when printed at A3)

LEGEND

- Proposed Pipe/Culverts Upgrades
- Pipes/Culverts With No Upgrades
- Cadastre

MACKAY REGIONAL COUNCIL
Sarina Drainage Study

Culvert/Pipe Mitigation Options
Bruce Highway & Sarina Beach Road

PROJECT ID 60567081
CREATED BY reitanod
LAST MODIFIED 30/08/2018
VERSION: v01

Data sources:
Base Data: (c) 2017 Qld Gov

Figure
18

A3 size





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LEGEND

- Proposed Pipe/Culvert Upgrades
- Pipes/Culverts With No Upgrades
- Cadastre

0 25 50 100 metres

1:2,500 (when printed at A3)

MACKAY REGIONAL COUNCIL
Sarina Drainage Study

Pipe/Culvert Mitigation Options
Hoei Street

PROJECT ID: 60567081
CREATED BY: reitanod
LAST MODIFIED: 30/08/2018
VERSION: v01

Figure
20

Data sources:
Base Data: (c) 2017 Qld Gov

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10.2 Design Peak Flood Depths, Extents and Velocities

Maps are contained in Volume 2 report displays the Mitigation Options results including flood depths, extents and velocities for the 1EY, 39% AEP, 18% AEP, 10% AEP, 5% AEP, 2% AEP, 1% AEP, 0.5% AEP, 0.2% AEP and PMF events respectively.

10.2.1 Mitigated Case Peak Water Surface Levels

Peak Water Surface levels across the range of design events were extracted at key locations with the study area and summarised in Table 19.

GIS results maps of the mitigated case peak water surface levels and Afflux across the entire model extent are available in the Sarina Drainage Study – Hydraulic Analysis Report (Volume 2) (Maps 33-74).

Table 19 Summary of Mitigated Case Peak Water Surface Levels

Location	Natural Surface	Peak Water Surface Level (mAHD)						
		1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
ANZAC_001	16.69	16.75	16.77	16.87	16.93	17.12	17.17	17.22
ANZAC_002	17.41	17.44	17.46	17.48	17.49	17.54	17.57	17.59
BROOK_002	15.32	15.39	15.40	15.42	15.43	15.45	15.45	15.48
BROWN_001	11.92	-	-	12.10	12.17	12.23	12.25	12.27
CSTRD_N_SH_01	16.00	-	-	-	-	-	-	16.04
CSTRD_N_SH_07	15.71	15.77	15.77	15.78	15.78	15.78	15.81	15.89
DAWN_01	15.29	15.45	15.47	15.50	15.52	15.59	15.69	15.81
DAWN_02	15.55	15.64	15.65	15.67	15.68	15.71	15.74	15.86
DAWN_INT_01	15.28	15.40	15.41	15.43	15.45	15.57	15.68	15.80
FREMO_001	11.64	11.75	11.76	11.80	11.83	11.90	11.92	11.96
FREMO_002	11.62	-	-	-	-	11.64	11.66	11.68
FREMO_DR_001	11.11	11.18	11.20	11.23	11.25	11.35	11.37	11.41
HOEY_DR_001	16.21	-	16.26	16.37	16.40	16.48	16.54	16.60
HOEY_ELD_001	16.45	16.73	16.76	16.79	16.81	16.87	16.90	16.93
HOEY_LOT_001	16.47	16.85	16.89	16.93	16.94	16.97	16.98	17.00
HOEY_TRACK_001	16.29	16.60	16.62	16.68	16.71	16.79	16.81	16.85
HWY_001	15.88	16.77	17.12	17.36	17.43	17.53	17.56	17.61
HWY_002	10.78	12.89	13.07	13.25	13.35	13.48	13.56	13.65
HWY_003	15.60	16.05	16.19	16.74	17.01	17.23	17.28	17.32
HWY_004	18.11	18.64	18.79	18.99	19.05	19.26	19.38	19.54
HWY_005	27.93	28.29	28.34	28.42	28.45	28.55	28.59	28.66
HWY_006	18.11	18.64	18.79	18.99	19.05	19.26	19.38	19.54
HWY_CBD_001	16.16	16.40	16.42	16.46	16.52	16.67	16.73	16.80
HWY_SH_03	16.46	-	-	-	-	16.63	16.67	16.70
HWY_SH_07	16.32	-	-	-	-	16.61	16.64	16.68
HWY_SH_09	16.46	-	-	-	-	16.61	16.65	16.69
KATH_001	12.30	12.46	12.51	12.59	12.61	12.64	12.65	12.67
LANDO_001	11.62	-	-	11.64	11.68	11.90	11.93	11.96

Location	Natural Surface	Peak Water Surface Level (mAHD)						
		1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
LANDO_002	11.60	11.64	11.65	11.69	11.72	11.91	11.94	11.97
MATT_001	13.77	13.90	13.91	13.91	13.91	13.92	13.92	14.18
MICHAEL_001	11.59	11.77	11.79	11.82	11.83	11.87	11.92	11.98
MILL_001	19.67	19.68	19.71	19.75	19.76	19.79	19.80	19.82
PHILL_001	15.78	15.95	16.03	16.09	16.11	16.14	16.15	16.17
PHILL_DR_001	15.05	15.83	15.88	15.93	15.94	15.98	16.00	16.00
PLANE_001	8.60	11.81	12.36	13.27	13.85	14.53	15.31	15.99
RANGE_001	20.74	20.97	20.98	21.01	21.02	21.05	21.06	21.07
RANGE_CUL_001	16.55	17.47	17.61	17.85	17.95	18.22	18.43	18.84
RANGE_CUL_002	19.42	20.12	20.24	20.43	20.49	20.71	20.75	20.80
RANGE_CUL_003	19.68	21.20	21.30	21.47	21.53	21.69	21.76	21.88
RANGE_CUL_004	24.54	25.06	25.14	25.30	25.36	25.53	25.60	25.66
RANGE_CUL_005	19.36	21.93	22.95	24.81	24.94	25.00	25.04	25.08
SBR_BROOK_001	14.90	-	-	-	-	-	15.07	15.46
SBR_LOT_001	15.50	15.51	15.51	15.51	15.51	15.52	15.57	15.71
SBR_SHOP_001	15.66	-	-	-	-	-	15.65	15.72
SBR_SPORT_001	15.02	15.30	15.33	15.46	15.51	15.61	15.64	15.73
SBR_SPORT_002	15.25	15.30	15.33	15.46	15.51	15.61	15.64	15.73
SBR_SPORT_003	15.16	15.30	15.37	15.46	15.49	15.55	15.59	15.71
SCR_BDG_001	4.10	6.92	7.22	7.69	7.96	8.33	8.49	8.63
SHB_001	12.49	13.95	14.05	14.34	14.43	14.60	14.72	14.83
SHOP_CP_002	15.30	15.44	15.45	15.47	15.47	15.60	15.66	15.72
SHOP_DR_001	15.35	15.41	15.42	15.43	15.43	15.52	15.56	15.62
SHOP_WEST_001	15.21	15.25	15.25	15.25	15.33	15.61	15.73	15.82
SHOWG_001	12.11	-	12.15	12.35	12.44	12.55	12.63	12.73
WEBB_001	11.73	12.32	12.38	12.47	12.50	12.59	12.63	12.71

10.2.2 Mitigated Peak Discharges

Peak Water Surface levels across the range of design events were extracted at key locations with the study area and summarised in Table 20.

Table 20 Peak Discharges at Select Locations for Mitigated Design Events

Location	Peak Distances (m ³ /s)						
	1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
L_BELL_CHAL_001	14.3	15.8	20.3	23.9	29.3	33.1	36.4
L_BELL_CHAL_002	38.8	45.8	57.4	65.4	76.8	86.2	95.6
L_BELL_OB_001	11.0	19.7	34.4	46.3	61.8	76.4	89.5
L_BELL_OB_002	2.0	3.9	7.8	10.7	15.3	18.3	20.9
L_BELL_OB_003	3.5	12.1	23.9	31.4	42.7	52.2	62.9
L_BELL_OB_004	0.5	2.9	8.6	12.6	18.4	25.6	39.5
L_BELLS_CHAL_001	46.1	64.6	94.9	114.8	144.5	170.3	202.5
L_BELLS_CHAL_002	155.5	219.5	333.1	403.5	517.5	578.9	641.3
L_BELLS_CHAL_003	162.6	226.7	343.6	415.0	532.7	597.8	664.1
L_BELLS_OB_001	0.5	0.7	1.2	1.4	2.0	2.2	3.3
L_BELLS_OB_002	0.2	0.3	0.5	0.5	0.7	1.5	5.0
L_BREW_001	2.2	2.7	3.9	4.3	5.4	6.1	6.9
L_FRE_DR_001	0.8	1.1	1.7	2.1	3.4	4.4	5.2
L_HANS_DR_001	0.1	0.1	0.2	0.2	0.8	1.2	2.1
L_HWY_BELL_001	42.3	60.2	89.0	108.1	134.5	154.1	170.2
L_HWY_BELL_002	42.3	60.3	89.1	108.7	136.9	158.0	176.3
L_HWY_CANE_001	12.0	15.8	20.5	22.2	24.2	25.3	26.9
L_HWY_CROSS_001	0.1	0.1	0.1	0.5	2.5	3.9	6.0
L_HWY_CROSS_002	8.5	11.7	15.3	16.2	18.6	20.1	21.8
L_HWY_CROSS_003	1.7	2.3	5.0	6.2	10.3	12.5	14.4
L_HWY_CROSS_004	1.1	1.5	4.1	5.2	7.2	8.4	9.6
L_HWY_CROSS_005	0.1	0.2	0.9	1.9	3.3	3.8	4.5
L_PHIL_001	3.1	3.9	4.9	5.1	5.7	5.8	6.1
L_PLANE_CK_001	159.5	238.8	394.0	505.7	657.4	858.3	1047.9
L_PLANE_CK_002	160.8	240.4	396.8	510.2	668.0	873.4	1066.7
L_PLANE_CK_003	161.1	240.9	397.8	511.3	669.5	877.0	1079.7
L_PLANE_CK_004	161.1	241.0	397.5	511.1	669.7	879.5	1072.1
L_PLANE_CK_005	161.4	241.2	398.4	511.4	670.1	880.0	1068.2
L_PLANE_CK_006	161.7	241.6	398.4	512.6	670.8	878.2	1071.4
L_PLANE_CK_007	161.8	241.6	398.6	512.3	670.5	878.4	1071.9
L_PLANE_IN_001	4.3	5.9	8.7	9.7	12.6	14.2	16.5
L_PLANE_IN_002	5.3	7.4	10.8	12.1	16.1	17.9	21.0
L_PLANE_SUB_001	10.0	13.7	19.0	25.9	33.0	39.4	47.1
L_PLANE_SUB_002	0.9	1.1	1.6	1.7	2.2	2.5	2.8
L_PLANE_SUB_003	1.4	1.8	2.4	2.7	3.3	3.5	3.9
L_PLANE_SUB_004	1.8	2.3	3.4	3.9	5.3	6.0	7.2
L_PLANE_SUB_005	2.4	3.2	4.6	5.2	7.0	7.9	9.4

Location	Peak Distances (m ³ /s)						
	1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
L_PLANE_SUB_006	8.2	11.3	17.0	20.7	26.0	30.8	36.3
L_PLANE_SUB_007	9.6	13.1	19.0	22.0	29.2	34.9	41.3
L_PLANE_SUB_008	0.5	0.7	1.3	1.6	5.7	39.4	42.2
L_PLANE_SUB_009	10.2	13.8	20.1	23.1	30.6	36.6	43.4
L_PLANE_SUB_010	12.8	17.5	26.2	30.6	41.9	83.8	95.2
L_RAIL_001	7.8	11.4	15.7	18.1	20.9	21.7	22.3
L_RAIL_002	7.6	10.2	12.8	13.7	16.3	18.5	20.0
L_RAIL_003	0.1	0.1	0.1	0.1	0.1	0.3	0.4
L_RAIL_004	15.3	15.3	15.5	15.5	15.6	15.6	15.7
L_SBR_CROSS_001	150.2	212.3	322.8	391.8	502.6	560.5	619.7
L_SBR_CROSS_002	151.5	213.7	324.7	393.6	505.0	563.3	623.0
L_SBR_NEW_DR	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L_SHOP_CHAL_001	9.1	12.4	22.7	27.2	38.5	47.9	56.1
L_SHOP_CHAL_003	20.3	27.8	43.5	49.5	65.8	79.1	94.5
L_SHOP_CHAL_005	22.8	31.8	50.0	57.0	76.0	90.3	107.7
L_SHOP_CUL_002	0.7	0.9	1.2	1.4	2.1	2.6	2.8
L_SHOP_CUL_003	0.0	0.0	0.1	0.3	1.3	2.2	3.1
L_SHOP_CUL_004	0.0	0.1	0.0	0.0	0.1	0.1	0.3
L_SHOP_CUL_005	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L_SHOP_DRAIN_002	18.6	25.5	40.2	45.8	61.0	73.6	88.4
L_SHOP_DRAIN_004	21.6	29.7	46.4	52.8	70.2	83.9	100.3
L_SHOP_DRAIN_006	23.8	33.0	52.1	59.3	79.2	93.4	112.0

10.3 Difference in Peak Water Surface Elevation

Difference in Peak Water Surface Elevation across the range of design events were extracted at key locations with the study area and summarised Table 21.

Table 21 Summary of Difference in Peak Water Surface Elevations (Base Case – Mitigated Case)

Location	Peak Water Surface Level Difference between Base and Mitigated Cases (mAHD)						
	1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
ANZAC_001	-0.23	-0.21	-0.20	-0.17	-0.07	-0.05	-0.03
ANZAC_002	-0.06	-0.06	-0.06	-0.06	-0.05	-0.04	-0.03
BROOK_002	-0.06	-0.06	-0.06	-0.05	-0.23	-0.26	-0.27
BROWN_001	0.00	-0.09	-0.08	-0.03	-0.01	-0.01	-0.01
CSTRD_N_SH_01	0.00	0.00	0.00	0.00	-0.06	-0.10	-0.10
CSTRD_N_SH_07	0.05	0.05	0.01	-0.02	-0.13	-0.15	-0.12
DAWN_01	-0.02	-0.07	-0.14	-0.16	-0.24	-0.20	-0.15
DAWN_02	0.00	0.00	-0.01	-0.03	-0.14	-0.18	-0.13

Location	Peak Water Surface Level Difference between Base and Mitigated Cases (mAHD)						
	1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
DAWN_INT_01	-0.06	-0.12	-0.20	-0.23	-0.25	-0.20	-0.15
FREMO_001	0.00	0.00	-0.03	-0.03	-0.02	-0.02	-0.02
FREMO_002	0.00	0.00	-0.01	-0.03	-0.03	-0.03	-0.03
FREMO_DR_001	-0.06	-0.07	-0.14	-0.16	-0.16	-0.18	-0.19
HOEY_DR_001	-0.58	-0.60	-0.64	-0.65	-0.67	-0.65	-0.63
HOEY_ELD_001	-0.13	-0.16	-0.21	-0.22	-0.20	-0.19	-0.19
HOEY_LOT_001	0.00	-0.03	-0.09	-0.12	-0.19	-0.22	-0.24
HOEY_TRACK_001	-0.17	-0.23	-0.27	-0.25	-0.21	-0.19	-0.16
HWY_001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWY_002	-0.01	-0.01	-0.01	-0.02	-0.02	0.00	0.00
HWY_003	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
HWY_003	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01
HWY_004	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWY_005	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWY_006	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HWY_CBD_001	-0.11	-0.11	-0.15	-0.13	-0.08	-0.07	-0.04
HWY_SH_03	0.06	0.06	-0.03	-0.11	-0.03	-0.02	-0.01
HWY_SH_07	-0.04	-0.03	-0.27	-0.32	-0.04	-0.03	-0.02
HWY_SH_09	-0.02	-0.02	-0.12	-0.16	-0.03	-0.02	-0.01
KATH_001	-0.01	-0.02	-0.01	0.00	0.00	0.00	0.00
LANDO_001	0.00	0.00	-0.15	-0.18	-0.03	-0.02	-0.01
LANDO_002	0.00	0.00	-0.11	-0.14	-0.03	-0.02	-0.01
MATT_001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MICHAEL_001	0.00	0.00	-0.04	-0.10	-0.15	-0.12	-0.07
MILL_001	-0.04	-0.03	-0.02	-0.02	-0.02	-0.02	-0.01
PHILL_001	-0.01	0.04	0.02	0.01	-0.01	-0.01	-0.01
PHILL_DR_001	0.11	0.12	0.11	0.11	0.11	0.06	0.05
PLANE_001	-0.03	-0.04	-0.08	-0.11	-0.13	0.00	0.00
RANGE_001	-0.02	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
RANGE_CUL_001	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RANGE_CUL_002	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RANGE_CUL_003	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RANGE_CUL_004	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RANGE_CUL_005	-0.04	-0.08	-0.03	-0.01	-0.01	0.00	0.00
SBR_BROOK_001	-0.16	-0.17	-0.32	-0.38	-0.79	-0.64	-0.29
SBR_LOT_001	0.00	0.00	-0.03	-0.10	-0.26	-0.27	-0.19
SBR_SHOP_001	0.00	0.00	-0.03	-0.04	-0.18	-0.19	-0.19

Location	Peak Water Surface Level Difference between Base and Mitigated Cases (mAHD)						
	1EY	39% AEP	18% AEP	10% AEP	5% AEP	2% AEP	1% AEP
SBR_SPORT_001	-0.04	-0.11	-0.09	-0.11	-0.17	-0.19	-0.17
SBR_SPORT_002	-0.04	-0.11	-0.09	-0.11	-0.17	-0.19	-0.17
SBR_SPORT_003	-0.03	-0.07	-0.09	-0.13	-0.23	-0.25	-0.19
SCR_BDG_001	0.00	0.00	-0.02	-0.03	-0.04	0.01	0.01
SHB_001	-0.01	0.00	-0.01	-0.01	-0.02	0.00	0.00
SHOP_CP_002	-0.04	-0.06	-0.09	-0.10	-0.18	-0.19	-0.19
SHOP_DR_001	0.00	-0.02	-0.06	-0.07	-0.20	-0.22	-0.22
SHOP_WEST_001	0.00	0.00	-0.14	-0.16	-0.20	-0.17	-0.15
SHOWG_001	0.00	-0.01	-0.01	-0.01	-0.02	0.00	0.00
WEBB_001	-0.17	-0.24	-0.28	-0.28	-0.43	-0.46	-0.50

10.4 Brewers Park Mitigated Case Drain

In raising the two north south playing fields to an approximate 18% AEP PWSE and with the proposed downstream infrastructure in place there is little or no change to the inundation extents in the adjacent area to the east – Dawson Street.

It is to be noted that the raising the playing fields cannot be undertaken in isolation from the range of proposed mitigation measures nominated for the park and downstream to Bells Creek. Mitigation measures include options C, D, E, F, Q, W.

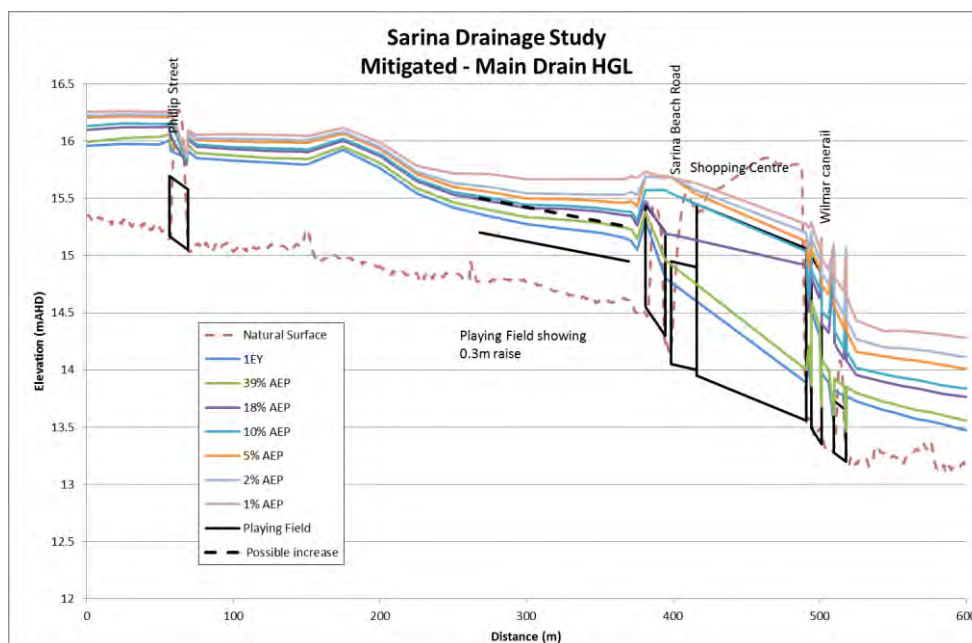


Figure 21 Brewers Park Drain Mitigated Case HGL

10.5 Mitigated Property Impacts

A high level estimate of the predicted above floor flooding property impacts, has also been conducted for the Scenario 1 Mitigated Case. The tables presented below are based on floor level data from Council Terrestrial LiDAR dataset, discussed in Section 11.5.

As noted in Section 6.2.4, the values shown in

Table 22 and Table 23 represent the number of properties where flood level is above the estimated floor level for the given flood event, Figure 22 identifies the building inundation locations.

Table 22 Basecase Property Impacts

ARI Event	No. Residential Buildings Impacted	No. Commercial Buildings Impacted	Total No. Buildings Impacted
2 year	-	3	3
5 year	-	4	4
10 year	-	5	5
20 year	2	8	10
50 year	3	9	12
100 year	7	14	21

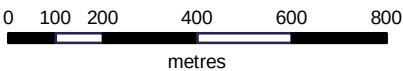
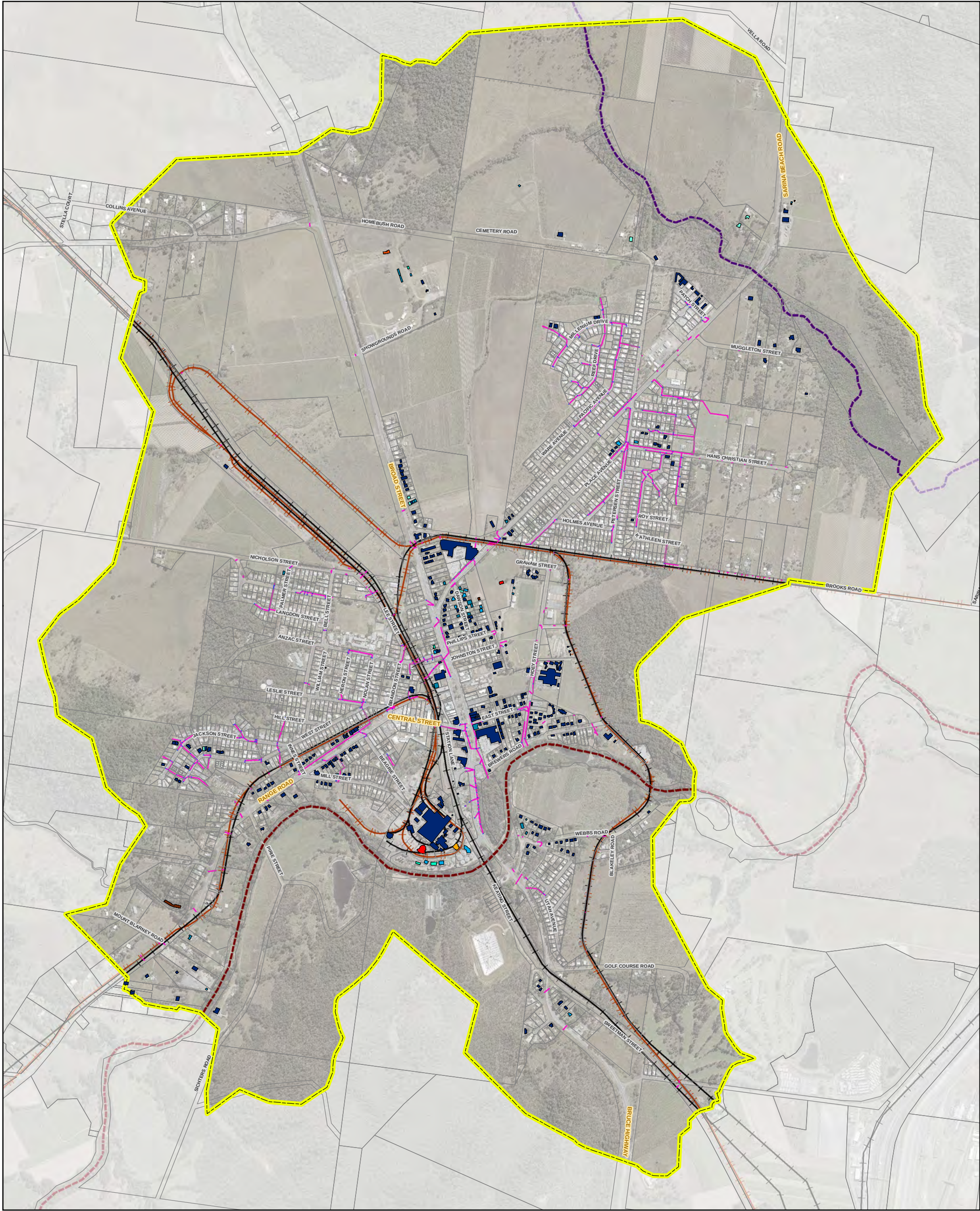
Table 23 Mitigated Case Property Impacts

ARI Event	No. Residential Buildings Impacted	No. Commercial Buildings Impacted	Total No. Buildings Impacted
2 year	-	3	3
5 year	-	4	4
10 year	-	5	5
20 year	-	8	8
50 year	-	8	8
100 year	7	12	19

Table 24 present a comparison between the Basecase and Mitigated Case property impacts. A positive value shows that the number of properties where floor flooding has been reduced in the Mitigated Case, compared to the Basecase.

Table 24 Difference in Property Impacts

ARI Event	No. Residential Buildings Impacted	No. Commercial Buildings Impacted	Total No. Buildings Impacted
2 year	-	-	-
5 year	-	-	-
10 year	-	-	-
20 year	-2	-	-2
50 year	-3	-1	-4
100 year	-	-2	-2



1:16,000 (when printed at A3)

LEGEND

- | | | |
|-----------------------------|-----------------------------|------------------|
| 2yr Properties Impacted | 200yr Properties Impacted | Existing Pit |
| 5yr Properties Impacted | 500yr Properties Impacted | Existing Pipe |
| 10yr Properties Impacted | PMF Properties Impacted | QLD Rail Line |
| 20yr Properties Impacted | Model Boundary | Sarina Cane Rail |
| 50yr Properties Impacted | Cadastre | |
| 100yr Properties Impacted | Bells Creek | |
| | Plane Creek | |

MACKAY REGIONAL COUNCIL
Sarina Drainage Study

Mitigated Case
Building Inundation Locations

PROJECT ID 60567081
CREATED BY reitanod
LAST MODIFIED 30/08/2018
VERSION: v01

Data sources:
Base Data: (c) 2017 Qld Gov

Figure
22

A3 size

11.0 Tangible Flood Damages Assessment

11.1 Objectives

As part of the Sarina Drainage Study, a flood damages assessment has been undertaken to help quantify the financial burden borne by the community due to the local catchment flood damages. An assessment of the savings in flood damages will also assist in determining the potential economic benefits of the proposed flood mitigation options to the Sarina area during flood events.

This flood damages assessment considers the financial impacts of flooding, comprising the costs associated with direct damages to property and infrastructure, and indirect costs associated with the disruptive impacts of flooding. This document presents the methodology used to assess flood damages, and the resulting estimates.

11.2 Estimating Flood Damages

Flooding can result in significant financial and social impacts on a community. A breakdown of the various types of flood damages is displayed Figure 23.

Intangible flood damages, such as emotional stress and inconvenience, cannot be quantified as a monetary value, and have not been included in this flood damages assessment. Therefore, reference to flood damages within this report refers to tangible flood damages only.

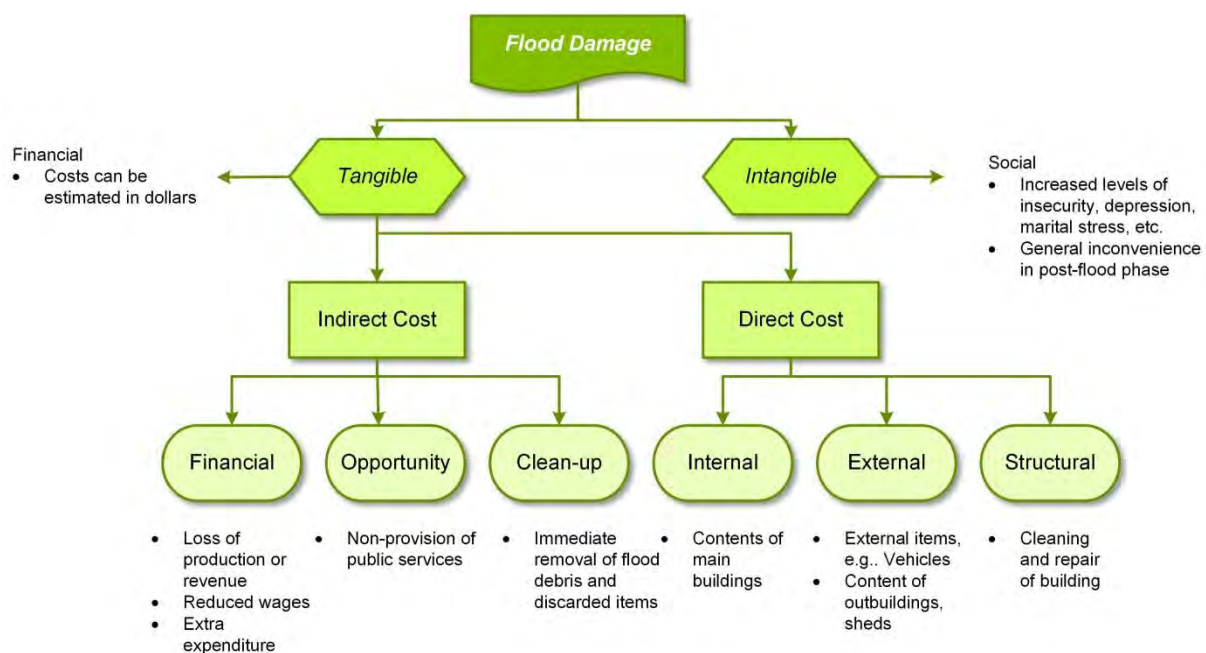


Figure 23 Breakdown of Flood Damage Categories (DNRM, 2002)

Tangible flood damages, or the anticipated cost to residents, businesses and local government infrastructure due to flooding, have been estimated using a standardised approach adopted throughout Australia.

The approach estimates the tangible impacts flooding has on people, property, and infrastructure, such as flooding of a building and contents, the lost opportunity value associated with wages and revenue and flooding of transport and utility networks. These tangible impacts are estimated based on the depth, likelihood of flooding and type of building/infrastructure.

A building's estimated depth of flooding and its classification (single storey, high-set, double storey or units), determines the total estimated flood damage for that building. The direct flood damage is determined based on stage-damage curves, which relate building type, building area and flood depth to the monetary loss associated with the structure and contents damage.

Indirect damages associated with lost opportunity value, i.e. wages and revenue and the cost of temporary relocation, are then estimated as an additional percentage for residential and non-residential buildings.

The combined direct and indirect damages then represent the total damage to the building. For this assessment, infrastructure damages, such as water treatment plants and utility and transport networks, are then estimated as a percentage of the total residential and non-residential damage combined.

11.3 General Methodology

Flood damages have been estimated through the application of stage-damage curves. These curves provide damage costs as a function of water depth, and are used to estimate direct flood damages for individual buildings based on the peak flood depth that the building experiences during a flood event. Indirect damages and infrastructure damage have been estimated as a percentage of the direct damage.

The assessment has been undertaken using the results of hydraulic modelling of the Sarina Catchment for the Sarina Drainage Study. Details of the hydraulic modelling are discussed in the Sarina Drainage Study – Volume 1 and Volume 2 (AECOM, 2018).

11.3.1 Council 2018 Stage-Damage Curves

Mackay Regional Council (Council) engaged WRM Water & Environment as part of the Mackay Floodplain Management Plan (2018) to undertake a review of flood stage-damage curves and develop curves specific to properties within the Mackay Region. This investigation was intended to provide the most accurate and up to date curves for use in flood damages assessments across the Mackay Region. The Council 2018 Stage-Damage Curves were provided by Council for application to the Sarina Drainage Study and have been developed using the following methodology (WRM, 2018):

“Flood stage-damage curves (flood damage curves) relate the depth of flooding at a property to the cost of flood damage. The underlying data in the existing flood stage-damage curves in Australia is generally quite dated. Therefore, a new property damage survey was undertaken to derive locally representative stage-damage curves for the predominant residential and commercial property types identified in Mackay. The survey was conducted by an experienced valuer (from VASA valuers) visiting and physically inspecting the selected properties and estimating potential internal, external and structural damages at different depths of flooding using the valuation survey method. The survey also captured general property information on size, style, age, construction material, ownership, etc.

The Mackay damage survey was conducted on 26 properties, 20 of which were residential and 6 of which were commercial properties. The properties for survey were selected from volunteers across Mackay. Comprehensive property damage assessment forms were designed and used to capture the specific data required for the derivation of stage-damage curves for the surveyed property types.

The data collected for Mackay properties was supplemented with an additional 96 property surveys (66 residential properties and 30 commercial properties) that were conducted by WRM and VASA for the Brisbane River Strategic Floodplain Management Plan (BRSFMP) in May and June 2017. The methodology for the BRSFMP property survey was consistent with Mackay property survey.

It was found that the shape and magnitude of the stage-damage curves developed from the Mackay residential data was consistent with the Brisbane data and therefore a combined dataset was considered suitable. There were some differences in the magnitude of the commercial stage-damage curves, however this was overcome by adopting value classes one class lower for the regional (Mackay) commercial properties when compared to the Brisbane commercial properties for higher value class enterprises.

The flood stage-damage curves are suitable for flood damage estimation on a regional scale and are not appropriate for estimation of flood damages on an individual property basis.”

11.3.2 Alternative Approaches

Several other approaches for estimating residential flood damages and stage-damage curves have been applied in Australia, including those by the Victorian Natural Resources and Environment, Risk Frontiers, WRM (for Sunshine Coast Regional Council) and O2 Environmental (for Ipswich City Council). While these approaches follow the same general approach as the Council Stage-Damage Curves as outlined in Section 11.3.1, they use different estimates for stage-damage curves or consider damage types differently. A summary of literature relevant to these approaches is provided below. These provide detail on these alternative approaches.

- Department of Infrastructure, Planning and Natural Resources (DIPNR) (2004) "Floodplain Management Guideline No 4 Residential Flood Damage Calculation", Department of Infrastructure, Planning and Natural Resources, New South Wales Government, February 2004.
- Middelmann-Fernandes, M.H. (2010) "Flood Damage Estimation Beyond Stage-Damage Functions: an Australian Example", M.H. Middelmann-Fernandes, Geoscience Australia, Canberra, Australia, 2010, Journal of Flood Risk Management.
- Department of Natural Resources and Water (2002) "Guidance on the Assessment of Tangible Flood Damages", Department of Natural Resources and Water, Queensland Government, 2002
- O2 Environmental (2012) "Stage Damage Functions for Flood Damage Estimation – Interim Functions for 2012", Prepared for Ipswich City Council, April 2012.
- Sunshine Coast Regional Council (SCRC) (2010) "Estimation of Tangible Flood Damages (Maroochy River, Mountain Creek and Sippy Creek Catchments)", Sunshine Coast Regional Council, April 2010.
- Smith, D.I. (1994) "Flood Damage Estimation – A Review of Urban Stage-Damage Curves and Loss Functions", DI Smith, Centre for Resource and Environmental Studies, Australian National University, Canberra, Australia, July 1994, Water SA.
- WRM Water & Environment (2006a) "Stage-Damage Relationships for Flood Damage Assessment in Maroochy Shire", WRM Water & Environment Pty Ltd, June 2006, prepared for Maroochy Shire Council.
- WRM Water & Environment (2006b) "Brisbane Valley Flood Damage Minimisation Study Brisbane City Flood Damage Assessment", WRM Water & Environment Pty Ltd, October 2006, prepared for Brisbane City Council City Design, submitted to the Queensland Floods Commission of Inquiry on 17 May 2011

The Queensland Department of Natural Resources and Mines (DNRM) recommends the use of the ANUFLOOD stage-damage curves for estimating potential flood damages; however there is a consensus that ANUFLOOD underestimates damage values for residential properties. For instance, DIPNR (2004) states:

"The Victorian Natural Resources and Environment, Rapid Assessment Method (RAM) for Floodplain Management, May 2000, indicates that ANUFLOOD estimates needed to be increased by 60% to be in the vicinity of Water Studies damages surveys. Even with this adjustment ANUFLOOD estimates are still well below those of Risk Frontiers."

A review of residential stage-damage curves was undertaken as part of the Mackay CBD Drainage Study (AECOM, 2015).

This review compares flood damages estimated using the ANUFLOOD stage-damage curves against two of the Australian methods mentioned above and one approach used in the USA, and demonstrates the variation in estimates of flood damages between different approaches.

Based on this review, the WRM stage-damage curves and O2 Environmental stage-damage curves based on rebuilding costs were adopted for estimating residential direct damages, to be presented as bounds of potential flood damages.

11.3.3 Actual and Potential Damages

The stage-damage curves used during this study provide estimates of the potential flood damages which would occur during a flood event if no actions were taken to reduce the amount of damage. During actual flood events, residents will usually take measures to reduce the amount of damage incurred, such as moving possessions to higher ground.

The reduction in flood damages resulting from such preventative measures is dependent on the warning time available during a flood, the experience of the community in preparing for flooding and whether or not it is possible to move possessions to safety.

Residents of Sarina typically have very little notice prior to a local catchment flood event, as critical durations for the study area are short (in the order of 1 to 2 hours). Therefore the stage-damage curves were not adjusted. An actual to potential damages ratio of 1 has been applied to all the damage curves.

11.4 Building Digitisation and Classification

11.4.1 Building Footprint Digitisation

Building footprints were digitized at a visual scale based on aerial imagery. Building footprints are used to determine whether a building is flooded, and to estimate the size of the building required for building classification. The following limitations to building footprints should be noted:

- Footprints were digitized based on roof outlines, which may not correspond to the actual building footprint when there is a complex roof shape and given the overhang of eaves. It is unlikely this will significantly impact flood damage estimates, since the variation in area and extent is typically minimal.
- Trees obscure some buildings, requiring an assumption of the likely extent and shape of the building. Again, it is unlikely this will significantly impact damages since rarely do trees prevent reasonable assessment of the building shape and extent in this catchment area
- Multiple tenancy complexes, e.g. units, shopping centres, strip malls, and warehouses, were digitized as multiple buildings where delineation between individual ownership could be identified from the cadastral boundaries. If a group of buildings could not be digitized separately based on the aerial image, this could skew localized estimates of damages; for instance, a shopping centre digitized as a single building where only the first business was flooded, would produce flood damages for the entire building.
- In cases where shared tenancies could not be separated by the cadastral boundaries, flood damages will be estimated based on the mean surveyed habitable floor level or assumed depth above ground elevation around the entire building footprint. This will tend to estimate flood damages only when the majority of the buildings is actually flooded, regardless of whether they were digitized individually or as a group.

The area of the building footprint was used for classifying buildings into different size classes. For large commercial buildings, the stage-damage curves give damages in units of \$/m², therefore building areas were used directly in the damage calculations.

11.4.2 Classification

To assign classes to buildings, the building footprints were intersected with property information from Council's Terrestrial LiDAR database for residential properties (refer Section 11.5) and the land use planning scheme layer for commercial properties. It is to be noted that commercial property classification includes commercial, industrial and public buildings.

11.4.2.1 Residential Building Classification

Residential buildings were further classified based on size, foundation type and storey height to align with the building categories presented in Appendix C. Building classification was based on the floor type classification from the Council Terrestrial LiDAR database (refer Section 11.5) as well as the area of the digitised building footprints.

11.4.2.2 Commercial Building Classification

Commercial buildings were further classified based on size and value of the building contents to align with the classes presented in Appendix C. Building classification was based on the area of the building footprints, and the property description field of the Council land use dataset.

11.5 Terrestrial LiDAR Data

Mackay Regional Council has recently captured property information through the attainment of Mobile Laser Scanning (MLS) point cloud LiDAR used to develop the Council Terrestrial LiDAR dataset.

The point cloud data has been translated into multiple GIS points as shown in Figure 24, these points contain property information and levels such as: building purpose, floor type, construction material, garage level, edge of building level, patio level, habitable floor level, bottom of window level and eave height.

For the purposes of the tangible flood damages assessment, the building purpose, floor type and habitable floor level information was used to help classify property and assess inundation above floor level.



Figure 24 Visualisation of the Council Terrestrial LiDAR Database

The point information contained within the Terrestrial LiDAR dataset (as shown in Figure 24) was joined to Council's cadastral database as part of the assessment, this made it easier to attach multiple fields to a singular building footprint for each lot.

An example of the attributes tagged to the cadastral dataset is shown in Table 25.

Table 25 Example Flood Damages Cadastre Attribute Table

Address	BUILD_PURP	FLOOR_TYPE	GROUND_LEVEL	FLOOR_LEVEL	BUILD_AREA
26 Mill Street SARINA QLD 4737	Dwelling	<Null>	<Null>	<Null>	152.8517
24 Mill Street SARINA QLD 4737	Dwelling	Stumps, Single Storey	<Null>	29.369	120.8256
22 Mill Street SARINA QLD 4737	Dwelling	UNKNOWN	<Null>	0	117.2502
18 Mill Street SARINA QLD 4737	Dwelling	<Null>	<Null>	<Null>	188.2491
16 Mill Street SARINA QLD 4737	Dwelling	Slab, Single Storey	<Null>	21.224	206.1322
20 Mill Street SARINA QLD 4737	Dwelling	Stumps, Single Storey	<Null>	23.689	175.4354
28 Mill Street SARINA QLD 4737	Dwelling	UNKNOWN	<Null>	0	145.1505
30 Mill Street SARINA QLD 4737	Dwelling	Stumps, Single Storey	<Null>	30.206	142.4941
26 Mill Street SARINA QLD 4737	Dwelling	<Null>	<Null>	<Null>	152.8517
24 Mill Street SARINA QLD 4737	Dwelling	Stumps, Single Storey	<Null>	29.369	120.8256

As shown in Table 25, some properties are missing floor level information or other building attributes, in this case, a desktop assessment using aerial imagery was undertaken to assume the classification and habitable floor level of each residence. This was based upon visible features such as slab height or number of steps into a dwelling. Where a floor level was not visible or easily determined, buildings were assumed to have a minimum habitable floor level of 100mm above ground level.

11.5.1 Ground Levels

The ground level at each building was estimated based on the 1m LiDAR DEM provided for the project. Ground levels were assigned to the building footprints based on the average elevation of the DEM immediately surrounding the building extents.

11.6 Survey Data

Approximately 550 buildings within Sarina was missing floor levels from the Terrestrial LiDAR, MRC provided addition survey for 151 of those buildings. The remaining buildings information was completed in accordance with Appendix C.

11.7 Consumer Price Index Adjustment

All stage-damage curves were adjusted to present day dollars based on Consumer Price Index (CPI) ratios. Current CPI values were taken from the most recent statistics available from the Australian Bureau of Statistics (ABS) dated December 2017.

The Council commercial damage curves were adjusted using the CPI for All Groups, as to the ratio of structure to contents damages is unknown. The external, contents and structural components of the Council damage curves were adjusted separately using their relevant CPI.

As the Council curves were developed using the June 2017 CPI's, the variance over 6 months was not significant. Table 26 shows the CPI adjustment ratios for the Council stage-damage curves.

Table 26 Council Stage-Damage Curves CPI Adjustment Summary (Dec 2017 \$)

Damage Curve	Relevant CPI Group	Reference	Reference CPI	Current CPI	CPI Ratio
Council Commercial	All Groups	June, 2017	111.0	112.3	+1.2%
Council External <i>Motor Vehicle</i>	Maintenance and repair of motor vehicle	June, 2017	107.4	106.6	-0.7%
Council External <i>Other Damage</i>	Tools and Equipment for house and garden	June, 2017	116.5	116.0	-0.4%
Council Contents	All Groups	June, 2017	111.0	112.3	+1.2%
Council Structural	Maintenance and repair of dwelling	June, 2017	107.8	109.6	+1.7%

Historically, the WRM & O2 Environmental curves have been used for residential tangible flood damages assessments in the Mackay Region, with ANUFLOOD curves utilised for commercial damages. To provide a comparison between the Council 2018 stage-damage curves and the historical curves, the WRM, O2 Environmental and ANUFLOOD curves have also been adjusted to December 2017 dollars.

The commercial ANUFLOOD damage curves were adjusted using the CPI for All Groups, as the allotment of ANUFLOOD damages to structure damages and contents damages is unknown. The external and structural components of the WRM & O2 Environmental damages were adjusted separately using the relevant CPI's.

The contents components of the O2 Environmental damages are usually not indexed, as the maximum value of \$80,000 for residential contents damages is considered reasonable. Table 27 presents an overview of the historical curve CPI adjustments.

Table 27 Historical Stage-Damage Curves CPI Adjustment Summary (Dec 2017 \$)

Damage Curve	Relevant CPI Group	Reference	Reference CPI	Current CPI	CPI Ratio
ANUFLOOD Commercial	All Groups	DNRM, 2002	74.2	112.3	+51.3%
O2 Residential External <i>Motor Vehicle</i>	Maintenance and repair of motor vehicle	WRM, 2006	82.8	106.6	+28.7%
O2 Residential External <i>Other Damage</i>	Tools and Equipment for house and garden	WRM, 2006	92.0	116.0	+26.1%
O2 Residential Contents	N/A	O2 Environmental, 2012	--	--	--
O2 Residential Structural	Maintenance and repair of dwelling	O2 Environmental, 2012	99.5	109.6	+10.2%
WRM External <i>Motor Vehicle</i>	Maintenance and repair of motor vehicle	WRM, 2006	82.8	106.6	+28.7%
WRM External <i>Other Damage</i>	Tools and Equipment for house and garden	WRM, 2006	92.0	116.0	+26.1%
WRM Contents	All Groups	WRM, 2006	83.0	112.3	+35.3%
WRM Structural	Maintenance and repair of dwelling	WRM, 2006	88.4	109.6	+24.0%

11.8 Damage Categories

The tangible damages assessment requires buildings to be categorised into three building types so that the relevant damages can be applied to the property. These categories are:

- Fully Detached Residential
- Multi-Unit Residential
- Commercial.

Fully detached residential properties are defined as standalone houses with one residential dwelling per allotment whilst multi-unit dwellings are made up of multiple buildings per allotment whether they are combined or smaller individual residences. Commercial properties are defined as property types. Summary of the residential and commercial property types is discussed in Appendix C.

Properties were categorised based on the 'Building Purpose' field of Council's Terrestrial LiDAR database (refer Section 11.5). Multi-unit properties were cross checked using the address fields of the Council cadastral database where the 'Unit' code was not equal to 0 (i.e. address formatted as Unit/Number Street Name).

11.9 Classifications and Damage Curves

11.9.1 Residential

Residential damages were estimated using the Council 2018 stage-damage curves and have been based on rebuilding costs associated with flooding.

Damage calculations were carried out separately for the external, contents and structural damage components and combined to give total damages. This allowed a range of raised building heights to be easily assessed, with external damages increasing with over ground depth, and contents and structural damages increasing with over floor depth. Raised floor levels were identified using Council's Terrestrial LiDAR database as per Section 11.5.

Refer to Figure 34 through Figure 41 in Appendix C for the residential classifications and damage curves applying to residential buildings.

11.9.2 Commercial

Commercial buildings were categorised into the ANUFLOOD commercial classes based on the property description field of the Council land use dataset. The ANUFLOOD damage value classes for commercial buildings are shown in Appendix C - Figure 33 and Table 41.

Commercial damages were estimated using the Council 2018 stage-damage curves. These curves represent present day adjusted ANUFLOOD commercial stage-damage curves and estimate rebuilding costs associated with flooding inflicted on commercial property.

Refer to Figure 42 through Figure 45 in Appendix C for the commercial damage curves applying to commercial buildings.

11.10 Infrastructure Damages

Costs associated with damage to infrastructure such as roads, water and wastewater facilities, and utilities have been estimated as 15% of the total direct residential and commercial flood damages. This is consistent with the recommendations of the Office of Environment and Heritage (OEH).

11.11 Average Annual Damages (AAD)

While the methodology above and in Appendix C provides an estimate of potential damages during specific flood events, understanding what damages may be expected on an annual basis is often an easier way to relate risk to residents and businesses.

As such, the above damages were converted to Average Annual Damages (AAD) based on the likelihood of the flood event and the total estimated damage during that event. The AAD is determined by taking the estimated damage for each AEP event and multiplying it by the likelihood of the event. The process is repeated and AAD values are summed for the total AAD.

For instance, the AAD for a 10% AEP event is based on the estimated \$8.02M damages and 10% or 0.01 likelihood, corresponding to an AAD of \$802,000. As a result, low-likelihood events such as the PMF have minor influence due to their low probability of occurrence.

AAD is a measure of the average tangible flood damages experienced each year, and is calculated as the area under the Probability Damages Curve. Therefore, accurate estimates of AAD require consideration of flood events ranging from the smallest flood that causes damage, up to the PMF. For this study, flood events ranging from the 39% AEP (2 year ARI) event up to the PMF have been considered.

12.0 Flood Damages Assessment Results

The subsequent sections present a summary of the estimated tangible flood damages (in March 2018 \$) for a range of design flood events using the Council 2018 stage-damage curves.

The results tables have been broken down into external, internal and structural damages (as per the stage-damage curves) as well as infrastructure damages (refer Section 11.10). The tables also show the number of properties impacted by flooding above the habitable floor level.

12.1 Present Case – Flood Damages Estimate

Table 28 shows the estimated tangible flood damages (in March 2018 \$) for a variety of design events, as well as the total AAD for the current catchment conditions.

Table 28 Comparative Tangible Flood Damages Assessment Results - Present Case (, 000's March 2018 \$)

Event (AEP %)	# Residential External Property Impacts	# Floor Level Impacts	External Damages (,000's \$)	Internal Damages (,000's \$)	Structural Damages (,000's \$)	Commercial Damages (,000's \$)	Infrastructure Damages (,000's \$)	TOTAL Damages (,000's \$)	Contribution to AAD (,000's \$)
1EY	0	2	0	0	0	54	8	62	21
39%	-	3	0	0	0	100	15	114	110
18%	-	4	0	0	0	799	120	919	80
10%	1	5	0	0	0	916	137	1,053	62
5%	13	10	84	21	82	1,046	185	1,418	47
2%	18	12	139	45	185	1,115	223	1,707	21
1%	42	21	266	127	509	1,335	335	2,572	24
0.5%	77	49	835	672	2,093	2,448	907	6,955	27
0.2%	103	68	1,454	1,113	3,307	3,852	1,459	11,186	124
PMF	398	402	13,572	14,546	38,754	31,267	14,721	112,860	0
									516

In summary, the Average Annual Damages experienced within the Sarina model extent in current conditions are approximately **\$516,099** when calculated using the Council 2018 stage-damage curves.

12.2 Mitigation Case - Flood Damages Estimate

Table 29 shows the estimated tangible flood damages (in March 2018 \$) for a range of design flood events, as well as the total AAD for the modelled flood conditions after construction of the Sarina Mitigation Options as outlined in Section 10.0.

Table 29 Comparative Tangible Flood Damages Assessment Results - Mitigated Case (, 000's March 2018 \$)

Event (AEP %)	# Residential External Property Impacts	# Floor Level Impacts	External Damages (,000's \$)	Internal Damages (,000's \$)	Structural Damages (,000's \$)	Commercial Damages (,000's \$)	Infrastructure Damages (,000's \$)	TOTAL Damages (,000's \$)	Contribution to AAD (,000's \$)
1EY	-	2	-	-	-	54	8	62	20
39%	-	3	-	-	-	89	13	102	106
18%	-	4	-	-	-	776	116	893	78
10%	-	5	-	-	-	891	134	1,025	55
5%	6	8	15	-	-	1,011	154	1,180	37
2%	12	8	43	-	-	1,065	166	1,275	20
1%	27	19	195	200	754	1,278	364	2,791	21
0.5%	61	39	641	460	1,526	2,357	748	5,732	24
0.2%	97	60	1,295	984	2,955	3,718	1,343	10,295	126
PMF	402	410	13,814	15,105	40,362	31,675	15,143	116,099	0
									487

In summary, the Average Annual Damages expected within the Sarina model extent for the mitigated case will be approximately **\$487,093** when calculated using the Council 2018 stage-damage curves.

12.3 Comparison

Table 30 shows the percentage reduction in tangible flood damages anticipated by the incorporation of the preliminary mitigation options. All values are given as a percentage comparison between design case and current conditions (except for floor level impacts which is number of buildings not percentage).

Table 30 Comparative Tangible Flood Damage Assessment Results – Change in Flood Damages (%) (Basecase vs Mitigated Case)

Event (AEP %)	Change in Res External Property Impacts	Change in Floor Impacts (#)	Change in External Damages (%)	Change in Internal Damages (%)	Change in Structural Damages (%)	Change in Commercial Damages (%)	Change in Infrastructure Damages (%)	Change in TOTAL Damages (%)	Change in Contribution to AAD (%)
1EY	-	-	-	-	-	-0.6	-0.6	-0.6	-0.3
39%	-	-	-	-	-	-11.0	-11.0	-11.0	-0.8
18%	-	-	-	-	-	-2.9	-2.9	-2.9	-0.4
10%	-1	-	-100.0	-	-	-2.7	-2.7	-2.7	-1.3
5%	-7	-2	-82.1	-100.0	-100.0	-3.3	-16.8	-16.8	-1.9
2%	-6	-4	-69.1	-100.0	-100.0	-4.5	-25.3	-25.3	-0.2
1%	-15	-2	-26.7	57.9	48.2	-4.3	8.5	8.5	-0.5
0.5%	-16	-10	-23.2	-31.6	-27.1	-3.7	-17.6	-17.6	-0.6
0.2%	-6	-8	-10.9	-11.7	-10.7	-3.5	-8.0	-8.0	0.5
PMF	4	8	1.8	3.8	4.2	1.3	2.9	2.9	-0.3
									-5.6

When comparing the flood damages results for the present and design case conditions, **a reduction of 5.6% in Average Annual Damages** is experienced. This corresponds to approximately \$29,109 in savings on the average tangible flood damages experienced each year, calculated by the area under the Probability Damages Curve.

This reduction has been achieved primarily by reducing the expected flood damages in the events (< 5% AEP). Of the 5.6% reduction in AAD, 4.8% reduction is experienced in the frequent, low order events (<5% AEP).

A comparison between the total damages expected and number of properties with floor level impacts has been plotted in Figure 25 and Figure 26 for the 1EY through 1% AEP event and 1% AEP event through PMF respectively.

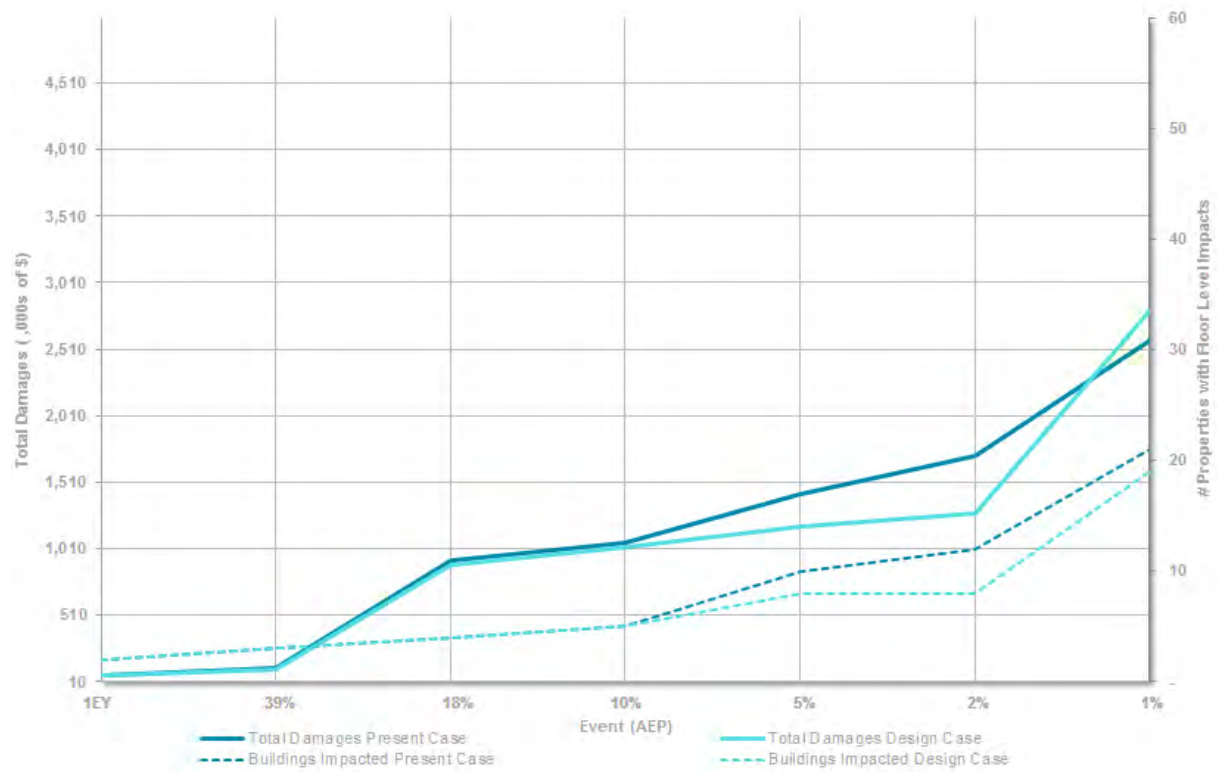


Figure 25 Total Damages and Impacted Properties Plot (1EY to 1% AEP)

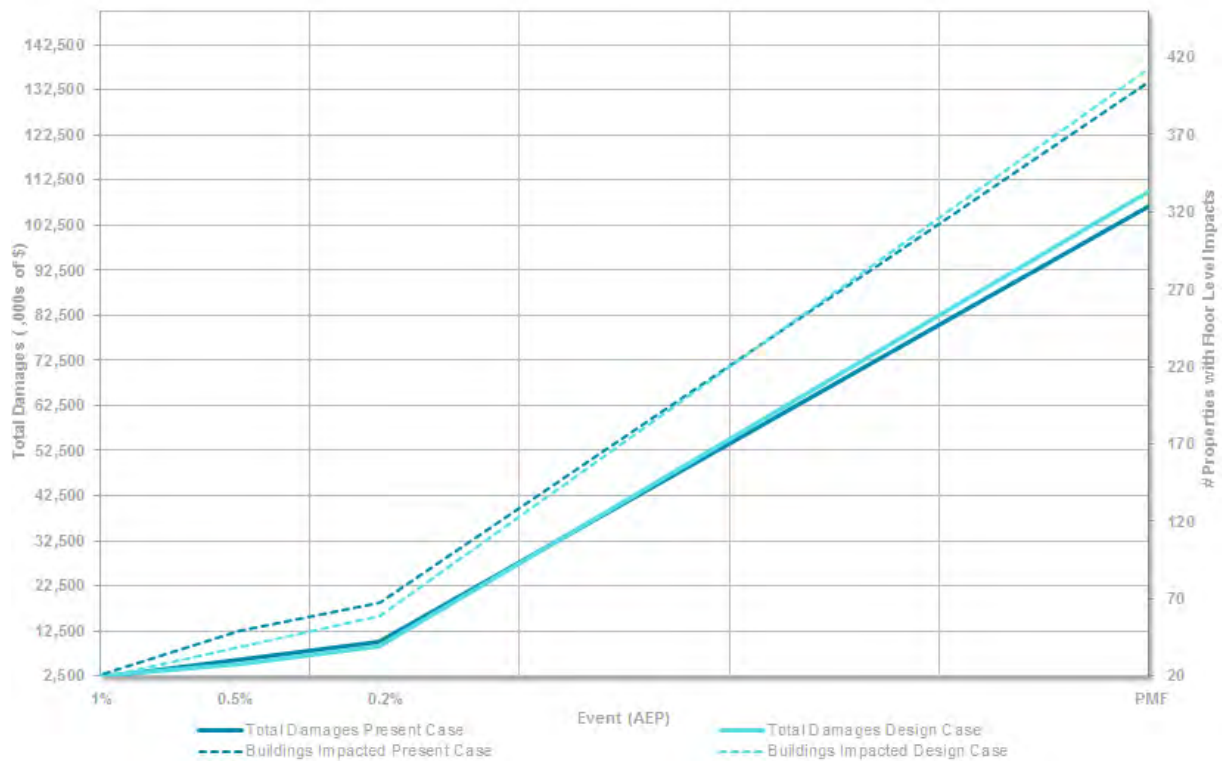


Figure 26 Total Damages and Impacted Properties Plot (1% AEP to PMF)

12.4 Mitigation Case - Other Improvements

Improvement in average annual damages costs are vital in determining whether mitigation options will be further investigated; other improvements are difficult to determine a specific dollar value. These include:

- Access to roads being maintained during major flood events;
- Reduction in flooding at sports facility or parks;
- Reduction in clean-up costs due to reducing flooding in public areas;
- Increased positive public perception due to flood improvement works.

The figures demonstrate the above points discussed above, while there is flooding improvement for the houses on Dawson Street, roads can still be accessed along Sarina Beach Road and Brooks Road.

Figure 27 2% AEP Base Case Sarina Beach Road and Property Flooding

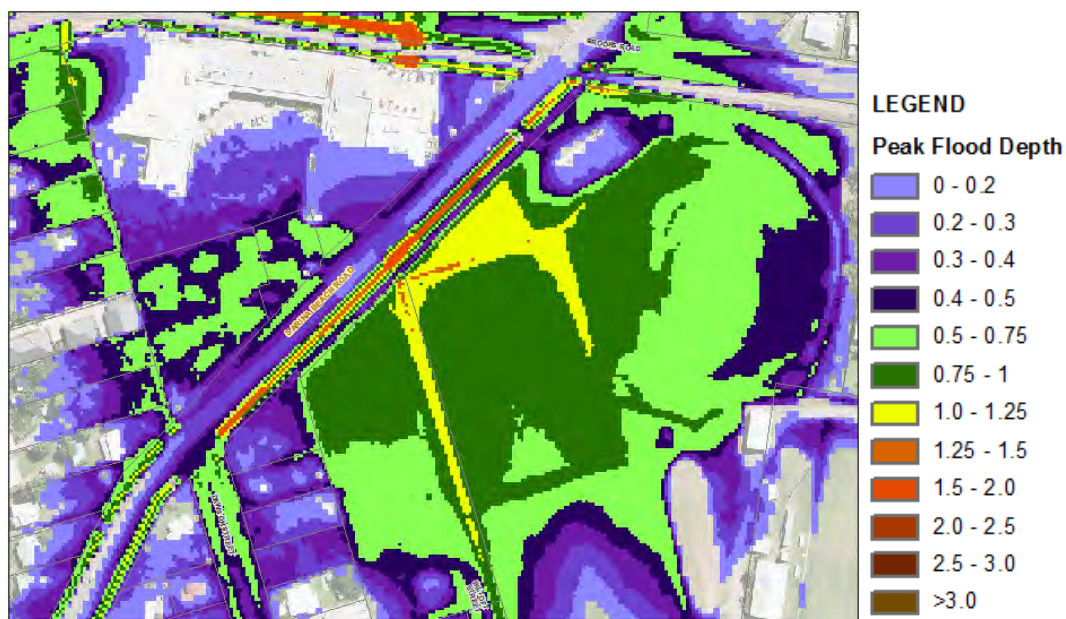
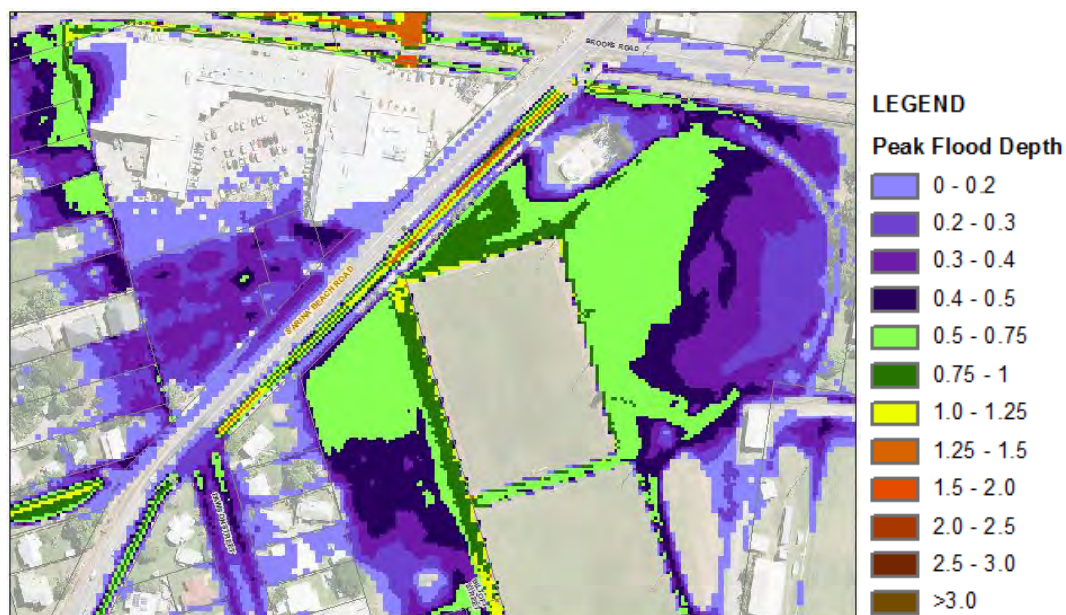


Figure 28 2% AEP Mitigated Case Sarina Beach Road and Property Flooding



13.0 Indicative Mitigation Infrastructure Costs

13.1 Structural Mitigation Costs

Indicative structural mitigation construction costs (base year 2015) for structural mitigation options are summarised in Table 31.

Table 31 Indicative Structural Mitigation Construction Costs

Mitigation Location	Description	Indicative Cost
NORTHERN DISCHARGE PATH	LOCATION: Shopping Centre To Pacific Palms Estate	\$3,850,300
BROOKS ROAD	LOCATION: Brooks Road, Place Avenue and Sarina Beach Road	\$1,666,700
BROAD STREET - BRUCE HIGHWAY	LOCATION: Anzac Street, Broad Street and Phillip Street	\$4,952,800
EXCAVATION FOR DRAIN (PLACED ADJACENT)	LOCATION: Hans Christian Street	\$3,124,400
HOEY STREET	LOCATION: Hoey Street and Discharge Path to Plane Creek	\$3,218,900
SARINA BEACH ROAD	LOCATION: Bruce Highway To Cane Railway	\$1,863,900
WEBB ROAD	LOCATION: Webb Road	\$249,500
BREWERS PARK SPORTS FIELDS	LOCATION: Brewers Park Playing Fields	\$1,026,600
MINOR WORKS	LOCATION: Range Road, Mill Street	\$861,900
TOTAL		\$20,815,000

The above project costs exclude Goods and Service Tax (GST).

The indicated project costs are for trunk drainage works only. The costs include a contingency of 15% of the direct costs for unforeseen works. This allowance is considered appropriate given the preliminary nature of the investigation. No allowance has been made in the project costs for any maintenance or repair costs associated with the existing drainage infrastructure. All new culverts are assumed to be non-aggressive environment culverts.

Earthworks volumes have been estimated using the topographical data from the 2015 aerial survey.

The volumes of earthworks are subject to final survey and detailed design. No detailed services infrastructure investigation has been undertaken for this study. In preparing the project costs, known service infrastructure has been identified and nominal allowances have been made for its location, protection and realignment (if required).

No subsurface investigations have been undertaken for this study. No allowance has been made for unsuitable ground conditions or for the remediation and management of potential acid sulfate soils.

The project costs do not include any allowances for government agency costs, community consultation costs and community awareness costs.

Indicative project costs for each individual section are based on separate standalone construction time frames. Project savings may accrue if sections are constructed within the same time frames.

14.0 Sequencing of Mitigation Options

The major mitigation options to improve trunk drainage are centred on improving the discharge path from the sports field north to Bells Creek.

This included the following works:

- Northern Discharge Path open drain;
- Sarina Beach Road stormwater culvert upgrade.

The above two projects will provide relief to the area around Dawson Street and reduce flooding to the Sarina Beach Road.

To reduce the flooding in the Broad Street and Anzac Street area the following works are required.

- Broad Street – Bruce Highway.

The projects listed below may be considered minor trunk drainage works and are included into the list of mitigation options as the majority are either included in previous studies or relieve localised flooding.

- Hans Christian Street;
- Hoey Street;
- Webb Road;
- Brewers Park Sports Fields;
- Minor Works.

Table 32 list the project their indicative construction cost, whether the projects are considered truck drainage.

Table 32 Mitigation Costs Trunk Drainage

Mitigation Option	Included in Damages Assessment and BCR	Trunk Drainage	Estimated Cost (excl. GST)	Trunk Drainage Estimated Cost (excl. GST)	Location and Description
Northern Discharge Path	Yes	Yes	\$ 3,850,300	\$ 3,850,300	Shopping Centre To Pacific Palms Estate. Prime discharge path for the majority of the Sarina Urban footprint.
Brooks Road	No	No	\$ 1,666,700		Brooks Road, Place Avenue and Sarina Beach Road. Local catchment pit and pipe drainage to reduce nuisance flooding
Broad Street - Bruce Highway	Yes	Yes	\$ 4,952,800	\$ 4,952,800	Anzac Street, Broad Street and Phillip Street. Targeted in previous reports to provide high order immunity to the Bruce Highway near Anzac Street.
Hans Christian Street	No	No	\$ 3,124,400		Targeted at reducing sewer infiltration and reduction of allotment flooding by reducing ponding and providing a positive flow path

Mitigation Option	Included in Damages Assessment and BCR	Trunk Drainage	Estimated Cost (excl. GST)	Trunk Drainage Estimated Cost (excl. GST)	Location and Description
Hoey Street	Yes	Yes	\$ 3,218,900	\$ 3,218,900	Minor Trunk Drainage Hoey Street and Discharge Path to Plane Creek. Targeted at reducing overland flows to the sport field area
Sarina Beach Road	Yes	Yes	\$ 1,863,900	\$ 1,863,900	Bruce Highway To cane railway. Targeted at improving the immunity of the Sarina Beach road and sports field.
Webb Road	No	No	\$ 249,500	-	Webb Road. Reduction of localised flooding
Brewers Park Sports Fields	No	No	\$ 1,026,600	-	Brewers Park Playing Fields Raising of two fields to improve flood immunity.
Minor Works	No	No	\$ 861,900	-	Range Road, Mill Street Reduction of localised flooding
Totals			\$20,815,000	\$13,885,900	

Assuming a minimum stormwater asset life of 50 years the preliminary benefit cost ratios for the three major trunk infrastructure projects are:

Project(s)	Cost	Reduction in damages	BCR
Northern Discharge Path, Sarina Beach Road	\$ 5,714,200	\$28,777	0.25
Sarina Beach Road	\$ 1,863,900	\$28,777	0.77
Broad Street - Bruce Highway	\$ 4,952,800	\$145	<0.1

The construction of the northern discharge path assumes that the excavated earthworks will be removed from the site and stockpiled within 5 kilometres as a conservative approach to the construction costs. Council may, at the time of construction, explore other options as follows:

- Cost sharing with the landowner/developer;
- Placing the excavated spoil on the adjacent properties;
- Using the excavated material for the sports precinct.

14.1.1 Discussion of benefit cost ratios

The combined project of the northern discharge path and the Sarina Beach Road has a BCR of 0.25, majority of the costs for these two projects relate to the excavation of the open channel. The BCR for the construction the Sarina Beach Road drainage works only is 0.77, these works relate to reducing the inundation to the Dawson Street area to the west of the Brewers Park.

The benefits accrued from both of these projects are:

- Reduced over floor flooding for the Dawson Street Area and the area on the corner of Brooks Road and Sarina Beach Road.
- Improvement in serviceability of the Sarina Beach Road due to an increase in immunity from 10% to near 1% AEP and matches the immunity of bridge over Bells Creek approximately 2 kilometres

northeast . A change in Average Annual Time of Submergence (AATOS) from 0.3hours/yr. to 0.01hrs/yr.

- Improved access to and use of the Brewer Park sports fields.

The project to reduce flooding to the Bruce Highway at Anzac Street has a BCR of less than 0.1 as there is very limited over floor flooding in this area. However when combined with the proposed construction by the department of transport of the roundabout at the intersection of the Bruce Highway and Sarina Beach Road there district benefits to the state controlled road in terms of increased immunity.

The relatively high cost to achieve this increased immunity is due to:

- Redirecting captured flows east along Phillips Street to Brewers Park system.
- General topography of the subject site requiring the use of box culverts.

If this project is delayed or not continued then the catchment flows will report to the newly constructed DTMR roundabout and the Dawson Street area.

As an alternative to augmenting the stormwater infrastructure in the Dawson Street and Sarina Beach Road is to purchase the properties that are currently recognised as flood prone is to purchase these properties outright. This would account for 14 individual properties in Dawson Street and Biltoft Street.

Assuming an indicative house and land price of \$300,000 per lot then the total purchase price may be in the order of \$4,200,000. An increase in house and land prices to \$400,000 will increase the acquisition cost to \$5,600,000.

In acquiring the lots and houses Council may elect to:

- Increase the areas available to Brewers Park sports complex;
- Resell the land and ensuring that flood resilience housing is the requirement;
- Or instead of acquiring the land, assist residents to flood proof their existing homes such that they may remain.

Acquisition of the impacted lots and houses would leave a few remaining houses somewhat isolated. If Council were to consider land acquisition and adding the lots to Brewers Park then it may be appropriate to acquire additional lots to provide usable area.

This may require an additional 7 lots. The total acquisition costs may be in the order of \$6,300,000 to \$8,400,000.

The preferred sequencing of the modelled mitigation options is as follows;

- Northern discharge path open channel;
- Sarina Beach Road culverts;
- Anzac Street, Broad Street and Phillips Street drainage;
- The remainder of the projects as required as these projects have been identified in previous designs and reports. These projects can be constructed when budget funding allows.

15.0 Conclusion and Recommendations

15.1 Key Findings

The key findings from the TUFLOW hydraulic modelling and associated analysis undertaken for the Sarina Drainage Study project are summarised below:

- Previous studies undertaken within the Sarina area highlight the drainage issues surrounding Bruce Highway and Sarina Beach Road including downstream drainage. These studies discussed potential outlet and drain upgrade scenarios.
- TUFLOW hydraulic modelling undertaken shown that the critical duration for the most constraining area of the Sarina catchment is the 1440 minute storm.
- Model results were compared to previous modelling work within the area as well as anecdotal levels provided by Council rather than a traditional calibration. This was due to the lack of recorded or observed flood records within the study area.
- Currently, the Bruce Highway / Sarina Beach Road intersection has cross culverts with a very low order event performance level (< 2 years ARI). This is due to a variety of factors; downstream network constraints, an inadequate catchment outlet, cross catchment surcharge reporting to the site and storage within the current road and drain geometry. Structural mitigation options investigated include increasing the size of the cross-culverts;
- Structural mitigations options were focused on constrained areas within the Sarina Township. These included; Bruce Highway and Sarina Beach Road; Anzac Street; Phillip Street and Hoey Street.
- Indicative structural mitigation costing was completed for 9 separate portions of works around the Sarina Township to improve flooding. Total indicative costs are \$20,815,000 (excl. GST);
- A flood damages assessment was undertaken for the 1EY to PMF storms to assess the proposed structural mitigation options to residential and commercial buildings. Average annual damages was reduced by 5.6%, with over 80% of the reduction occurring for low order events (<5% AEP).
- Other improvements due to the structure mitigation that is not captured in the damages assessment includes road access being maintained, reduction in clean-up and increased positive perception.

16.0 References

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Appendix A

Hydraulic Model Development

Appendix A Hydraulic Model Development

Model Setup Parameters

The time step for the 1D and 2D model domains has been set to 0.1 seconds and 0.5 seconds respectively. These time steps are within the feasible time step range given the grid cell size.

The wetting and drying depth represents the depth of water on a cell which is the criteria for whether the cell is “wet” or “dry”. Direct rainfall modelling applies rainfall to each cell in small increments, so the wetting and drying values must also be very small or the calculation will not take place. The wetting and drying depth has been set to the default of 0.0002 m for the centre of a cell and 0.001 m for the side of a cell.

One Dimensional Model Development

Modelling parameters associated with the 1D network is consistent with the recommended loss values in the TUFLOW reference manual. Manning’s roughness values applied to the cross drainage infrastructure is consistent with aged concrete and applies the same assumptions for developed case models.

As outlined in Section 3.7.1, Council provided a database of existing stormwater drainage networks including culverts within the study area. These networks have been incorporated into the model as 1d elements, which are dynamically linked to the 2D domain via pit structures.

All culverts were represented as dynamically linked 1D elements with major sets of closely situated culverts being digitized using multi-cell links (CN-SX lines). Culvert roughness was set as 0.013 for RCPs and RCBCs.

Site specific roughness values and blockage were not applied into the model as no calibration or validation data available to check validity of those claims. The default culvert loss values applied to models are based on the TUFLOW user’s manual (WBM BMT) on satisfying conditions of cross drainage structures.

Blockage Assessment

The procedure for blockage assessment involves a series of decisions leading to estimation of the likely magnitude of debris reaching a structure in a 1% AEP event based on consideration of debris availability, mobility, and transportability and the most likely blockage level that would develop at the structure under consideration. Subsequent adjustments are then made to reflect the most likely design blockage levels in lessor or greater AEP events and to establish the associated most likely blockage mechanism. This procedure provides a probability neutral approach to the assessment of an appropriate level of blockage for the simulation of design behaviour, but may not reflect specific conditions in an equivalent historical event.

Debris Types and Dimension

It is necessary to first assess the type of debris likely to arrive at the structure under consideration and the likely dimensions of that debris. Where more than one type of debris is present in quantity in the source area, the procedure will need to be repeated for each debris type to establish the debris type with the most impact on the performance of the blocked structure.

All blockages that do occur arise from the arrival and build-up of debris at a structure. There are three different types of debris typically present in debris accumulated upstream of or within a blocked structure. This debris may be classified as

- Floating (e.g. trees);
- Non-floating or depositional (e.g. sediment); and
- Urban (e.g. cars and other urban debris).

Floating debris in rural or forested streams is generally vegetation of various types:

- a. small floating debris - less than 150 mm long, can include small tree branches, sticks, leaves and refuse from yards such as litter and lawn clippings and all types of rural vegetation.
- b. Medium floating debris - typically between 150 mm and 3 m long, mainly consists of tree branches of various sizes.
- c. Large floating debris - more than 3 m long, consists of logs or trees, typically from the same sources as for medium floating debris.

Non-floating debris in rural or forested streams is usually sediment of all types.

The ratio of the opening width of the structure (e.g. diameter or width of the culvert or bridge pier spacing) to the average length of the longest 10% of the debris that could arrive at the site (termed here as L_{10}) is a well correlated guide to the likelihood that this material could bridge the openings of the structure and cause blockage.

This L_{10} value is defined as the average length of the longest 10% of the debris reaching the site and should preferably be estimated from sampling of typical debris loads. However, if such data is not available, it should be determined from an inspection of debris on the floor of the source area, with due allowance for snagging and reduction in size during transportation to the structure.

For smaller more turbulent streams (less than say 6 m bank to bank) the width between banks of the stream through the source area will normally limit the size/length of larger floating debris to less than the stream width.

Debris Availability

The availability of a particular type of debris (floating, non-floating or urban) in a source area limits the level of that particular debris that can be ultimately mobilised and transported to a structure.

The characteristics of high, medium and low availability are hard to quantify, so there is some judgment required in their evaluation. Table 33 describes typical source area characteristics and a corresponding ranking for the likely availability of a particular type of debris in that source area.

As this procedure is based on a 1% AEP flood (with later adjustment for other AEPs) the effective source area is that associated with a 1% AEP event.

Table 33 Debris Availability - in Source Area of a particular debris type/size

Availability	Typical Source Area Characteristics (1% AEP Event)
High	- Natural forested areas with thick vegetation and extensive canopy cover, difficult to walk through with considerable fallen limbs, leaves and high levels of floor litter. - Streams with boulder/cobble beds and steep bed slopes and steep banks showing signs of substantial past bed/bank movements. - Arid areas, where loose vegetation and exposed loose soils occur and vegetation is sparse. - Urban areas that are not well maintained and/or where old paling fences, sheds, cars and/or stored loose material etc., are present on the floodplain close to the water course.
Medium	- State forest areas with clear understory, grazing land with stands of trees. - Source areas generally falling between the High and Low categories.
Low	- Well maintained rural lands and paddocks with minimal outbuildings or stored materials in the source area. - Streams with moderate to flat slopes and stable bed and banks. - Arid areas where vegetation is deep rooted and soils are resistant to scour. - Urban areas that are well maintained with limited debris present in the source area.

Debris Mobility

The ability for debris to become mobilised from the source area into a stream has an effect on the amount of debris that can then be ultimately transported to a structure. Table 34 describes typical source area characteristics and a corresponding rank for the likely mobility of debris from the source area into receiving streams.

Table 34 Debris Mobility - Ability of a particular type/size debris to be moved into streams

Mobility	Typical Source Area Characteristics
High	• Steep source areas with fast response times and high annual rainfall and/or storm intensities and/or source areas subject to high rainfall intensities with sparse vegetation cover. • Receiving streams that frequently overtop their banks. • Main debris source areas close to streams.
Medium	• Source areas generally falling between the High and Low mobility categories.
Low	• Low rainfall intensities and large, flat source areas. • Receiving streams infrequently overtops their banks. • Main debris source areas well away from streams.

Debris Transportability

The ability for debris to be transported by a stream down to a structure has an effect on the amount of debris arriving at the structure. Table 35 describes typical stream characteristics and a corresponding rank for the likely transportability of debris.

Table 35 Debris Transportability - Ability of a stream to transport debris down to the structure

Transportability	Typical Source Area Characteristics
High	• Steep bed slopes ($> 3\%$) and/or high stream velocity ($V > 2.5 \text{ m/s}$) • Deep stream relative to vertical debris dimension ($D > 0.5L_{10}$) • Wide stream relative to horizontal debris dimension. ($W > L_{10}$) • Stream relatively straight and free of major constrictions or snag points. • High temporal variability in maximum stream flows.
Medium	• Stream generally falling between High and Low categories.
Low	• Flatbed slopes ($< 1\%$) and/or low stream velocity ($V < 1 \text{ m/s}$). • Shallow depth relative to vertical debris dimension ($D < 0.5L_{10}$). • Narrow stream relative to horizontal debris dimension ($W < L_{10}$). • Stream meanders with frequent constrictions/snag points. • Low temporal variability in maximum stream flows.

Debris Potential

The potential quantity of debris reaching a structure at a site from a contributing source area in a 1% AEP event will be estimated from Table 36.

Table 36 Site Based Debris Potential 1% AEP - for the select debris type/size arriving at the site

Debris Potential	Combinations of the Above (any order)
DP _{High}	HHH or HHM
DP _{Medium}	MMM or HML or HMM or HLL
DP _{Low}	LLL or MML or MLL

Adjustment for Annual Exceedance Probability

Observation of debris conveyed in streams strongly suggests a correlation between an event's magnitude and debris potential at a site. This is accommodated in Table 37 as follows.

Table 37 AEP Adjusted Site Debris Potential - for the select debris type/size

Event AEP	At Site 1% AEP Debris Potential		
	DP _{High}	DP _{Medium}	DP _{Low}
AEP > 5% (frequent)	Medium	Low	Low
AEP 5% - AEP 0.5%	High	Medium	Low
AEP < 0.5%	High	High	Medium

Design Blockage Level

In conjunction with the quantity of debris likely to arrive at the site, Table 38 provides an estimate of the 'most likely' inlet blockage level should a blockage form from floating or non-floating debris bridging the inlet.

Table 38 Most Likely Design Inlet Blockage Level (BDes %) for selected debris type/size

Control Dimension Inlet Width W (m)	At-Site Debris Potential		
	High	Medium	Low
$W < L_{10}$	100%	50%	25%
$W \geq L_{10} \leq 3 L_{10}$	20%	10%	0%
$W > 3 L_{10}$	10%	0%	0%

Model Topography

Base model topography was derived from LiDAR data supplied by Council as a 1m resolution Digital Elevation Model (DEM).

Hydraulic Roughness and Losses

The specified hydraulic roughness reflects the different types of development and ground cover that exists within the hydraulic model extent. The roughness categories adopted for this study were developed based on roughness maps developed in previous studies, aerial imagery, building footprints, site visits and land use zoning information.

Variable Manning's 'n' values based on depth can be utilised within TUFLOW. Manning's 'n' 1 is applied for all flow depths up to depth 1, between depths 1 and 2 the Manning's 'n' is interpolated between Manning's 'n' 1 and 2 and for all depths greater than depth 2 Manning's 'n' 2 is applied. In the instance of road reserve and open water a single roughness has been applied.

Specific roughness values for each category as applied in the model are outlined in Table 39.

Table 39 Adopted Roughness Values

Material Description	Manning's 'n'			
	Depth 1 (m)	Manning's 'n' 1	Depth 2 (m)	Manning's 'n' 2
Residential	0.1	0.070	0.3	0.090
Open Space and Recreational Areas	0.1	0.050	0.3	0.032
Road Reserve	0.025			
Rural Residential	0.1	0.070	0.3	0.040
Commercial / Manufacturing	0.1	0.060	0.3	0.030
Open Water	0.027			

Material Description	Manning's 'n'			
Cane Rail	0.1	0.072	0.3	0.059
Sugar Cane	0.1	0.130	0.3	0.050
Channel	0.1	0.035	0.3	0.030
Buildings	0.1	0.018	0.3	0.500
Dense Vegetation	0.1	0.090	0.3	0.060
Long Grass Channel	0.1	0.045	0.7	0.030
Medium Grass Channel	0.1	0.075	0.3	0.050
Light Vegetation	0.1	0.060	0.3	0.045

Rainfall losses allow TUFLOW to model situations in which water is prevented from reaching the ground or is infiltrated into the soil system before surface ponding and/or runoff occurs. When using a direct rainfall approach initial losses and continuing losses are specified for soils file. Soils file shares identical roughness definitions to define soil boundaries. Any losses applied remove the loss depth from the rainfall amount prior to being applied as a boundary on the 2D cells. Once the initial losses have been satisfied the soil is considered saturated and any additional rainfall will become surface water.

Many other Council local catchment studies utilise initial / continuing loss models. For consistency, similar losses have been adopted in this study in absence of model calibration and validation. The initial losses and continuing losses applied to this model are indicated below in.

Table 40 Adopted Initial and Continuing Loss Values

Material Description	Initial Loss (mm)	Continuing Loss (mm/hr)
Residential	15	2
Open Space and Recreational Areas	15	2
Road Reserve	0	0
Rural Residential	15	2
Commercial / Manufacturing	5	1
Open Water	0	0
Cane Rail	10	1
Sugar Cane	20	2
Channel	10	2
Buildings	0	0
Dense Vegetation	15	2
Long Grass Channel	15	1
Medium Grass Channel	15	1
Light Vegetation	15	1

Initial Conditions

Initial water levels were applied to the 1D pipe network and 2D domain. The Mean High Water Springs Level (MHWS) of 2.46m AHD was specified for the entire model area under the baseline scenario and mitigation events to simulate tide events. Due to the topography across the study area, this only had an influence in the lower reaches of Bells Creek, and did not impact the PIA area.

An initial water level was applied to Plane Creek to stabilise the model and simulate continue flow of water through Plane Creek.

Boundary Conditions

A range of different boundary conditions have been applied within the Sarina Drainage Study hydraulic model. The types of boundaries are as follows:

- Direct rainfall over 2D model terrain.
- Time-varying discharge (QT) inflow boundaries for external catchments.
- Height varying time (HT) outflow boundary for Plane Creek and outflow boundary south of Plane Creek.
- Height-varying discharge (HQ) outflow boundaries based on surface slope for flows leaving the model internal model boundaries.

Direct rainfall has been applied to the 2D domain; background to this approach is described in Section 4.2.2. The inflow and outflow boundaries are identified on Figure 6.

The QT inflow boundaries apply the predicted inflow over time as generated by the WBNM hydrologic model for the catchment area external to the 2D domain. HQ type boundaries allow flood waters to discharge from the model relative to the water surface elevation.

HT type boundaries allow flood waters to discharge from the model relative to an assigned water surface elevation. Using a downstream slope value established using the 1m DEM. A constant level of 5.86m AHD was applied at the Plane Creek outlet during all design runs. A constant level of 12.8m AHD was applied to the remaining HT boundary as identified in Figure 6.

Appendix B

Anecdotal Flooding Information

Appendix B Anecdotal Flooding Information

Site Visit

On Wednesday 4th October 2017, AECOM met with Brian McCanna an inspector for Mackay Regional Council (Council) based at the Sarina Depot on Sarina Beach Road to discuss historical flooding within the Sarina Township, particularly around the Bruce Highway / Sarina Beach Road intersection site.

Mr McCanna provided anecdotal levels of peak flood heights that were reached in two separate flood events in early 2017. One event in January, and the other event associated with Tropical Cyclone Debbie in March. Investigations into the rainfall intensity associated with Tropical Cyclone Debbie were undertaken by GHD (2017) as part of the Middle Creek Dam Hydrological Assessment.

Pluviograph data from the Plane Creek Sugar Mill recorded over a 12 hour period (9:00am – 9:00pm, 29th March 2017) was calculated to have an intensity between a 5% and 2% AEP event (20 and 50 year ARI).

As shown in the sections below, flood levels indicated by Mr McCanna from the Tropical Cyclone Debbie rainfall event aligned with those being produced in the 2% AEP (50 year ARI) model, providing a degree of confidence in the performance of the model.

Flooding at Sarina Beach Road / Brooks Road

During the rainfall event Tropical Cyclone Debbie, flooding along Sarina Beach Road overtopped at the intersection with Brooks Road opposite the corner store. Information provided by Mr McCanna advised that the white fence around the store (pictured in Figure 29) was only just protruding from the floodwaters, with the store fully inundated. From inspections on site this level appeared to be similar to that of the cane rail line adjacent to Brooks Road.

As shown in Figure 30, the 2% AEP (50 year ARI) event produced levels similar to that described by Mr McCanna on site. That is, the rail line adjacent to Brooks Road was above the peak water surface except for the footpath crossing near the intersection. The results also shown that the corner store was inundated with depths of over 0.5m around the site.



Figure 29 Sarina Beach Road / Brooks Road Intersection

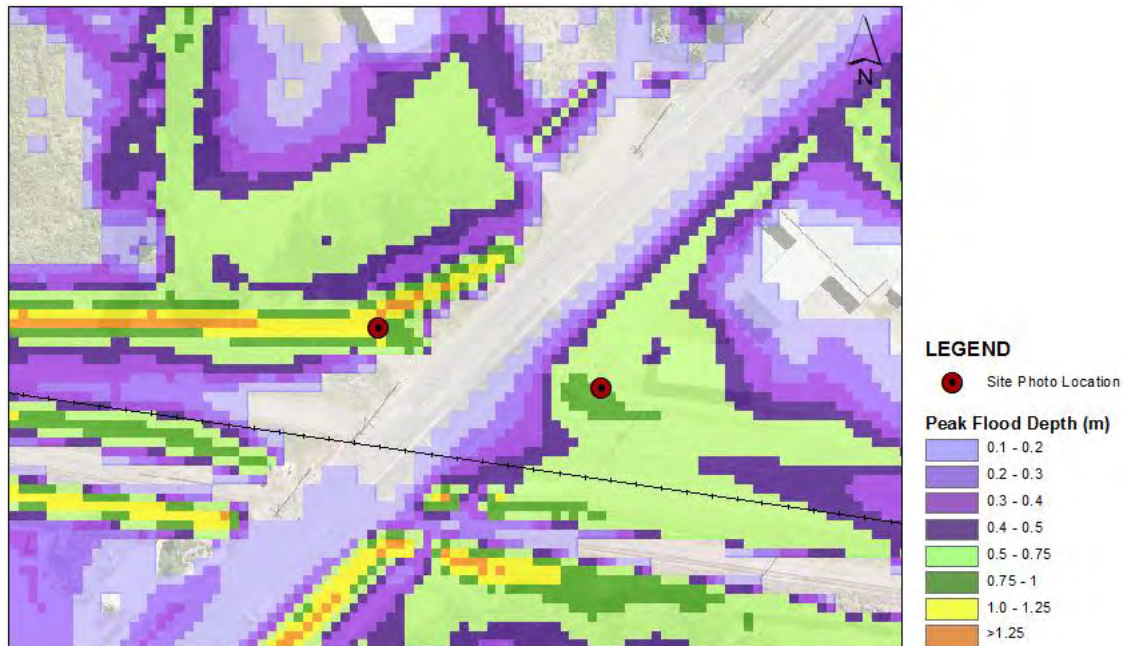


Figure 30 2% AEP (50 year ARI) Peak Flood Depth at Sarina Beach Road / Brooks Road Intersection

Flooding at Bruce Highway / Phillips Street

During the rainfall event Tropical Cyclone Debbie, the Bruce Highway at the Phillips Street intersection (refer Figure 31) was closed over the northbound lanes with flood extents reaching and slightly overtopping the concrete median as per Mr McCanna's recount.

As shown in Figure 32, the 2% AEP (50 year ARI) event produced flood extents similar to those described on site. The northbound lanes were inundated over the intersection and towards Sarina Beach Road (depths above 0.1m) with the extents reaching the concrete median.



Figure 31 Bruce Highway (looking south) at Phillips Street Intersection



Figure 32 2% AEP (50 year ARI) Peak Flood Depth at Bruce Highway / Phillips Street Intersection

Appendix C

Damage Categories and Curves

Appendix C Damage Categories and Curves

Residential Property Sub-Categories

Properties identified as residential (fully detached or multi-unit) were then categorised based on the 'Floor Type' field of Council's Terrestrial LiDAR database (refer Section 11.5). The 6 residential property sub-categories are as follows:

- Fully Detached Residential:
 - Fully detached, lowset, single storey, slab-on-ground (FDSS-SOG)
 - Fully detached, lowset, single storey, stumps (FDSS-Stumps)
 - Fully detached, highset (FDHS)
 - Fully detached, double storey (FDDS).
- Multi-Unit Residential:
 - Semi/non-detached (multi-unit) single storey (MUSS)
 - Semi/non-detached (multi-unit) double storey (MUDS).

It is to be noted that fully detached highset (built-in) houses were classed as FDDS, fully detached houses on stumps (not built-in) with less than 2.0m difference between floor level and ground level were classed as FDSS-Stumps and when clearance reached 2.0m or greater they were classed as FDHS.

Using the damage categories applied to each property, buildings on slabs (FDSS-SOG, FDDS, MUSS, MUDS) were assumed to have a minimum habitable floor level of 100mm above ground level. Low set buildings (FDSS-Stumps) were assumed to have a minimum habitable floor level of 600mm above ground level and high set buildings (FDHS) were assumed to have a minimum habitable floor level of 1,800mm above ground level. Buildings with floor levels below ground level were increased based on their category specified above. Buildings lacking data regarding what type of floor they have were assumed to be on slabs.

Commercial Categories

Commercial buildings were categorised into the ANUFLOOD commercial classes based on the property description field of the Council land use dataset. The ANUFLOOD damage value classes for commercial buildings are shown in Figure 33.

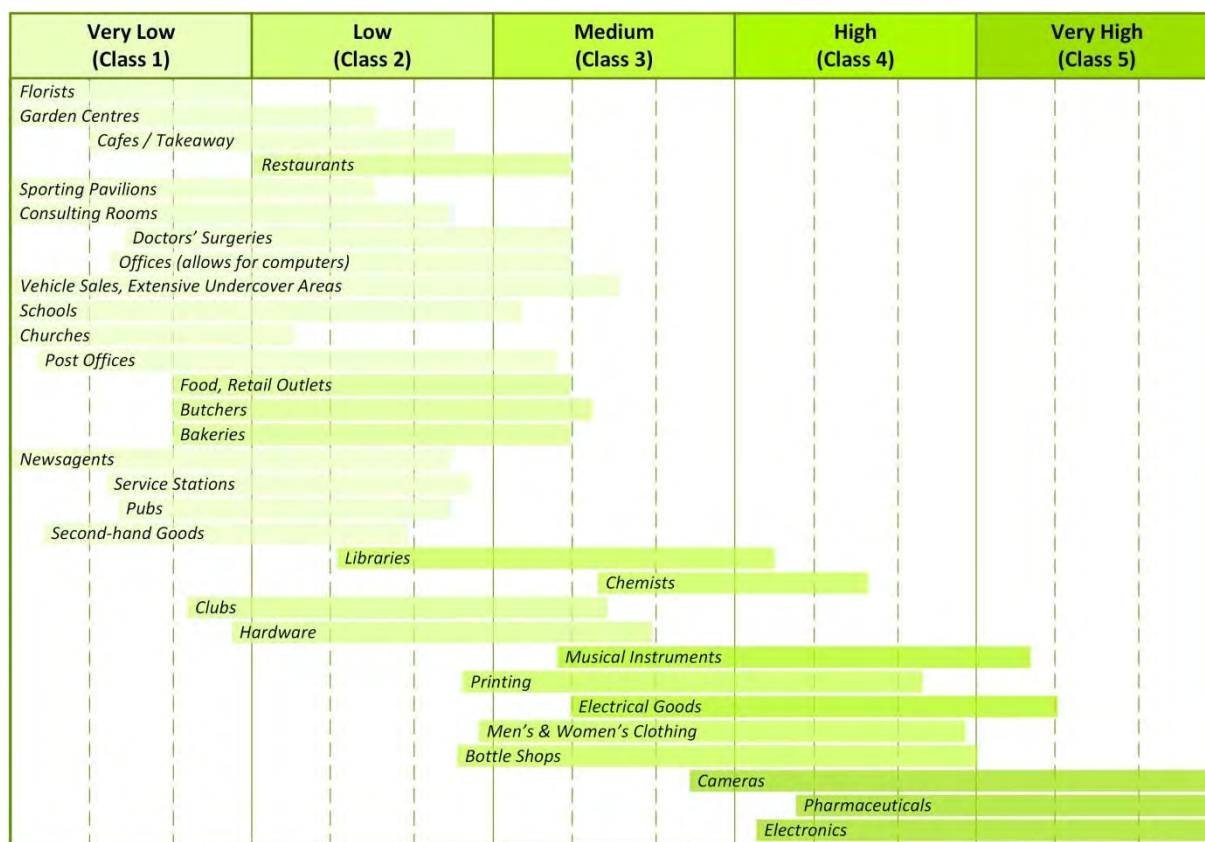


Figure 33 ANUFLOOD Commercial Damage Value Classes (DNRM, 2002)

Commercial buildings were assigned an ANUFLOOD damage class value based on the property description field of the council land use dataset. Where the property description code did not correspond directly to an ANUFLOOD damage value class, a reasonable value class was assigned. Table 41 shows the value class assigned to each property description code in the Council land use dataset.

Table 41 Assignment of Commercial Damage Class Curves Based on Council Land Use Dataset

Council Land Use	Class	Council Land Use	Class	Council Land Use	Class
Animals Special	3	Horses	1	Service Station	2
Builders Yards/Contractors Yard	3	Hospitals/Nursing Homes	2	Shop Single	3
Car Park	2	Hotel/Tavern	2	Shops 2 to 6	3
Car Yards etc.	2	Iceworks	2	Shops Main Retail	3
Caravan Parks	2	Irrigation Small Corps	2	Shops over 6	3
Cattle Breeding/Fattening	2	Library	3	Shops Secondary Retail	3
Child Care Centre	1	Licenced Clubs	2	Showgrounds etc.	2
Churches/Halls	1	Light Industry	3	Sports Clubs	2
Clubs Non-Business	2	Motel	2	Theatre/Cinema	3
Council Owned	2	Nurseries	2	Transformers	3
Defence Forces	4	Offices	2	Transport Terminal	3

Council Land Use	Class	Council Land Use	Class	Council Land Use	Class
Drive Shopping Centre	3	Oil Depot	3	Tropical Fruits	1
Fire/Ambulance	3	Parks & Gardens	1	Uni/Schools etc.	2
Funeral Parlours	1	Reservoirs etc.	3	Vineyards	2
General Industry	3	Restaurant	2	Warehouses etc.	3
Guesthouse	2	Retail Warehouse & Showroom	2	Service Station	2
		School	2	Shop Single	3

Building Footprint Size

Furthermore to the category, a building footprint size is also required to attribute each property to the correct stage-damage curve for their size. As the building footprints have been digitised as part of the damages assessment (refer Section 11.4.1) using GIS software the footprint size can be automatically calculated. From this size, the building can then be classified as a small, medium or large type property based on the following criteria:

- Fully Detached and Multi-Unit Residential Properties:
 - Small (< 140m²)
 - Medium (140 to 210m²)
 - Large (> 210m²).
- Commercial Properties:
 - Small (< 186m²)
 - Medium (186 to 650m²)
 - Large (> 650m²).

Fully Detached Residential Damages

Fully detached residential damages were estimated using the Council 2018 stage-damage curves and have been based on rebuilding costs associated with flooding.

Damage calculations were carried out separately for the external, contents and structural damage components and combined to give total damages. This allowed a range of raised building heights to be easily assessed, with external damages increasing with over ground depth, and contents and structural damages increasing with over floor depth. Raised floor levels were identified using Council's Terrestrial LiDAR database as per Section 11.5.

All damage values have been adjusted to December 2017 Dollars, which corresponds to the most recent Consumer Price Index (CPI) values available. Details of the adjustment are provided in Section 11.7. No adjustment of Stage-Damage curves to represent actual / potential flood damages was undertaken, as described in Section 11.3.3.

Figure 34 shows the decision processes made as part of the fully detached residential building classification prior to applying the relevant stage-damage curve. The 12 classifications as shown in the flow chart have individual stage-damage curves that have been graphed in Figure 35 through Figure 38. Individual curves are given for external, contents and structural damages, however these graphs present stage damage curves representing total flood damages (sum of external, contents and structural damages). The historical WRM and O2Environmental curves (CPI adjusted to December 2017 dollars) have also been graphed for comparison.

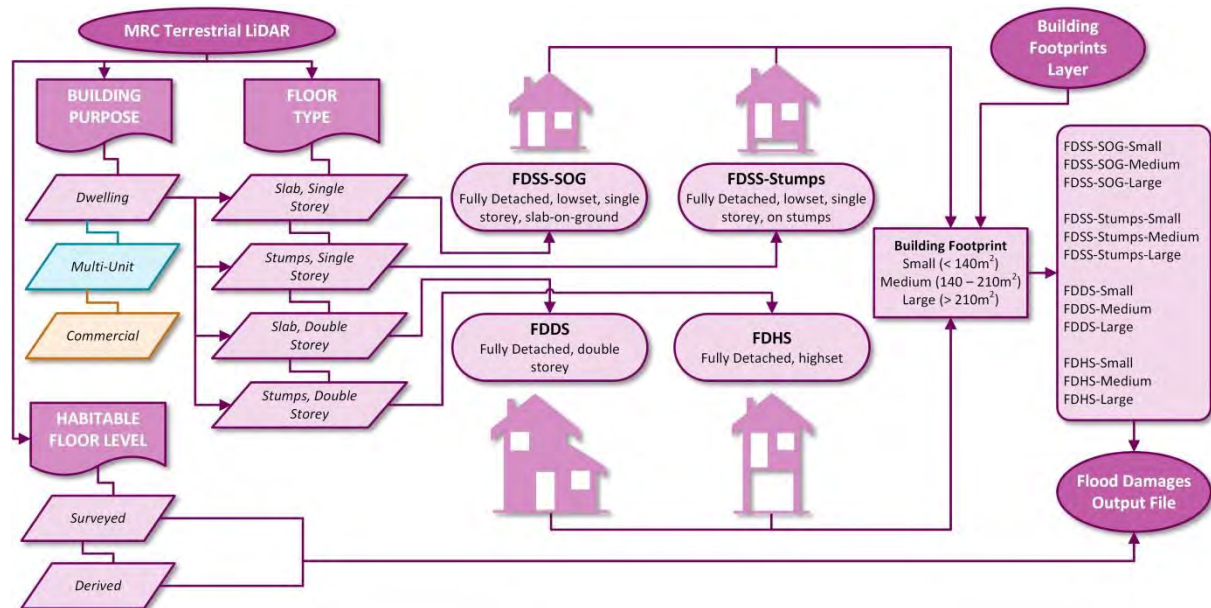


Figure 34 Fully Detached Residential Building Classification Flowchart

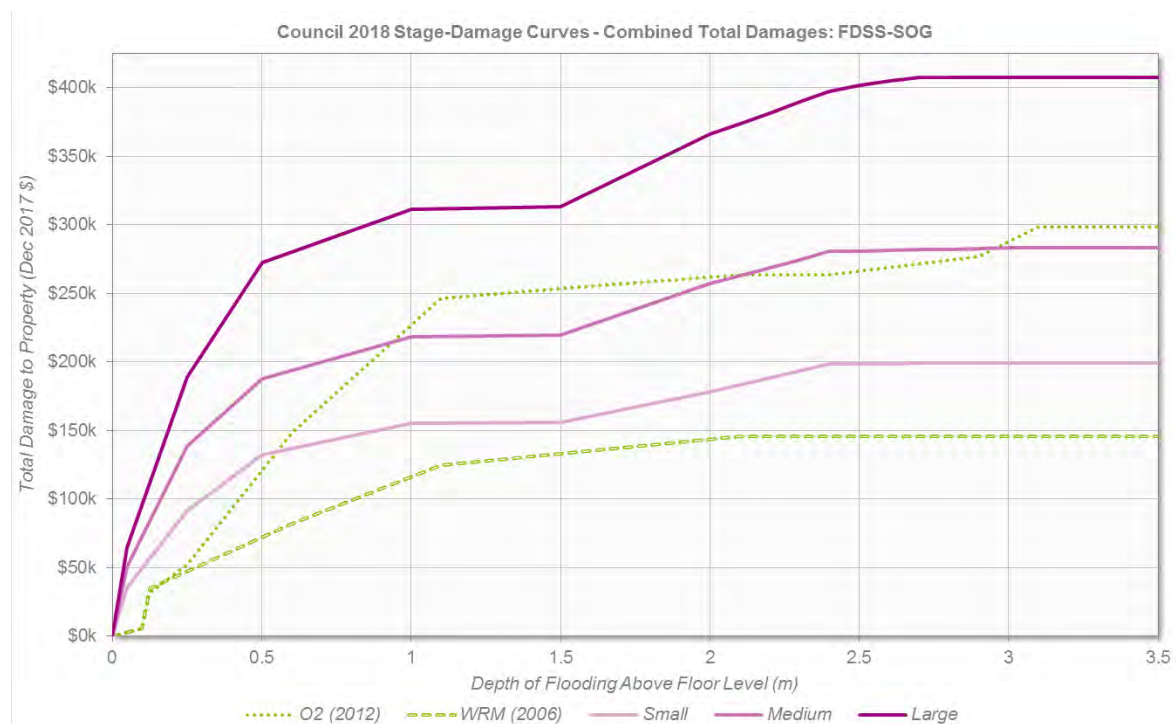


Figure 35 Combined Stage-Damage Curves: FDSS-SOG

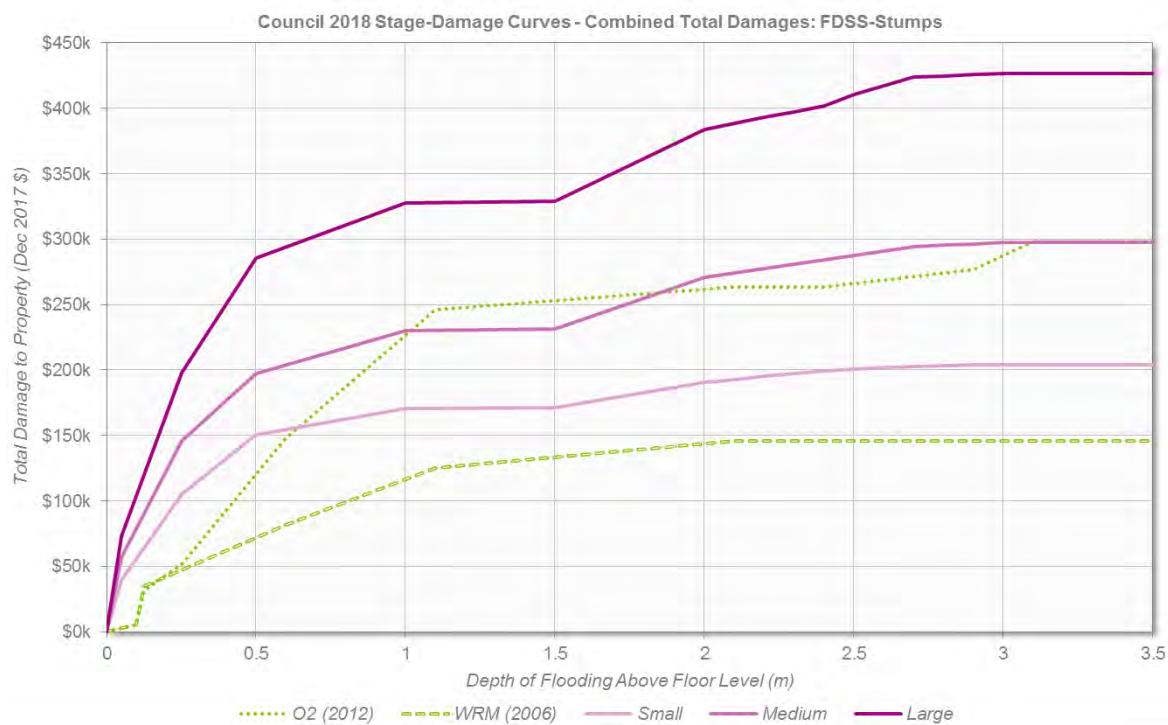


Figure 36 Combined Stage-Damage Curves: FDSS-Stumps

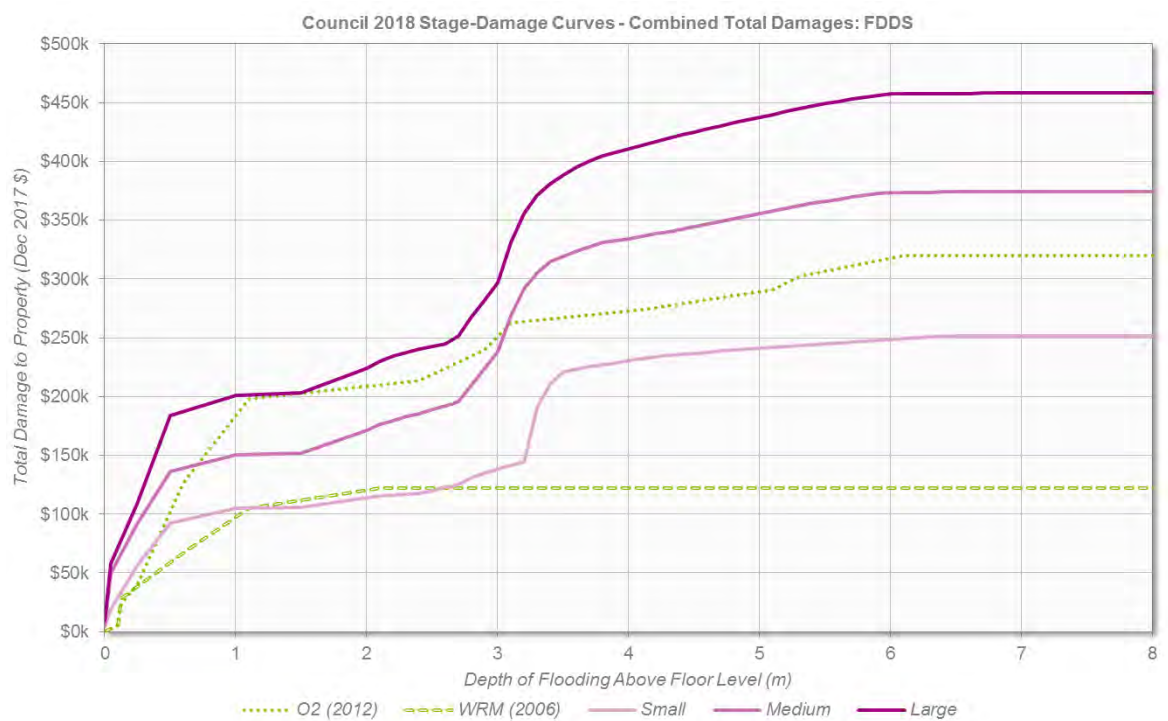


Figure 37 Combined Stage-Damage Curves: FDSS

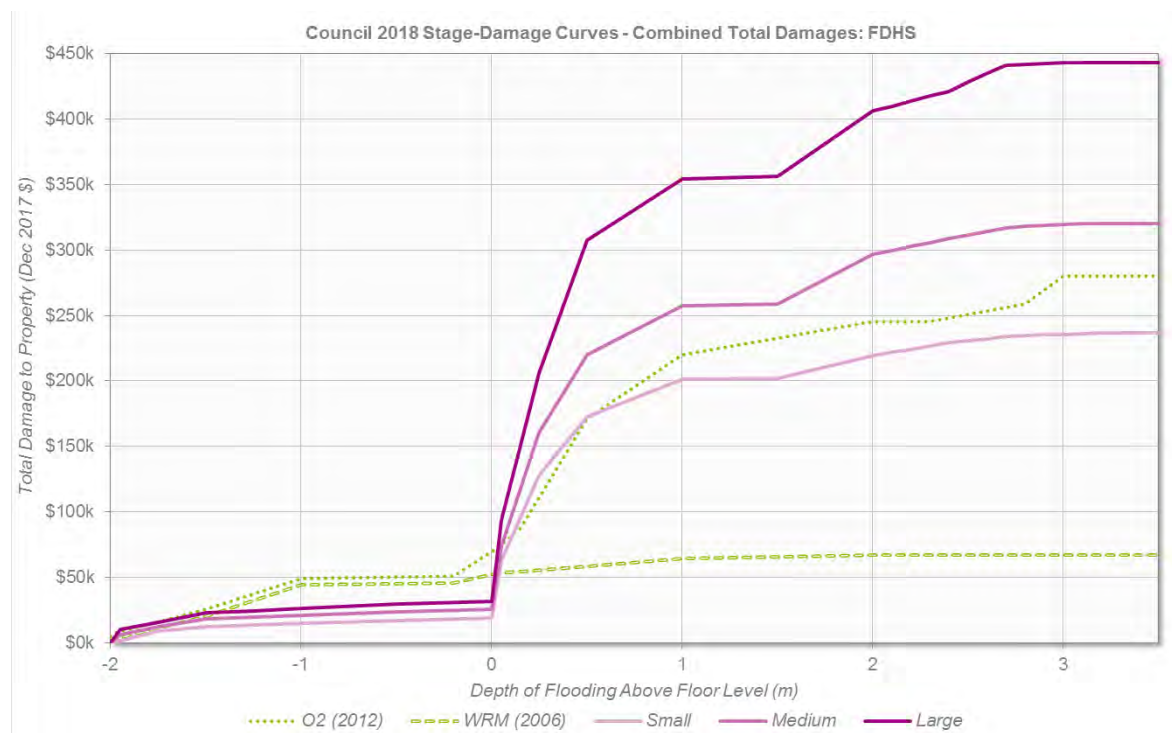


Figure 38 Combined Stage-Damage Curves: FDHS

Indirect Fully Detached Residential Damages

Indirect fully detached residential damages were assumed to be 15% of the total direct residential damages (DNRM, 2002).

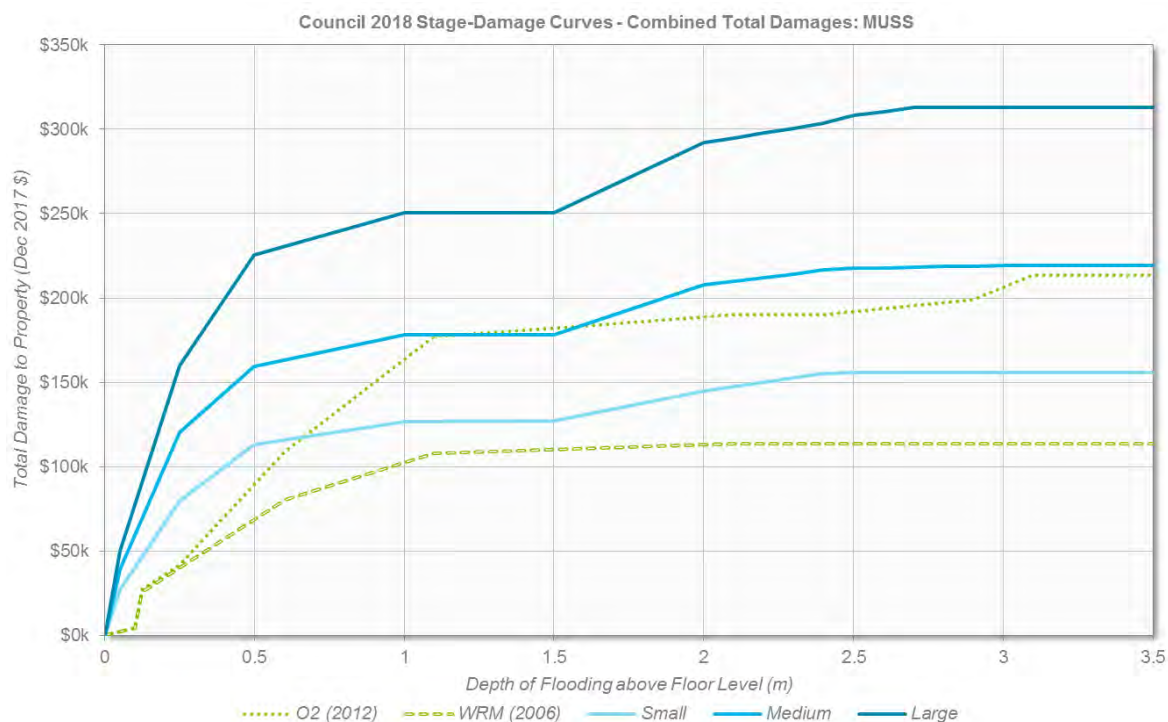
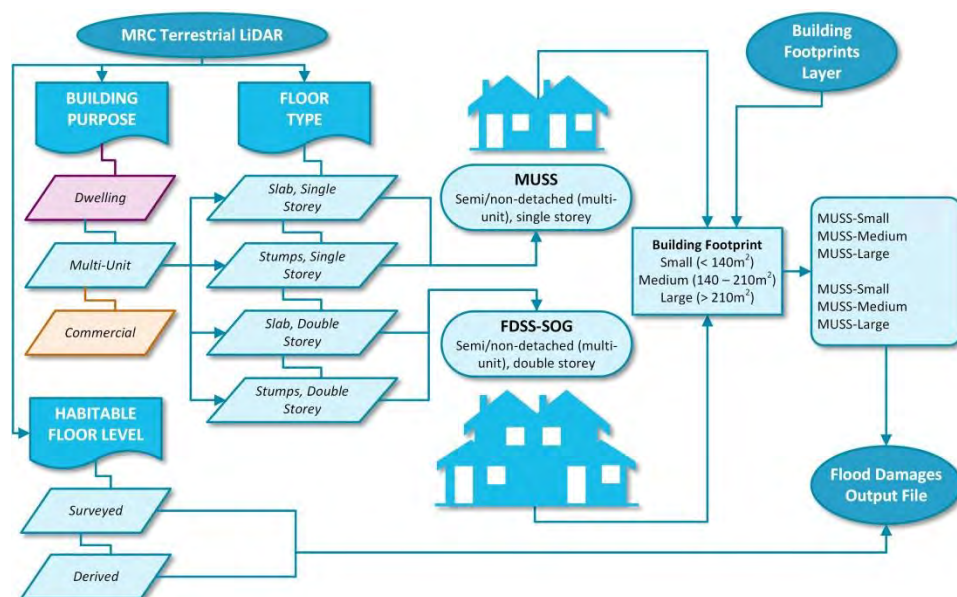
Multi-Unit Residential Damages

Multi-unit residential damages were estimated using the Council 2018 stage-damage curves and have been based on rebuilding costs associated with flooding.

Damage calculations were carried out separately for the external, contents and structural damage components and combined to give total damages. This allowed a range of raised building heights to be easily assessed, with external damages increasing with over ground depth, and contents and structural damages increasing with over floor depth. Raised floor levels were identified using Council's Terrestrial LiDAR database as per Section 11.5.

All damage values have been adjusted to December 2017 Dollars, which corresponds to the most recent Consumer Price Index (CPI) values available. Details of the adjustment are provided in Section 11.7. No adjustment of Stage-Damage curves to represent actual / potential flood damages was undertaken, as described in Section 11.3.3.

Figure 39 shows the decision processes made as part of the multi-unit residential building classification prior to applying the relevant stage-damage curve. The 6 classifications as shown in the flow chart have individual stage-damage curves that have been graphed in Figure 40 and Figure 41. Individual curves are given for external, contents and structural damages, however these graphs present stage damage curves representing total flood damages (sum of external, contents and structural damages). The historical WRM and O2 Environmental curves (CPI adjusted to December 2017 dollars) have also been graphed for comparison.



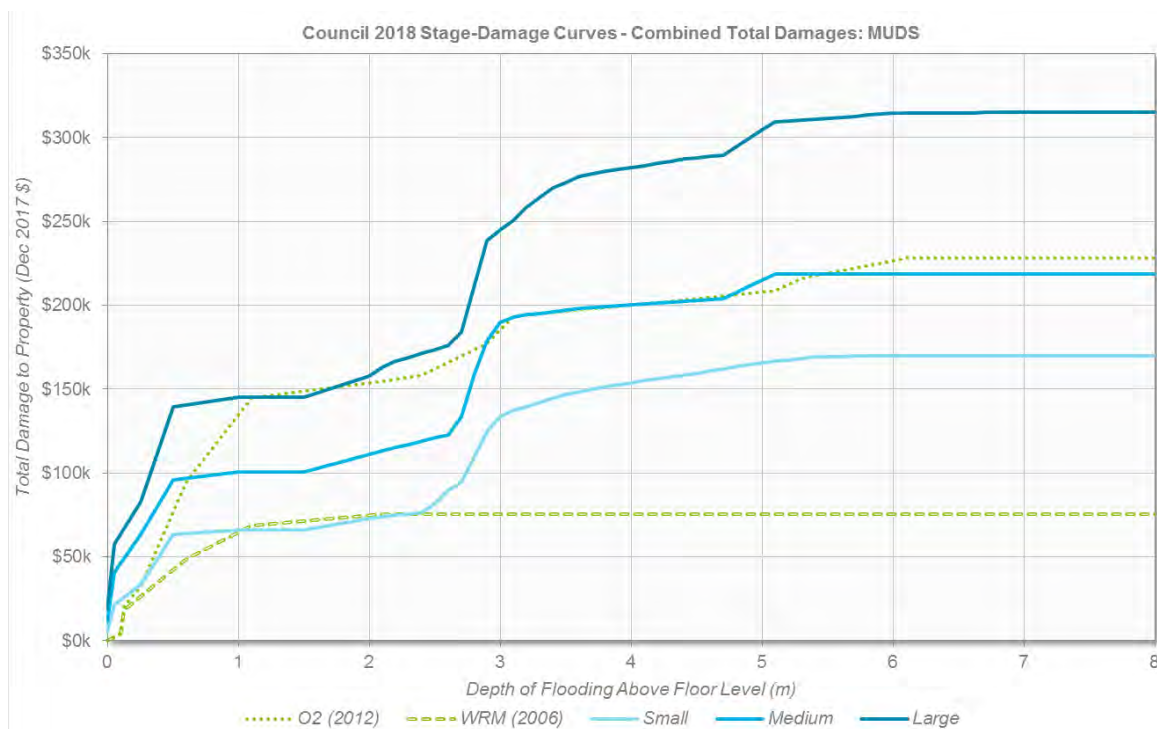


Figure 41 Combined Stage-Damage Curves: MUDS

Indirect Multi-Unit Residential Damages

Indirect multi-unit residential damages were assumed to be 15% of the total direct residential damages (DNRM, 2002).

Commercial Damages

Commercial damages were estimated using the Council 2018 stage-damage curves. These curves represent present day adjusted ANUFLOOD commercial stage-damage curves and estimate rebuilding costs associated with flooding inflicted on commercial property.

Commercial buildings were assigned a value class based on their use. Details on commercial building classification are presented in Section 0. It should be noted that large-classed building damages were estimated using area directly (i.e. the large-class building damage curves are in units of \$/m² vs. \$). Raised floor levels were applied using the surveyed floor level from the Council's Terrestrial LiDAR dataset. Estimated damages were assumed to remain constant after a depth over floor of 4m, corresponding to the maximum damage value provided in the ANUFLOOD literature.

All damage values have been adjusted to December 2017 Dollars, which corresponds to the most recent Consumer Price Index (CPI) values available. Details of the adjustment are provided in Section 11.7. No adjustment of Stage-Damage curves to represent actual / potential flood damages was undertaken, as described in Section 11.3.3.

Figure 42 shows the decision processes made as part of the multi-unit residential building classification prior to applying the relevant stage-damage curve. The 15 classifications as shown in the flow chart have individual stage-damage curves that have been graphed in Figure 43 through Figure 45. The historical ANUFLOOD curves (CPI adjusted to December 2017 dollars) have also been graphed for comparison.

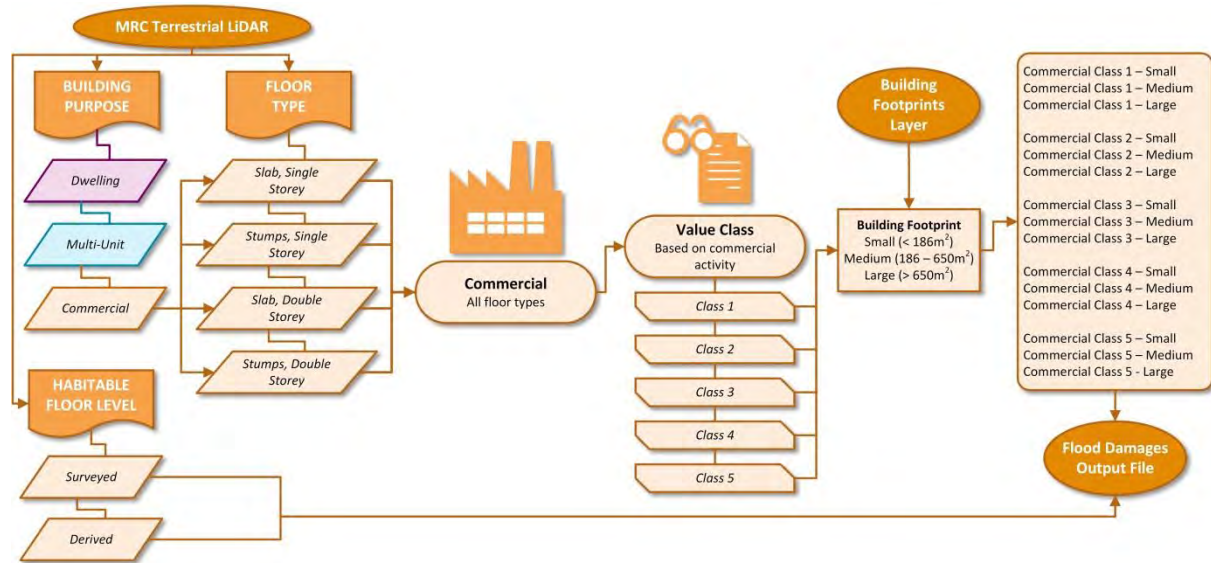


Figure 42 Commercial Building Classification Flowchart

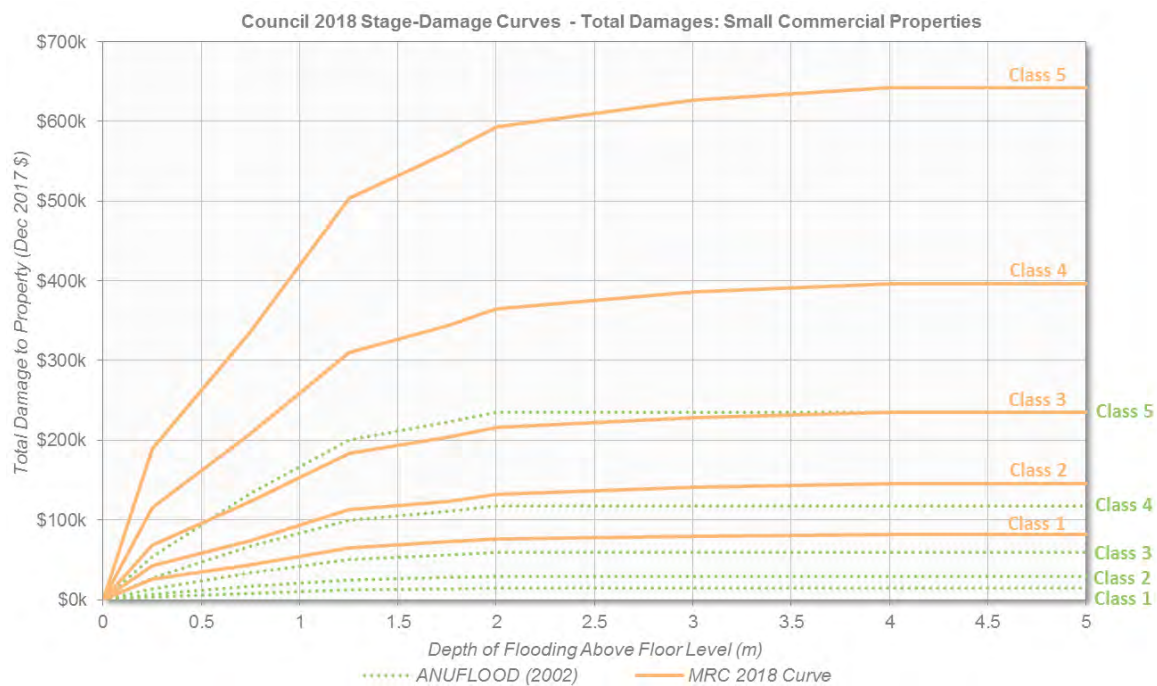


Figure 43 Total Stage-Damage Curve: Small Commercial

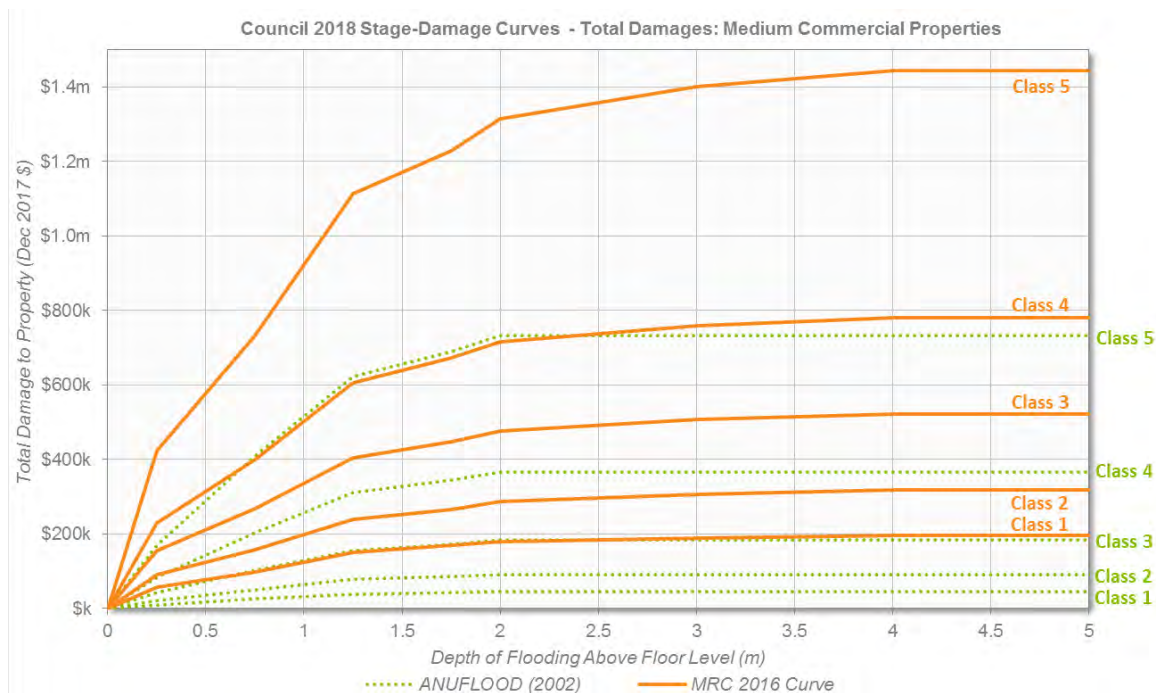


Figure 44 Total Stage-Damage Curve: Medium Commercial

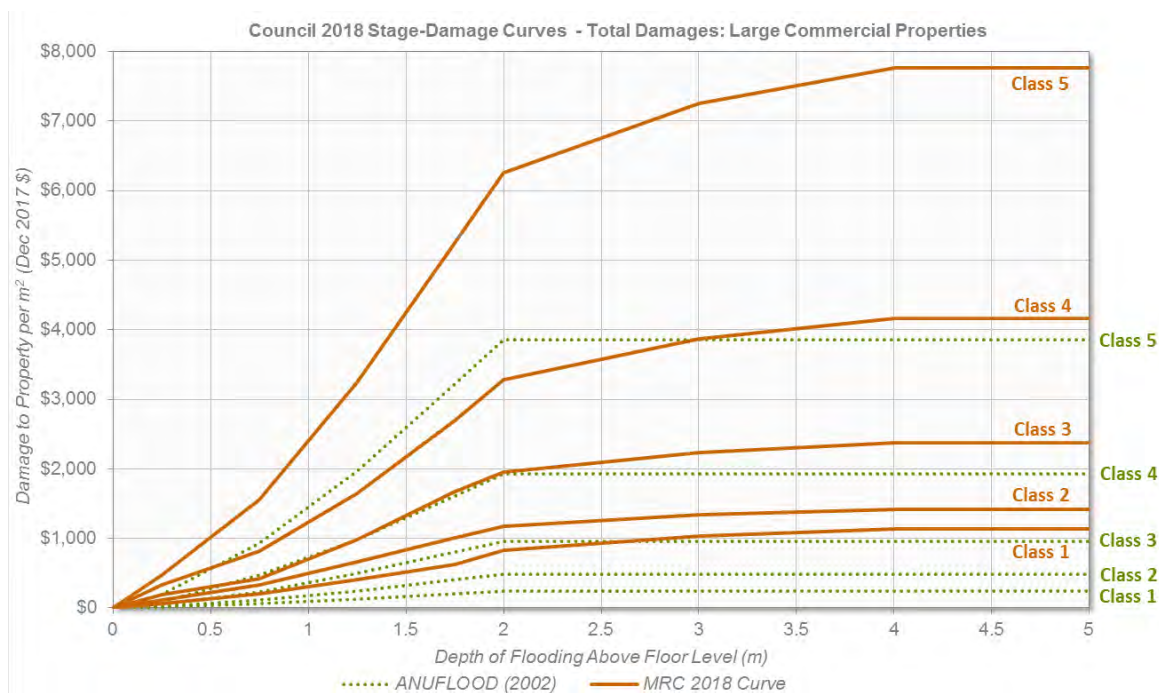


Figure 45 Total Stage-Damage Curve: Large Commercial

Indirect Commercial Damages

Indirect damages for commercial buildings were assumed to be 55% of the direct damages. This number is significantly higher than the indirect damage value for residential buildings due to the assumed loss of business revenue, according to the ANUFLOOD literature. It should be noted that this applies to all buildings classified as commercial, which includes community assets such as park facilities, schools, etc. which may not actually recognize business-related revenue.

Appendix D

Property Impacts Assessment

Appendix D Property Impacts Assessment

A property by property impacts assessment was undertaken for allotments within the Sarina model boundary. This assessment was undertaken to ensure that there is no worsening to present flood conditions for properties adjacent to the intersection and road corridor.

The assessment was undertaken all properties within the Sarina model boundary in Figure 2. Property information such as floor levels and dwelling type was provided by MRC, which was obtained using Mobile Laser Scanning.

The following limitations should be noted in regards to the assessment:

- Design flood events were assessed using a singular critical duration (1440min storm), based on an analysis of multiple storm durations for the 1% AEP event (refer Section 5.3).
- The hydraulic models have not been calibrated to any historical events due to unavailability of measured or observed flood records. Instead, anecdotal information from Mackay Regional Council staff was used to assess the performance of the model against historical events.
- Aerial survey data (in the form of LiDAR) used to develop the topography for the hydraulic model has a vertical accuracy of ± 0.15 m on clear, hard surfaces and a horizontal accuracy of ± 0.45 m.
- Results presented are based on peak values of water surface level, flow, depth and velocity. Therefore, using flood levels as an example, the peak level does not occur everywhere at the same time and, therefore, the values presented are based on taking the maximum value which occurred at each computational point in the model during the entire flood. Hence, a presentation of peak levels does not represent an instantaneous point in time, but rather an envelope of the maximum values that occurred at each computational point over the duration of the flood event.
- The velocity values reported are from the depth-averaged velocity value reported by TUFLOW and velocities may be higher at a certain depths.
- The slope of allotments may report higher Peak Water Surface Elevations (PWSE) higher than that of the floor level, although the floor level may not be inundated. This is due to the steep terrain of some lots and shallow surface flooding towards the rear (higher end) of the allotments.
- Floor levels under ground level were increased based on building classifications as discussed in Appendix C.

Property Floor Levels and Classification

Properties with supplied Terrestrial LiDAR HFL lower than that of the average ground LiDAR levels surrounding the building footprint is shown in **red text** and survey levels has provided by MRC has **green text** as shown in Table 42 below.

Table 42 Property Floor Levels and Classifications

Address	Terrestrial LiDAR HFL (mAHD)	Average Ground LiDAR (mAHD)	Damage Category	Assumed HFL (mAHD)
40 Lee Street SARINA QLD 4737	0.00	21.98	COM2-M	22.08
L 1 Breen Street SARINA QLD 4737	0.00	19.38	COM2-M	19.50
6 Nolan Street SARINA QLD 4737	0.00	23.35	FDHS-S	25.72
L 3 Bruce Highway SARINA QLD 4737	0.00	16.64	COM3-M	16.74
L 3 Bruce Highway SARINA QLD 4737	0.00	16.69	COM3-S	16.79
3/13 Hoey Street SARINA QLD 4737	17.46	17.23	FDSS-SOG-S	17.46
22 East Street SARINA QLD 4737	17.99	17.35	FDSS-Stumps-S	17.99
16 East Street SARINA QLD 4737	17.98	17.36	FDSS-Stumps-S	17.98
14 East Street SARINA QLD 4737	18.01	17.43	FDSS-SOG-L	18.01
10 East Street SARINA QLD 4737	17.83	17.37	FDDS-S	17.83
8 East Street SARINA QLD 4737	0.00	17.73	FDSS-SOG-L	17.83
4 East Street SARINA QLD 4737	18.14	17.62	FDSS-Stumps-M	18.14
26 Broad Street SARINA QLD 4737	17.71	17.79	COM3-M	17.89
36-38 Broad Street SARINA QLD 4737	18.19	18.12	COM2-S	18.22
8 Triggers Lane SARINA QLD 4737	0.00	17.82	FDDS-M	17.92
40 Broad Street SARINA QLD 4737	18.64	18.53	COM3-M	18.64
40 Broad Street SARINA QLD 4737	18.64	17.78	COM2-M	18.64
44-50 Broad Street SARINA QLD 4737	22.94	17.53	COM2-S	17.63
44-50 Broad Street SARINA QLD 4737	22.94	17.38	COM2-S	17.48
44-50 Broad Street SARINA QLD 4737	22.94	17.14	COM2-S	17.24
46 Broad Street SARINA QLD 4737	19.71	19.68	COM3-M	19.78
48 Broad Street SARINA QLD 4737	20.03	20.01	COM3-M	20.11
46 Broad Street SARINA QLD 4737	0.00	19.31	COM3-S	19.41
L 2 Broad Street SARINA QLD 4737	0.00	18.06	FDSS-SOG-S	18.16
L 2 Broad Street SARINA QLD 4737	0.00	18.24	FDSS-SOG-M	18.34
44-50 Broad Street SARINA QLD 4737	22.94	17.80	COM2-M	17.90
44-50 Broad Street SARINA QLD 4737	22.94	18.15	COM2-M	18.25
44-50 Broad Street SARINA QLD 4737	22.94	18.44	COM2-M	18.54
44-50 Broad Street SARINA QLD 4737	22.94	18.54	COM2-M	18.64
44-50 Broad Street SARINA QLD 4737	22.94	19.16	COM2-S	19.26
44-50 Broad Street SARINA QLD 4737	22.94	19.76	COM2-M	19.86
44-50 Broad Street SARINA QLD 4737	22.94	19.61	COM2-M	19.71
44-50 Broad Street SARINA QLD 4737	22.94	18.14	COM2-M	18.24

44-50 Broad Street SARINA QLD 4737	22.94	18.58	COM2-S	18.68
56-60 Broad Street SARINA QLD 4737	19.81	19.18	COM1-M	19.81
56-60 Broad Street SARINA QLD 4737	19.81	19.12	COM1-M	19.81
4 Johnston Street SARINA QLD 4737	19.32	18.55	FDSS-Stumps-M	19.32
6 Johnston Street SARINA QLD 4737	18.30	18.33	FDSS-Stumps-M	18.93
58-60 Broad Street SARINA QLD 4737	18.71	18.50	COM1-M	18.71
17 Brewers Road SARINA QLD 4737	18.29	17.79	FDSS-Stumps-S	18.29
15 Brewers Road SARINA QLD 4737	17.85	17.89	FDDS-M	17.99
13 Brewers Road SARINA QLD 4737	20.28	17.85	FDHS-M	20.28
11 Brewers Road SARINA QLD 4737	19.96	17.96	FDDS-S	19.96
9 Brewers Road SARINA QLD 4737	17.92	17.98	FDDS-S	18.08
3 Brewers Road SARINA QLD 4737	18.15	18.09	FDDS-M	18.19
1 Brewers Road SARINA QLD 4737	18.85	18.09	FDSS-SOG-M	18.85
24 Broad Street SARINA QLD 4737	17.79	17.74	COM3-M	17.84
24 Broad Street SARINA QLD 4737	17.79	17.77	COM3-S	17.87
1 East Street SARINA QLD 4737	18.16	17.56	FDSS-Stumps-M	18.16
3 East Street SARINA QLD 4737	19.39	17.59	FDSS-Stumps-S	19.39
7 East Street SARINA QLD 4737	17.83	17.67	FDSS-SOG-S	17.83
9 East Street SARINA QLD 4737	18.45	17.52	FDSS-Stumps-M	18.45
11 East Street SARINA QLD 4737	17.63	17.54	FDSS-Stumps-S	17.64
13 East Street SARINA QLD 4737	18.05	17.53	FDSS-Stumps-S	18.05
15 East Street SARINA QLD 4737	17.98	17.48	FDSS-Stumps-M	17.98
17 East Street SARINA QLD 4737	17.90	17.40	FDSS-Stumps-S	17.90
7 Hoey Street SARINA QLD 4737	0.00	17.61	FDSS-SOG-S	17.71
5 Hoey Street SARINA QLD 4737	19.94	17.64	FDDS-S	19.94
3 Hoey Street SARINA QLD 4737	17.87	17.80	FDSS-SOG-S	17.90
65-67 Broad Street SARINA QLD 4737	17.60	18.12	COM3-M	18.22
61 Broad Street SARINA QLD 4737	19.39	18.42	COM3-M	18.52
61 Broad Street SARINA QLD 4737	19.39	18.47	COM3-S	18.57
59 Broad Street SARINA QLD 4737	19.47	18.64	COM3-M	19.47
57 Broad Street SARINA QLD 4737	19.20	19.01	COM3-L	19.20
49-55 Broad Street SARINA QLD 4737	19.87	19.95	COM2-M	20.05
41-45 Broad Street SARINA QLD 4737	0.00	19.24	COM2-M	19.34
27-29 Broad Street SARINA QLD 4737	18.21	18.18	COM2-M	18.28
39 Broad Street SARINA QLD 4737	18.73	18.66	COM3-M	18.76
37 Broad Street SARINA QLD 4737	18.27	18.52	COM3-M	18.62
33-35 Broad Street SARINA QLD 4737	18.12	18.43	COM3-M	18.53
7 Anzac Street SARINA QLD 4737	19.35	19.42	FDSS-Stumps-M	20.02
8 Keilbach Court SARINA QLD 4737	19.34	19.43	FDSS-Stumps-M	20.03
6 Keilbach Court SARINA QLD 4737	19.79	19.87	FDHS-S	19.97
12 Brandon Street SARINA QLD 4737	0.00	20.22	FDDS-S	20.32
4 Keilbach Court SARINA QLD 4737	20.60	20.58	FDHS-S	20.68

16 Brandon Street SARINA QLD 4737	20.77	20.01	FDSS-Stumps-M	20.77
10A Brandon Street SARINA QLD 4737	19.95	20.10	COM1-M	20.20
10 Brandon Street SARINA QLD 4737	22.76	20.33	FDSS-Stumps-S	20.66
2 Brandon Street SARINA QLD 4737	0.00	21.41	COM3-M	21.51
20 Central Street SARINA QLD 4737	20.52	20.43	COM3-M	20.53
22 Central Street SARINA QLD 4737	21.24	20.56	COM3-L	21.24
24 Central Street SARINA QLD 4737	21.62	20.75	COM3-S	21.62
24 Central Street SARINA QLD 4737	21.62	21.33	COM3-S	21.62
26 Central Street SARINA QLD 4737	21.73	21.60	COM3-S	21.73
28 Central Street SARINA QLD 4737	22.22	21.93	COM3-M	22.22
14 McCowan Street SARINA QLD 4737	0.00	20.00	FDSS-SOG-S	20.10
38-40 Central Street SARINA QLD 4737	23.51	23.10	COM3-L	23.51
10-12 Central Street SARINA QLD 4737	20.79	19.01	COM3-S	20.79
10-12 Central Street SARINA QLD 4737	20.79	19.16	COM3-S	20.79
17-25 Broad Street SARINA QLD 4737	18.32	18.30	COM2-L	18.40
17-25 Broad Street SARINA QLD 4737	18.32	19.12	COM2-S	19.22
13-15 Broad Street SARINA QLD 4737	18.75	18.19	COM2-M	18.75
9-11 Broad Street SARINA QLD 4737	18.15	18.18	COM3-M	18.28
L 2 Railway Square SARINA QLD 4737	19.19	19.00	COM3-S	19.19
L 125 Station Lane SARINA QLD 4737	19.21	19.18	COM3-M	19.28
L 125 Station Lane SARINA QLD 4737	19.21	19.23	COM3-S	19.33
L 125 Station Lane SARINA QLD 4737	19.21	19.15	COM3-S	19.25
Mill Street SARINA QLD 4737	0.00	19.83	COM3-M	19.93
Mill Street SARINA QLD 4737	0.00	20.29	COM3-M	20.39
Mill Street SARINA QLD 4737	0.00	19.87	COM3-M	19.97
Mill Street SARINA QLD 4737	0.00	20.01	COM3-S	20.11
Mill Street SARINA QLD 4737	0.00	19.85	COM3-M	19.95
Mill Street SARINA QLD 4737	0.00	20.55	COM3-L	20.65
Mill Street SARINA QLD 4737	0.00	20.59	COM3-M	20.69
Mill Street SARINA QLD 4737	0.00	20.98	COM3-M	21.08
Mill Street SARINA QLD 4737	0.00	21.54	COM3-L	21.64
Mill Street SARINA QLD 4737	0.00	21.78	COM3-S	21.88
Mill Street SARINA QLD 4737	0.00	20.16	COM3-L	20.26
Mill Street SARINA QLD 4737	0.00	20.23	COM3-L	20.33
L 2 Bruce Highway SARINA QLD 4737	0.00	20.16	COM3-S	20.26
Mill Street SARINA QLD 4737	0.00	20.44	COM3-L	20.54
L 4 Mill Street SARINA QLD 4737	0.00	19.32	COM2-M	19.42
L 3 Mill Street SARINA QLD 4737	0.00	19.64	COM3-S	19.74
Mill Street SARINA QLD 4737	0.00	21.51	COM3-M	21.61
L 8 Mill Street SARINA QLD 4737	0.00	28.05	COM3-S	28.15
Mill Street SARINA QLD 4737	0.00	24.20	COM3-L	24.30
L 8 Mill Street SARINA QLD 4737	0.00	31.13	COM3-M	31.23

39 Mill Street SARINA QLD 4737	29.09	28.26	FDSS-Stumps-S	29.09
37 Mill Street SARINA QLD 4737	29.62	29.24	FDSS-Stumps-S	29.62
35 Mill Street SARINA QLD 4737	31.24	29.67	FDHS-S	31.24
33 Mill Street SARINA QLD 4737	30.50	30.01	FDSS-Stumps-S	30.50
31 Mill Street SARINA QLD 4737	32.08	30.35	FDHS-L	32.08
27 Mill Street SARINA QLD 4737	28.90	29.47	FDDS-L	29.57
25 Mill Street SARINA QLD 4737	28.61	27.77	FDSS-Stumps-S	28.61
23 Mill Street SARINA QLD 4737	28.21	26.50	FDSS-Stumps-S	28.21
21 Mill Street SARINA QLD 4737	26.09	25.48	FDSS-Stumps-M	26.09
9 Mill Street SARINA QLD 4737	20.66	20.21	FDSS-Stumps-M	20.66
3 Mill Street SARINA QLD 4737	21.54	21.06	FDSS-Stumps-S	21.54
71-73 Range Road SARINA QLD 4737	24.04	23.43	FDSS-Stumps-M	24.04
65 Range Road SARINA QLD 4737	23.12	22.37	FDSS-Stumps-S	23.12
6 Pirie Street SARINA QLD 4737	21.38	21.14	FDSS-Stumps-S	21.38
4 Pirie Street SARINA QLD 4737	23.01	21.35	FDSS-Stumps-S	23.01
55 Range Road SARINA QLD 4737	21.84	21.62	FDSS-Stumps-M	21.84
57 Range Road SARINA QLD 4737	0.00	21.96	FDSS-SOG-M	22.06
59 Range Road SARINA QLD 4737	24.29	22.24	FDSS-Stumps-M	24.29
61 Range Road SARINA QLD 4737	22.56	22.14	FDSS-Stumps-M	22.56
63 Range Road SARINA QLD 4737	23.50	21.71	FDSS-Stumps-M	23.50
53 Range Road SARINA QLD 4737	0.00	20.87	FDSS-SOG-L	20.97
51 Range Road SARINA QLD 4737	0.00	21.21	FDSS-SOG-L	21.31
Mill Street SARINA QLD 4737	0.00	21.42	COM3-S	21.52
Mill Street SARINA QLD 4737	0.00	21.15	COM3-S	21.25
Mill Street SARINA QLD 4737	0.00	20.61	COM3-M	20.71
Mill Street SARINA QLD 4737	0.00	21.44	COM3-M	21.54
1 Noden Street SARINA QLD 4737	26.03	26.92	FDSS-SOG-L	27.02
3-5 Noden Street SARINA QLD 4737	27.36	26.67	FDSS-Stumps-L	27.36
5 Beagrie Street SARINA QLD 4737	27.15	27.19	FDSS-SOG-L	27.29
3 Beagrie Street SARINA QLD 4737	27.33	26.60	COM1-M	27.33
6/1 Beagrie Street SARINA QLD 4737	23.96	26.19	FDSS-SOG-S	26.29
7-9 Range Road SARINA QLD 4737	25.77	24.69	COM1-M	25.77
7-9 Range Road SARINA QLD 4737	25.77	25.24	COM1-M	25.77
1-3 Range Road SARINA QLD 4737	25.26	25.15	COM2-L	25.26
1-3 Range Road SARINA QLD 4737	25.26	25.82	COM2-S	25.92
35 Central Street SARINA QLD 4737	25.37	25.05	COM2-M	25.37
1/33 Central Street SARINA QLD 4737	24.40	24.20	COM3-M	24.40
2/33 Central Street SARINA QLD 4737	0.00	24.99	COM3-M	25.09
17-19 Central Street SARINA QLD 4737	27.63	26.76	COM2-L	27.63
17-19 Central Street SARINA QLD 4737	27.63	25.18	COM2-S	25.28
21-25 Central Street SARINA QLD 4737	22.82	23.02	COM3-M	23.12
11-13 Central Street SARINA QLD 4737	21.12	22.01	COM3-M	22.11

11-13 Central Street SARINA QLD 4737	21.12	21.04	COM3-S	21.14
Mill Street SARINA QLD 4737	0.00	25.07	COM3-M	25.17
45 Range Road SARINA QLD 4737	21.07	21.18	COM2-M	21.28
43 Range Road SARINA QLD 4737	0.00	20.95	FDSS-SOG-S	21.05
1/37 Range Road SARINA QLD 4737	21.10	21.13	FDSS-Stumps-S	21.73
35 Range Road SARINA QLD 4737	21.38	21.09	FDSS-Stumps-M	21.38
33 Range Road SARINA QLD 4737	21.53	20.89	FDSS-Stumps-M	21.53
31 Range Road SARINA QLD 4737	20.97	20.83	FDSS-Stumps-S	20.97
29 Range Road SARINA QLD 4737	21.45	21.05	FDSS-Stumps-S	21.45
27 Range Road SARINA QLD 4737	21.75	21.30	FDSS-Stumps-S	21.75
25 Range Road SARINA QLD 4737	23.41	21.27	FDHS-S	23.41
21-23 Range Road SARINA QLD 4737	21.70	21.60	FDSS-Stumps-L	21.70
13 Range Road SARINA QLD 4737	25.61	23.34	FDHS-M	25.61
12 Beagrie Street SARINA QLD 4737	28.32	28.36	FDSS-SOG-L	28.46
38 Mill Street SARINA QLD 4737	28.39	28.36	FDHS-S	28.46
36 Mill Street SARINA QLD 4737	29.37	28.92	FDSS-Stumps-M	29.37
26 Mill Street SARINA QLD 4737	0.00	26.99	FDSS-SOG-M	27.09
24 Mill Street SARINA QLD 4737	29.37	26.20	FDSS-Stumps-S	26.50
22 Mill Street SARINA QLD 4737	0.00	24.80	FDDS-S	24.90
18 Mill Street SARINA QLD 4737	0.00	22.44	FDDS-M	22.54
14 Mill Street SARINA QLD 4737	0.00	19.86	FDDS-S	19.96
8 Beagrie Street SARINA QLD 4737	0.00	26.96	FDDS-M	27.06
6 Beagrie Street SARINA QLD 4737	0.00	24.51	FDDS-M	24.61
3 Greetham Street SARINA QLD 4737	23.95	24.91	FDHS-S	25.01
68 Range Road SARINA QLD 4737	26.27	25.52	FDSS-Stumps-M	26.27
70 Range Road SARINA QLD 4737	26.30	25.49	FDSS-Stumps-M	26.30
5 Greetham Street SARINA QLD 4737	26.32	26.62	FDSS-SOG-M	26.72
7 Greetham Street SARINA QLD 4737	27.58	28.27	FDHS-M	28.37
9 Greetham Street SARINA QLD 4737	29.72	30.10	FDDS-S	30.20
L 11 Greetham Street SARINA QLD 4737	24.04	24.62	COM2-M	24.72
L 11 Greetham Street SARINA QLD 4737	24.04	26.03	COM2-S	26.13
L 11 Greetham Street SARINA QLD 4737	24.04	24.01	COM2-S	24.11
L 11 Greetham Street SARINA QLD 4737	24.04	24.29	COM2-S	24.39
L 11 Greetham Street SARINA QLD 4737	24.04	24.58	COM2-S	24.68
L 11 Greetham Street SARINA QLD 4737	24.04	24.90	COM2-S	25.00
64 Range Road SARINA QLD 4737	23.20	22.73	FDSS-Stumps-S	23.20
L 66 Range Road SARINA QLD 4737	22.50	22.32	FDSS-SOG-S	22.50
58-62 Range Road SARINA QLD 4737	22.17	22.09	FDSS-Stumps-L	22.19
56 Range Road SARINA QLD 4737	22.59	21.61	FDSS-Stumps-S	22.59
54 Range Road SARINA QLD 4737	21.63	21.62	FDSS-SOG-M	21.72
52 Range Road SARINA QLD 4737	0.00	21.46	FDSS-Stumps-M	21.56
3 Innes Street SARINA QLD 4737	22.08	21.94	FDSS-Stumps-M	22.08

1 Innes Street SARINA QLD 4737	21.76	21.08	FDSS-Stumps-M	21.76
7 Innes Street SARINA QLD 4737	25.70	23.77	FDSS-Stumps-M	25.70
43 West Street SARINA QLD 4737	23.42	22.69	FDSS-Stumps-S	23.42
49 West Street SARINA QLD 4737	23.60	23.32	FDSS-Stumps-M	23.60
42 Range Road SARINA QLD 4737	22.12	22.04	FDSS-SOG-L	22.14
40 Range Road SARINA QLD 4737	0.00	21.74	FDSS-SOG-M	21.84
38 Range Road SARINA QLD 4737	22.48	22.02	FDSS-Stumps-S	22.48
36 Range Road SARINA QLD 4737	0.00	21.82	FDSS-SOG-S	21.92
34 Range Road SARINA QLD 4737	21.67	22.08	FDDS-S	22.18
32 Range Road SARINA QLD 4737	23.97	22.07	FDSS-Stumps-M	23.97
30 Range Road SARINA QLD 4737	24.08	22.15	FDSS-Stumps-M	24.08
28 Range Road SARINA QLD 4737	0.00	22.06	FDHS-M	23.85
26 Range Road SARINA QLD 4737	21.69	22.04	FDHS-M	22.14
24 Range Road SARINA QLD 4737	22.62	21.93	FDSS-Stumps-M	22.62
37 West Street SARINA QLD 4737	26.73	25.55	FDSS-Stumps-S	26.73
35 West Street SARINA QLD 4737	26.86	26.06	FDSS-Stumps-M	26.86
33 West Street SARINA QLD 4737	26.47	26.19	FDSS-SOG-S	26.47
31 West Street SARINA QLD 4737	26.57	26.38	FDDS-M	26.57
27 West Street SARINA QLD 4737	25.81	26.42	FDDS-S	26.52
25 West Street SARINA QLD 4737	26.74	26.24	FDSS-Stumps-S	26.74
23A West Street SARINA QLD 4737	25.74	25.97	FDDS-M	26.07
23 West Street SARINA QLD 4737	27.28	25.83	FDSS-Stumps-M	27.28
21 West Street SARINA QLD 4737	26.76	25.40	FDSS-Stumps-S	26.76
19 West Street SARINA QLD 4737	0.00	24.97	FDSS-SOG-S	25.07
17 West Street SARINA QLD 4737	24.65	24.29	FDSS-Stumps-M	24.65
11 West Street SARINA QLD 4737	23.87	24.02	FDHS-M	25.82
9 West Street SARINA QLD 4737	0.00	23.56	FDSS-SOG-M	23.66
7 West Street SARINA QLD 4737	0.00	24.00	FDDS-M	26.18
5 West Street SARINA QLD 4737	23.98	23.56	COM3-M	23.98
3 West Street SARINA QLD 4737	25.34	23.31	FDSS-Stumps-S	25.34
1 West Street SARINA QLD 4737	25.34	23.27	FDSS-Stumps-S	25.34
7 Leslie Street SARINA QLD 4737	23.55	22.97	FDSS-Stumps-M	23.55
5 Leslie Street SARINA QLD 4737	23.60	22.91	FDSS-Stumps-S	23.60
1-3 Leslie Street SARINA QLD 4737	0.00	22.84	COM1-M	22.94
16 Range Road SARINA QLD 4737	0.00	22.48	COM3-S	22.58
20 Range Road SARINA QLD 4737	0.00	22.05	COM3-M	22.15
22 Range Road SARINA QLD 4737	0.00	22.10	COM3-S	22.20
22 Range Road SARINA QLD 4737	0.00	22.27	COM3-S	22.37
22 Range Road SARINA QLD 4737	0.00	22.06	COM3-M	22.16
11 Anzac Street SARINA QLD 4737	22.45	21.63	FDHS-S	22.45
1/15 Anzac Street SARINA QLD 4737	23.22	23.08	FDSS-Stumps-S	23.22
10 Nolan Street SARINA QLD 4737	24.41	23.71	FDSS-Stumps-S	24.41

4 Nolan Street SARINA QLD 4737	25.67	23.70	FDSS-Stumps-M	25.67
2 Nolan Street SARINA QLD 4737	24.15	23.79	FDSS-Stumps-M	24.15
8 Leslie Street SARINA QLD 4737	23.48	23.33	FDSS-Stumps-M	23.48
1-3 Brandon Street SARINA QLD 4737	22.63	22.13	FDDS-L	22.63
9-11 Brandon Street SARINA QLD 4737	0.00	21.44	FDSS-SOG-S	21.54
19 Anzac Street SARINA QLD 4737	0.00	25.10	FDHS-L	27.30
21 Anzac Street SARINA QLD 4737	25.31	25.66	FDHS-S	25.76
16 Heron Street SARINA QLD 4737	29.12	27.13	FDHS-S	29.12
14 Heron Street SARINA QLD 4737	28.03	27.35	FDSS-Stumps-M	28.03
10 Heron Street SARINA QLD 4737	29.50	27.57	FDSS-Stumps-L	29.50
6 Heron Street SARINA QLD 4737	0.00	27.65	FDSS-SOG-S	27.75
4 Heron Street SARINA QLD 4737	28.14	27.54	FDSS-Stumps-S	28.14
18 Leslie Street SARINA QLD 4737	29.30	27.45	FDSS-Stumps-M	29.30
16 Leslie Street SARINA QLD 4737	0.00	26.59	FDSS-SOG-M	26.69
14 Leslie Street SARINA QLD 4737	25.81	25.83	FDSS-SOG-L	25.93
12 Leslie Street SARINA QLD 4737	25.11	25.09	FDSS-Stumps-S	25.19
11 Nolan Street SARINA QLD 4737	26.35	26.28	FDSS-Stumps-M	26.38
15 Nolan Street SARINA QLD 4737	0.00	25.30	FDHS-M	27.39
1 Heron Street SARINA QLD 4737	31.55	29.55	FDSS-Stumps-M	31.55
7 Heron Street SARINA QLD 4737	30.18	29.34	FDSS-Stumps-S	30.18
9 Heron Street SARINA QLD 4737	30.10	29.62	FDSS-Stumps-M	30.10
27 Anzac Street SARINA QLD 4737	29.22	28.46	FDSS-Stumps-L	29.22
29 Anzac Street SARINA QLD 4737	29.79	29.37	FDSS-Stumps-M	29.79
31 Anzac Street SARINA QLD 4737	30.21	30.08	COM2-S	30.21
31 Anzac Street SARINA QLD 4737	30.86	31.33	COM3-S	31.43
4 William Street SARINA QLD 4737	33.56	32.48	FDSS-Stumps-M	33.56
26 Leslie Street SARINA QLD 4737	35.68	34.28	FDSS-Stumps-S	35.68
13 William Street SARINA QLD 4737	33.51	34.12	FDSS-Stumps-S	34.22
13 William Street SARINA QLD 4737	33.51	33.13	FDSS-Stumps-M	33.51
11 William Street SARINA QLD 4737	32.66	32.61	FDSS-Stumps-S	32.71
11 William Street SARINA QLD 4737	32.66	32.84	FDSS-Stumps-S	33.44
3A William Street SARINA QLD 4737	35.47	34.66	FDSS-Stumps-S	35.47
3 William Street SARINA QLD 4737	0.00	35.18	FDSS-SOG-S	35.78
28 Leslie Street SARINA QLD 4737	37.77	37.01	FDSS-Stumps-L	37.77
6 Hospital Street SARINA QLD 4737	39.54	38.97	FDSS-Stumps-S	39.54
32 Leslie Street SARINA QLD 4737	0.00	40.26	FDSS-Stumps-S	40.36
34 Leslie Street SARINA QLD 4737	43.48	41.86	FDDS-S	43.48
58 Anzac Street SARINA QLD 4737	0.00	67.90	FDSS-SOG-L	68.00
13 Leslie Street SARINA QLD 4737	25.12	25.55	FDHS-L	25.65
15 Leslie Street SARINA QLD 4737	0.00	26.44	FDDS-M	26.54
17 Leslie Street SARINA QLD 4737	27.23	27.73	FDHS-M	27.83
19 Leslie Street SARINA QLD 4737	0.00	28.58	FDDS-M	28.68

23 Leslie Street SARINA QLD 4737	34.08	31.87	FDSS-Stumps-S	34.08
25 Leslie Street SARINA QLD 4737	33.17	33.82	FDHS-S	33.92
29 Leslie Street SARINA QLD 4737	38.03	37.17	FDSS-Stumps-S	38.03
6 Hill Street SARINA QLD 4737	35.65	33.99	FDSS-Stumps-M	35.65
4 Hill Street SARINA QLD 4737	31.58	31.43	FDSS-Stumps-S	31.58
26 West Street SARINA QLD 4737	29.59	29.02	FDSS-Stumps-M	29.59
24 West Street SARINA QLD 4737	26.03	26.67	FDHS-M	26.77
28 West Street SARINA QLD 4737	33.43	31.26	FDHS-M	33.43
30 West Street SARINA QLD 4737	34.43	32.91	FDSS-Stumps-M	34.43
45 Leslie Street SARINA QLD 4737	58.22	58.97	FDSS-SOG-L	59.07
43 Leslie Street SARINA QLD 4737	58.55	56.36	FDSS-Stumps-S	58.55
1/41 Leslie Street SARINA QLD 4737	54.31	52.01	FDHS-M	54.31
39 Leslie Street SARINA QLD 4737	51.43	49.32	FDDS-M	51.43
33 Leslie Street SARINA QLD 4737	44.25	42.22	FDDS-M	44.25
31 Leslie Street SARINA QLD 4737	41.02	40.86	FDDS-M	41.02
3 Swayne Street SARINA QLD 4737	40.57	39.92	FDSS-SOG-S	40.57
14 Hill Street SARINA QLD 4737	0.00	39.86	FDSS-SOG-M	39.96
16 Hill Street SARINA QLD 4737	39.60	38.78	FDSS-Stumps-S	39.60
13 Hill Street SARINA QLD 4737	36.46	35.39	FDSS-Stumps-M	36.46
15 Hill Street SARINA QLD 4737	36.01	34.78	FDSS-Stumps-S	36.01
17 Hill Street SARINA QLD 4737	35.30	33.96	FDSS-SOG-S	34.06
21 Hill Street SARINA QLD 4737	33.14	32.05	FDSS-Stumps-M	33.14
23 Hill Street SARINA QLD 4737	34.38	33.54	FDSS-Stumps-S	34.38
6 Jackson Street SARINA QLD 4737	26.73	26.44	FDSS-Stumps-S	26.73
4 Jackson Street SARINA QLD 4737	26.72	26.36	FDSS-Stumps-M	26.72
2 Jackson Street SARINA QLD 4737	27.74	26.99	FDSS-Stumps-L	27.74
34 West Street SARINA QLD 4737	28.46	28.12	FDSS-Stumps-S	28.46
5 Phillip Street SARINA QLD 4737	16.61	16.16	FDSS-Stumps-L	16.61
7 Phillip Street SARINA QLD 4737	16.61	16.11	FDSS-Stumps-S	16.61
11 Phillip Street SARINA QLD 4737	0.00	16.03	FDHS-S	18.14
25-39 Hoey Street SARINA QLD 4737	0.00	16.51	COM2-S	16.61
12 Johnston Street SARINA QLD 4737	17.34	16.97	FDSS-Stumps-M	17.34
62-64 Broad Street SARINA QLD 4737	0.00	17.58	FDSS-SOG-M	17.68
8 Johnston Street SARINA QLD 4737	18.22	17.63	FDSS-Stumps-M	18.22
3 Venton Street SARINA QLD 4737	18.10	17.41	FDSS-Stumps-S	18.10
17 William Street SARINA QLD 4737	33.87	33.50	FDSS-Stumps-M	33.87
15 William Street SARINA QLD 4737	33.91	34.13	FDHS-M	34.23
1 Palmer Street SARINA QLD 4737	0.00	55.36	FDSS-SOG-M	55.46
L 3 Bruce Highway SARINA QLD 4737	0.00	16.74	COM3-M	16.84
1 Jackson Street SARINA QLD 4737	25.29	24.56	FDSS-Stumps-S	25.29
3 Jackson Street SARINA QLD 4737	25.88	25.39	FDSS-Stumps-M	25.88
5 Jackson Street SARINA QLD 4737	26.37	25.71	FDSS-Stumps-S	26.37

45 Sarina Beach Road SARINA QLD 4737	0.00	17.60	COM3-M	17.70
45 Sarina Beach Road SARINA QLD 4737	0.00	17.69	COM3-S	17.79
31 Sarina Beach Road SARINA QLD 4737	15.41	14.96	FDSS-SOG-M	15.41
28 Sarina Beach Road SARINA QLD 4737	15.78	15.22	COM2-S	15.78
23 Sarina Beach Road SARINA QLD 4737	0.00	15.07	COM1-M	15.82
10 Graham Street SARINA QLD 4737	16.74	16.16	FDSS-Stumps-S	16.74
9 Graham Street SARINA QLD 4737	18.09	15.91	FDHS-M	18.09
41-61 Hoey Street SARINA QLD 4737	0.00	15.82	COM2-S	15.92
10 Sarina Beach Road SARINA QLD 4737	17.80	15.62	FDHS-S	17.80
24 Dawson Street SARINA QLD 4737	0.00	15.65	FDHS-S	15.96
20 Dawson Street SARINA QLD 4737	15.95	15.58	FDSS-Stumps-L	15.95
L 26 Dawson Street SARINA QLD 4737	18.48	15.96	COM2-S	16.06
16-18 Dawson Street SARINA QLD 4737	0.00	15.92	COM3-M	16.02
14 Dawson Street SARINA QLD 4737	16.07	15.83	COM3-S	16.07
13 Biltoft Street SARINA QLD 4737	15.58	15.57	COM2-S	15.67
11 Biltoft Street SARINA QLD 4737	17.78	15.66	FDDS-M	17.78
9 Biltoft Street SARINA QLD 4737	16.01	15.90	FDDS-S	16.01
12 Dawson Street SARINA QLD 4737	17.95	15.83	FDHS-S	17.95
4 Dawson Street SARINA QLD 4737	16.48	15.99	FDSS-Stumps-S	16.48
1 Biltoft Street SARINA QLD 4737	18.01	15.88	FDHS-S	18.01
7 Biltoft Street SARINA QLD 4737	15.95	15.88	FDDS-M	15.98
20 Phillip Street SARINA QLD 4737	16.86	16.22	FDSS-Stumps-S	16.86
13 Johnston Street SARINA QLD 4737	17.15	16.44	FDSS-Stumps-S	17.15
14 Johnston Street SARINA QLD 4737	17.23	16.65	FDSS-Stumps-M	17.23
18 Phillip Street SARINA QLD 4737	17.16	16.28	FDSS-Stumps-S	17.16
16 Phillip Street SARINA QLD 4737	16.99	16.38	FDSS-Stumps-S	16.99
14 Phillip Street SARINA QLD 4737	17.17	16.70	FDSS-Stumps-L	17.17
12 Phillip Street SARINA QLD 4737	17.31	16.95	FDSS-Stumps-S	17.31
10 Phillip Street SARINA QLD 4737	19.18	17.13	FDHS-S	19.18
8 Phillip Street SARINA QLD 4737	17.80	17.17	FDSS-Stumps-M	17.80
6 Phillip Street SARINA QLD 4737	19.38	17.25	FDHS-S	19.38
4 Phillip Street SARINA QLD 4737	0.00	17.08	FDSS-Stumps-S	17.18
66 Broad Street SARINA QLD 4737	18.91	16.81	FDHS-M	18.91
10 Johnston Street SARINA QLD 4737	17.27	17.12	FDHS-S	17.27
1 Dawson Street SARINA QLD 4737	16.74	16.26	FDSS-Stumps-S	16.74
3 Dawson Street SARINA QLD 4737	0.00	16.26	FDSS-Stumps-M	16.86
5 Dawson Street SARINA QLD 4737	16.72	16.07	FDSS-Stumps-S	16.72
7 Dawson Street SARINA QLD 4737	16.70	16.06	FDSS-Stumps-S	16.70

9 Dawson Street SARINA QLD 4737	16.83	16.06	FDSS-Stumps-M	16.83
11 Dawson Street SARINA QLD 4737	15.99	16.05	FDDS-S	16.15
13 Dawson Street SARINA QLD 4737	16.46	15.93	FDSS-Stumps-S	16.46
4 Sarina Beach Road SARINA QLD 4737	16.48	15.98	FDSS-Stumps-M	16.48
80 Broad Street SARINA QLD 4737	16.70	16.16	FDSS-Stumps-S	16.70
78 Broad Street SARINA QLD 4737	0.00	16.10	FDSS-SOG-S	16.49
76 Broad Street SARINA QLD 4737	16.61	16.20	FDSS-Stumps-M	16.61
72 Broad Street SARINA QLD 4737	16.69	16.28	FDSS-Stumps-M	16.69
70 Broad Street SARINA QLD 4737	16.74	16.38	FDSS-Stumps-S	16.74
68 Broad Street SARINA QLD 4737	17.45	16.49	FDSS-SOG-L	17.45
7 Sarina Beach Road SARINA QLD 4737	0.00	15.85	FDSS-SOG-S	15.95
86 Broad Street SARINA QLD 4737	15.59	15.94	FDDS-M	16.04
88 Broad Street SARINA QLD 4737	16.66	16.14	FDSS-Stumps-M	16.66
92 Broad Street SARINA QLD 4737	16.74	16.26	FDSS-Stumps-M	16.74
94 Broad Street SARINA QLD 4737	19.05	16.28	FDHS-M	16.38
96 Broad Street SARINA QLD 4737	16.49	16.17	FDSS-Stumps-M	16.49
4/104 Broad Street SARINA QLD 4737	16.14	15.85	FDSS-SOG-S	16.14
108 Broad Street SARINA QLD 4737	0.00	15.81	FDSS-Stumps-S	16.56
110 Broad Street SARINA QLD 4737	0.00	15.78	COM2-L	16.17
1 Brooks Road West SARINA QLD 4737	16.68	16.41	FDSS-Stumps-S	16.68
114 Broad Street SARINA QLD 4737	0.00	16.62	FDSS-Stumps-M	16.81
116 Broad Street SARINA QLD 4737	18.86	16.68	FDDS-S	18.86
2/122 Broad Street SARINA QLD 4737	0.00	16.62	FDSS-SOG-S	17.14
124 Broad Street SARINA QLD 4737	0.00	16.81	FDSS-SOG-M	16.91
128 Broad Street SARINA QLD 4737	0.00	16.95	FDSS-SOG-M	17.27
130 Broad Street SARINA QLD 4737	0.00	17.14	FDDS-M	17.24
138 Broad Street SARINA QLD 4737	17.13	17.05	FDSS-SOG-L	17.15
140 Broad Street SARINA QLD 4737	0.00	16.88	FDSS-SOG-L	16.98
105 Broad Street SARINA QLD 4737	17.80	17.23	FDSS-Stumps-M	17.80
99 Broad Street SARINA QLD 4737	16.43	16.85	FDHS-S	16.95
97 Broad Street SARINA QLD 4737	18.58	16.94	FDSS-Stumps-S	18.58
95 Broad Street SARINA QLD 4737	17.35	16.80	FDHS-M	17.35
93 Broad Street SARINA QLD 4737	17.43	16.80	FDSS-Stumps-S	17.43
4 Breen Street SARINA QLD 4737	19.02	17.15	FDSS-Stumps-S	19.02
6 Breen Street SARINA QLD 4737	19.26	17.46	FDSS-Stumps-S	19.26
8 Breen Street SARINA QLD 4737	17.63	17.73	FDSS-SOG-S	17.83
7 Breen Street SARINA QLD 4737	18.91	18.31	FDSS-Stumps-M	18.91
5 Breen Street SARINA QLD 4737	19.56	17.75	FDSS-Stumps-M	19.56
3 Breen Street SARINA QLD 4737	19.65	17.55	FDSS-Stumps-M	19.65
91 Broad Street SARINA QLD 4737	17.04	16.88	FDSS-Stumps-M	17.04
89 Broad Street SARINA QLD 4737	17.26	16.59	FDSS-Stumps-M	17.26
87 Broad Street SARINA QLD 4737	18.42	16.77	FDSS-Stumps-S	18.42

85 Broad Street SARINA QLD 4737	17.00	16.61	FDSS-Stumps-M	17.00
4 Venton Street SARINA QLD 4737	19.08	17.38	FDSS-Stumps-S	19.08
6 Venton Street SARINA QLD 4737	18.43	17.80	FDSS-Stumps-M	18.43
7 Venton Street SARINA QLD 4737	20.46	18.64	FDSS-Stumps-S	20.46
6 Anzac Street SARINA QLD 4737	19.82	18.21	FDSS-Stumps-S	19.82
4 Anzac Street SARINA QLD 4737	18.21	17.78	FDSS-Stumps-M	18.21
2 Anzac Street SARINA QLD 4737	18.17	17.52	FDSS-Stumps-S	18.17
75 Broad Street SARINA QLD 4737	0.00	17.29	FDSS-SOG-M	18.24
77 Broad Street SARINA QLD 4737	18.49	17.13	COM2-S	18.60
81 Broad Street SARINA QLD 4737	17.22	16.66	FDSS-Stumps-S	17.22
43 Grovely Road SARINA QLD 4737	0.00	44.87	FDSS-SOG-M	44.97
43 Grovely Road SARINA QLD 4737	0.00	46.59	FDSS-SOG-L	46.69
144 Broad Street SARINA QLD 4737	17.72	17.20	FDSS-Stumps-M	17.72
146 Broad Street SARINA QLD 4737	18.38	18.12	FDSS-SOG-M	18.38
7 Brooks Road West SARINA QLD 4737	0.00	17.93	COM2-S	18.03
7 Brooks Road West SARINA QLD 4737	0.00	16.05	COM2-M	16.15
91238 Bruce Highway SARINA QLD 4737	0.00	13.61	COM2-M	16.12
91238 Bruce Highway SARINA QLD 4737	0.00	13.80	COM2-S	14.82
91238 Bruce Highway SARINA QLD 4737	0.00	12.12	COM2-S	12.22
69 Sarina Homebush Road SARINA QLD 4737	0.00	36.50	FDSS-SOG-L	36.60
90 Broad Street SARINA QLD 4737	18.05	16.12	FDHS-S	18.05
29 Sarina Beach Road SARINA QLD 4737	15.11	14.82	FDSS-SOG-S	15.11
66 Sarina Beach Road SARINA QLD 4737	20.32	19.90	FDSS-Stumps-S	20.32
46 Sarina Beach Road SARINA QLD 4737	20.68	18.47	FDDS-S	20.68
7 Place Avenue SARINA QLD 4737	19.03	18.34	FDSS-Stumps-S	19.03
17 Place Avenue SARINA QLD 4737	24.14	22.77	FDSS-SOG-M	22.87
19 Place Avenue SARINA QLD 4737	24.18	23.83	FDDS-S	24.18
21 Place Avenue SARINA QLD 4737	24.08	23.94	FDDS-S	24.08
23 Place Avenue SARINA QLD 4737	26.17	23.40	FDSS-Stumps-M	23.70
20 Place Avenue SARINA QLD 4737	22.74	22.38	FDSS-Stumps-M	22.74
12-14 Place Avenue SARINA QLD 4737	26.56	25.78	FDSS-SOG-L	26.56
3 Holmes Avenue SARINA QLD 4737	0.00	24.77	FDHS-M	24.87
2 Lawrie Street SARINA QLD 4737	24.50	22.25	FDHS-M	24.50
10 Place Avenue SARINA QLD 4737	21.97	21.34	FDSS-SOG-L	21.97
2 Holmes Avenue SARINA QLD 4737	24.31	23.33	FDSS-Stumps-S	24.31
4 Holmes Avenue SARINA QLD 4737	24.85	23.30	FDDS-M	24.85
6 Holmes Avenue SARINA QLD 4737	0.00	24.51	FDSS-Stumps-M	24.61
10 Holmes Avenue SARINA QLD 4737	0.00	25.16	FDSS-Stumps-S	25.26
12 Holmes Avenue SARINA QLD 4737	0.00	24.59	FDSS-Stumps-M	24.69

14-16 Holmes Avenue SARINA QLD 4737	0.00	23.86	FDHS-M	23.96
18 Holmes Avenue SARINA QLD 4737	25.69	23.31	FDHS-M	25.69
20 Holmes Avenue SARINA QLD 4737	23.86	23.09	FDSS-SOG-M	23.86
26 Holmes Avenue SARINA QLD 4737	23.81	21.59	FDHS-S	23.81
24 Holmes Avenue SARINA QLD 4737	22.14	21.90	FDSS-SOG-M	22.14
28 Holmes Avenue SARINA QLD 4737	23.67	21.29	FDDS-M	23.67
30 Holmes Avenue SARINA QLD 4737	21.12	21.07	FDDS-M	21.17
35 Brooks Road SARINA QLD 4737	21.30	21.27	FDDS-M	21.37
33 Brooks Road SARINA QLD 4737	24.06	21.75	FDHS-S	24.06
31 Brooks Road SARINA QLD 4737	22.03	22.26	FDDS-S	22.36
27 Brooks Road SARINA QLD 4737	24.78	22.41	FDDS-M	24.78
19 Brooks Road SARINA QLD 4737	21.85	21.38	FDSS-Stumps-M	21.85
13 Brooks Road SARINA QLD 4737	20.73	20.07	FDSS-Stumps-M	20.73
11 Brooks Road SARINA QLD 4737	20.39	19.78	FDSS-Stumps-M	20.39
9 Brooks Road SARINA QLD 4737	21.65	19.49	FDHS-S	21.65
4 Place Avenue SARINA QLD 4737	19.07	18.80	FDSS-SOG-M	19.07
6 Place Avenue SARINA QLD 4737	19.70	19.23	FDSS-SOG-S	19.70
8 Place Avenue SARINA QLD 4737	20.80	20.10	FDSS-SOG-M	20.80
69 Hoey Street SARINA QLD 4737	19.34	17.86	FDDS-M	19.34
60 Hoey Street SARINA QLD 4737	0.00	17.47	COM1-M	17.57
60 Hoey Street SARINA QLD 4737	0.00	17.72	COM1-S	17.82
40-58 Hoey Street SARINA QLD 4737	0.00	17.38	COM2-L	17.99
40-58 Hoey Street SARINA QLD 4737	0.00	17.19	COM2-S	17.29
4 Maureen Avenue SARINA QLD 4737	0.00	17.26	COM2-S	17.36
133 Brooks Road SARINA QLD 4737	0.00	12.36	FDSS-SOG-M	12.46
125 Brooks Road SARINA QLD 4737	12.76	12.49	FDSS-SOG-L	12.76
111 Brooks Road SARINA QLD 4737	13.18	13.34	FDSS-SOG-S	13.44
81 Brooks Road SARINA QLD 4737	0.00	14.41	FDSS-SOG-L	14.51
57 Brooks Road SARINA QLD 4737	15.47	15.22	FDSS-SOG-M	15.47
55 Brooks Road SARINA QLD 4737	15.72	15.53	FDSS-SOG-S	15.72
51 Brooks Road SARINA QLD 4737	16.74	16.35	FDSS-SOG-M	16.74
49 Brooks Road SARINA QLD 4737	17.32	17.20	FDSS-SOG-S	17.32
1/41 Brooks Road SARINA QLD 4737	19.60	19.47	FDSS-SOG-S	19.60
39 Brooks Road SARINA QLD 4737	19.90	19.68	FDSS-SOG-M	19.90
2 Petersen Street SARINA QLD 4737	20.63	20.65	FDDS-M	20.75
4 Petersen Street SARINA QLD 4737	0.00	20.18	FDSS-SOG-L	20.28
6 Petersen Street SARINA QLD 4737	0.00	20.27	FDSS-SOG-M	20.37
8 Petersen Street SARINA QLD 4737	0.00	20.23	FDDS-M	20.33
10 Petersen Street SARINA QLD 4737	20.67	19.86	FDDS-L	20.67
12 Petersen Street SARINA QLD 4737	19.95	19.63	FDDS-S	19.95
14 Petersen Street SARINA QLD 4737	19.15	18.88	FDSS-SOG-L	19.15
18 Petersen Street SARINA QLD 4737	0.00	17.91	FDSS-SOG-S	18.01

20 Petersen Street SARINA QLD 4737	17.81	17.59	FDDS-S	17.81
22 Petersen Street SARINA QLD 4737	17.58	17.28	FDSS-SOG-M	17.58
24 Petersen Street SARINA QLD 4737	17.27	16.85	FDSS-SOG-M	17.27
26 Petersen Street SARINA QLD 4737	18.87	16.38	FDSS-Stumps-S	18.87
28 Petersen Street SARINA QLD 4737	15.92	15.76	FDDS-S	15.92
30 Petersen Street SARINA QLD 4737	0.00	15.45	FDDS-S	17.40
32 Petersen Street SARINA QLD 4737	15.13	14.81	FDSS-Stumps-M	15.13
21 Lilliendal Avenue SARINA QLD 4737	0.00	16.00	FDSS-SOG-S	16.10
19 Lilliendal Avenue SARINA QLD 4737	17.02	16.70	FDSS-SOG-M	17.02
17 Lilliendal Avenue SARINA QLD 4737	0.00	17.40	FDSS-SOG-S	17.50
11 Lilliendal Avenue SARINA QLD 4737	20.20	19.51	FDSS-SOG-M	20.20
9 Lilliendal Avenue SARINA QLD 4737	21.05	20.46	FDSS-Stumps-L	21.05
7 Lilliendal Avenue SARINA QLD 4737	23.48	21.12	FDSS-SOG-M	21.22
22 Place Avenue SARINA QLD 4737	21.78	21.13	FDDS-L	21.78
24 Place Avenue SARINA QLD 4737	20.83	20.68	FDSS-SOG-M	20.83
26 Place Avenue SARINA QLD 4737	20.78	19.84	FDSS-Stumps-M	20.78
28 Place Avenue SARINA QLD 4737	0.00	19.11	FDSS-Stumps-M	19.21
30 Place Avenue SARINA QLD 4737	19.46	18.60	FDSS-Stumps-S	19.46
5 Holmes Avenue SARINA QLD 4737	21.97	21.88	FDDS-S	21.98
7 Holmes Avenue SARINA QLD 4737	0.00	21.22	FDSS-Stumps-M	21.32
9 Petersen Street SARINA QLD 4737	18.44	18.36	FDHS-S	18.46
11 Petersen Street SARINA QLD 4737	0.00	17.80	FDHS-S	17.90
13 Petersen Street SARINA QLD 4737	19.73	17.17	FDHS-M	19.73
12 Kathleen Street SARINA QLD 4737	14.49	14.39	FDDS-M	14.49
14 Kathleen Street SARINA QLD 4737	17.25	14.92	FDHS-S	17.25
16 Kathleen Street SARINA QLD 4737	0.00	15.42	FDDS-S	16.58
18 Kathleen Street SARINA QLD 4737	0.00	15.68	FDDS-S	17.89
20 Kathleen Street SARINA QLD 4737	16.19	16.13	FDDS-S	16.23
22 Kathleen Street SARINA QLD 4737	0.00	16.53	FDDS-S	18.70
24 Kathleen Street SARINA QLD 4737	0.00	16.58	FDDS-S	16.68
30 Kathleen Street SARINA QLD 4737	0.00	17.89	FDDS-S	17.99
32 Kathleen Street SARINA QLD 4737	0.00	18.49	FDDS-S	18.59
34 Kathleen Street SARINA QLD 4737	0.00	18.70	FDDS-S	18.80
38 Kathleen Street SARINA QLD 4737	0.00	18.58	FDDS-S	18.68
40 Kathleen Street SARINA QLD 4737	18.15	17.82	FDSS-SOG-S	18.15
42 Kathleen Street SARINA QLD 4737	17.21	17.19	FDSS-Stumps-M	17.29
29 Kathleen Street SARINA QLD 4737	15.17	14.90	FDSS-SOG-M	15.17
27 Kathleen Street SARINA QLD 4737	13.51	15.37	FDSS-SOG-M	15.47
25 Kathleen Street SARINA QLD 4737	15.84	15.60	FDSS-SOG-S	15.84
23 Kathleen Street SARINA QLD 4737	0.00	16.70	FDDS-S	16.80
21 Kathleen Street SARINA QLD 4737	0.00	16.21	FDHS-S	18.50
17 Kathleen Street SARINA QLD 4737	0.00	15.58	FDDS-S	15.68

19 Kathleen Street SARINA QLD 4737	0.00	15.83	FDDS-S	15.93
2B Roy Street SARINA QLD 4737	15.79	14.90	FDSS-SOG-S	15.79
4 Roy Street SARINA QLD 4737	14.59	14.51	FDSS-SOG-M	14.61
8 Roy Street SARINA QLD 4737	0.00	14.23	FDSS-Stumps-S	14.33
10 Roy Street SARINA QLD 4737	14.45	14.19	FDSS-SOG-S	14.45
9 Roy Street SARINA QLD 4737	13.84	13.63	FDSS-SOG-M	13.84
7 Roy Street SARINA QLD 4737	13.93	13.81	FDSS-SOG-M	13.93
5 Roy Street SARINA QLD 4737	14.03	13.81	FDSS-SOG-S	14.03
3 Roy Street SARINA QLD 4737	14.92	13.90	FDSS-Stumps-M	14.92
1 Roy Street SARINA QLD 4737	15.12	14.08	FDSS-Stumps-S	15.12
15 Kathleen Street SARINA QLD 4737	0.00	14.86	FDDS-S	14.96
13 Kathleen Street SARINA QLD 4737	0.00	14.60	FDDS-S	14.70
11 Kathleen Street SARINA QLD 4737	16.68	14.37	FDHS-S	16.68
9 Kathleen Street SARINA QLD 4737	16.26	13.93	FDHS-S	16.26
7 Kathleen Street SARINA QLD 4737	14.50	13.57	FDSS-Stumps-S	14.50
5 Kathleen Street SARINA QLD 4737	15.66	13.38	FDSS-Stumps-S	15.66
3 Kathleen Street SARINA QLD 4737	15.56	13.15	FDHS-S	15.56
2 Elizabeth Street SARINA QLD 4737	12.98	12.92	FDSS-SOG-M	13.02
4 Elizabeth Street SARINA QLD 4737	13.23	13.12	FDSS-SOG-S	13.23
6 Elizabeth Street SARINA QLD 4737	13.64	13.47	FDSS-SOG-M	13.64
8 Elizabeth Street SARINA QLD 4737	13.72	13.45	FDSS-SOG-S	13.72
10 Elizabeth Street SARINA QLD 4737	14.43	13.58	FDSS-SOG-S	14.43
12 Elizabeth Street SARINA QLD 4737	0.00	13.38	FDDS-S	13.48
1/14 Elizabeth Street SARINA QLD 4737	13.26	12.92	FDSS-SOG-S	13.26
55 Sarina Beach Road SARINA QLD 4737	21.09	20.24	FDSS-SOG-M	21.09
11 Lawrie Street SARINA QLD 4737	20.06	19.93	FDHS-M	20.06
13 Lawrie Street SARINA QLD 4737	0.00	19.97	FDSS-Stumps-M	20.10
15 Lawrie Street SARINA QLD 4737	20.02	19.85	FDSS-SOG-L	20.02
17 Lawrie Street SARINA QLD 4737	19.76	19.71	FDSS-SOG-L	19.81
1 Ware Avenue SARINA QLD 4737	22.58	20.22	FDDS-M	22.58
3 Ware Avenue SARINA QLD 4737	20.22	20.10	FDSS-SOG-S	20.22
5 Ware Avenue SARINA QLD 4737	0.00	19.86	FDSS-SOG-S	19.96
7 Ware Avenue SARINA QLD 4737	19.88	19.80	FDSS-SOG-M	19.90
9 Ware Avenue SARINA QLD 4737	0.00	19.62	FDSS-SOG-M	19.72
11 Ware Avenue SARINA QLD 4737	0.00	19.49	FDSS-SOG-M	19.59
13 Ware Avenue SARINA QLD 4737	20.00	19.21	FDSS-Stumps-M	20.00
15 Ware Avenue SARINA QLD 4737	19.22	19.08	FDDS-M	19.22
17 Ware Avenue SARINA QLD 4737	19.24	18.97	FDSS-SOG-M	19.24
19 Ware Avenue SARINA QLD 4737	18.89	18.71	FDSS-SOG-M	18.89
4/23 Ware Avenue SARINA QLD 4737	18.68	18.66	FDSS-SOG-S	18.76
2 Ware Avenue SARINA QLD 4737	20.71	20.48	FDSS-Stumps-M	20.71

4 Ware Avenue SARINA QLD 4737	0.00	20.40	FDSS-Stumps-M	20.50
6 Ware Avenue SARINA QLD 4737	21.02	20.24	FDSS-SOG-M	21.02
63A Sarina Beach Road SARINA QLD 4737	0.00	19.42	FDSS-Stumps-S	20.64
63 Sarina Beach Road SARINA QLD 4737	0.00	19.28	FDSS-SOG-L	19.38
61 Sarina Beach Road SARINA QLD 4737	20.81	20.14	FDSS-Stumps-M	20.81
59 Sarina Beach Road SARINA QLD 4737	21.48	20.59	FDSS-Stumps-M	21.48
57 Sarina Beach Road SARINA QLD 4737	21.13	20.64	FDSS-SOG-M	21.13
65 Sarina Beach Road SARINA QLD 4737	33.99	18.26	FDSS-SOG-M	18.36
69 Sarina Beach Road SARINA QLD 4737	0.00	17.14	FDDS-M	18.89
3 Arthur Street SARINA QLD 4737	17.61	17.66	FDSS-SOG-L	17.76
20 Ware Avenue SARINA QLD 4737	17.89	18.34	FDSS-SOG-M	18.44
18 Ware Avenue SARINA QLD 4737	18.64	18.50	FDSS-SOG-S	18.64
16 Ware Avenue SARINA QLD 4737	19.04	18.89	FDDS-M	19.04
10 Arthur Street SARINA QLD 4737	18.18	18.27	FDSS-SOG-M	18.37
8 Arthur Street SARINA QLD 4737	17.70	17.78	FDDS-S	17.88
6 Arthur Street SARINA QLD 4737	17.49	17.15	FDSS-SOG-L	17.49
4 Arthur Street SARINA QLD 4737	16.97	16.78	FDSS-SOG-L	16.97
75 Sarina Beach Road SARINA QLD 4737	15.27	15.29	FDSS-SOG-S	15.39
77 Sarina Beach Road SARINA QLD 4737	0.00	15.28	FDDS-S	15.38
79 Sarina Beach Road SARINA QLD 4737	15.73	15.17	FDSS-SOG-M	15.73
81 Sarina Beach Road SARINA QLD 4737	0.00	15.15	FDDS-M	15.25
83 Sarina Beach Road SARINA QLD 4737	15.39	15.20	FDSS-SOG-M	15.39
85 Sarina Beach Road SARINA QLD 4737	15.25	15.11	FDSS-SOG-L	15.25
87 Sarina Beach Road SARINA QLD 4737	0.00	15.16	FDDS-M	15.26
89 Sarina Beach Road SARINA QLD 4737	14.93	14.92	FDSS-SOG-L	15.02
91 Sarina Beach Road SARINA QLD 4737	0.00	14.72	FDSS-SOG-M	14.82
93 Sarina Beach Road SARINA QLD 4737	14.82	14.71	FDSS-SOG-L	14.82
9 Cemetery Road SARINA QLD 4737	14.28	14.13	FDSS-SOG-L	14.28
L 9 Cemetery Road SARINA QLD 4737	14.31	14.17	FDSS-SOG-M	14.31
19 Cemetery Road SARINA QLD 4737	13.95	13.66	FDSS-SOG-L	13.95
21 Cemetery Road SARINA QLD 4737	0.00	13.72	FDSS-SOG-S	13.96

23 Cemetery Road SARINA QLD 4737	0.00	13.79	FDSS-SOG-M	13.93
25 Cemetery Road SARINA QLD 4737	0.00	13.91	FDDS-S	14.01
27 Cemetery Road SARINA QLD 4737	14.04	13.95	FDSS-SOG-S	14.05
29 Cemetery Road SARINA QLD 4737	14.90	13.96	FDSS-Stumps-M	14.90
101-153 Sarina Beach Road SARINA QLD 4737	0.00	14.05	COM3-S	14.15
101-153 Sarina Beach Road SARINA QLD 4737	0.00	14.00	COM3-S	14.10
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.90	COM3-M	14.00
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.95	COM3-S	14.05
101-153 Sarina Beach Road SARINA QLD 4737	0.00	14.01	COM3-S	14.11
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.90	COM3-S	14.00
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.61	COM3-S	13.77
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.90	COM3-S	14.00
5 Boyle Road SARINA QLD 4737	0.00	10.90	COM3-M	11.00
48 Sarina Beach Road SARINA QLD 4737	19.82	19.13	FDSS-Stumps-M	19.82
54 Sarina Beach Road SARINA QLD 4737	21.09	21.04	FDSS-SOG-M	21.14
58 Sarina Beach Road SARINA QLD 4737	21.68	21.09	FDSS-Stumps-M	21.68
25 Place Avenue SARINA QLD 4737	25.39	22.76	FDSS-Stumps-S	23.06
5 Lawrie Street SARINA QLD 4737	21.91	21.18	FDSS-SOG-M	21.91
35 Place Avenue SARINA QLD 4737	19.39	19.27	FDDS-M	19.39
37 Place Avenue SARINA QLD 4737	19.05	18.58	FDSS-Stumps-M	19.05
39 Place Avenue SARINA QLD 4737	0.00	17.97	FDSS-SOG-M	18.07
41 Place Avenue SARINA QLD 4737	19.26	17.23	FDDS-S	19.26
43 Place Avenue SARINA QLD 4737	17.40	16.45	FDSS-Stumps-S	17.40
45 Place Avenue SARINA QLD 4737	18.12	15.69	FDHS-S	18.12
47 Place Avenue SARINA QLD 4737	14.99	15.02	FDSS-Stumps-S	15.62
49 Place Avenue SARINA QLD 4737	14.59	14.55	FDDS-M	14.65
51 Place Avenue SARINA QLD 4737	0.00	13.90	FDSS-SOG-M	14.02
53 Place Avenue SARINA QLD 4737	13.18	13.46	FDDS-S	13.56
55 Place Avenue SARINA QLD 4737	0.00	13.25	FDSS-SOG-M	13.35
57 Place Avenue SARINA QLD 4737	15.41	13.08	FDDS-S	13.20
92 Sarina Beach Road SARINA QLD 4737	0.00	14.33	FDSS-Stumps-S	16.28
90 Sarina Beach Road SARINA QLD 4737	14.68	14.28	FDSS-SOG-M	14.68
84 Sarina Beach Road SARINA QLD 4737	14.81	14.78	FDDS-M	14.88

78-80 Sarina Beach Road SARINA QLD 4737	0.00	15.59	FDSS-Stumps-S	15.89
76 Sarina Beach Road SARINA QLD 4737	16.99	16.28	FDSS-SOG-S	16.99
74 Sarina Beach Road SARINA QLD 4737	17.43	16.98	FDSS-Stumps-M	17.43
72 Sarina Beach Road SARINA QLD 4737	0.00	17.75	FDSS-SOG-M	17.85
70 Sarina Beach Road SARINA QLD 4737	18.81	18.52	FDSS-SOG-M	18.81
68 Sarina Beach Road SARINA QLD 4737	0.00	19.06	FDSS-Stumps-M	19.16
48 Place Avenue SARINA QLD 4737	0.00	13.11	FDDS-S	13.21
46 Place Avenue SARINA QLD 4737	13.97	13.52	FDSS-SOG-L	13.97
44 Place Avenue SARINA QLD 4737	0.00	14.09	FDSS-SOG-L	14.96
42 Place Avenue SARINA QLD 4737	17.06	14.71	FDDS-S	17.06
38 Place Avenue SARINA QLD 4737	16.19	15.89	FDSS-SOG-S	16.19
19 Petersen Street SARINA QLD 4737	14.84	14.73	FDSS-SOG-L	14.84
17 Petersen Street SARINA QLD 4737	0.00	14.96	FDHS-S	17.16
23 Lilliendal Avenue SARINA QLD 4737	15.51	15.33	FDSS-SOG-L	15.51
40 Petersen Street SARINA QLD 4737	13.34	13.17	FDSS-SOG-L	13.34
38 Petersen Street SARINA QLD 4737	0.00	13.39	FDHS-S	15.81
2 Kathleen Street SARINA QLD 4737	12.99	12.83	FDDS-S	12.99
4 Kathleen Street SARINA QLD 4737	0.00	12.97	FDDS-S	13.54
6 Kathleen Street SARINA QLD 4737	13.02	13.18	FDHS-S	14.98
36 Petersen Street SARINA QLD 4737	0.00	13.78	FDSS-SOG-M	13.88
34 Petersen Street SARINA QLD 4737	0.00	14.12	FDSS-Stumps-M	14.22
8 Kathleen Street SARINA QLD 4737	13.15	13.54	FDHS-S	13.64
2 Fremont Avenue SARINA QLD 4737	12.96	12.66	FDSS-SOG-L	12.96
8 Fremont Avenue SARINA QLD 4737	0.00	12.21	FDDS-S	12.31
11 Hans Christian Street SARINA QLD 4737	0.00	12.28	FDSS-SOG-M	12.50
13 Hans Christian Street SARINA QLD 4737	12.46	12.18	FDSS-SOG-M	12.46
15 Hans Christian Street SARINA QLD 4737	0.00	12.13	FDSS-SOG-L	12.90
17 Hans Christian Street SARINA QLD 4737	12.27	12.03	FDSS-SOG-M	12.27
2 Michael Avenue SARINA QLD 4737	13.58	13.35	FDSS-SOG-L	13.58
4 Michael Avenue SARINA QLD 4737	13.37	13.07	FDSS-SOG-L	13.37
6 Michael Avenue SARINA QLD 4737	13.13	12.90	FDSS-SOG-L	13.13
8 Michael Avenue SARINA QLD 4737	12.72	12.53	FDSS-SOG-S	12.72
10 Michael Avenue SARINA QLD 4737	12.84	12.54	FDSS-SOG-M	12.84
12 Michael Avenue SARINA QLD 4737	0.00	12.36	FDSS-SOG-L	12.46
16 Michael Avenue SARINA QLD 4737	12.47	12.35	FDSS-SOG-M	12.47

18 Michael Avenue SARINA QLD 4737	12.58	12.41	FDSS-SOG-M	12.58
102 Sarina Beach Road SARINA QLD 4737	14.15	14.00	FDSS-SOG-L	14.15
7 Michael Avenue SARINA QLD 4737	13.58	13.47	FDSS-SOG-L	13.58
9 Michael Avenue SARINA QLD 4737	13.19	13.22	FDSS-SOG-M	13.32
1/13 Michael Avenue SARINA QLD 4737	13.24	13.06	FDSS-SOG-M	13.24
15 Michael Avenue SARINA QLD 4737	12.94	12.79	FDSS-SOG-L	12.94
17 Michael Avenue SARINA QLD 4737	12.80	12.63	FDSS-SOG-M	12.80
1 Patroyce Court SARINA QLD 4737	0.00	14.36	COM2-L	14.54
1 Patroyce Court SARINA QLD 4737	0.00	14.02	COM2-S	14.12
126 Sarina Beach Road SARINA QLD 4737	13.59	13.11	FDSS-SOG-L	13.59
10 Muggleton Street SARINA QLD 4737	0.00	11.14	FDSS-SOG-L	11.42
32 Hans Christian Street SARINA QLD 4737	0.00	12.20	FDDS-L	12.30
75 Hans Christian Street SARINA QLD 4737	0.00	10.32	FDSS-SOG-L	10.42
63 Hans Christian Street SARINA QLD 4737	0.00	11.15	FDSS-SOG-L	11.25
55 Hans Christian Street SARINA QLD 4737	19.88	11.64	FDSS-SOG-L	11.74
21 Muggleton Street SARINA QLD 4737	0.00	10.70	FDDS-M	10.80
34 Muggleton Street SARINA QLD 4737	0.00	9.86	FDSS-SOG-L	9.99
38 Muggleton Street SARINA QLD 4737	0.00	10.17	FDSS-SOG-M	10.27
35 Muggleton Street SARINA QLD 4737	0.00	9.50	FDSS-SOG-M	9.60
45 Muggleton Street SARINA QLD 4737	0.00	8.98	FDSS-SOG-L	9.08
50 Muggleton Street SARINA QLD 4737	0.00	8.67	FDDS-S	8.77
1 Kathleen Street SARINA QLD 4737	13.14	13.01	FDSS-Stumps-M	13.14
45 Sarina Beach Road SARINA QLD 4737	0.00	17.81	COM3-S	17.91
39 Sarina Beach Road SARINA QLD 4737	16.82	16.19	FDSS-SOG-S	16.82
37 Sarina Beach Road SARINA QLD 4737	16.37	15.80	FDSS-SOG-S	16.37
35 Sarina Beach Road SARINA QLD 4737	15.95	15.44	FDSS-SOG-L	15.95
33 Sarina Beach Road SARINA QLD 4737	15.47	14.97	FDSS-SOG-S	15.47
38 Sarina Beach Road SARINA QLD 4737	18.62	16.83	FDHS-S	18.62
36 Sarina Beach Road SARINA QLD 4737	16.68	16.35	FDSS-SOG-M	16.68
34 Sarina Beach Road SARINA QLD 4737	16.52	15.81	FDSS-Stumps-S	16.52
32 Sarina Beach Road SARINA QLD 4737	0.00	15.63	FDSS-Stumps-S	16.30
30 Sarina Beach Road SARINA QLD	0.00	15.43	FDSS-Stumps-S	15.80

4737

5 Brooks Road SARINA QLD 4737	17.27	16.55	FDSS-SOG-L	17.27
3 Brooks Road SARINA QLD 4737	16.42	15.99	FDSS-SOG-M	16.42
8 Graham Street SARINA QLD 4737	16.97	16.33	FDSS-Stumps-M	16.97
41-61 Hoey Street SARINA QLD 4737	0.00	15.77	COM2-S	15.87
7 Fremont Avenue SARINA QLD 4737	14.78	12.21	FDHS-S	14.78
22 Holmes Avenue SARINA QLD 4737	22.93	22.55	FDSS-SOG-M	22.93
26 Kathleen Street SARINA QLD 4737	0.00	17.09	FDDS-S	17.73
53 Brooks Road SARINA QLD 4737	16.06	15.89	FDSS-SOG-M	16.06
12-14 Hoey Street SARINA QLD 4737	0.00	17.34	COM3-S	17.53
4-10 Hoey Street SARINA QLD 4737	17.92	17.51	FDSS-Stumps-S	17.69
4-10 Hoey Street SARINA QLD 4737	17.92	17.73	FDSS-Stumps-S	18.33
4-10 Hoey Street SARINA QLD 4737	17.92	17.75	FDSS-Stumps-S	18.35
4-10 Hoey Street SARINA QLD 4737	17.92	17.53	FDSS-Stumps-S	17.70
4-10 Hoey Street SARINA QLD 4737	17.92	17.69	FDSS-Stumps-S	17.79
4-10 Hoey Street SARINA QLD 4737	17.92	17.61	FDSS-Stumps-S	18.00
4-10 Hoey Street SARINA QLD 4737	17.92	17.68	FDSS-Stumps-M	18.11
4-10 Hoey Street SARINA QLD 4737	17.92	17.70	FDSS-Stumps-M	17.87
4-10 Hoey Street SARINA QLD 4737	17.92	17.70	FDSS-Stumps-M	17.80
4-10 Hoey Street SARINA QLD 4737	17.92	17.96	FDSS-Stumps-S	18.06
4-10 Hoey Street SARINA QLD 4737	17.92	18.01	FDSS-Stumps-S	18.61
23 Brewers Road SARINA QLD 4737	0.00	17.87	FDSS-Stumps-M	17.97
21 Brewers Road SARINA QLD 4737	0.00	17.77	FDSS-SOG-M	17.87
19 Brewers Road SARINA QLD 4737	19.71	17.68	FDSS-Stumps-S	19.71
27 Brewers Road SARINA QLD 4737	17.68	17.62	FDSS-SOG-M	17.72
29 Brewers Road SARINA QLD 4737	17.80	17.51	FDSS-SOG-M	17.80
31-33 Brewers Road SARINA QLD 4737	0.00	17.30	COM2-S	17.49
L 12 Brewers Road SARINA QLD 4737	17.57	17.54	FDDS-L	17.64
35 Brewers Road SARINA QLD 4737	18.11	17.45	FDSS-SOG-S	18.11
37 Brewers Road SARINA QLD 4737	0.00	17.79	FDSS-SOG-M	17.89
41-45 Brewers Road SARINA QLD 4737	17.43	17.49	FDSS-SOG-L	17.59
44 Brewers Road SARINA QLD 4737	19.48	17.43	FDHS-S	19.48
40 Brewers Road SARINA QLD 4737	19.94	17.50	FDSS-Stumps-S	19.94
38 Brewers Road SARINA QLD 4737	0.00	17.40	FDHS-S	19.81
36 Brewers Road SARINA QLD 4737	19.46	17.48	FDSS-Stumps-S	19.46
32 Brewers Road SARINA QLD 4737	0.00	17.42	FDSS-Stumps-S	17.81
28 Brewers Road SARINA QLD 4737	18.25	17.60	FDSS-Stumps-S	18.25
30 Brewers Road SARINA QLD 4737	18.25	17.50	FDSS-Stumps-S	18.25
26 Brewers Road SARINA QLD 4737	17.38	17.49	FDHS-M	19.29
24 Brewers Road SARINA QLD 4737	0.00	17.46	FDSS-SOG-S	17.56
61-75 Brewers Road SARINA QLD 4737	0.00	43.58	FDDS-M	43.68
61-75 Brewers Road SARINA QLD 4737	0.00	29.24	FDSS-SOG-L	29.34

100 Brewers Road SARINA QLD 4737	0.00	28.55	FDSS-SOG-M	28.65
18 East Street SARINA QLD 4737	19.36	17.39	FDHS-S	19.36
4 Maureen Avenue SARINA QLD 4737	0.00	17.41	COM2-S	17.51
47 Cemetery Road SARINA QLD 4737	13.91	13.84	FDSS-SOG-M	13.94
6 Millenium Drive SARINA QLD 4737	13.56	13.39	FDSS-SOG-L	13.56
10 Millenium Drive SARINA QLD 4737	13.01	12.88	FDSS-SOG-L	13.01
12 Millenium Drive SARINA QLD 4737	12.75	12.62	FDSS-SOG-L	12.75
14 Millenium Drive SARINA QLD 4737	12.58	12.52	FDSS-SOG-L	12.62
16 Millenium Drive SARINA QLD 4737	12.49	12.34	FDSS-SOG-L	12.49
11 Millenium Drive SARINA QLD 4737	12.64	12.56	FDSS-SOG-L	12.66
9 Millenium Drive SARINA QLD 4737	12.72	12.60	FDSS-SOG-M	12.72
49 Pacific Avenue SARINA QLD 4737	12.73	12.77	FDSS-SOG-M	12.87
47 Pacific Avenue SARINA QLD 4737	12.81	12.77	FDSS-SOG-L	12.87
43 Pacific Avenue SARINA QLD 4737	12.88	12.84	FDSS-SOG-M	12.94
11 Reef Drive SARINA QLD 4737	12.86	12.78	FDSS-SOG-L	12.88
13 Reef Drive SARINA QLD 4737	12.94	12.87	FDSS-SOG-L	12.97
17 Reef Drive SARINA QLD 4737	13.47	13.31	FDSS-SOG-L	13.47
31 Pacific Avenue SARINA QLD 4737	13.64	13.50	FDSS-SOG-L	13.64
29 Pacific Avenue SARINA QLD 4737	13.58	13.60	FDSS-SOG-L	13.70
27 Pacific Avenue SARINA QLD 4737	13.84	13.79	FDSS-SOG-L	13.89
19 Reef Drive SARINA QLD 4737	13.68	13.55	FDSS-SOG-L	13.68
21 Reef Drive SARINA QLD 4737	13.80	13.82	FDSS-SOG-L	13.92
35 Pacific Avenue SARINA QLD 4737	13.16	13.05	FDSS-SOG-L	13.16
37 Pacific Avenue SARINA QLD 4737	13.06	13.01	FDSS-SOG-M	13.11
33 Pacific Avenue SARINA QLD 4737	13.36	13.24	FDSS-SOG-L	13.36
32 Pacific Avenue SARINA QLD 4737	13.32	13.24	FDSS-SOG-L	13.34
38 Pacific Avenue SARINA QLD 4737	13.06	12.85	FDSS-SOG-L	13.06
40 Pacific Avenue SARINA QLD 4737	0.00	12.84	FDSS-SOG-L	12.94
42 Pacific Avenue SARINA QLD 4737	12.93	12.84	FDSS-SOG-L	12.94
44 Pacific Avenue SARINA QLD 4737	12.96	12.86	FDSS-SOG-L	12.96
5 Millenium Drive SARINA QLD 4737	13.58	13.45	FDSS-SOG-M	13.58
31 Cemetery Road SARINA QLD 4737	14.13	13.92	FDSS-SOG-M	14.13
20 Millenium Drive SARINA QLD 4737	11.74	11.69	FDSS-SOG-M	11.79
22 Millenium Drive SARINA QLD 4737	11.78	11.77	FDSS-SOG-L	11.87
28 Millenium Drive SARINA QLD 4737	12.08	11.94	FDSS-SOG-L	12.08
30 Millenium Drive SARINA QLD 4737	12.25	12.19	FDSS-SOG-M	12.29
32 Millenium Drive SARINA QLD 4737	12.47	12.32	FDSS-SOG-L	12.47
25 Millenium Drive SARINA QLD 4737	12.68	12.60	FDSS-SOG-L	12.70
23 Millenium Drive SARINA QLD 4737	12.54	12.42	FDSS-SOG-L	12.54
21 Millenium Drive SARINA QLD 4737	12.34	12.34	FDSS-SOG-L	12.44
8 Ocean Court SARINA QLD 4737	12.47	12.23	FDSS-SOG-L	12.47
7 Ocean Court SARINA QLD 4737	12.89	12.69	FDSS-SOG-L	12.89

5 Ocean Court SARINA QLD 4737	13.42	13.29	FDSS-SOG-L	13.42
3 Ocean Court SARINA QLD 4737	13.47	13.33	FDSS-SOG-L	13.47
40 Millenium Drive SARINA QLD 4737	13.39	13.12	FDSS-SOG-M	13.39
42 Millenium Drive SARINA QLD 4737	13.45	11.27	FDSS-SOG-L	11.37
1/46 Millenium Drive SARINA QLD 4737	14.00	13.95	FDSS-SOG-L	14.05
48 Millenium Drive SARINA QLD 4737	14.15	14.05	FDSS-SOG-L	14.15
50 Millenium Drive SARINA QLD 4737	14.25	14.20	FDSS-SOG-L	14.30
4 Ocean Court SARINA QLD 4737	12.68	12.51	FDSS-SOG-M	12.68
2 Ocean Court SARINA QLD 4737	12.79	12.66	FDSS-SOG-M	12.79
27 Millenium Drive SARINA QLD 4737	13.01	12.92	FDSS-SOG-L	13.02
6 Reef Drive SARINA QLD 4737	12.78	12.71	FDSS-SOG-L	12.81
1/8 Reef Drive SARINA QLD 4737	12.67	12.52	FDSS-SOG-L	12.67
31 Millenium Drive SARINA QLD 4737	13.33	13.30	FDSS-SOG-L	13.40
33 Millenium Drive SARINA QLD 4737	13.55	13.46	FDSS-SOG-L	13.56
35 Millenium Drive SARINA QLD 4737	13.69	13.64	FDSS-SOG-L	13.74
37 Millenium Drive SARINA QLD 4737	13.96	13.91	FDSS-SOG-L	14.01
39 Millenium Drive SARINA QLD 4737	14.06	14.02	FDSS-SOG-L	14.12
41 Millenium Drive SARINA QLD 4737	14.43	14.35	FDSS-SOG-L	14.45
10 Credlin Court SARINA QLD 4737	13.61	13.55	FDSS-SOG-L	13.65
7 Credlin Court SARINA QLD 4737	13.88	13.80	FDSS-SOG-L	13.90
5 Credlin Court SARINA QLD 4737	13.70	13.64	FDSS-SOG-L	13.74
3 Credlin Court SARINA QLD 4737	13.86	13.71	FDSS-SOG-L	13.86
16 Reef Drive SARINA QLD 4737	13.62	13.42	FDSS-SOG-L	13.62
18-20 Reef Drive SARINA QLD 4737	14.59	14.48	FDSS-SOG-L	14.59
6 Hook Court SARINA QLD 4737	15.10	15.04	FDSS-SOG-L	15.14
2 Hook Court SARINA QLD 4737	14.84	12.25	FDSS-SOG-L	12.35
10 Hook Court SARINA QLD 4737	15.29	15.07	FDSS-SOG-L	15.29
11 Hook Court SARINA QLD 4737	0.00	15.01	FDSS-SOG-L	15.11
9 Hook Court SARINA QLD 4737	0.00	16.14	FDSS-SOG-L	16.93
9 Credlin Court SARINA QLD 4737	13.86	13.71	FDSS-SOG-L	13.86
14 Reef Drive SARINA QLD 4737	13.12	12.99	FDSS-SOG-M	13.12
12 Reef Drive SARINA QLD 4737	12.94	12.73	FDSS-SOG-M	12.94
30 Reef Drive SARINA QLD 4737	16.93	16.93	FDSS-SOG-M	17.03
28 Reef Drive SARINA QLD 4737	16.80	16.65	FDSS-SOG-L	16.80
1/1 Hook Court SARINA QLD 4737	16.52	16.19	FDSS-SOG-M	16.52
3 Hook Court SARINA QLD 4737	16.21	12.48	FDSS-SOG-L	12.58
2/25 Reef Drive SARINA QLD 4737	0.00	14.80	FDSS-SOG-M	15.46
17 Pacific Avenue SARINA QLD 4737	14.88	14.80	FDSS-SOG-L	14.90
15 Pacific Avenue SARINA QLD 4737	15.27	15.10	FDSS-SOG-L	15.27
27 Reef Drive SARINA QLD 4737	14.99	14.96	FDSS-SOG-L	15.06
29 Reef Drive SARINA QLD 4737	15.10	15.03	FDSS-SOG-L	15.13
13 Pacific Avenue SARINA QLD 4737	15.58	15.46	FDSS-SOG-L	15.58

11 Pacific Avenue SARINA QLD 4737	16.06	15.92	FDSS-SOG-L	16.06
9 Pacific Avenue SARINA QLD 4737	16.20	16.21	FDSS-SOG-L	16.31
33-35 Reef Drive SARINA QLD 4737	16.30	16.17	FDSS-SOG-L	16.30
7 Pacific Avenue SARINA QLD 4737	0.00	16.53	FDSS-SOG-L	16.63
5 Pacific Avenue SARINA QLD 4737	17.17	17.18	FDSS-SOG-L	17.28
6 Pacific Avenue SARINA QLD 4737	16.87	16.75	FDSS-SOG-L	16.87
10 Pacific Avenue SARINA QLD 4737	16.06	16.08	FDSS-SOG-L	16.18
14 Pacific Avenue SARINA QLD 4737	15.65	15.54	FDSS-SOG-L	15.65
16 Pacific Avenue SARINA QLD 4737	15.29	15.25	FDSS-SOG-L	15.35
18 Pacific Avenue SARINA QLD 4737	15.15	15.02	FDSS-SOG-L	15.15
20 Pacific Avenue SARINA QLD 4737	14.93	14.97	COM2-S	15.07
22 Pacific Avenue SARINA QLD 4737	0.00	14.52	FDSS-SOG-M	14.62
26 Pacific Avenue SARINA QLD 4737	14.13	13.90	FDSS-SOG-L	14.13
30 Pacific Avenue SARINA QLD 4737	0.00	13.57	FDSS-SOG-L	13.82
7 Cemetery Road SARINA QLD 4737	14.22	14.01	FDSS-SOG-L	14.22
4 Patroyce Court SARINA QLD 4737	0.00	13.87	FDSS-SOG-M	13.97
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.65	COM3-S	13.75
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.51	COM3-S	13.61
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.35	COM3-M	13.45
101-153 Sarina Beach Road SARINA QLD 4737	0.00	14.37	COM3-M	14.47
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.82	COM3-M	13.92
5 Cyril McKie Court SARINA QLD 4737	0.00	11.51	COM3-M	11.61
6 Cyril McKie Court SARINA QLD 4737	0.00	12.11	COM3-M	12.21
6 Cyril McKie Court SARINA QLD 4737	0.00	12.08	COM3-S	12.18
4 Cyril McKie Court SARINA QLD 4737	11.80	11.73	COM3-S	11.83
4 Cyril McKie Court SARINA QLD 4737	11.80	11.95	COM3-S	12.05
7 Patch Street SARINA QLD 4737	11.75	11.73	COM3-S	11.83
3 Boyle Road SARINA QLD 4737	0.00	10.98	COM3-M	11.08
1 Patch Street SARINA QLD 4737	10.78	10.77	COM3-S	10.87
1 Patch Street SARINA QLD 4737	10.78	7.34	COM3-S	7.44
3 Cyril McKie Court SARINA QLD 4737	10.98	10.95	COM3-M	11.05
2 Patch Street SARINA QLD 4737	0.00	10.69	COM3-M	10.79
6 Patch Street SARINA QLD 4737	10.60	10.78	COM3-M	10.88
L 9 Patch Street SARINA QLD 4737	11.03	11.15	COM3-M	11.25
L 9 Patch Street SARINA QLD 4737	11.03	10.54	COM3-S	11.03
12 Patch Street SARINA QLD 4737	11.39	11.15	COM3-M	11.39
14 Patch Street SARINA QLD 4737	10.97	10.90	COM3-M	11.00
16 Patch Street SARINA QLD 4737	0.00	10.70	COM3-L	10.80

73 Sarina Beach Road SARINA QLD 4737	16.82	16.23	FDSS-SOG-M	16.82
71 Sarina Beach Road SARINA QLD 4737	0.00	16.57	FDSS-SOG-L	17.08
67 Sarina Beach Road SARINA QLD 4737	0.00	17.64	FDDS-L	17.74
10 Ware Avenue SARINA QLD 4737	19.96	19.95	FDSS-SOG-L	20.05
8 Ware Avenue SARINA QLD 4737	20.36	20.05	FDSS-SOG-L	20.36
53 Sarina Beach Road SARINA QLD 4737	20.59	19.77	FDSS-SOG-L	20.59
51 Sarina Beach Road SARINA QLD 4737	21.88	19.48	FDSS-Stumps-S	21.88
49 Sarina Beach Road SARINA QLD 4737	19.08	18.65	FDDS-S	19.08
43 Sarina Beach Road SARINA QLD 4737	17.60	17.08	FDSS-Stumps-S	17.60
41 Sarina Beach Road SARINA QLD 4737	17.30	16.54	FDSS-SOG-S	17.30
47 Sarina Beach Road SARINA QLD 4737	18.14	18.16	FDDS-M	18.26
52 Sarina Beach Road SARINA QLD 4737	20.88	20.22	FDSS-Stumps-M	20.88
15 Place Avenue SARINA QLD 4737	0.00	21.35	FDDS-M	21.45
22 Ware Avenue SARINA QLD 4737	20.27	17.88	FDDS-M	20.27
21 Ware Avenue SARINA QLD 4737	0.00	18.51	FDDS-M	18.85
28 Sarina Beach Road SARINA QLD 4737	15.78	15.76	COM2-S	15.86
5 Place Avenue SARINA QLD 4737	18.34	17.76	FDSS-Stumps-S	18.34
40 Sarina Beach Road SARINA QLD 4737	17.89	17.23	FDSS-Stumps-M	17.89
42 Sarina Beach Road SARINA QLD 4737	17.76	17.62	FDDS-M	17.76
44 Sarina Beach Road SARINA QLD 4737	18.80	17.95	FDSS-Stumps-M	18.80
13 Place Avenue SARINA QLD 4737	0.00	19.90	FDSS-SOG-S	20.00
9 Place Avenue SARINA QLD 4737	19.82	18.85	FDSS-Stumps-M	19.82
2/11 Place Avenue SARINA QLD 4737	0.00	19.36	FDSS-Stumps-M	19.46
3/11 Place Avenue SARINA QLD 4737	0.00	18.70	FDSS-Stumps-M	18.80
27 Place Avenue SARINA QLD 4737	21.82	21.92	FDDS-S	22.02
56 Sarina Beach Road SARINA QLD 4737	21.62	21.03	FDSS-Stumps-S	21.62
60 Sarina Beach Road SARINA QLD 4737	21.68	21.15	FDSS-SOG-L	21.68
62 Sarina Beach Road SARINA QLD 4737	22.21	21.24	FDSS-Stumps-S	22.21
31 Place Avenue SARINA QLD 4737	21.50	20.80	FDSS-SOG-L	21.50
59 Place Avenue SARINA QLD 4737	13.02	12.90	FDSS-SOG-L	13.02
23 Petersen Street SARINA QLD 4737	13.20	13.04	FDSS-SOG-M	13.20

2 Place Avenue SARINA QLD 4737	18.72	17.91	FDSS-Stumps-S	18.72
8 Holmes Avenue SARINA QLD 4737	25.92	24.97	FDSS-Stumps-L	25.92
25 Brooks Road SARINA QLD 4737	22.26	22.33	FDDS-L	22.43
3 Lilliendal Avenue SARINA QLD 4737	23.54	23.52	FDSS-SOG-L	23.62
18 Place Avenue SARINA QLD 4737	24.02	23.83	FDSS-SOG-M	24.02
16 Place Avenue SARINA QLD 4737	0.00	24.74	FDSS-Stumps-L	24.84
11 Holmes Avenue SARINA QLD 4737	20.72	20.72	FDHS-L	22.52
4 Lilliendal Avenue SARINA QLD 4737	21.21	20.42	FDSS-Stumps-L	21.21
6 Lilliendal Avenue SARINA QLD 4737	19.84	19.17	FDSS-Stumps-L	19.84
36 Place Avenue SARINA QLD 4737	0.00	16.51	FDHS-M	18.76
15 Lilliendal Avenue SARINA QLD 4737	0.00	18.24	FDSS-SOG-L	18.34
15 Petersen Street SARINA QLD 4737	16.49	16.62	FDSS-SOG-L	16.72
2 Hans Christian Street SARINA QLD 4737	13.21	13.05	FDSS-SOG-L	13.21
7 Patroyce Court SARINA QLD 4737	0.00	13.73	FDSS-SOG-M	13.92
9 Patroyce Court SARINA QLD 4737	0.00	13.68	FDSS-SOG-L	13.78
11 Patroyce Court SARINA QLD 4737	0.00	13.66	FDSS-SOG-L	13.85
15 Patroyce Court SARINA QLD 4737	0.00	13.30	FDSS-SOG-L	13.60
24 Patroyce Court SARINA QLD 4737	0.00	12.96	FDSS-SOG-L	13.12
22 Patroyce Court SARINA QLD 4737	0.00	13.02	FDSS-SOG-M	13.16
20 Patroyce Court SARINA QLD 4737	0.00	13.15	FDSS-SOG-L	13.32
23 Michael Avenue SARINA QLD 4737	12.28	12.19	FDSS-SOG-L	12.29
1 Hans Christian Street SARINA QLD 4737	12.94	12.59	FDSS-SOG-L	12.94
3 Hans Christian Street SARINA QLD 4737	0.00	12.46	FDSS-SOG-M	12.61
4 Fremont Avenue SARINA QLD 4737	12.88	12.50	FDSS-SOG-L	12.88
10 Fremont Avenue SARINA QLD 4737	12.49	12.16	FDSS-SOG-M	12.49
12 Fremont Avenue SARINA QLD 4737	12.46	12.18	FDSS-SOG-M	12.46
14 Fremont Avenue SARINA QLD 4737	12.40	12.13	FDSS-SOG-M	12.40
16 Fremont Avenue SARINA QLD 4737	12.08	11.99	FDSS-SOG-M	12.09
19-27 Hans Christian Street SARINA QLD 4737	12.43	12.08	FDSS-SOG-L	12.43
51 Hans Christian Street SARINA QLD 4737	12.11	11.95	FDSS-SOG-L	12.11
1 Fremont Avenue SARINA QLD 4737	13.45	13.18	FDSS-SOG-M	13.45
13 Fremont Avenue SARINA QLD 4737	12.46	12.19	FDSS-SOG-M	12.46
15 Fremont Avenue SARINA QLD 4737	12.46	12.22	FDSS-SOG-M	12.46
14 Michael Avenue SARINA QLD 4737	0.00	12.31	FDSS-SOG-M	13.18
20 Michael Avenue SARINA QLD 4737	12.27	12.23	FDSS-SOG-L	12.33
24 Michael Avenue SARINA QLD 4737	0.00	12.02	FDSS-SOG-M	12.20
19 Michael Avenue SARINA QLD 4737	12.40	12.44	FDSS-SOG-M	12.54
10 Patroyce Court SARINA QLD 4737	0.00	13.71	FDSS-SOG-L	13.88

8 Patroyce Court SARINA QLD 4737	13.92	13.81	FDSS-SOG-M	13.92
12 Patroyce Court SARINA QLD 4737	0.00	13.75	FDSS-SOG-M	13.92
18 Patroyce Court SARINA QLD 4737	0.00	13.18	FDSS-SOG-M	13.42
1 Patroyce Court SARINA QLD 4737	0.00	13.91	COM2-S	14.01
47 Muggleton Street SARINA QLD 4737	9.22	9.20	FDSS-SOG-L	9.30
29 Muggleton Street SARINA QLD 4737	0.00	8.60	FDSS-Stumps-L	9.71
14 Hans Christian Street SARINA QLD 4737	12.67	12.51	FDSS-SOG-M	12.67
6 Brownsey Court SARINA QLD 4737	12.70	12.57	FDSS-SOG-L	12.70
4 Brownsey Court SARINA QLD 4737	13.00	12.71	FDSS-SOG-L	13.00
1 Brownsey Court SARINA QLD 4737	12.38	12.20	FDSS-SOG-L	12.38
3 Brownsey Court SARINA QLD 4737	12.60	12.30	FDSS-SOG-M	12.60
8 Lando Avenue SARINA QLD 4737	12.34	12.05	FDSS-SOG-M	12.34
12 Lando Avenue SARINA QLD 4737	12.33	12.05	FDSS-SOG-M	12.33
20 Lando Avenue SARINA QLD 4737	12.79	12.63	FDSS-SOG-L	12.79
9 Brownsey Court SARINA QLD 4737	0.00	11.13	FDSS-Stumps-L	12.81
L 3 Elizabeth Street SARINA QLD 4737	13.02	12.93	COM1-M	13.03
17 Lando Avenue SARINA QLD 4737	12.50	12.27	FDSS-SOG-M	12.50
15 Lando Avenue SARINA QLD 4737	12.40	12.21	FDSS-SOG-L	12.40
11 Lando Avenue SARINA QLD 4737	0.00	12.17	FDSS-SOG-M	13.02
9 Lando Avenue SARINA QLD 4737	0.00	12.19	FDSS-SOG-L	12.29
5 Lando Avenue SARINA QLD 4737	12.35	12.14	FDSS-SOG-M	12.35
1 Lando Avenue SARINA QLD 4737	12.44	12.10	FDSS-SOG-L	12.44
54 Hans Christian Street SARINA QLD 4737	0.00	11.86	FDSS-SOG-L	11.96
68 Hans Christian Street SARINA QLD 4737	0.00	10.58	FDSS-SOG-L	10.68
74 Hans Christian Street SARINA QLD 4737	0.00	10.00	FDSS-SOG-L	10.10
121 Brooks Road SARINA QLD 4737	0.00	12.42	FDSS-SOG-L	12.52
113 Brooks Road SARINA QLD 4737	0.00	15.36	FDSS-SOG-L	15.46
83 Brooks Road SARINA QLD 4737	0.00	14.02	FDSS-SOG-M	14.12
47 Brooks Road SARINA QLD 4737	18.20	18.07	FDSS-SOG-M	18.20
45 Brooks Road SARINA QLD 4737	18.54	18.29	FDSS-SOG-L	18.54
43 Brooks Road SARINA QLD 4737	18.98	18.68	FDSS-SOG-M	18.98
28 Kathleen Street SARINA QLD 4737	0.00	17.60	FDDS-S	17.70
6 Roy Street SARINA QLD 4737	14.63	14.36	FDSS-SOG-S	14.63
17 Kathleen Street SARINA QLD 4737	0.00	15.22	FDDS-S	15.32
18-26 Sarina Beach Road SARINA QLD 4737	0.00	15.26	COM2-M	15.36
41-61 Hoey Street SARINA QLD 4737	0.00	15.96	COM2-M	16.06
41-61 Hoey Street SARINA QLD 4737	0.00	17.19	COM2-M	17.48
41-61 Hoey Street SARINA QLD 4737	0.00	16.92	COM2-M	17.02

3/5 Graham Street SARINA QLD 4737	16.76	16.63	FDSS-SOG-M	16.76
5/5 Graham Street SARINA QLD 4737	0.00	16.61	FDSS-SOG-M	16.71
2/5 Graham Street SARINA QLD 4737	16.36	16.32	FDSS-SOG-M	16.42
6 Graham Street SARINA QLD 4737	16.93	16.71	FDSS-SOG-L	16.93
4 Graham Street SARINA QLD 4737	17.63	16.85	FDSS-SOG-L	17.63
60 Hoey Street SARINA QLD 4737	0.00	17.47	COM1-M	17.72
40-58 Hoey Street SARINA QLD 4737	0.00	17.13	COM2-S	17.23
40-58 Hoey Street SARINA QLD 4737	0.00	17.03	COM2-S	17.75
18-32 Hoey Street SARINA QLD 4737	17.74	17.51	COM2-S	17.61
18-32 Hoey Street SARINA QLD 4737	17.74	17.66	COM2-M	17.76
18-32 Hoey Street SARINA QLD 4737	17.74	17.67	COM2-M	17.77
18-32 Hoey Street SARINA QLD 4737	17.74	17.59	COM2-M	17.69
18-32 Hoey Street SARINA QLD 4737	17.74	17.61	COM2-M	17.71
18-32 Hoey Street SARINA QLD 4737	17.74	17.68	COM2-S	17.78
18-32 Hoey Street SARINA QLD 4737	17.74	17.72	COM2-S	17.82
18-32 Hoey Street SARINA QLD 4737	17.74	17.72	COM2-S	17.82
18-32 Hoey Street SARINA QLD 4737	17.74	17.75	COM2-M	17.85
18-32 Hoey Street SARINA QLD 4737	17.74	17.43	COM2-S	17.53
18-32 Hoey Street SARINA QLD 4737	17.74	17.42	COM2-S	17.52
4-10 Hoey Street SARINA QLD 4737	17.92	17.77	FDSS-Stumps-S	17.87
4-10 Hoey Street SARINA QLD 4737	17.92	17.53	FDSS-Stumps-S	17.74
4-10 Hoey Street SARINA QLD 4737	17.92	17.81	FDSS-Stumps-S	18.02
4-10 Hoey Street SARINA QLD 4737	17.92	17.98	FDSS-Stumps-S	18.08
4-10 Hoey Street SARINA QLD 4737	17.92	17.94	FDSS-Stumps-S	18.04
4-10 Hoey Street SARINA QLD 4737	17.92	17.95	FDSS-Stumps-S	18.05
39 Brewers Road SARINA QLD 4737	17.33	17.94	COM3-M	18.04
59 Brewers Road SARINA QLD 4737	17.69	17.82	COM3-L	17.92
59 Brewers Road SARINA QLD 4737	17.69	17.57	COM3-S	17.69
62 Brewers Road SARINA QLD 4737	0.00	18.26	COM3-S	18.36
L 81 Broad Street SARINA QLD 4737	18.98	18.48	COM2-L	18.98
5 Railway Square SARINA QLD 4737	19.88	18.02	COM2-S	18.12
5 Railway Square SARINA QLD 4737	19.88	18.68	COM2-M	19.88
5 Railway Square SARINA QLD 4737	19.88	18.52	COM2-S	19.88
3-5 Broad Street SARINA QLD 4737	0.00	18.25	COM3-L	18.35
1-3 Railway Square SARINA QLD 4737	18.54	17.44	COM2-S	17.54
1-3 Railway Square SARINA QLD 4737	18.54	18.00	COM2-M	18.54
L 3 Mill Street SARINA QLD 4737	0.00	19.78	COM3-M	19.88
27 Collins Avenue SARINA QLD 4737	0.00	30.08	FDSS-SOG-L	30.18
19 Collins Avenue SARINA QLD 4737	0.00	26.03	FDSS-SOG-L	26.13
15 Collins Avenue SARINA QLD 4737	0.00	24.94	FDSS-SOG-L	25.04
6 Collins Avenue SARINA QLD 4737	0.00	20.02	FDSS-SOG-L	20.32
20 Collins Avenue SARINA QLD 4737	0.00	27.41	FDSS-SOG-L	27.51

14 Collins Avenue SARINA QLD 4737	0.00	21.73	FDSS-SOG-L	21.83
8 Collins Avenue SARINA QLD 4737	0.00	19.05	FDSS-SOG-L	19.15
40 Sarina Homebush Road SARINA QLD 4737	0.00	17.78	FDSS-SOG-L	17.88
34 Sarina Homebush Road SARINA QLD 4737	0.00	16.07	COM3-M	16.17
34 Sarina Homebush Road SARINA QLD 4737	0.00	16.17	COM3-S	16.27
2 Collins Avenue SARINA QLD 4737	0.00	18.86	COM2-M	18.96
91330 Bruce Highway SARINA QLD 4737	0.00	18.48	FDSS-SOG-L	18.58
91328 Bruce Highway SARINA QLD 4737	0.00	20.32	FDSS-SOG-L	20.42
91338 Bruce Highway SARINA QLD 4737	0.00	30.01	FDSS-SOG-L	30.11
91238 Bruce Highway SARINA QLD 4737	0.00	12.24	COM2-S	12.34
91238 Bruce Highway SARINA QLD 4737	0.00	12.41	COM2-S	12.51
91238 Bruce Highway SARINA QLD 4737	0.00	12.48	COM2-S	12.58
91238 Bruce Highway SARINA QLD 4737	0.00	12.51	COM2-S	12.61
91238 Bruce Highway SARINA QLD 4737	0.00	12.45	COM2-M	12.55
91238 Bruce Highway SARINA QLD 4737	0.00	13.73	COM2-M	13.83
91238 Bruce Highway SARINA QLD 4737	0.00	14.41	COM2-L	14.51
91238 Bruce Highway SARINA QLD 4737	0.00	14.53	COM2-S	14.63
91238 Bruce Highway SARINA QLD 4737	0.00	14.77	COM2-M	14.87
91238 Bruce Highway SARINA QLD 4737	0.00	15.36	COM2-S	15.46
88 Cemetery Road SARINA QLD 4737	0.00	11.56	FDSS-SOG-L	11.66
78 Cemetery Road SARINA QLD 4737	0.00	9.67	FDSS-SOG-L	9.77
241 Sarina Beach Road SARINA QLD 4737	0.00	9.29	FDSS-SOG-M	9.46
233 Sarina Beach Road SARINA QLD 4737	0.00	9.41	FDSS-SOG-L	9.51
264 Sarina Beach Road SARINA QLD 4737	0.00	11.31	COM2-M	11.41
264 Sarina Beach Road SARINA QLD 4737	0.00	11.93	COM2-S	12.03
264 Sarina Beach Road SARINA QLD 4737	0.00	10.84	COM2-M	10.94
23 Muggleton Street SARINA QLD 4737	9.33	9.42	FDSS-SOG-L	9.52
28 Jackson Street SARINA QLD 4737	36.77	36.60	FDSS-Stumps-L	36.77
30 Jackson Street SARINA QLD 4737	39.33	39.39	FDSS-SOG-L	39.49
34 Jackson Street SARINA QLD 4737	45.52	45.44	FDSS-Stumps-L	45.54
8-12 Diamond Crescent SARINA QLD 4737	34.94	36.61	FDSS-SOG-M	36.71
4 Diamond Crescent SARINA QLD 4737	32.50	32.47	FDSS-Stumps-M	32.57
22 Jackson Street SARINA QLD 4737	31.57	31.08	FDSS-Stumps-M	31.57
24-26 Jackson Street SARINA QLD 4737	33.53	33.51	FDSS-Stumps-L	33.61
38 Jackson Street SARINA QLD 4737	0.00	51.29	FDDS-M	51.39
40 Jackson Street SARINA QLD 4737	0.00	52.59	FDDS-M	52.69

42 Jackson Street SARINA QLD 4737	0.00	51.55	FDDS-S	51.65
44 Jackson Street SARINA QLD 4737	45.20	45.32	FDHS-M	47.12
46 Jackson Street SARINA QLD 4737	42.83	43.57	FDHS-L	43.67
48 Jackson Street SARINA QLD 4737	41.87	22.40	FDDS-L	22.50
4 Mark Andrew Terrace SARINA QLD 4737	48.16	47.55	FDSS-Stumps-M	48.16
2/50 Jackson Street SARINA QLD 4737	41.34	41.98	FDSS-Stumps-M	42.08
52 Jackson Street SARINA QLD 4737	42.35	42.25	FDSS-SOG-M	42.35
56 Jackson Street SARINA QLD 4737	44.86	44.68	FDSS-Stumps-L	44.86
58 Jackson Street SARINA QLD 4737	47.89	47.32	FDSS-Stumps-L	47.89
60 Jackson Street SARINA QLD 4737	47.65	47.51	FDSS-Stumps-M	47.65
62 Jackson Street SARINA QLD 4737	0.00	49.93	FDSS-SOG-M	50.03
64 Jackson Street SARINA QLD 4737	53.99	52.95	FDSS-Stumps-L	53.99
59 Jackson Street SARINA QLD 4737	51.05	50.21	FDSS-Stumps-M	51.05
57 Jackson Street SARINA QLD 4737	45.78	47.44	FDSS-SOG-L	47.54
55 Jackson Street SARINA QLD 4737	45.43	44.24	FDSS-Stumps-L	45.43
1/51 Jackson Street SARINA QLD 4737	0.00	41.81	FDSS-SOG-M	41.91
49 Jackson Street SARINA QLD 4737	41.18	40.65	FDSS-Stumps-L	41.18
47 Jackson Street SARINA QLD 4737	40.28	40.11	FDSS-SOG-L	40.28
45 Jackson Street SARINA QLD 4737	38.64	38.04	FDSS-Stumps-L	38.64
43 Jackson Street SARINA QLD 4737	38.19	38.11	FDSS-SOG-L	38.21
39 Jackson Street SARINA QLD 4737	36.86	36.89	FDSS-Stumps-L	37.49
37 Jackson Street SARINA QLD 4737	37.01	36.92	FDSS-Stumps-L	37.02
2/35 Jackson Street SARINA QLD 4737	37.73	38.63	FDHS-S	38.73
29 Jackson Street SARINA QLD 4737	38.13	37.33	FDSS-SOG-L	38.13
27 Jackson Street SARINA QLD 4737	37.43	36.53	FDSS-Stumps-L	37.43
25 Jackson Street SARINA QLD 4737	0.00	34.48	FDSS-SOG-L	34.58
23 Jackson Street SARINA QLD 4737	33.85	33.15	FDSS-SOG-L	33.85
21 Jackson Street SARINA QLD 4737	32.74	32.50	FDSS-SOG-M	32.74
19 Jackson Street SARINA QLD 4737	31.20	31.09	FDSS-SOG-M	31.20
17 Jackson Street SARINA QLD 4737	30.23	30.17	FDSS-Stumps-M	30.27
48 West Street SARINA QLD 4737	27.11	27.29	FDSS-Stumps-M	27.89
46 West Street SARINA QLD 4737	26.59	25.93	FDSS-Stumps-M	26.59
48 West Street SARINA QLD 4737	27.11	26.69	FDSS-Stumps-M	27.11
50 West Street SARINA QLD 4737	27.82	27.45	FDSS-Stumps-S	27.82
52 West Street SARINA QLD 4737	28.36	28.16	FDSS-SOG-M	28.36
54 West Street SARINA QLD 4737	29.05	28.92	FDSS-Stumps-L	29.05
60 West Street SARINA QLD 4737	30.86	30.72	FDSS-Stumps-M	30.86
62 West Street SARINA QLD 4737	32.20	31.87	FDSS-Stumps-M	32.20
64 West Street SARINA QLD 4737	33.10	32.98	FDSS-Stumps-L	33.10
2/66 West Street SARINA QLD 4737	33.69	33.50	FDSS-SOG-M	33.69
68 West Street SARINA QLD 4737	34.75	34.50	FDSS-Stumps-L	34.75

74 West Street SARINA QLD 4737	35.89	35.55	FDSS-Stumps-M	35.89
74 West Street SARINA QLD 4737	35.89	35.84	FDSS-Stumps-L	35.94
1/78 West Street SARINA QLD 4737	36.63	36.42	FDSS-Stumps-M	36.63
80 West Street SARINA QLD 4737	37.13	36.58	FDSS-Stumps-M	37.13
2/82 West Street SARINA QLD 4737	38.40	38.25	FDSS-SOG-M	38.40
1/86 West Street SARINA QLD 4737	40.83	40.60	FDSS-Stumps-M	40.83
2/86 West Street SARINA QLD 4737	0.00	39.91	FDSS-Stumps-M	40.51
97-99 West Street SARINA QLD 4737	0.00	42.35	FDSS-Stumps-L	42.55
93 West Street SARINA QLD 4737	0.00	37.02	FDSS-SOG-S	37.12
91 West Street SARINA QLD 4737	34.79	34.56	FDSS-SOG-L	34.79
85-87 West Street SARINA QLD 4737	34.29	34.16	FDSS-SOG-L	34.29
81-83 West Street SARINA QLD 4737	34.11	33.90	FDSS-SOG-L	34.11
5/69 West Street SARINA QLD 4737	0.00	29.58	FDSS-Stumps-S	29.83
65 West Street SARINA QLD 4737	28.07	27.86	FDSS-SOG-M	28.07
61 West Street SARINA QLD 4737	26.87	26.47	FDSS-Stumps-M	26.87
59 West Street SARINA QLD 4737	25.83	25.67	FDSS-Stumps-M	25.83
L 11 Greetham Street SARINA QLD 4737	24.04	28.30	COM2-S	28.40
L 11 Greetham Street SARINA QLD 4737	24.04	25.07	COM2-S	25.17
L 11 Greetham Street SARINA QLD 4737	24.04	25.09	COM2-S	25.19
72 Range Road SARINA QLD 4737	26.99	26.20	FDSS-Stumps-S	26.99
11 Greetham Street SARINA QLD 4737	31.11	32.10	FDDS-M	32.20
74 Range Road SARINA QLD 4737	0.00	29.83	FDSS-SOG-L	29.93
45 West Street SARINA QLD 4737	23.32	22.75	FDSS-Stumps-M	23.32
1/6 Innes Street SARINA QLD 4737	24.34	24.06	FDSS-SOG-L	24.34
L 11 Greetham Street SARINA QLD 4737	24.04	25.95	COM2-S	26.05
L 11 Greetham Street SARINA QLD 4737	24.04	25.19	COM2-S	25.29
L 11 Greetham Street SARINA QLD 4737	24.04	25.89	COM2-S	25.99
15 Greetham Street SARINA QLD 4737	0.00	56.38	FDSS-SOG-L	56.48
69 Range Road SARINA QLD 4737	0.00	21.73	FDSS-SOG-M	21.83
16 Mill Street SARINA QLD 4737	21.22	21.23	FDSS-SOG-M	21.33
20 Mill Street SARINA QLD 4737	23.69	23.74	FDSS-Stumps-M	24.34
28 Mill Street SARINA QLD 4737	0.00	27.66	FDDS-M	27.76
32-34 Mill Street SARINA QLD 4737	30.81	29.04	FDSS-Stumps-S	30.81
17-19 Central Street SARINA QLD 4737	27.63	24.73	COM2-M	24.83
17-19 Central Street SARINA QLD 4737	27.63	23.69	COM2-M	23.79
1-3 Range Road SARINA QLD 4737	25.26	26.77	COM2-S	26.87
1-3 Range Road SARINA QLD 4737	25.26	26.04	COM2-S	26.14
26 Central Street SARINA QLD 4737	21.73	21.75	COM3-S	21.85
13 West Street SARINA QLD 4737	25.92	24.22	FDSS-Stumps-M	25.92
41 Range Road SARINA QLD 4737	21.03	21.05	FDSS-SOG-M	21.15
21-23 Range Road SARINA QLD 4737	21.70	21.95	FDSS-Stumps-S	22.05
19 Range Road SARINA QLD 4737	22.52	22.43	FDSS-SOG-M	22.53

65-67 Broad Street SARINA QLD 4737	17.60	17.65	COM1-S	17.75
4-20 Broad Street SARINA QLD 4737	17.94	18.02	COM3-L	18.12
1/5 East Street SARINA QLD 4737	17.99	17.84	FDSS-SOG-M	17.99
2/5 East Street SARINA QLD 4737	0.00	17.92	FDSS-SOG-M	18.02
3/5 East Street SARINA QLD 4737	0.00	18.04	FDSS-SOG-M	18.14
4/5 East Street SARINA QLD 4737	0.00	18.15	FDSS-SOG-M	18.25
5 Brewers Road SARINA QLD 4737	19.63	18.04	FDDS-S	19.63
6 East Street SARINA QLD 4737	19.97	17.42	FDHS-M	19.97
2/12 East Street SARINA QLD 4737	0.00	17.39	FDSS-SOG-S	17.49
4/12 East Street SARINA QLD 4737	0.00	17.45	FDSS-SOG-S	17.55
L 4 East Street SARINA QLD 4737	17.73	17.61	FDSS-SOG-M	17.73
44-50 Broad Street SARINA QLD 4737	22.94	16.92	COM2-L	17.35
44-50 Broad Street SARINA QLD 4737	22.94	17.14	COM2-S	17.35
25-39 Hoey Street SARINA QLD 4737	0.00	16.67	COM2-S	16.80
41-61 Hoey Street SARINA QLD 4737	0.00	16.15	COM2-S	16.25
5 Johnston Street SARINA QLD 4737	0.00	17.76	FDSS-Stumps-S	17.86
7 Brandon Street SARINA QLD 4737	23.78	21.83	FDSS-Stumps-M	23.78
5 Brandon Street SARINA QLD 4737	0.00	22.11	FDSS-SOG-M	22.21
156 Broad Street SARINA QLD 4737	19.87	19.60	FDSS-SOG-M	19.87
154 Broad Street SARINA QLD 4737	0.00	19.95	FDSS-SOG-S	20.05
152 Broad Street SARINA QLD 4737	21.73	19.89	FDSS-SOG-L	19.99
150 Broad Street SARINA QLD 4737	0.00	19.15	COM2-S	19.25
148 Broad Street SARINA QLD 4737	0.00	18.85	FDDS-S	18.95
134 Broad Street SARINA QLD 4737	17.03	17.11	FDSS-SOG-L	17.21
118 Broad Street SARINA QLD 4737	0.00	16.61	FDSS-Stumps-L	17.21
3 Brooks Road West SARINA QLD 4737	15.71	16.02	FDDS-M	16.12
4 Brooks Road West SARINA QLD 4737	0.00	16.14	COM3-S	16.24
4 Brooks Road West SARINA QLD 4737	0.00	16.13	COM3-M	16.23
112 Broad Street SARINA QLD 4737	16.55	16.31	COM3-S	16.55
13 Sarina Beach Road SARINA QLD 4737	15.83	15.76	COM3-L	15.86
2/106 Broad Street SARINA QLD 4737	16.24	16.13	FDSS-SOG-S	16.24
102 Broad Street SARINA QLD 4737	16.65	16.13	FDSS-Stumps-S	16.65
98 Broad Street SARINA QLD 4737	16.71	16.67	FDSS-SOG-M	16.77
98 Broad Street SARINA QLD 4737	16.71	16.54	FDSS-SOG-M	16.71
98 Broad Street SARINA QLD 4737	16.71	16.35	FDSS-SOG-M	16.71
8 Sarina Beach Road SARINA QLD 4737	15.83	15.89	FDSS-Stumps-S	16.49
19 Dawson Street SARINA QLD 4737	15.86	15.79	FDSS-SOG-M	15.89
2 Sarina Beach Road SARINA QLD 4737	0.00	16.05	FDSS-Stumps-M	16.55
74 Broad Street SARINA QLD 4737	0.00	16.39	COM2-M	16.49
41-61 Hoey Street SARINA QLD 4737	0.00	16.43	COM2-S	16.54
41-61 Hoey Street SARINA QLD 4737	0.00	16.49	COM2-S	16.59

41-61 Hoey Street SARINA QLD 4737	0.00	16.33	COM2-S	16.43
6 Dawson Street SARINA QLD 4737	16.48	15.96	FDSS-Stumps-S	16.48
9 Phillip Street SARINA QLD 4737	16.47	16.24	FDSS-SOG-L	16.47
8 Dawson Street SARINA QLD 4737	0.00	15.97	FDSS-SOG-L	16.17
5 Biltoft Street SARINA QLD 4737	16.15	17.54	FDSS-SOG-S	17.64
3 Biltoft Street SARINA QLD 4737	17.93	15.90	FDHS-S	17.93
22 Dawson Street SARINA QLD 4737	15.49	15.61	FDSS-SOG-S	15.71
22 Dawson Street SARINA QLD 4737	15.49	15.70	FDSS-SOG-M	15.80
15 Dawson Street SARINA QLD 4737	16.04	15.92	FDSS-SOG-M	16.04
2/73 Broad Street SARINA QLD 4737	17.31	17.36	COM3-M	17.46
83 Broad Street SARINA QLD 4737	17.53	16.82	COM2-M	17.53
5 Venton Street SARINA QLD 4737	18.79	18.17	FDSS-Stumps-L	18.79
8 Venton Street SARINA QLD 4737	18.93	18.23	FDSS-Stumps-M	18.93
103 Broad Street SARINA QLD 4737	17.73	17.21	FDSS-Stumps-S	17.73
L 8 Bruce Highway SARINA QLD 4737	0.00	18.33	COM2-S	18.43
L 1 Breen Street SARINA QLD 4737	0.00	18.77	COM2-L	18.87
L 1 Breen Street SARINA QLD 4737	0.00	18.74	COM2-M	18.84
88 Sarina Beach Road SARINA QLD 4737	0.00	14.29	FDSS-SOG-L	14.39
8 Brandon Street SARINA QLD 4737	0.00	20.13	FDSS-SOG-S	20.45
6 Leslie Street SARINA QLD 4737	23.60	22.88	FDSS-Stumps-M	23.60
12 Nolan Street SARINA QLD 4737	24.07	23.92	FDHS-M	24.07
1/13 Anzac Street SARINA QLD 4737	22.29	22.27	FDSS-SOG-M	22.37
2/13 Anzac Street SARINA QLD 4737	0.00	22.32	FDSS-SOG-M	22.42
4/13-15 Brandon Street SARINA QLD 4737	0.00	22.44	FDSS-Stumps-M	22.54
3/13-15 Brandon Street SARINA QLD 4737	0.00	21.87	FDSS-Stumps-M	21.97
2/13-15 Brandon Street SARINA QLD 4737	0.00	21.47	FDSS-Stumps-M	21.57
25 Anzac Street SARINA QLD 4737	27.24	26.88	FDHS-M	27.24
5 Nolan Street SARINA QLD 4737	25.23	25.09	FDSS-SOG-M	25.23
7 Nolan Street SARINA QLD 4737	25.21	25.11	FDSS-Stumps-M	25.21
9-13 Nolan Street SARINA QLD 4737	25.40	25.54	FDSS-Stumps-S	26.14
13 Nolan Street SARINA QLD 4737	25.47	25.15	FDSS-Stumps-S	25.47
31 Anzac Street SARINA QLD 4737	30.21	30.48	COM2-S	30.58
31 Anzac Street SARINA QLD 4737	30.21	30.58	COM2-S	30.68
31 Anzac Street SARINA QLD 4737	30.21	30.30	COM2-S	30.40
2 William Street SARINA QLD 4737	0.00	33.59	FDDS-M	33.69
30 Leslie Street SARINA QLD 4737	38.17	37.87	FDSS-Stumps-M	38.17
7 William Street SARINA QLD 4737	0.00	33.71	FDDS-S	33.81
8-18 Hospital Street SARINA QLD 4737	0.00	45.72	COM2-S	45.82
8-18 Hospital Street SARINA QLD 4737	0.00	45.83	COM2-S	45.93

8-18 Hospital Street SARINA QLD 4737	0.00	41.23	COM2-M	41.33
31 Anzac Street SARINA QLD 4737	0.00	30.04	COM2-S	31.27
31 Anzac Street SARINA QLD 4737	0.00	29.85	COM2-S	29.97
31 Anzac Street SARINA QLD 4737	0.00	29.72	COM2-S	29.83
31 Anzac Street SARINA QLD 4737	0.00	29.35	COM2-S	29.45
31 Anzac Street SARINA QLD 4737	30.86	30.70	COM3-S	30.86
31 Anzac Street SARINA QLD 4737	30.86	31.13	COM3-S	31.23
33 Anzac Street SARINA QLD 4737	31.63	31.59	COM2-S	31.69
33 Anzac Street SARINA QLD 4737	31.63	31.30	COM2-S	31.63
33 Anzac Street SARINA QLD 4737	31.63	31.28	COM2-S	31.63
33 Anzac Street SARINA QLD 4737	31.63	31.27	COM2-S	31.63
47 Leslie Street SARINA QLD 4737	62.09	60.14	FDSS-SOG-L	60.24
35 Leslie Street SARINA QLD 4737	44.51	43.76	FDSS-Stumps-L	44.51
12 Hill Street SARINA QLD 4737	39.99	39.99	FDDS-M	40.09
21 Leslie Street SARINA QLD 4737	29.34	30.15	FDHS-M	30.25
20 Hill Street SARINA QLD 4737	41.04	40.67	FDDS-S	41.04
18 Hill Street SARINA QLD 4737	40.00	39.47	FDSS-Stumps-M	40.00
11 Hill Street SARINA QLD 4737	35.57	35.01	FDSS-Stumps-S	35.57
32 West Street SARINA QLD 4737	30.56	29.93	FDSS-Stumps-S	30.56
8 Jackson Street SARINA QLD 4737	27.64	26.86	FDSS-Stumps-M	27.64
12-14 Jackson Street SARINA QLD 4737	28.77	28.47	FDSS-Stumps-L	28.77
2/2 Noden Street SARINA QLD 4737	27.20	27.23	FDSS-SOG-M	27.33
4 Noden Street SARINA QLD 4737	27.74	27.25	FDSS-SOG-L	27.74
12 Anzac Street SARINA QLD 4737	22.29	22.43	COM3-M	22.53
19 Brandon Street SARINA QLD 4737	23.29	21.18	FDHS-L	23.29
14-30 Anzac Street SARINA QLD 4737	24.91	30.83	COM2-S	30.93
3 Lee Street SARINA QLD 4737	0.00	21.17	FDSS-SOG-L	21.27
5A Lee Street SARINA QLD 4737	21.41	20.88	FDSS-Stumps-S	21.41
14-30 Anzac Street SARINA QLD 4737	24.91	22.04	COM2-S	22.14
14-30 Anzac Street SARINA QLD 4737	24.91	24.89	COM2-S	24.99
14-30 Anzac Street SARINA QLD 4737	24.91	25.60	COM2-S	25.70
14-30 Anzac Street SARINA QLD 4737	24.91	26.44	COM2-M	26.54
14-30 Anzac Street SARINA QLD 4737	24.91	29.26	COM2-S	29.36
36-38 Lee Street SARINA QLD 4737	23.61	23.05	COM1-S	23.61
36-38 Lee Street SARINA QLD 4737	23.61	25.18	COM1-S	25.28
4 Bell Street SARINA QLD 4737	28.57	26.40	FDHS-M	28.57
6 Bell Street SARINA QLD 4737	27.45	25.55	FDHS-M	27.45
8 Bell Street SARINA QLD 4737	0.00	24.74	FDHS-S	26.57
10 Bell Street SARINA QLD 4737	24.99	24.01	FDSS-Stumps-S	24.99
12 Bell Street SARINA QLD 4737	24.36	23.28	FDSS-Stumps-S	24.36
1 Nicholson Street SARINA QLD 4737	23.03	23.16	COM3-S	23.26
42 Lee Street SARINA QLD 4737	21.69	22.59	COM3-M	22.69

2 Atherton Street SARINA QLD 4737	28.09	27.54	FDSS-Stumps-M	28.09
4 Atherton Street SARINA QLD 4737	29.97	27.84	FDHS-S	29.97
8 Atherton Street SARINA QLD 4737	0.00	27.32	FDSS-Stumps-S	27.42
10 Atherton Street SARINA QLD 4737	27.27	27.36	FDSS-SOG-M	27.46
12 Atherton Street SARINA QLD 4737	27.76	27.57	FDDS-M	27.76
14 Atherton Street SARINA QLD 4737	28.62	28.02	FDSS-Stumps-S	28.62
16 Atherton Street SARINA QLD 4737	31.56	28.59	FDHS-S	28.69
18 Atherton Street SARINA QLD 4737	29.78	29.00	FDSS-Stumps-S	29.78
15 Nicholson Street SARINA QLD 4737	26.31	26.43	FDDS-S	26.53
13 Nicholson Street SARINA QLD 4737	28.84	26.70	FDSS-Stumps-S	28.84
11 Nicholson Street SARINA QLD 4737	26.59	25.64	FDSS-Stumps-S	26.59
7 Nicholson Street SARINA QLD 4737	25.82	25.31	FDSS-Stumps-S	25.82
3 Nicholson Street SARINA QLD 4737	25.02	24.52	FDSS-Stumps-M	25.02
5 Nicholson Street SARINA QLD 4737	25.06	24.99	FDSS-Stumps-M	25.09
21 Bell Street SARINA QLD 4737	24.75	24.66	FDSS-SOG-L	24.76
17 Bell Street SARINA QLD 4737	26.67	26.24	FDSS-SOG-M	26.67
19 Bell Street SARINA QLD 4737	25.73	25.28	FDSS-Stumps-M	25.73
1 Atherton Street SARINA QLD 4737	29.71	29.02	FDSS-Stumps-M	29.71
11 Bell Street SARINA QLD 4737	30.22	29.79	FDSS-Stumps-S	30.22
9 Bell Street SARINA QLD 4737	30.88	30.27	FDSS-Stumps-M	30.88
7 Bell Street SARINA QLD 4737	31.18	30.72	FDSS-SOG-L	31.18
3 Atherton Street SARINA QLD 4737	30.94	29.24	FDHS-S	30.94
7 Atherton Street SARINA QLD 4737	30.98	30.38	FDSS-Stumps-M	30.98
6 Langdon Street SARINA QLD 4737	35.01	33.33	FDSS-Stumps-S	35.01
8 Langdon Street SARINA QLD 4737	32.57	33.04	FDDS-S	33.14
10 Langdon Street SARINA QLD 4737	33.39	32.61	FDSS-Stumps-S	33.39
12 Langdon Street SARINA QLD 4737	33.77	32.95	FDSS-Stumps-S	33.77
9 Atherton Street SARINA QLD 4737	0.00	29.49	FDSS-SOG-M	29.59
1 Bell Street SARINA QLD 4737	34.29	33.58	FDSS-Stumps-S	34.29
3 Bell Street SARINA QLD 4737	33.28	33.17	FDSS-SOG-L	33.28
38 Anzac Street SARINA QLD 4737	38.21	35.67	FDSS-Stumps-M	38.21
40 Anzac Street SARINA QLD 4737	39.24	36.79	FDSS-Stumps-S	39.24
42 Anzac Street SARINA QLD 4737	0.00	38.13	FDSS-SOG-M	38.23
44 Anzac Street SARINA QLD 4737	0.00	39.34	FDSS-SOG-S	39.44
27 Langdon Street SARINA QLD 4737	0.00	42.40	FDHS-M	42.50
25 Langdon Street SARINA QLD 4737	42.22	39.77	FDHS-M	42.22
23 Langdon Street SARINA QLD 4737	0.00	41.00	FDHS-M	41.10
19 Langdon Street SARINA QLD 4737	40.31	37.88	FDHS-M	40.31
15 Langdon Street SARINA QLD 4737	37.97	37.42	FDSS-Stumps-M	37.97
13 Langdon Street SARINA QLD 4737	38.36	36.98	FDSS-Stumps-S	38.36
11 Langdon Street SARINA QLD 4737	37.62	36.53	FDSS-Stumps-M	37.62
18 Langdon Street SARINA QLD 4737	34.85	34.71	FDSS-Stumps-S	34.85

17 Atherton Street SARINA QLD 4737	33.69	31.38	FDDS-S	33.69
19 Atherton Street SARINA QLD 4737	34.02	32.00	FDSS-Stumps-S	34.02
25 Atherton Street SARINA QLD 4737	35.36	35.18	FDSS-SOG-M	35.36
27 Atherton Street SARINA QLD 4737	37.93	36.70	FDDS-M	37.93
29 Atherton Street SARINA QLD 4737	38.61	37.31	FDSS-Stumps-M	38.61
20 Langdon Street SARINA QLD 4737	37.53	34.99	FDHS-S	37.53
22 Langdon Street SARINA QLD 4737	36.13	36.13	FDSS-Stumps-M	36.73
24 Langdon Street SARINA QLD 4737	40.24	37.95	FDHS-S	40.24
26 Langdon Street SARINA QLD 4737	42.39	40.08	FDHS-M	42.39
1/30 Langdon Street SARINA QLD 4737	45.14	44.94	FDSS-SOG-S	45.14
32 Langdon Street SARINA QLD 4737	0.00	45.84	FDHS-M	45.94
31 Atherton Street SARINA QLD 4737	40.42	39.08	FDSS-Stumps-M	40.42
34 Atherton Street SARINA QLD 4737	33.76	32.17	FDSS-Stumps-S	33.76
28 Atherton Street SARINA QLD 4737	32.06	30.80	FDSS-Stumps-S	32.06
24 Atherton Street SARINA QLD 4737	30.19	29.25	FDSS-Stumps-M	30.19
17-19 Nicholson Street SARINA QLD 4737	27.20	27.11	FDSS-SOG-M	27.21
20 Atherton Street SARINA QLD 4737	29.72	28.79	FDSS-Stumps-M	29.72
22 Atherton Street SARINA QLD 4737	29.66	29.03	FDSS-SOG-S	29.66
14 Gurnett Street SARINA QLD 4737	48.05	47.01	FDSS-Stumps-L	48.05
8 Gurnett Street SARINA QLD 4737	38.89	38.78	FDHS-M	38.89
6 Gurnett Street SARINA QLD 4737	38.47	36.82	FDSS-SOG-M	36.92
4 Gurnett Street SARINA QLD 4737	36.70	35.06	FDSS-Stumps-S	36.70
12 Gurnett Street SARINA QLD 4737	44.05	43.56	FDSS-Stumps-L	44.05
21 Atherton Street SARINA QLD 4737	33.42	32.90	FDSS-SOG-M	33.42
28 Langdon Street SARINA QLD 4737	0.00	42.12	FDSS-Stumps-L	42.22
23 Atherton Street SARINA QLD 4737	35.02	34.37	FDDS-M	35.02
10 Gurnett Street SARINA QLD 4737	42.02	41.14	FDSS-SOG-L	42.02
32 Atherton Street SARINA QLD 4737	32.98	31.42	FDSS-Stumps-M	32.98
30 Atherton Street SARINA QLD 4737	32.97	31.32	FDSS-Stumps-M	32.97
26 Atherton Street SARINA QLD 4737	31.36	30.02	FDSS-Stumps-M	31.36
6 Atherton Street SARINA QLD 4737	28.04	27.91	FDSS-SOG-M	28.04
9 Nicholson Street SARINA QLD 4737	25.51	25.49	FDSS-SOG-M	25.59
16 Langdon Street SARINA QLD 4737	35.01	33.64	FDSS-Stumps-S	35.01
21 Langdon Street SARINA QLD 4737	40.85	38.58	FDHS-S	40.85
17 Langdon Street SARINA QLD 4737	39.26	37.82	FDSS-Stumps-S	39.26
50-52 Anzac Street SARINA QLD 4737	50.37	48.78	FDSS-Stumps-M	50.37
48 Anzac Street SARINA QLD 4737	46.53	44.09	FDSS-Stumps-L	46.53
46 Anzac Street SARINA QLD 4737	0.00	41.10	FDSS-SOG-M	41.20
7 Langdon Street SARINA QLD 4737	35.62	34.89	FDSS-Stumps-S	35.62
9 Langdon Street SARINA QLD 4737	36.65	35.86	FDSS-Stumps-M	36.65
5 Langdon Street SARINA QLD 4737	35.15	34.49	FDSS-Stumps-M	35.15

3 Langdon Street SARINA QLD 4737	33.50	33.48	FDSS-Stumps-M	33.58
1 Langdon Street SARINA QLD 4737	0.00	32.49	FDSS-Stumps-M	32.59
2 Langdon Street SARINA QLD 4737	32.38	32.17	FDSS-Stumps-M	32.38
4 Langdon Street SARINA QLD 4737	33.80	33.05	FDSS-Stumps-M	33.80
14 Langdon Street SARINA QLD 4737	34.81	33.33	FDSS-Stumps-M	34.81
15 Atherton Street SARINA QLD 4737	32.61	30.62	FDSS-Stumps-M	32.61
13 Atherton Street SARINA QLD 4737	31.80	30.04	FDHS-S	31.80
11 Atherton Street SARINA QLD 4737	0.00	29.74	FDSS-Stumps-S	31.14
36-38 Lee Street SARINA QLD 4737	23.61	24.94	COM1-S	25.04
42 Lee Street SARINA QLD 4737	21.69	21.83	COM3-S	21.93
42 Lee Street SARINA QLD 4737	21.69	23.02	COM3-S	23.12
32-34 Lee Street SARINA QLD 4737	22.19	21.53	COM1-S	22.19
32-34 Lee Street SARINA QLD 4737	22.19	22.21	COM1-M	22.31
14-30 Anzac Street SARINA QLD 4737	24.91	24.50	COM2-S	24.60
14-30 Anzac Street SARINA QLD 4737	24.91	21.33	COM2-S	21.43
8 Anzac Street SARINA QLD 4737	20.41	19.91	FDSS-SOG-L	20.41
1 Lee Street SARINA QLD 4737	21.12	21.09	FDDS-M	21.19
12 Anzac Street SARINA QLD 4737	22.29	22.36	COM3-S	22.46
14-30 Anzac Street SARINA QLD 4737	24.91	22.19	COM2-L	22.29
14-30 Anzac Street SARINA QLD 4737	24.91	22.51	COM2-M	22.61
14-30 Anzac Street SARINA QLD 4737	24.91	25.54	COM2-L	25.64
14-30 Anzac Street SARINA QLD 4737	24.91	25.20	COM2-M	25.30
14-30 Anzac Street SARINA QLD 4737	24.91	25.20	COM2-S	25.30
14-30 Anzac Street SARINA QLD 4737	24.91	24.06	COM2-M	24.16
14-30 Anzac Street SARINA QLD 4737	24.91	23.54	COM2-M	23.64
14-30 Anzac Street SARINA QLD 4737	24.91	23.12	COM2-M	23.22
14-30 Anzac Street SARINA QLD 4737	24.91	22.20	COM2-S	22.30
14-30 Anzac Street SARINA QLD 4737	24.91	30.72	COM2-M	30.82
14-30 Anzac Street SARINA QLD 4737	24.91	28.41	COM2-M	28.51
14-30 Anzac Street SARINA QLD 4737	24.91	28.18	COM2-S	28.35
14-30 Anzac Street SARINA QLD 4737	24.91	26.81	COM2-M	26.91
14-30 Anzac Street SARINA QLD 4737	24.91	30.80	COM2-S	30.98
14-30 Anzac Street SARINA QLD 4737	24.91	28.49	COM2-S	28.59
2 Hoey Street SARINA QLD 4737	17.85	17.62	FDSS-SOG-M	17.85
91238 Bruce Highway SARINA QLD 4737	0.00	12.83	COM2-S	12.93
L 3 Bruce Highway SARINA QLD 4737	0.00	17.27	COM3-M	17.37
158-160 Broad Street SARINA QLD 4737	0.00	18.53	FDSS-SOG-L	18.63
34 Sarina Homebush Road SARINA QLD 4737	0.00	16.17	COM3-L	16.27
91332 Bruce Highway SARINA QLD 4737	0.00	17.43	FDSS-SOG-M	18.36
91238 Bruce Highway SARINA QLD 4737	0.00	12.21	COM2-M	12.31
91238 Bruce Highway SARINA QLD 4737	0.00	12.38	COM2-M	12.48

79 Sarina Homebush Road SARINA QLD 4737	0.00	45.55	FDSS-SOG-L	45.65
5 Brooks Road West SARINA QLD 4737	16.34	15.75	FDSS-Stumps-M	16.34
98 Broad Street SARINA QLD 4737	16.71	16.54	FDSS-SOG-L	16.71
63-69 Broad Street SARINA QLD 4737	18.36	18.34	COM2-L	18.44
52-54 Broad Street SARINA QLD 4737	20.73	20.41	COM4-L	20.73
41-45 Broad Street SARINA QLD 4737	18.88	18.93	COM2-L	19.03
L 8 Railway Square SARINA QLD 4737	0.00	18.36	COM3-S	18.46
17-19 Central Street SARINA QLD 4737	27.63	27.81	COM2-L	27.91
17 Range Road SARINA QLD 4737	24.77	22.75	FDSS-Stumps-M	24.77
7 Mill Street SARINA QLD 4737	20.98	20.71	FDSS-Stumps-M	20.98
5 Mill Street SARINA QLD 4737	21.37	21.02	FDSS-Stumps-S	21.37
39 Range Road SARINA QLD 4737	21.46	20.91	FDSS-Stumps-S	21.46
57 West Street SARINA QLD 4737	25.36	24.93	FDSS-Stumps-L	25.36
44 West Street SARINA QLD 4737	25.47	25.28	FDSS-Stumps-L	25.47
63 West Street SARINA QLD 4737	27.44	27.16	FDSS-SOG-M	27.44
2/69 West Street SARINA QLD 4737	0.00	29.40	FDSS-Stumps-S	29.50
67 West Street SARINA QLD 4737	29.26	28.87	FDSS-SOG-M	29.26
75 West Street SARINA QLD 4737	32.54	32.22	FDSS-Stumps-M	32.54
77 West Street SARINA QLD 4737	33.73	33.51	FDSS-Stumps-M	33.73
70 West Street SARINA QLD 4737	35.49	35.03	FDSS-Stumps-M	35.49
41 Jackson Street SARINA QLD 4737	37.31	37.29	FDSS-SOG-L	37.39
95 West Street SARINA QLD 4737	41.08	40.70	FDSS-Stumps-M	41.08
57 Jackson Street SARINA QLD 4737	45.78	45.71	FDSS-SOG-L	45.81
53 Jackson Street SARINA QLD 4737	43.57	43.45	FDSS-SOG-L	43.57
33 Jackson Street SARINA QLD 4737	40.72	38.92	FDSS-Stumps-M	40.72
36 Jackson Street SARINA QLD 4737	49.12	48.42	FDSS-Stumps-L	49.12
32 Jackson Street SARINA QLD 4737	41.83	41.70	FDSS-Stumps-L	41.83
8-12 Diamond Crescent SARINA QLD 4737	34.94	34.65	FDSS-SOG-L	34.94
6 Diamond Crescent SARINA QLD 4737	33.53	33.46	FDSS-SOG-L	33.56
18-20 Jackson Street SARINA QLD 4737	29.51	29.42	FDSS-Stumps-L	29.52
15 Jackson Street SARINA QLD 4737	29.60	29.42	FDSS-Stumps-M	29.60
11 Jackson Street SARINA QLD 4737	28.22	27.85	FDSS-Stumps-L	28.22
10 Jackson Street SARINA QLD 4737	27.68	27.50	FDSS-Stumps-M	27.68
37 Leslie Street SARINA QLD 4737	46.39	45.93	FDSS-SOG-L	46.39
22 Hill Street SARINA QLD 4737	42.35	41.95	FDSS-Stumps-M	42.35
25 Hill Street SARINA QLD 4737	36.35	34.10	FDSS-Stumps-M	36.35
19 Hill Street SARINA QLD 4737	33.67	32.37	FDSS-SOG-M	32.47
8 Hill Street SARINA QLD 4737	34.84	36.38	FDHS-L	36.48
2 Hill Street SARINA QLD 4737	30.38	29.57	FDSS-Stumps-M	30.38
10 Hill Street SARINA QLD 4737	37.87	38.67	FDDS-S	38.77

1-3 Range Road SARINA QLD 4737	25.26	25.06	COM2-M	25.26
27-31 Central Street SARINA QLD 4737	24.02	24.32	COM3-M	24.42
27 Leslie Street SARINA QLD 4737	34.65	35.28	FDHS-M	35.38
24 Leslie Street SARINA QLD 4737	31.30	32.17	FDDS-M	32.27
5 Heron Street SARINA QLD 4737	29.22	29.41	FDHS-M	29.51
8-18 Hospital Street SARINA QLD 4737	0.00	43.59	COM2-L	43.69
8-18 Hospital Street SARINA QLD 4737	0.00	48.83	COM2-M	48.93
47 West Street SARINA QLD 4737	24.28	23.33	FDSS-Stumps-S	24.28
5 Innes Street SARINA QLD 4737	23.04	22.91	FDSS-SOG-S	23.04
15 West Street SARINA QLD 4737	25.51	24.39	FDSS-Stumps-L	25.51
10 Keilbach Court SARINA QLD 4737	0.00	19.28	FDHS-M	21.63
1/13-15 Brandon Street SARINA QLD 4737	21.82	21.59	FDSS-Stumps-M	21.82
8 Nolan Street SARINA QLD 4737	23.23	23.60	FDHS-S	23.70
14 Nolan Street SARINA QLD 4737	24.40	23.87	FDSS-Stumps-M	24.40
17 Nolan Street SARINA QLD 4737	25.04	25.29	FDHS-M	25.39
31 Anzac Street SARINA QLD 4737	30.21	30.37	COM2-S	30.47
9 William Street SARINA QLD 4737	32.50	33.03	FDHS-S	33.13
5 William Street SARINA QLD 4737	0.00	34.33	FDDS-M	34.43
44-50 Broad Street SARINA QLD 4737	22.94	17.07	COM2-M	17.31
18-32 Hoey Street SARINA QLD 4737	17.74	17.63	COM2-M	17.73
18-32 Hoey Street SARINA QLD 4737	17.74	17.62	COM2-S	17.72
18-32 Hoey Street SARINA QLD 4737	17.74	17.57	COM2-L	17.67
Mill Street SARINA QLD 4737	0.00	20.42	COM3-L	20.52
6 Sarina Beach Road SARINA QLD 4737	16.33	15.88	FDSS-Stumps-M	16.33
78 Range Road SARINA QLD 4737	0.00	31.21	FDSS-SOG-M	31.31
80 Range Road SARINA QLD 4737	0.00	32.09	FDSS-SOG-S	32.19
82 Range Road SARINA QLD 4737	33.02	32.53	FDHS-M	33.02
76 Marlborough-Sarina Road SARINA QLD 4737	0.00	39.33	FDSS-SOG-L	39.43
88 Range Road SARINA QLD 4737	34.68	34.13	FDSS-Stumps-L	34.68
90 Range Road SARINA QLD 4737	32.66	32.55	FDSS-SOG-M	32.66
92-94 Range Road SARINA QLD 4737	31.32	31.14	FDSS-SOG-L	31.32
94 Range Road SARINA QLD 4737	29.81	31.02	FDSS-Stumps-L	31.12
96-98 Range Road SARINA QLD 4737	30.19	29.78	FDSS-Stumps-M	30.19
77 Range Road SARINA QLD 4737	0.00	24.41	FDSS-SOG-M	24.51
85 Range Road SARINA QLD 4737	0.00	25.19	FDSS-SOG-M	25.29
89 Marlborough-Sarina Road SARINA QLD 4737	26.54	26.46	FDSS-SOG-L	26.56
93 Marlborough-Sarina Road SARINA QLD 4737	25.69	25.70	FDDS-M	25.80
100 Range Road SARINA QLD 4737	33.25	32.81	FDSS-Stumps-S	33.25
95 Marlborough-Sarina Road SARINA	25.16	25.18	FDSS-Stumps-L	25.78

QLD 4737

87 Range Road SARINA QLD 4737	0.00	23.11	FDSS-SOG-L	23.21
2 Webster Road SARINA QLD 4737	58.30	56.76	FDSS-Stumps-M	58.30
7 Webster Road SARINA QLD 4737	65.31	75.20	FDSS-SOG-L	75.30
6 Webster Road SARINA QLD 4737	0.00	92.64	FDSS-SOG-L	92.74
8 Webster Road SARINA QLD 4737	0.00	102.89	FDSS-SOG-L	102.99
108 Range Road SARINA QLD 4737	0.00	33.78	FDSS-SOG-S	33.88
110 Range Road SARINA QLD 4737	0.00	23.34	COM2-L	23.44
143 Marlborough-Sarina Road SARINA QLD 4737	23.91	23.43	FDSS-Stumps-L	23.91
147 Marlborough-Sarina Road SARINA QLD 4737	23.76	23.65	FDHS-M	23.76
155 Marlborough-Sarina Road SARINA QLD 4737	23.95	23.89	FDSS-Stumps-L	23.99
159 Marlborough-Sarina Road SARINA QLD 4737	0.00	21.66	COM3-M	21.76
165 Marlborough-Sarina Road SARINA QLD 4737	0.00	22.21	FDSS-SOG-S	22.31
14 Mount Blarney Road SARINA QLD 4737	0.00	28.25	COM3-M	28.35
21 Mount Blarney Road SARINA QLD 4737	0.00	39.89	FDSS-SOG-M	39.99
22 Mount Blarney Road SARINA QLD 4737	0.00	49.14	FDSS-SOG-M	49.24
11 Mount Blarney Road SARINA QLD 4737	0.00	28.29	FDSS-SOG-L	28.39
167 Marlborough-Sarina Road SARINA QLD 4737	0.00	23.00	FDSS-SOG-M	23.10
185 Marlborough-Sarina Road SARINA QLD 4737	0.00	23.71	FDSS-SOG-L	23.81
100 Sichter Road SARINA QLD 4737	0.00	23.45	COM3-M	23.55
L 31 Matthews Street SARINA QLD 4737	15.20	14.69	FDSS-Stumps-M	15.20
10 Sichter Street SARINA QLD 4737	15.08	14.96	FDSS-SOG-L	15.08
2 Matthews Street SARINA QLD 4737	14.68	14.85	FDSS-SOG-S	14.95
4 Matthews Street SARINA QLD 4737	17.65	15.30	FDDS-S	17.65
6 Matthews Street SARINA QLD 4737	15.94	15.28	FDSS-Stumps-S	15.94
8 Matthews Street SARINA QLD 4737	15.46	15.43	FDSS-SOG-L	15.53
10 Matthews Street SARINA QLD 4737	15.20	15.23	FDSS-SOG-M	15.33
12 Matthews Street SARINA QLD 4737	16.07	15.44	FDSS-SOG-S	16.07
1 Maudsley Road SARINA QLD 4737	15.16	14.83	FDSS-Stumps-S	15.16
3 Maudsley Road SARINA QLD 4737	15.62	15.30	FDSS-Stumps-S	15.62
5 Maudsley Road SARINA QLD 4737	14.95	15.10	FDSS-Stumps-M	15.70
2 Maudsley Road SARINA QLD 4737	14.82	14.87	FDSS-Stumps-M	15.47
8 Sichter Street SARINA QLD 4737	14.73	16.41	FDSS-SOG-S	16.51
13 Holmes Avenue SARINA QLD 4737	20.22	20.14	FDHS-S	20.24
16 Petersen Street SARINA QLD 4737	0.00	18.29	FDDS-M	18.39

7 Petersen Street SARINA QLD 4737	21.89	19.10	FDDS-M	19.20
6 Sichter Street SARINA QLD 4737	17.30	17.17	FDSS-SOG-M	17.30
4 Sichter Street SARINA QLD 4737	19.76	17.58	FDDS-S	19.76
4 Maudsley Road SARINA QLD 4737	19.72	18.35	FDSS-Stumps-S	19.72
2 Sichter Street SARINA QLD 4737	19.57	18.74	FDSS-Stumps-M	19.57
12 Goonyella Avenue SARINA QLD 4737	22.20	22.32	FDSS-Stumps-S	22.92
12 Goonyella Avenue SARINA QLD 4737	23.39	22.32	FDSS-Stumps-S	22.92
10 Goonyella Avenue SARINA QLD 4737	23.39	23.38	FDSS-Stumps-S	23.48
8 Goonyella Avenue SARINA QLD 4737	23.25	23.59	FDHS-S	23.69
6 Goonyella Avenue SARINA QLD 4737	23.66	23.80	FDHS-S	25.60
6 Goonyella Avenue SARINA QLD 4737	23.66	27.30	FDHS-S	27.40
3 Charles Taylor Avenue SARINA QLD 4737	31.56	29.64	FDSS-Stumps-S	31.56
12 Utah Avenue SARINA QLD 4737	35.30	33.43	FDHS-S	35.30
10 Utah Avenue SARINA QLD 4737	35.62	33.91	FDSS-Stumps-S	35.62
8 Utah Avenue SARINA QLD 4737	33.45	31.80	FDSS-Stumps-S	33.45
14 Utah Avenue SARINA QLD 4737	32.23	32.02	FDSS-SOG-S	32.23
4 Charles Taylor Avenue SARINA QLD 4737	29.98	27.84	FDHS-S	29.98
4 Goonyella Avenue SARINA QLD 4737	23.07	23.16	FDDS-S	23.26
4 Goonyella Avenue SARINA QLD 4737	23.07	24.99	FDDS-S	25.09
2 Goonyella Avenue SARINA QLD 4737	23.06	23.04	FDDS-S	23.14
90970 Bruce Highway SARINA QLD 4737	0.00	22.65	FDSS-SOG-M	22.75
16 Utah Avenue SARINA QLD 4737	33.15	30.53	FDSS-SOG-S	30.63
18 Utah Avenue SARINA QLD 4737	35.03	33.66	FDSS-Stumps-S	35.03
20 Utah Avenue SARINA QLD 4737	37.55	35.68	FDHS-S	37.55
22 Utah Avenue SARINA QLD 4737	38.46	36.80	FDSS-Stumps-S	38.46
24 Utah Avenue SARINA QLD 4737	39.24	37.93	FDSS-SOG-M	38.03
16 Penfold Street SARINA QLD 4737	42.87	41.05	FDSS-Stumps-S	42.87
26 Utah Avenue SARINA QLD 4737	40.13	38.27	FDSS-SOG-M	38.37
28 Utah Avenue SARINA QLD 4737	40.51	39.16	FDSS-Stumps-S	40.51
30 Utah Avenue SARINA QLD 4737	42.04	40.02	FDHS-S	42.04
32 Utah Avenue SARINA QLD 4737	42.04	39.84	FDHS-S	42.04
34 Utah Avenue SARINA QLD 4737	41.50	39.96	FDSS-Stumps-M	41.50
36 Utah Avenue SARINA QLD 4737	38.46	38.98	FDDS-S	39.08
38 Utah Avenue SARINA QLD 4737	38.68	37.07	FDDS-S	38.68
40 Utah Avenue SARINA QLD 4737	36.73	34.88	FDSS-Stumps-M	36.73
42 Utah Avenue SARINA QLD 4737	35.69	33.38	FDSS-Stumps-S	35.69
44 Utah Avenue SARINA QLD 4737	33.79	31.85	FDSS-Stumps-S	33.79
1/1 Golf Course Road SARINA QLD 4737	0.00	30.07	FDSS-SOG-S	30.17
2/1 Golf Course Road SARINA QLD 4737	28.97	28.83	FDSS-SOG-M	28.97
3/1 Golf Course Road SARINA QLD 4737	0.00	28.12	FDSS-SOG-M	28.22

5 Golf Course Road SARINA QLD 4737	25.98	25.72	FDSS-Stumps-S	25.98
9 Golf Course Road SARINA QLD 4737	24.63	24.41	FDSS-SOG-M	24.63
11 Golf Course Road SARINA QLD 4737	0.00	23.36	COM1-M	23.52
8 Golf Course Road SARINA QLD 4737	27.47	26.46	FDSS-SOG-M	26.56
12 Keating Street SARINA QLD 4737	0.00	32.08	FDDS-S	32.18
10 Keating Street SARINA QLD 4737	30.41	30.12	FDSS-Stumps-S	30.41
8 Keating Street SARINA QLD 4737	0.00	29.79	FDSS-SOG-S	29.89
6 Keating Street SARINA QLD 4737	29.37	29.77	FDSS-SOG-S	29.87
13 Ablett Street SARINA QLD 4737	0.00	27.68	FDSS-SOG-S	27.78
11 Ablett Street SARINA QLD 4737	27.42	27.35	FDSS-SOG-S	27.45
4 Keating Street SARINA QLD 4737	34.12	34.07	FDDS-L	34.17
2 Keating Street SARINA QLD 4737	35.13	32.85	FDDS-S	35.13
2 Mapley Court SARINA QLD 4737	30.68	30.71	FDSS-SOG-L	30.81
4 Mapley Court SARINA QLD 4737	32.47	32.51	FDSS-SOG-M	32.61
6 Mapley Court SARINA QLD 4737	36.58	36.61	FDSS-SOG-L	36.71
8 Mapley Court SARINA QLD 4737	32.94	38.43	FDSS-SOG-L	38.53
9 Mapley Court SARINA QLD 4737	34.16	34.18	FDSS-SOG-L	34.28
7 Mapley Court SARINA QLD 4737	31.49	31.41	FDSS-SOG-L	31.51
5 Mapley Court SARINA QLD 4737	29.56	29.52	FDSS-SOG-L	29.62
3 Mapley Court SARINA QLD 4737	29.32	29.20	FDSS-SOG-L	29.32
1 Mapley Court SARINA QLD 4737	29.08	29.03	FDSS-SOG-M	29.13
L 51 Bruce Highway SARINA QLD 4737	0.00	27.62	COM2-S	27.99
1 Armstrong Beach Road SARINA QLD 4737	30.07	30.22	FDDS-S	30.32
6 Sweetman Street SARINA QLD 4737	0.00	27.88	FDSS-SOG-S	27.98
3 Armstrong Beach Road SARINA QLD 4737	0.00	29.82	FDSS-SOG-M	29.92
L 5 Armstrong Beach Road SARINA QLD 4737	0.00	28.45	FDSS-SOG-S	28.55
5 Armstrong Beach Road SARINA QLD 4737	0.00	28.93	FDSS-SOG-M	29.03
1 Ablett Street SARINA QLD 4737	0.00	25.97	FDSS-SOG-M	26.23
3-5 Ablett Street SARINA QLD 4737	26.28	26.41	FDSS-SOG-M	26.51
7 Ablett Street SARINA QLD 4737	0.00	26.38	FDSS-SOG-L	26.48
9 Ablett Street SARINA QLD 4737	27.30	27.16	FDSS-SOG-M	27.30
26 Golf Course Road SARINA QLD 4737	0.00	24.39	FDSS-SOG-S	24.49
L 83 Golf Course Road SARINA QLD 4737	0.00	20.68	FDSS-SOG-S	20.78
44 Golf Course Road SARINA QLD 4737	0.00	21.57	FDSS-SOG-L	21.67
44 Golf Course Road SARINA QLD 4737	0.00	22.26	FDSS-SOG-M	22.36
25 Golf Course Road SARINA QLD 4737	0.00	22.33	FDSS-SOG-S	22.43
29 Utah Avenue SARINA QLD 4737	38.64	37.14	FDSS-Stumps-S	38.64
27 Utah Avenue SARINA QLD 4737	38.41	38.44	FDSS-SOG-S	38.54

25 Utah Avenue SARINA QLD 4737	40.42	38.52	FDHS-S	40.42
23 Utah Avenue SARINA QLD 4737	0.00	39.37	FDHS-M	39.47
7 Penfold Street SARINA QLD 4737	41.74	39.85	FDSS-SOG-S	39.95
5 Penfold Street SARINA QLD 4737	41.64	39.93	FDSS-Stumps-S	41.64
3 Penfold Street SARINA QLD 4737	39.71	38.52	FDSS-Stumps-S	39.71
1 Penfold Street SARINA QLD 4737	37.60	36.47	FDSS-Stumps-S	37.60
14 Penfold Street SARINA QLD 4737	42.61	40.60	FDDS-M	42.61
12 Penfold Street SARINA QLD 4737	42.31	40.39	FDDS-S	42.31
10 Penfold Street SARINA QLD 4737	41.35	40.02	FDHS-S	41.35
19 Utah Avenue SARINA QLD 4737	37.73	36.53	FDSS-Stumps-S	37.73
17 Utah Avenue SARINA QLD 4737	38.53	37.25	FDHS-S	38.53
15 Utah Avenue SARINA QLD 4737	39.21	37.85	FDHS-S	39.21
8 Penfold Street SARINA QLD 4737	39.17	37.39	FDSS-Stumps-S	39.17
13 Utah Avenue SARINA QLD 4737	38.51	36.74	FDHS-S	38.51
6 Penfold Street SARINA QLD 4737	36.24	34.79	FDSS-Stumps-S	36.24
4 Penfold Street SARINA QLD 4737	30.11	31.09	FDHS-S	31.19
11 Utah Avenue SARINA QLD 4737	36.12	34.69	FDHS-S	36.12
9 Utah Avenue SARINA QLD 4737	33.44	31.72	FDDS-S	33.44
7 Utah Avenue SARINA QLD 4737	29.02	27.61	FDSS-Stumps-S	29.02
5 Utah Avenue SARINA QLD 4737	26.36	24.61	FDHS-S	26.36
3 Utah Avenue SARINA QLD 4737	21.49	22.40	FDDS-S	22.50
1 Utah Avenue SARINA QLD 4737	19.57	20.20	FDDS-S	20.30
6 Utah Avenue SARINA QLD 4737	31.52	29.59	FDSS-Stumps-S	31.52
4 Utah Avenue SARINA QLD 4737	27.25	25.64	FDSS-Stumps-S	27.25
10 Maudsley Road SARINA QLD 4737	22.02	20.55	FDSS-Stumps-S	22.02
6 Maudsley Road SARINA QLD 4737	21.78	21.73	FDSS-Stumps-S	21.83
8 Maudsley Road SARINA QLD 4737	20.41	19.52	FDSS-Stumps-S	20.41
2 Webb Road SARINA QLD 4737	15.14	14.97	FDDS-S	15.14
9 Maudsley Road SARINA QLD 4737	15.34	14.78	FDSS-Stumps-S	15.34
11 Maudsley Road SARINA QLD 4737	14.93	14.58	FDSS-SOG-S	14.93
6 Webb Road SARINA QLD 4737	14.59	14.37	FDSS-SOG-S	14.59
13 Maudsley Road SARINA QLD 4737	15.04	14.73	FDSS-Stumps-M	15.04
8 Webb Road SARINA QLD 4737	14.90	14.11	FDSS-Stumps-S	14.90
10 Webb Road SARINA QLD 4737	14.15	13.98	FDSS-SOG-M	14.15
12 Webb Road SARINA QLD 4737	14.44	13.67	FDSS-Stumps-S	14.44
15 Maudsley Road SARINA QLD 4737	0.00	15.23	FDSS-SOG-S	15.33
6 Blakeley Road SARINA QLD 4737	0.00	22.92	FDSS-SOG-L	23.02
2 Blakeley Road SARINA QLD 4737	0.00	20.28	FDSS-SOG-M	20.38
11 Blakeley Road SARINA QLD 4737	0.00	22.98	FDSS-SOG-S	23.08
38 Webb Road SARINA QLD 4737	0.00	20.95	FDSS-SOG-M	21.05
40 Webb Road SARINA QLD 4737	0.00	19.26	FDSS-SOG-S	19.36
42 Webb Road SARINA QLD 4737	0.00	17.78	FDSS-SOG-M	17.88

44 Webb Road SARINA QLD 4737	0.00	16.80	FDSS-SOG-S	17.41
62 Brewers Road SARINA QLD 4737	0.00	18.42	COM3-S	18.52
95 Sarina Beach Road SARINA QLD 4737	0.00	14.53	FDSS-SOG-L	14.63
97 Sarina Beach Road SARINA QLD 4737	14.67	14.32	FDSS-SOG-M	14.67
99 Sarina Beach Road SARINA QLD 4737	14.46	14.37	FDSS-SOG-S	14.47
3 Cemetery Road SARINA QLD 4737	14.34	14.27	FDDS-M	14.37
5 Cemetery Road SARINA QLD 4737	14.66	14.24	COM3-S	14.66
28 Pacific Avenue SARINA QLD 4737	13.73	13.72	FDSS-SOG-L	13.82
24 Pacific Avenue SARINA QLD 4737	14.45	14.32	FDSS-SOG-L	14.45
11 Cemetery Road SARINA QLD 4737	14.14	13.95	FDSS-SOG-M	14.14
34 Pacific Avenue SARINA QLD 4737	13.18	13.10	FDSS-SOG-M	13.20
36 Pacific Avenue SARINA QLD 4737	13.02	12.87	FDSS-SOG-L	13.02
41 Pacific Avenue SARINA QLD 4737	12.91	12.86	FDSS-SOG-M	12.96
15 Reef Drive SARINA QLD 4737	13.22	13.19	FDSS-SOG-L	13.29
13 Millenium Drive SARINA QLD 4737	12.37	12.22	FDSS-SOG-M	12.37
17 Millenium Drive SARINA QLD 4737	12.17	12.06	FDSS-SOG-L	12.17
19 Millenium Drive SARINA QLD 4737	12.25	12.24	FDSS-SOG-L	12.34
8 Millenium Drive SARINA QLD 4737	13.46	13.18	FDSS-SOG-M	13.46
33 Cemetery Road SARINA QLD 4737	14.37	13.99	FDSS-SOG-L	14.37
35 Cemetery Road SARINA QLD 4737	0.00	14.42	FDSS-SOG-M	14.52
37 Cemetery Road SARINA QLD 4737	14.61	14.36	FDSS-SOG-M	14.61
39 Cemetery Road SARINA QLD 4737	14.64	14.38	FDSS-SOG-S	14.64
41 Cemetery Road SARINA QLD 4737	14.75	14.64	FDSS-SOG-M	14.75
43 Cemetery Road SARINA QLD 4737	14.67	14.47	FDSS-SOG-S	14.67
45 Cemetery Road SARINA QLD 4737	14.21	14.02	FDSS-SOG-M	14.21
4 Cyril McKie Court SARINA QLD 4737	11.80	11.91	COM3-M	12.01
8-10 Patch Street SARINA QLD 4737	14.18	10.88	COM3-M	10.98
4 Patch Street SARINA QLD 4737	10.54	10.70	COM3-M	10.80
7 Patch Street SARINA QLD 4737	11.75	11.82	COM3-S	11.92
5 Patch Street SARINA QLD 4737	11.66	11.70	COM3-S	11.80
8-10 Patch Street SARINA QLD 4737	14.18	11.13	COM3-S	11.23
5 Patch Street SARINA QLD 4737	11.66	11.75	COM3-S	11.85
5 Patch Street SARINA QLD 4737	11.66	11.66	COM3-S	11.76
1 Boyle Road SARINA QLD 4737	0.00	11.27	COM3-M	11.37
101-153 Sarina Beach Road SARINA QLD 4737	0.00	14.05	COM3-S	14.15
46 Pacific Avenue SARINA QLD 4737	13.10	12.99	FDSS-SOG-M	13.10
24-26 Millenium Drive SARINA QLD 4737	11.88	11.91	FDSS-SOG-L	12.01
6 Ocean Court SARINA QLD 4737	12.57	12.46	FDSS-SOG-L	12.57
10 Ocean Court SARINA QLD 4737	12.30	12.15	FDSS-SOG-L	12.30

4 Reef Drive SARINA QLD 4737	13.09	13.02	FDSS-SOG-L	13.12
29 Millenium Drive SARINA QLD 4737	13.23	12.96	FDSS-SOG-L	13.23
6-8 Credlin Court SARINA QLD 4737	13.34	13.21	FDSS-SOG-L	13.34
44 Millenium Drive SARINA QLD 4737	13.83	13.72	FDSS-SOG-L	13.83
8 Hook Court SARINA QLD 4737	15.32	15.11	FDSS-SOG-L	15.32
7 Hook Court SARINA QLD 4737	16.48	16.23	FDSS-SOG-L	16.48
5 Hook Court SARINA QLD 4737	16.58	16.57	FDSS-SOG-L	16.67
31 Reef Drive SARINA QLD 4737	15.91	15.70	FDSS-SOG-L	15.91
37 Reef Drive SARINA QLD 4737	0.00	16.91	FDSS-SOG-L	17.01
12 Pacific Avenue SARINA QLD 4737	15.84	15.72	FDSS-SOG-L	15.84
8 Pacific Avenue SARINA QLD 4737	16.55	16.42	FDSS-SOG-M	16.55
100 Sarina Beach Road SARINA QLD 4737	15.94	13.85	FDDS-S	15.94
1 Michael Avenue SARINA QLD 4737	14.00	13.75	FDSS-SOG-M	14.00
3 Michael Avenue SARINA QLD 4737	13.68	13.58	FDDS-M	13.68
5 Michael Avenue SARINA QLD 4737	13.81	13.57	FDSS-SOG-L	13.81
3 Fremont Avenue SARINA QLD 4737	12.96	12.68	FDSS-SOG-M	12.96
5 Fremont Avenue SARINA QLD 4737	12.61	12.36	FDSS-SOG-L	12.61
9 Fremont Avenue SARINA QLD 4737	12.45	12.22	FDSS-SOG-M	12.45
11 Fremont Avenue SARINA QLD 4737	12.29	12.16	FDSS-SOG-M	12.29
2/17 Fremont Avenue SARINA QLD 4737	12.48	12.27	FDSS-SOG-S	12.48
26 Michael Avenue SARINA QLD 4737	12.19	12.02	FDSS-SOG-M	12.19
25 Michael Avenue SARINA QLD 4737	12.32	12.14	FDSS-SOG-M	12.32
21 Michael Avenue SARINA QLD 4737	12.46	12.24	FDSS-SOG-L	12.46
16 Patroyce Court SARINA QLD 4737	0.00	13.39	FDSS-SOG-M	13.53
3 Lando Avenue SARINA QLD 4737	12.30	12.12	FDSS-SOG-M	12.30
2 Lando Avenue SARINA QLD 4737	12.36	12.12	FDSS-SOG-L	12.36
4 Lando Avenue SARINA QLD 4737	12.20	12.16	FDSS-SOG-L	12.26
6 Lando Avenue SARINA QLD 4737	0.00	12.14	FDSS-SOG-L	12.53
7 Lando Avenue SARINA QLD 4737	12.27	12.12	FDSS-SOG-M	12.27
10 Lando Avenue SARINA QLD 4737	12.30	12.15	FDSS-SOG-M	12.30
13 Lando Avenue SARINA QLD 4737	12.26	12.13	FDSS-SOG-S	12.26
14 Lando Avenue SARINA QLD 4737	12.34	12.16	FDSS-SOG-L	12.34
16 Lando Avenue SARINA QLD 4737	12.43	12.25	FDSS-SOG-L	12.43
18 Lando Avenue SARINA QLD 4737	12.73	12.57	FDSS-SOG-L	12.73
48 Hans Christian Street SARINA QLD 4737	12.20	11.84	FDSS-SOG-M	12.20
33 Hans Christian Street SARINA QLD 4737	0.00	11.68	FDSS-SOG-M	11.78
11 Roy Street SARINA QLD 4737	0.00	13.14	FDSS-SOG-L	13.24
73 Hans Christian Street SARINA QLD 4737	0.00	10.73	FDSS-SOG-L	10.83
17 Patroyce Court SARINA QLD 4737	0.00	13.25	FDSS-SOG-M	13.35

14 Patroyce Court SARINA QLD 4737	0.00	13.45	FDSS-SOG-M	13.61
5 Patroyce Court SARINA QLD 4737	0.00	13.76	FDSS-SOG-M	13.93
2 Patroyce Court SARINA QLD 4737	14.18	14.03	FDSS-SOG-L	14.18
5 Hans Christian Street SARINA QLD 4737	0.00	12.53	FDSS-SOG-M	12.72
7 Hans Christian Street SARINA QLD 4737	12.65	12.45	FDSS-SOG-M	12.65
9 Hans Christian Street SARINA QLD 4737	12.62	12.33	FDSS-SOG-M	12.62
6 Fremont Avenue SARINA QLD 4737	12.41	12.29	FDSS-SOG-S	12.41
4 Hans Christian Street SARINA QLD 4737	13.21	12.91	FDSS-SOG-S	13.21
6 Hans Christian Street SARINA QLD 4737	13.12	12.86	FDSS-SOG-L	13.12
8 Hans Christian Street SARINA QLD 4737	12.91	12.77	FDSS-SOG-L	12.91
10 Hans Christian Street SARINA QLD 4737	12.93	12.74	FDSS-SOG-L	12.93
12 Hans Christian Street SARINA QLD 4737	13.03	12.79	FDSS-SOG-L	13.03
5 Elizabeth Street SARINA QLD 4737	13.38	13.19	FDSS-SOG-L	13.38
3 Elizabeth Street SARINA QLD 4737	13.53	13.27	FDSS-SOG-M	13.53
L 2 Elizabeth Street SARINA QLD 4737	0.00	13.16	FDSS-SOG-S	13.26
13 Lilliendal Avenue SARINA QLD 4737	19.05	18.87	FDSS-SOG-M	19.05
33 Place Avenue SARINA QLD 4737	20.57	19.93	FDSS-SOG-S	20.57
32 Place Avenue SARINA QLD 4737	17.87	17.93	FDDS-S	18.03
34 Place Avenue SARINA QLD 4737	0.00	17.24	FDSS-SOG-M	18.01
64 Sarina Beach Road SARINA QLD 4737	0.00	20.70	FDSS-SOG-S	20.80
50 Sarina Beach Road SARINA QLD 4737	20.24	19.74	FDSS-Stumps-S	20.24
28 Sarina Beach Road SARINA QLD 4737	15.78	15.54	COM2-M	15.78
7 Brooks Road SARINA QLD 4737	19.81	19.12	FDSS-Stumps-M	19.81
3 Place Avenue SARINA QLD 4737	19.13	17.38	FDSS-Stumps-S	19.13
17 Brooks Road SARINA QLD 4737	21.22	20.83	FDSS-Stumps-S	21.22
15 Brooks Road SARINA QLD 4737	21.12	20.43	FDHS-M	21.12
21 Brooks Road SARINA QLD 4737	22.73	22.11	FDSS-Stumps-L	22.73
23 Brooks Road SARINA QLD 4737	22.23	22.16	FDDS-M	22.26
23A Brooks Road SARINA QLD 4737	24.60	22.60	FDDS-S	24.60
29 Brooks Road SARINA QLD 4737	0.00	22.27	FDDS-M	22.37
44 Kathleen Street SARINA QLD 4737	16.23	16.17	FDSS-SOG-M	16.27
31 Kathleen Street SARINA QLD 4737	0.00	14.53	FDSS-SOG-M	14.64
9 Holmes Avenue SARINA QLD 4737	21.03	20.90	FDSS-SOG-L	21.03
L 7 Place Avenue SARINA QLD 4737	25.45	25.47	FDSS-SOG-S	25.57
4/106 Broad Street SARINA QLD 4737	16.24	15.83	FDSS-SOG-S	16.24

5/106 Broad Street SARINA QLD 4737	16.24	15.41	FDSS-SOG-S	16.24
13 Phillip Street SARINA QLD 4737	16.86	16.07	FDSS-Stumps-L	16.86
41-61 Hoey Street SARINA QLD 4737	0.00	16.45	COM2-S	16.61
3 Phillip Street SARINA QLD 4737	16.52	16.55	FDSS-SOG-M	16.65
45 Anzac Street SARINA QLD 4737	0.00	89.54	FDSS-SOG-L	89.64
34 Brewers Road SARINA QLD 4737	17.66	17.46	FDSS-SOG-M	17.66
7 Brownsey Court SARINA QLD 4737	12.72	12.49	FDSS-SOG-M	12.72
5 Brownsey Court SARINA QLD 4737	12.72	12.38	FDSS-SOG-L	12.72
18 Fremont Avenue SARINA QLD 4737	12.23	12.07	FDSS-SOG-M	12.23
62 Cemetery Road SARINA QLD 4737	0.00	10.18	FDSS-SOG-L	10.92
142 Broad Street SARINA QLD 4737	0.00	16.60	FDSS-Stumps-S	16.85
132 Broad Street SARINA QLD 4737	16.94	17.08	FDDS-S	17.18
126 Broad Street SARINA QLD 4737	19.30	16.79	FDSS-Stumps-S	19.30
31 Anzac Street SARINA QLD 4737	0.00	29.63	COM2-S	29.73
31 Anzac Street SARINA QLD 4737	0.00	29.93	COM2-S	30.03
31 Anzac Street SARINA QLD 4737	0.00	29.07	COM2-S	29.17
12 Ware Avenue SARINA QLD 4737	19.83	19.78	FDSS-SOG-L	19.88
14 Ware Avenue SARINA QLD 4737	19.44	19.33	FDSS-SOG-L	19.44
11 Michael Avenue SARINA QLD 4737	13.25	13.12	FDSS-SOG-M	13.25
13 Patroyce Court SARINA QLD 4737	0.00	13.49	FDSS-SOG-L	13.71
101-153 Sarina Beach Road SARINA QLD 4737	0.00	13.55	COM3-S	13.65
1 Patch Street SARINA QLD 4737	10.78	10.76	COM3-M	10.86
6 Patch Street SARINA QLD 4737	10.60	10.71	COM3-S	10.81
12 Patch Street SARINA QLD 4737	11.39	11.01	COM3-S	11.39
88 Cemetery Road SARINA QLD 4737	0.00	10.92	COM2-S	11.02
67 Sarina Homebush Road SARINA QLD 4737	0.00	32.36	COM1-S	32.46
7 Carol Court SARINA QLD 4737	36.93	36.87	FDSS-SOG-M	36.97
7 Carol Court SARINA QLD 4737	36.93	36.90	FDSS-SOG-S	37.00
3 Carol Court SARINA QLD 4737	0.00	37.90	FDSS-SOG-L	38.00
38 Collins Avenue SARINA QLD 4737	0.00	37.76	FDSS-SOG-M	37.86
28 Collins Avenue SARINA QLD 4737	0.00	36.31	FDSS-SOG-L	36.41
307 Sarina Beach Road SARINA QLD 4737	0.00	16.14	FDSS-SOG-L	16.24
264 Sarina Beach Road SARINA QLD 4737	0.00	11.79	FDSS-SOG-L	11.89
264 Sarina Beach Road SARINA QLD 4737	0.00	11.61	COM2-S	11.71
264 Sarina Beach Road SARINA QLD 4737	0.00	11.51	COM2-S	11.61
264 Sarina Beach Road SARINA QLD 4737	0.00	11.85	COM2-S	11.95
264 Sarina Beach Road SARINA QLD	0.00	11.61	COM2-S	11.71

4737

22 Michael Avenue SARINA QLD 4737	12.26	12.12	FDSS-SOG-L	12.26
10 Kathleen Street SARINA QLD 4737	0.00	13.84	FDDS-M	13.94
40 Place Avenue SARINA QLD 4737	17.51	15.29	FDDS-S	17.51
4 Maureen Avenue SARINA QLD 4737	0.00	17.45	COM2-S	17.55
4-10 Hoey Street SARINA QLD 4737	17.92	17.68	FDSS-Stumps-S	17.88
39 Webb Road SARINA QLD 4737	0.00	17.55	FDSS-SOG-S	17.65
50 Armstrong Beach Road SARINA QLD 4737	0.00	31.21	FDDS-M	31.31
90836 Bruce Highway SARINA QLD 4737	0.00	48.10	FDDS-M	48.20
30 Mill Street SARINA QLD 4737	30.21	28.37	FDSS-Stumps-M	30.21
L 11 Greetham Street SARINA QLD 4737	24.04	25.33	COM2-S	25.43
L 11 Greetham Street SARINA QLD 4737	24.04	25.37	COM2-S	25.47
L 11 Greetham Street SARINA QLD 4737	24.04	25.73	COM2-S	25.83
L 11 Greetham Street SARINA QLD 4737	24.04	24.58	COM2-S	24.68
L 11 Greetham Street SARINA QLD 4737	24.04	24.35	COM2-S	24.45
L 11 Greetham Street SARINA QLD 4737	24.04	23.45	COM2-S	23.55
L 11 Greetham Street SARINA QLD 4737	24.04	26.75	COM2-S	26.85
L 11 Greetham Street SARINA QLD 4737	24.04	26.53	COM2-S	26.63
L 11 Greetham Street SARINA QLD 4737	24.04	27.53	COM2-S	27.63
L 11 Greetham Street SARINA QLD 4737	24.04	27.94	COM2-S	28.04
L 11 Greetham Street SARINA QLD 4737	24.04	29.51	COM2-S	29.61
L 11 Greetham Street SARINA QLD 4737	24.04	29.26	COM2-S	29.36
L 11 Greetham Street SARINA QLD 4737	24.04	28.66	COM2-S	28.76
L 11 Greetham Street SARINA QLD 4737	24.04	28.74	COM2-S	28.84
L 11 Greetham Street SARINA QLD 4737	24.04	26.22	COM2-S	26.32
L 11 Greetham Street SARINA QLD 4737	24.04	25.75	COM2-S	25.85
58 West Street SARINA QLD 4737	30.51	30.31	FDSS-Stumps-M	30.51
56 West Street SARINA QLD 4737	29.67	29.54	FDSS-Stumps-M	29.67
183 Marlborough-Sarina Road SARINA QLD 4737	24.06	23.85	FDSS-SOG-L	24.06
187 Marlborough-Sarina Road SARINA QLD 4737	0.00	23.72	FDSS-SOG-L	23.82
195 Marlborough-Sarina Road SARINA QLD 4737	0.00	24.17	FDSS-SOG-L	24.27
165 Marlborough-Sarina Road SARINA QLD 4737	0.00	20.36	COM3-S	20.46
L 7 Bruce Highway SARINA QLD 4737	0.00	23.28	COM3-L	24.36
L 7 Bruce Highway SARINA QLD 4737	0.00	22.55	COM3-L	22.65
L 7 Bruce Highway SARINA QLD 4737	0.00	24.37	COM3-S	24.47
72 Golf Course Road SARINA QLD 4737	0.00	30.05	COM2-S	30.15
91239 Bruce Highway SARINA QLD 4737	0.00	32.49	FDSS-SOG-S	32.59
L 2 Grovely Road SARINA QLD 4737	0.00	26.21	COM3-M	26.31

L 2 Grovely Road SARINA QLD 4737	0.00	26.22	COM3-M	26.32
31 Anzac Street SARINA QLD 4737	30.86	31.63	COM3-S	31.73
5/5 East Street SARINA QLD 4737	0.00	18.20	FDSS-SOG-S	18.30
6/5 East Street SARINA QLD 4737	0.00	18.35	FDSS-SOG-S	18.45
52-54 Broad Street SARINA QLD 4737	20.73	19.75	COM4-M	20.73
7 Brewers Road SARINA QLD 4737	18.11	18.02	FDDS-S	18.12
10 Dawson Street SARINA QLD 4737	16.11	15.85	FDSS-Stumps-M	16.11
136 Broad Street SARINA QLD 4737	17.16	17.28	FDDS-M	17.38
91334 Bruce Highway SARINA QLD 4737	0.00	23.22	FDSS-SOG-M	23.32
91336 Bruce Highway SARINA QLD 4737	0.00	39.42	FDSS-SOG-L	39.52
10 Venton Street SARINA QLD 4737	18.87	18.56	FDSS-Stumps-S	18.87
44-50 Broad Street SARINA QLD 4737	22.94	20.31	COM2-M	20.41
44-50 Broad Street SARINA QLD 4737	22.94	20.37	COM2-M	20.47
1/12 East Street SARINA QLD 4737	17.60	17.46	FDSS-SOG-S	17.60
3/12 East Street SARINA QLD 4737	0.00	17.46	FDSS-SOG-S	17.56
L 2 Broad Street SARINA QLD 4737	0.00	18.73	FDSS-SOG-M	18.83
1/35 Jackson Street SARINA QLD 4737	37.73	38.66	FDHS-S	38.76
1/66 West Street SARINA QLD 4737	33.69	33.51	FDSS-SOG-M	33.69
2/78 West Street SARINA QLD 4737	36.63	36.41	FDSS-Stumps-M	36.63
2/51 Jackson Street SARINA QLD 4737	0.00	41.83	FDSS-SOG-M	41.93
4/69 West Street SARINA QLD 4737	0.00	29.61	FDSS-Stumps-S	29.71
3/69 West Street SARINA QLD 4737	0.00	29.39	FDSS-Stumps-S	29.49
1/69 West Street SARINA QLD 4737	29.57	29.38	FDSS-Stumps-S	29.57
2/6 Innes Street SARINA QLD 4737	24.34	24.34	FDSS-SOG-M	24.44
1/11 Place Avenue SARINA QLD 4737	0.00	19.39	FDSS-Stumps-S	19.49
2A Roy Street SARINA QLD 4737	15.79	14.68	FDSS-SOG-S	14.78
1/23 Ware Avenue SARINA QLD 4737	18.68	18.37	FDSS-SOG-S	18.68
2/23 Ware Avenue SARINA QLD 4737	18.68	18.49	FDSS-SOG-S	18.68
3/23 Ware Avenue SARINA QLD 4737	18.68	18.61	FDSS-SOG-S	18.71
2/8 Reef Drive SARINA QLD 4737	12.67	12.54	FDSS-SOG-L	12.67
2/30 Langdon Street SARINA QLD 4737	45.14	45.07	FDSS-SOG-S	45.17
1/122 Broad Street SARINA QLD 4737	0.00	16.65	FDSS-SOG-S	16.80
4/122 Broad Street SARINA QLD 4737	0.00	16.51	FDSS-SOG-S	16.61
3/122 Broad Street SARINA QLD 4737	0.00	16.62	FDSS-SOG-S	16.72
112 Broad Street SARINA QLD 4737	16.55	16.41	COM3-M	16.55
1/106 Broad Street SARINA QLD 4737	16.24	16.15	FDSS-SOG-S	16.25
3/106 Broad Street SARINA QLD 4737	16.24	15.89	FDSS-SOG-S	16.24
6/106 Broad Street SARINA QLD 4737	16.24	15.39	FDSS-SOG-S	16.24
1/104 Broad Street SARINA QLD 4737	16.14	16.08	FDSS-SOG-S	16.18
2/104 Broad Street SARINA QLD 4737	16.14	16.06	FDSS-SOG-S	16.16
3/104 Broad Street SARINA QLD 4737	16.14	15.96	FDSS-SOG-S	16.14
101 Broad Street SARINA QLD 4737	16.49	16.96	FDSS-Stumps-S	17.06

14 Dawson Street SARINA QLD 4737	16.07	15.86	COM3-S	16.07
2/1 Hook Court SARINA QLD 4737	16.52	16.02	FDSS-SOG-M	16.52
1/25 Reef Drive SARINA QLD 4737	0.00	14.55	FDSS-SOG-S	14.65
2/46 Millenium Drive SARINA QLD 4737	14.00	13.93	FDSS-SOG-M	14.03
38 Place Avenue SARINA QLD 4737	16.19	16.00	FDSS-SOG-S	16.19
38 Place Avenue SARINA QLD 4737	16.19	15.90	FDSS-SOG-S	16.19
1/5 Graham Street SARINA QLD 4737	16.36	16.32	FDSS-SOG-M	16.42
4/5 Graham Street SARINA QLD 4737	16.76	16.66	FDSS-SOG-M	16.76
6/5 Graham Street SARINA QLD 4737	0.00	16.67	FDSS-SOG-M	16.77
5/71 Broad Street SARINA QLD 4737	17.26	17.39	COM3-S	17.49
4/71 Broad Street SARINA QLD 4737	17.36	17.47	COM3-S	17.57
3/71 Broad Street SARINA QLD 4737	17.31	17.43	COM3-S	17.53
2/71 Broad Street SARINA QLD 4737	17.39	17.48	COM3-S	17.58
1/71 Broad Street SARINA QLD 4737	17.39	17.48	COM3-M	17.58
2/73 Broad Street SARINA QLD 4737	17.31	17.38	COM3-S	17.48
1/50 Jackson Street SARINA QLD 4737	41.34	41.22	FDSS-Stumps-M	41.34
23 Anzac Street SARINA QLD 4737	26.79	26.17	FDSS-Stumps-M	26.79
13 Nolan Street SARINA QLD 4737	25.47	26.14	FDSS-Stumps-S	26.24
13 Nolan Street SARINA QLD 4737	25.47	25.50	FDSS-Stumps-S	25.60
9-13 Nolan Street SARINA QLD 4737	25.40	26.31	FDSS-Stumps-S	26.41
9-13 Nolan Street SARINA QLD 4737	25.40	25.18	FDSS-Stumps-S	25.40
17 Anzac Street SARINA QLD 4737	23.68	23.61	FDSS-SOG-M	23.71
2/15 Anzac Street SARINA QLD 4737	23.22	23.14	FDSS-Stumps-S	23.24
3/15 Anzac Street SARINA QLD 4737	23.22	23.13	FDSS-Stumps-S	23.23
4/15 Anzac Street SARINA QLD 4737	23.22	23.12	FDSS-Stumps-S	23.22
5/13-15 Brandon Street SARINA QLD 4737	0.00	22.46	FDSS-Stumps-M	22.56
1-3 Brandon Street SARINA QLD 4737	22.63	22.52	COM3-S	22.63
2/37 Range Road SARINA QLD 4737	21.10	21.13	FDSS-Stumps-S	21.73
3/37 Range Road SARINA QLD 4737	21.10	21.15	FDSS-Stumps-S	21.75
L 12 Range Road SARINA QLD 4737	0.00	22.27	COM3-M	22.37
16 Range Road SARINA QLD 4737	0.00	22.19	COM3-M	22.29
1/1 Beagrie Street SARINA QLD 4737	23.96	24.04	FDSS-SOG-S	24.14
2/1 Beagrie Street SARINA QLD 4737	23.96	24.56	FDSS-SOG-S	24.66
3/1 Beagrie Street SARINA QLD 4737	23.96	24.93	FDSS-SOG-S	25.03
4/1 Beagrie Street SARINA QLD 4737	23.96	25.32	FDSS-SOG-S	25.42
5/1 Beagrie Street SARINA QLD 4737	23.96	25.74	FDSS-SOG-S	25.84
1/2 Noden Street SARINA QLD 4737	27.20	27.24	FDSS-SOG-M	27.34
38-40 Central Street SARINA QLD 4737	23.51	22.06	COM3-L	23.51
38-40 Central Street SARINA QLD 4737	23.51	22.49	COM3-M	23.51
31 Broad Street SARINA QLD 4737	18.21	18.18	COM3-S	18.28
47 Broad Street SARINA QLD 4737	19.19	19.56	COM3-M	19.66

30-34 Broad Street SARINA QLD 4737	17.73	17.91	COM3-M	18.01
28 Broad Street SARINA QLD 4737	17.93	17.88	COM3-M	17.98
3 Boyle Road SARINA QLD 4737	0.00	11.13	COM3-M	11.23
1/13 Michael Avenue SARINA QLD 4737	13.24	12.98	FDSS-SOG-S	13.24
1/17 Fremont Avenue SARINA QLD 4737	12.50	12.27	FDSS-SOG-S	12.50
2/14 Elizabeth Street SARINA QLD 4737	13.25	13.03	FDSS-SOG-S	13.25
2/41 Brooks Road SARINA QLD 4737	19.60	19.36	FDSS-SOG-S	19.60
1/82 West Street SARINA QLD 4737	38.40	38.29	FDSS-SOG-M	38.40
1/13 Hoey Street SARINA QLD 4737	17.46	17.25	FDSS-SOG-S	17.46
2/13 Hoey Street SARINA QLD 4737	17.46	17.25	FDSS-SOG-S	17.46
4/13 Hoey Street SARINA QLD 4737	17.46	17.30	FDSS-SOG-S	17.46
L 2 Broad Street SARINA QLD 4737	0.00	18.68	FDSS-SOG-S	18.78
L 2 Broad Street SARINA QLD 4737	0.00	18.57	FDSS-SOG-S	18.67
L 2 Broad Street SARINA QLD 4737	0.00	18.43	FDSS-SOG-S	18.53
L 2 Broad Street SARINA QLD 4737	0.00	18.28	FDSS-SOG-S	18.38
1 Biltoft Street SARINA QLD 4737	18.01	15.90	FDHS-S	18.01
1 Biltoft Street SARINA QLD 4737	18.01	15.88	FDHS-S	18.01
1 Biltoft Street SARINA QLD 4737	18.01	15.92	FDHS-S	18.01
1 Biltoft Street SARINA QLD 4737	18.01	15.89	FDHS-S	18.01
Mill Street SARINA QLD 4737	20.40	17.28	COM2-M	17.38
101-153 Sarina Beach Road SARINA QLD 4737	0.00	14.10	COM3-S	14.20
2 Broad Street SARINA QLD 4737	18.60	18.25	FDSS-Stumps-S	18.60
42 Range Road SARINA QLD 4737	22.12	22.20	FDSS-SOG-L	22.30
22 Pacific Avenue SARINA QLD 4737	0.00	14.58	FDSS-SOG-M	14.68