

PLANS AND DOCUMENTS
referred to in the ULDA

APPROVAL dated 11 / 4 / 11

STORMWATER MANAGEMENT PLAN

FOR THE PROPOSED
SHOWROOM AND OFFICES

LOCATED AT
10 THEODORE STREET
EAGLE FARM

PREPARED FOR VOXSON PTY LTD
BY BORNHORST & WARD PTY LTD

Bornhorst & Ward Project No. **10230**

If you have any queries regarding this report please contact Kris Rensch

Revision	Date	Description	Author	Rev.	App.
A	Oct 2010	Issue for Approval	KR	NR	NR

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1. INTRODUCTION

Bornhorst and Ward has been commissioned to investigate and report on the stormwater drainage characteristics pertaining to a proposed commercial development, located at 10 Theodore Street, Eagle Farm. The location of the proposed site is indicated in Figure 4, Appendix A.

The Civil Engineering requirements for this proposal have been addressed in relation to the Brisbane City Council Subdivision and Development Guidelines and the Queensland Urban Drainage Manual.

2. SITE CHARACTERISTICS

2.1 LOCATION

The proposed site is located on the eastern side of Theodore Street, Eagle Farm. The site is bound by an existing commercial property on the southern boundary, a park on the northern boundary and an open drain following the eastern property boundary. This is indicated in Figure 1 below.

Street Address: 10 Theodore Street, Eagle Farm
RP Description: Lot 1 on SP228434



Figure 1: Orientation Plan

2.2 LANDUSE

2.2.1 EXISTING

The existing site has an area of approximately 0.215Ha and is currently occupied by two commercial buildings and associated carpark areas. There are also a number of landscaping areas within the site consisting of trees and short grasses. A copy of the site survey undertaken by Jones, Flint & Pike, drawing B2957-04C is attached in Appendix A.

2.2.2 PROPOSED

The proposal detailed in this report is for the construction of a commercial building consisting of a number of showrooms and offices with associated carparking areas fronting Theodore Street. There is also a single level basement proposed beneath the building for carparking. Access to the site is via a one way entrance from Theodore Street, with egress being provided via the existing circulation road of the adjoining commercial property. The proposed layout is shown on the Mode Design drawing DD011_A attached in Appendix A.

2.3 TOPOGRAPHY AND SITE DRAINAGE

2.3.1 EXISTING SITE DRAINAGE

In existing conditions the site generally falls towards the northern and eastern property boundaries at relatively flat grades. The survey indicates that the site levels range around RL 2.5 - 3.0m AHD. Stormwater is currently discharged to the existing drainage system surrounding the site via three discharge locations described in the following section. These form the existing legal point of discharge for the site.

2.3.2 EXISTING STORMWATER INFRASTRUCTURE

There is an existing open drain following the eastern property boundary of the site. This collects stormwater discharges from drainage infrastructure within Theodore Street and upstream catchments, and directs it towards a more defined tidal channel on the southern side of Curtin Avenue West. Stormwater runoff ultimately discharges to the Brisbane River. This is indicated in the figure below.

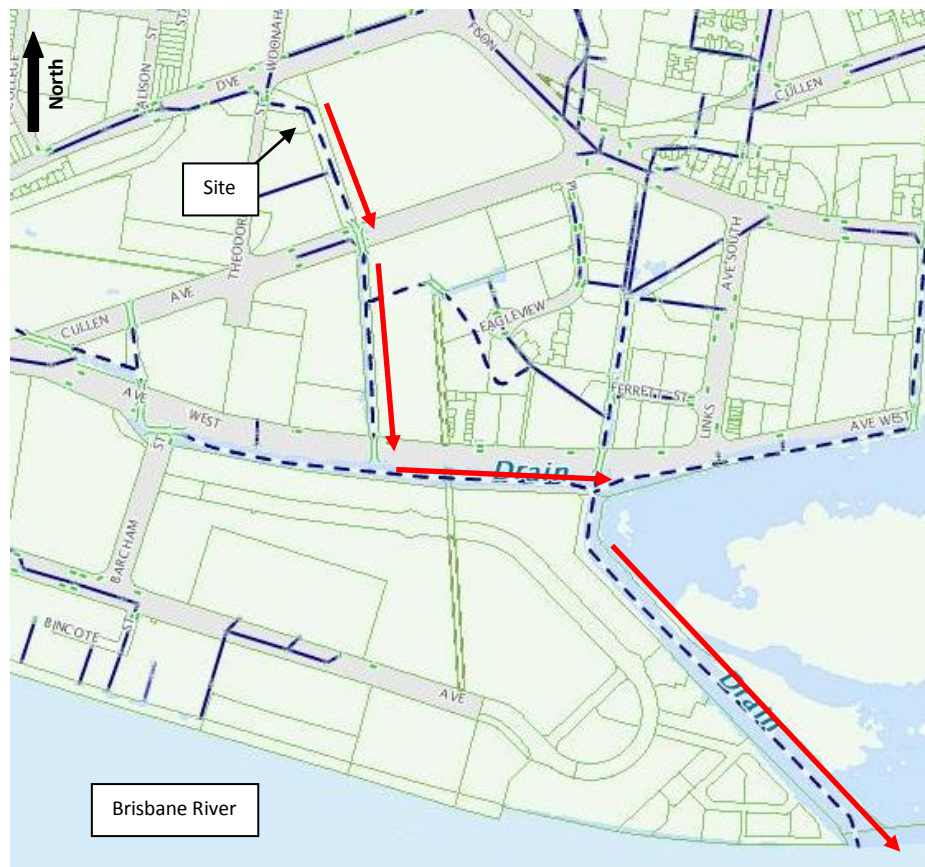


Figure 2: Existing Drainage System

There are a number of gully pits within Theodore Street, close to the development site. BCC records indicate that these discharge via a headwall into an open channel within the adjoining park area. From review of the site survey and a site inspection, the 1800mm diameter pipes have since been extended from Theodore Street, to the existing open channel at the rear of the property. There is also no well defined overland flow path within the adjoining park area.

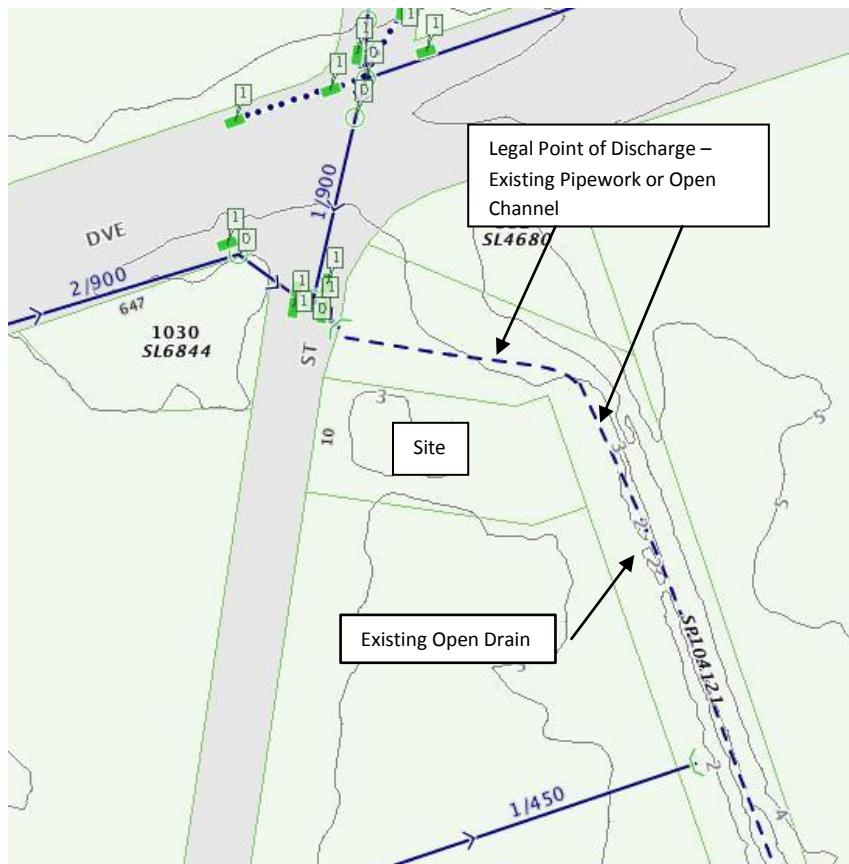


Figure 3: Existing Piped Stormwater Infrastructure

Internal to the development site, there is a single 300mm diameter outlet into the open channel at the rear of the property, providing connection to a single field inlet. There is also a 300mm direct connection to the existing 1800mm diameter stormwater line crossing through the park, providing drainage to the existing carpark area within the site.

There is an existing 600mm diameter stormwater line within the site, following the front boundary. This services the upstream properties, as well as a provides drainage to a single field inlet close to the existing entrance. The location of these is indicated on the attached Jones Flint & Pike Survey, and the Bornhorst & Ward Conceptual Stormwater Layout SKC001 attached in Appendix A.

2.3.3 PROPOSED

Due to the existing site uses, the stormwater characteristics of the site will not change as a result of the development. It is expected that the existing 300mm diameter outlet to the open channel is utilised as the roofwater connection for the site. The existing 600mm diameter stormwater line close to the front property boundary will form the legal point of discharge for the small carpark area proposed for the front of the development. It is proposed that a new manhole is constructed over the existing line to provide a connection

to a new stormwater field inlet and GPT. Stormwater quality improvement devices are detailed further in Section 4 of this report.

2.4 EXTERNAL CATCHMENTS

A review of the Brisbane City Plan contours and a site inspection has indicated that there are generally no external catchments draining into the site. There are however external catchments draining towards the gully pits within Theodore Street, close to Kingsford Smith Drive. Theodore Street is very flat, however grades towards gully pits located within a sag fronting the park area. During a major storm event, stormwater will pond in this location, until the pipe capacity is reached. It is believed, based on a site inspection and spot levels provided by the site survey, that runoff not captured by the existing gully pits will flow south via Theodore Street.

Due to the generally flat topography of the area, it is however difficult to determine without further survey information whether water will pond at the gully pits and outlet south through Theodore Street, or pond around the gully pits and flow through the park area into the open channel at the rear of the property. As there is no defined overland flow path within the adjoining park area, and drainage from Theodore Street has been extended to the open channel, it can be assumed that water will outlet via Theodore Street. This can be confirmed during future stages of the project, if survey is undertaken of a section of the adjoining park area and spot levels of the Theodore Street kerb line.

2.5 SITE FLOODING

A Brisbane City Council Floodwise Property Report has been obtained for the development site. The Highest Defined Flood Level (DFL) has identified as RL 2.5m AHD, as a result of Storm Tide from the Brisbane River. This report indicates the Storm Tide as the highest flooding source, however the site is subject to other forms of flooding. The BCC flood report is attached in Appendix C.

The Northern Australia Trade Coast – Drainage and Fill Study, completed by Connell Wagner in 2007 has also been reviewed. Flood levels within the open drain approximately 200m south of the site, on the northern side of Cullen Avenue West have been defined as RL3.2m AHD, prior to implementation of any mitigation measures. At this stage it is unknown what drainage relief options have been implemented by Council or the Port of Brisbane. Maps indicating flood levels are attached in Appendix C.

Discussions with Council Engineers have also taken place regarding flooding of the development site. Council officers have advised that the Flood Wise report level of RL2.5m AHD is the flood level adopted by Council, however the site may be subject to additional sources of flooding, of which Council do not have records.

It was noted from a site inspection, that there is no defined overland flow path through the adjoining park area. As discussed in the section above this can be confirmed following survey of levels surrounding the site, however it is expected that localised overland flow can discharge via Theodore Street.

Based on the above information, the Q_{100} flood level of RL3.2m has been adopted for the site. Although this flood level is for a downstream section of the open channel following the eastern site boundary, the surrounding areas are very flat, hence it is not expected that the level would rise significantly upstream.

Table 1 below indicates the required minimum development levels. In terms of Flood Immunity Levels specified by Council, the building has been classified as Category C, therefore no freeboard is required by council guidelines. As a safety factor it is recommended that 300mm freeboard is provided to the site. This is consistent with QUDM requirements for freeboard to the road reserve. It is expected that these levels are achievable, as site levels range around RL 3.0m. It is believed that the option for an underground basement will be acceptable for this development, as long as the basement entrance is at or above the maximum flood level defined for the site. Again it is recommended that the entrance and exit ramps to the basement are also provided freeboard to the Q_{100} flood level. Existing and proposed levels are indicated on the Bornhorst & Ward Drawing SKC001 attached in Appendix A.

Table 1: Minimum Development Levels

	Council Requirements		Recommendations	
	Minimum Level (m AHD)	Freeboard Required	Minimum Level (m AHD – incl Freeboard)	Freeboard
Non Habitable Finished Floor Level	RL 3.2m	0.0m	RL3.5m	0.3m
Basement Access Level	RL 3.2m	0.0m	RL3.5m	0.3m

3. STORMWATER QUANTITY

3.1 STORMWATER DRAINAGE METHODOLOGY

Modelling of stormwater runoff quantity has been considered for the existing case and operational phase of the development. In order to assess the existing and predicted future (operational phase) discharge rates from the development site, calculations have been conducted based on the Rational Method, according to the methods specified in the Queensland Urban Drainage Manual and the Brisbane City Council Subdivision and Development Guidelines.

3.2 PEAK FLOW CALCULATIONS

The Rational Method as outlined by the Queensland Urban Drainage Manual was used to determine the peak flow rate corresponding to the minor and major storm events for this development. Brisbane City Council Subdivision and Development Guidelines, Table B2.1, "Design Standards for Major/Minor Drainage Systems" was used to identify the design storm events for this development as:

Minor - 1 in 10 year ARI

Major - 1 in 50 year ARI

Major (overland flow) - 1 in 100 year ARI

Flow rates were calculated at the point of discharge from the site for the existing and developed phases of the development. Detailed calculations can be reviewed in Appendix B. The existing and developed coefficient of runoff (C_{10}) has been calculated based on a review of aerial photography and the development layout.

Table 2: Pre & Post Development Peak Flow Calculations

Catchment Details	Parameter	Existing	Proposed
	Area (Ha)	0.2150	0.2150
	Fraction Impervious	85%	90%
	Coefficient of Runoff (C10)	0.87	0.88
	Time of Concentration (min)	5.0	5.0
	10 year Rainfall Intensity (mm/hr)	215	215
	50 year Rainfall Intensity (mm/hr)	292	292
	100 year Rainfall Intensity (mm/hr)	327	327
Discharge	1 in 10 year ARI (m ³ /s)	0.112	0.113
	1 in 50 year ARI (m ³ /s)	0.175	0.175
	1 in 100 year ARI (m ³ /s)	0.195	0.195

As indicated in the table above, the proposed development will not result in a significant increase in runoff from the site. As the site in existing conditions is completely developed with a large amount of impervious area, the proposed development will not make any changes to the stormwater characteristics of the site.

The small increase in runoff in the minor storm of 1L/s can be attributed to a slight reduction of landscaping areas on the site as part of the development proposal. This is considered minor and negligible, and will not affect surrounding properties and existing infrastructure. It is believed that the development proposal is consistent with surrounding land uses. On site stormwater detention is therefore not required for this development proposal. Roofwater tanks may be used within the development, which will provide mitigation to the minor storm events.

4. STORMWATER QUALITY

4.1 WATER QUALITY

All references to water quality objectives and design requirements within this report have been based on Brisbane City Council Standards and in particular Brisbane City Council Subdivision and Development Guidelines Part C – Water Quality Management Guidelines.

The Brisbane City Council Subdivision and Development Guidelines, Part C – Water Quality Management Guidelines, specifies that the level of stormwater treatment is determined by the development falling into either the 'high' or 'low' risk categories. For a development to be classified as 'high risk' it must fall within one of the following categories as specified in Section 3.1.1 of the above guidelines:

- Development located in a waterway corridor, Brisbane River corridor, or wetland area;
- Multi-unit dwellings or commercial uses with an impermeable surface area (not including roof area) in excess of 2500m²;
- Subdivision where greater than 6 lots are involved
- Industrial activities that are not impact assessable (under Council's City Plan) and have at least 1000m² in uncovered storage / working space;
- Industrial activities that are impact assessable (under Council's City Plan);

- Uncovered car parks with at least 100 spaces;
- Developments which discharge stormwater or wastewater to an area deemed by Council to have significant environmental value.

From a review of these categories, we believe that the development can be classified as 'low risk' for Water Quality as the site is not located in a waterway corridor, Brisbane River corridor or wetland area. Also, the site area is 2150m², less than the 2500m² trigger for 'high risk' developments, and the majority of the site will consist of roof areas. As the development has been classified as 'low risk' Best Management Practices will be applied.

4.2 SITE CHARACTERISTICS AND IMPACTS

The proposed development is such that much of the site is covered with roof area. The uncovered areas of the site, excluding roof areas, consist of a small carpark at the site frontage, as well as landscaping areas following the front and, northern site boundaries. It is hence expected that the generation of pollutants would be low. Best management practices will be applied to mitigate the pollutant discharge from the site. The proposed development use and intensity is consistent with surrounding land uses.

4.3 PROPOSED TREATMENT TRAIN

It is proposed that runoff from the roof area of the development is directed to a rainwater tank, with the overflow pipe discharging to the open channel at the rear of the site, via the existing headwall. Drainage from the basement area can also be directed to this location, following treatment by a GPT or oil / grease arrestor. Any rainwater tanks and treatment devices located within the basement, shall be designed and located by the Hydraulic Engineer during the detailed design phase of the development.

It is proposed that stormwater quality treatment of the small carparking area at the front of the site is achieved by constructing a bio-retention swale within the landscaping area. Runoff from the carparking area will be allowed to sheet flow over a flush kerb into the swale, where stormwater will percolate through filter media within the swale, and discharge via a subsoil drain at the base of the swale. Any excess flows during a major storm event will be captured by a new field inlet. It is also proposed that a small GPT is installed downstream of the new field inlet to capture any additional litter and sediments, prior to discharge into the existing drainage system. We expect that this would be of the Ecosol RSF4000 range which allows trapping of oils and grease. A preliminary location of the swale and GPT is shown on the Bornhorst & Ward Drawing SKC001 attached in Appendix A.

As this development discharges stormwater into the existing drainage system using stormwater quality Best Management Practices, no proposal for water quality monitoring has been made. The measures proposed for water quality and water quantity treatment are reasonably well understood and demonstrated in Brisbane. It is hence anticipated that they are acceptable here.

5. SUMMARY

From the investigations conducted, it has been shown that stormwater characteristics of the site located at 10 Theodore Street, Eagle Farm will not be significantly altered as a result of the development proposal. It has been calculated that no increase in runoff will occur as a result of the development. Flood effects of the property have also been investigated, with minimum floor levels being set based on information obtained from

flood reports of the surrounding area. The site has been classified as 'low risk' in terms of water quality, with a stormwater treatment train being specified.

6. REFERENCES

- 1) Draft Australian Runoff Quality (IEAust 2003).
- 2) Queensland Urban Drainage Manual (2007).
- 3) Brisbane City Council Subdivision and Development Guidelines.
- 4) A Bibliography of Urban Stormwater Quality (Duncan 1995)
- 5) Soil Erosion and Sediment Control Guidelines for Queensland Construction Sites (1996). The Queensland Division of the Institution of Engineers, Australia.

APPENDIX A

FIGURES AND DRAWINGS



Figure 4: Locality Map UBD Map: Brisbane UBD, Map 141 – D16

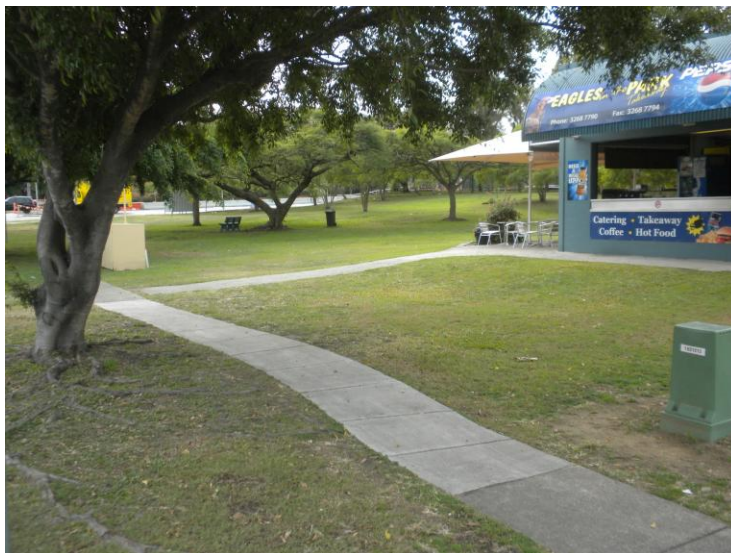


Figure 5: Site Frontage



Figure 6: Park Adjoining Northern Boundary – Facing West from Theodore Street



Figure 7: Open Drain Adjoining Eastern Boundary – Facing South

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(3) Services shown hereon have been located where possible by field survey. If not able to be so located, services have been plotted from the records of the relevant authorities where available and have been noted accordingly on this plan. However, the information shown on these records pertinent to services location is indicative only and sometimes inadequate.

(5) Spot heights, contours and invert levels are representative of the existing services and topographical terrain at time of survey, 31/07/2008, 13/02/2009 & 31/08/2009.

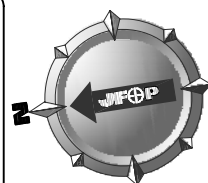
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12D Project: S:\B2957\Stage 0\12D\DTM.project

LOT 617 ON RP214770
PARISH OF TOOMBUL
COUNTY OF STANLEY
TOTAL AREA 2.2965 ha (Deed)



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(A3) 1:750

0 7.5 15 22.5 30 37.5 45 metres

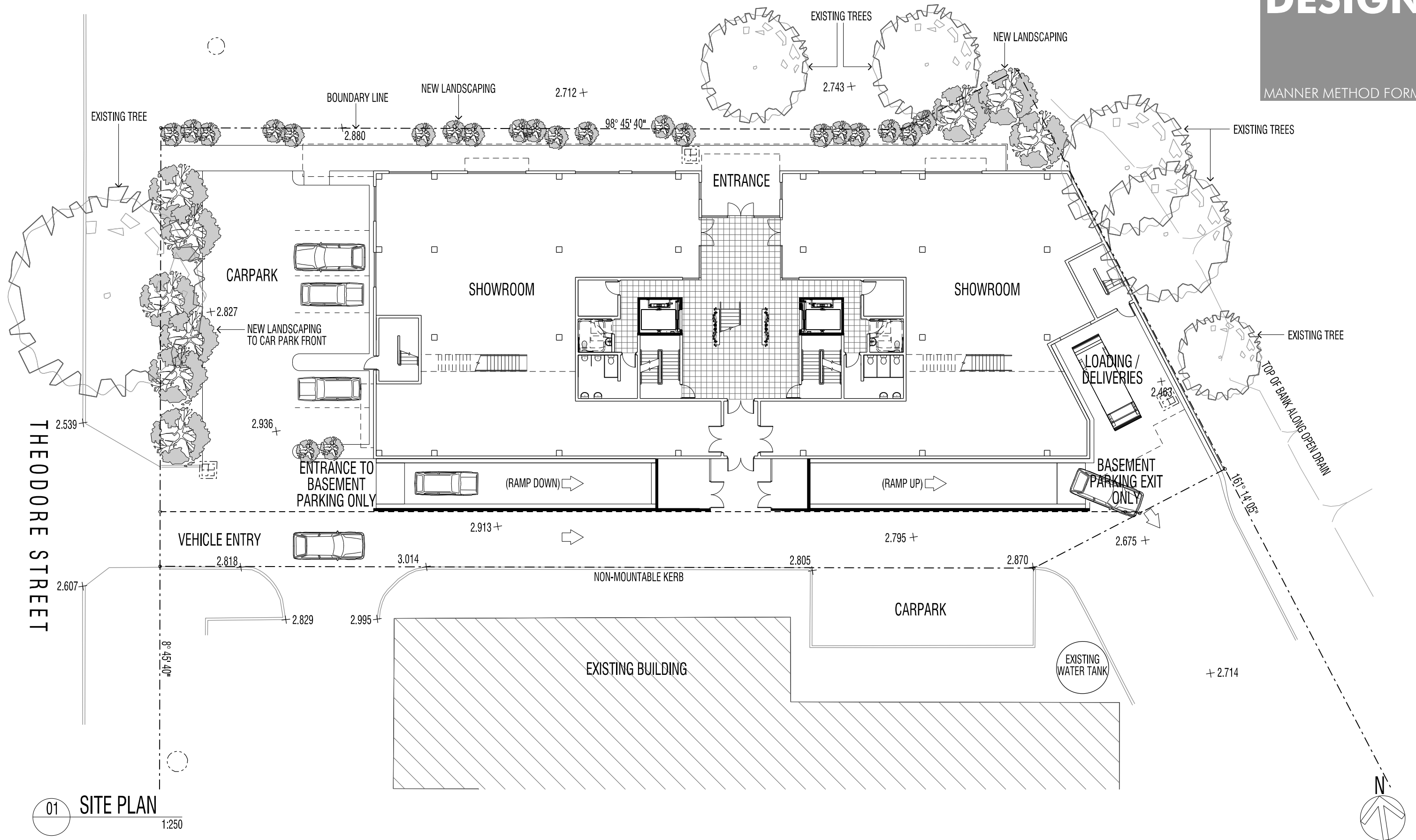
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revision			
a'ment	details	date	init
A	original issue	13.02.09	DNH
B	Added RIs	18.08.09	ADW
C	Added RIs + Changed Scale to 1:750	1.09.09	TNP

KINGSFORD SMITH CORPORATE PARK - EAGLE FARM
DIMENSION PROPERTY GROUP
CONTOUR AND DETAIL PLAN

sheet 1 of 1 sheets
drawing number B2957-04C
file name DTM.dwg
date 1st September, 2009



■ PROPOSED SHOWROOM AND OFFICES: THEODORE STREET-NEW FARM
1:200 SITE PLAN

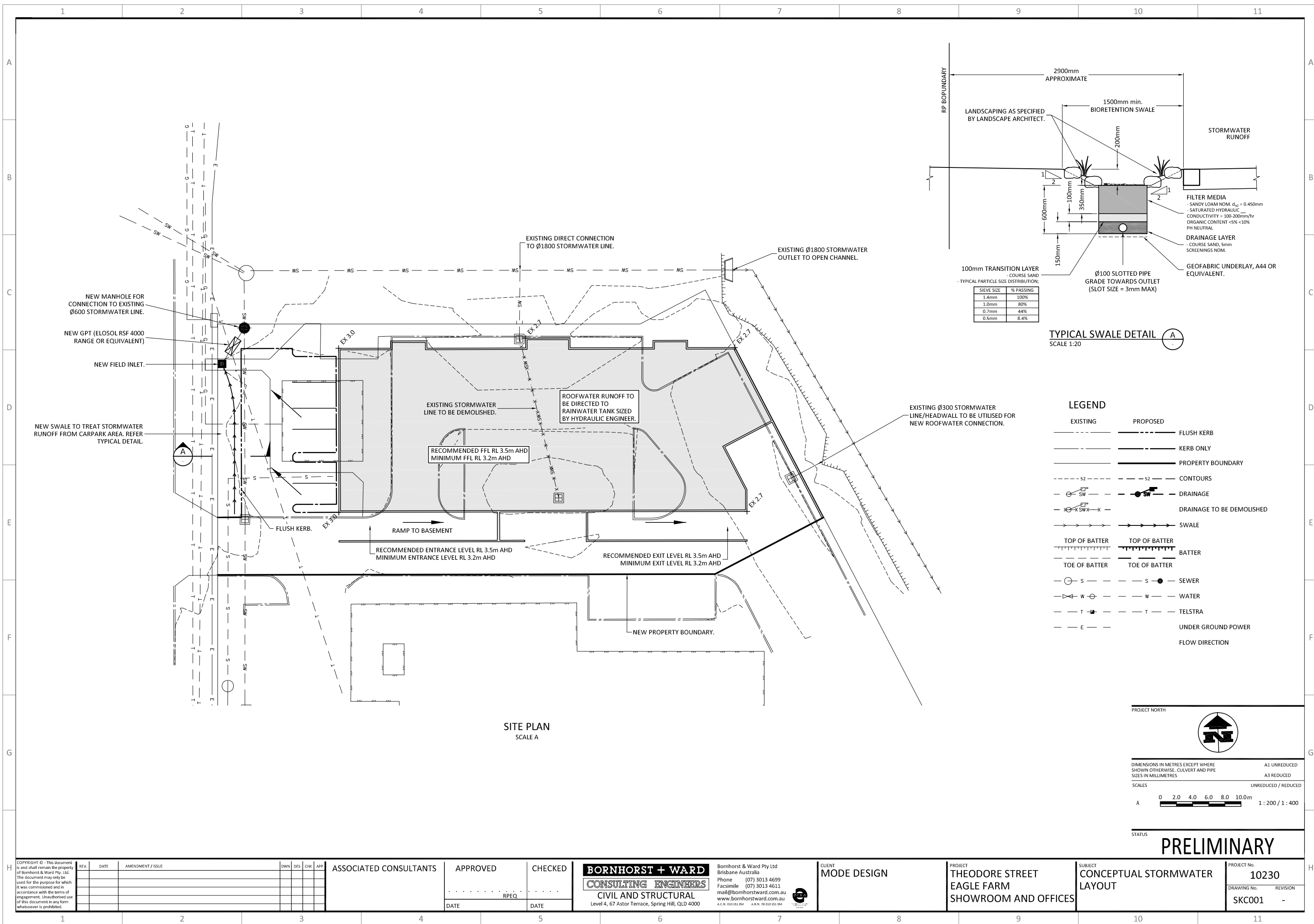
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PROJECT No: 09378BNE
DATE: JUNE 2010
SCALE: 1:200 @ A3
DRAWING No: DD011_A



APPENDIX B

HYDRAULIC CALCULATIONS

INITIAL PEAK FLOW CALCULATIONS

Based on QUDM 4.00 'Catchment Hydrology'

Written by BB 31/10/08

BORNHORST + WARD
CONSULTING ENGINEERS
CIVIL AND STRUCTURAL

Job Number: **10230**
Job Name: **10 Theodore Street**
Eagle Farm

IFD : Brisbane

Please note:

User Data to be placed in the
Green Cells only

Designed: **KR**
Checked: **NR**

TOTAL RUNOFF COEFF.						
Sub Catchment Area (Ha)		Runoff Coefficients		Calculated C10		
No.	Existing	Proposed	Existing	Proposed	Existing	Proposed
1	0.215	0.215	0.87	0.88		
2						
3						
4						
5						
	0.215	0.215			0.87	0.88

EXISTING TIME OF CONCENTRATION		
SHEET FLOW	Std Inlet Time	
	Site Slope (%)	
	Flow Length (m)	
	Horton's "n"	
	Travel Time (min)	
CHANNEL/PIPE FLOW	Travel Length (m)	
	Fall (m)	
	Travel Time (min)	
	Multiplier	
	Travel Time (min)	
Total Time (Tc)		5.0

DEVELOPED TIME OF CONCENTRATION		
SHEET FLOW	Std Inlet Time	5
	Site Slope (%)	
	Flow Length (m)	
	Horton's "n"	
	Travel Time (min)	
CHANNEL/PIPE FLOW	Travel Length (m)	
	Fall (m)	
	Travel Time (min)	
	Multiplier	
	Travel Time (min)	
Total Time (Tc)		5.0

PEAK RUNOFF CALCULATIONS						
ARI Event yr	Rainfall Intensity (mm/hr)		Coefficient of Runoff		Peak Runoff Rates (m ³ /s)	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
1	116	116	0.70	0.70	0.048	0.049
2	149	149	0.74	0.75	0.066	0.067
5	190	190	0.83	0.84	0.094	0.095
10	215	215	0.87	0.88	0.112	0.113
20	248	248	0.91	0.92	0.135	0.137
50	292	292	1.00	1.00	0.175	0.175
100	327	327	1.00	1.00	0.195	0.195

PEAK FLOWS FOR FREQUENT EVENTS			
ARI Event yr	% of Q1	Peak discharge (m ³ /s)	
		Existing	Proposed
1mth	25%	0.01	0.01
2mth	40%	0.02	0.02
3mth	50%	0.02	0.02
4mth	60%	0.03	0.03
6mth	75%	0.04	0.04
9mth	90%	0.04	0.04
12mth	100%	0.05	0.05

APPENDIX C

ADDITIONAL INFORMATION



DISCLAIMER

- 1 This FloodWise Property Report provides defined flood levels from river, creek, waterway and storm tide flooding and ground levels and whether a property is mapped as being in an overland flow path.
- 2 Defined flood levels are determined from the information available to Council at the date of issue. The defined flood level for a particular property may change if more detailed information becomes available, or changes are made in the method of calculating flood levels.
- 3 For these reasons, Council makes no warranty or representation regarding the accuracy or completeness of a FloodWise Property Report. Council disclaims any responsibility or liability in relation to the use or reliance by any person on a FloodWise Property Report.

EXPLANATIONS

- 1 The flood information supplied does not represent the highest possible flood level that could occur on this property. A flood level more severe than the defined flood level can occur, although, such events are rare.
- 2 A property may be affected by several sources of flooding (e.g. river, creek, waterway, storm tide, and or overland flow). Council provides flood information on the highest known source.
- 3 Council receives ground level information from a number of sources, including design plans, as-constructed drawings, ground surveys and airborne laser scanning. This report contains Council's most recent ground levels obtained from airborne laser scanning but there is still a possibility that Council's records may show ground levels prior to recent development. A registered surveyor can confirm exact ground levels.
- 4 If your property is flagged as being in a waterway corridor, development is controlled to preserve the capacity of the land to meet the waterway objectives. For further information contact the Development Assessment Customer Liaison Officer on 3403 8888.
- 5 Any proposed filling of land must be undertaken in accordance with both legal responsibilities and the requirements specified in the *Brisbane City Plan 2000*. Habitable floor levels are to be in accordance with the *Brisbane City Plan 2000*.
- 6 This FloodWise Property Report is a guide only and should not be used or relied upon for development purposes. The information provided may not take into account recent building and development which may impact on overland flow paths. If you intend to build or develop it is recommended that a Registered Surveyor or Registered Professional Engineer in Queensland (RPEQ) be engaged to undertake the appropriate assessments.

This FloodWise Property Report shows the type of flooding that may occur at the property address selected below. It shows the maximum height that flood water may reach in the table titled "Flood Level Information".

PROPERTY DETAILS

Street Address	10 THEODORE ST EAGLE FARM QLD 4009
Lot on Plan	L.1/SP.228434

FLOOD LEVEL INFORMATION

Note: Please read the Disclaimer, Explanations and Terms and Definitions to help you understand and interpret the information contained in this report.

Minimum Ground Level based on most recent Council information	2.5 m AHD
Maximum Ground Level based on most recent Council information	3.5 m AHD
Highest defined flood level (DFL) (or 100 Year ARI Flood Level)	2.5 m AHD
Highest flooding source from	STORM TIDE
Flooding may also occur from *	RIVER, OVERLAND FLOW
Approximate depth of flooding on this property defined flood level (DFL) less the minimum ground level	Refer to Property and Development Information on Page 3.
Minimum habitable floor level Highest defined flood level (DFL) in metres + 500 mm	Refer to Property and Development Information on Page 3.

**If flooding also occurs from an overland flow path, see the information below:*

Flood levels from overland flow path flooding are difficult to predict and may result in a higher overall flood level than that indicated from other sources. Please read the information about overland flow given in the Definitions section. Please note that the depth of a potential overland flow path cannot be determined in this report.

FURTHER FLOOD LEVEL INFORMATION

If you are planning a subdivision, building a new dwelling, extending an existing dwelling, and/or other similar development, the following information may also apply:

ARI Flood Level

Highest 100 Year or DFL	2.5 m AHD	Flooding from: STORM TIDE
Highest 50 Year	2.2 m AHD	Flooding from: STORM TIDE
Highest 20 Year	2.1 m AHD	Flooding from: STORM TIDE
Highest 5 Year	1.9 m AHD	Flooding from: STORM TIDE

Flooding may also occur from: **RIVER, OVERLAND FLOW**

Property and Development Information

The following may impact on development of your chosen site:

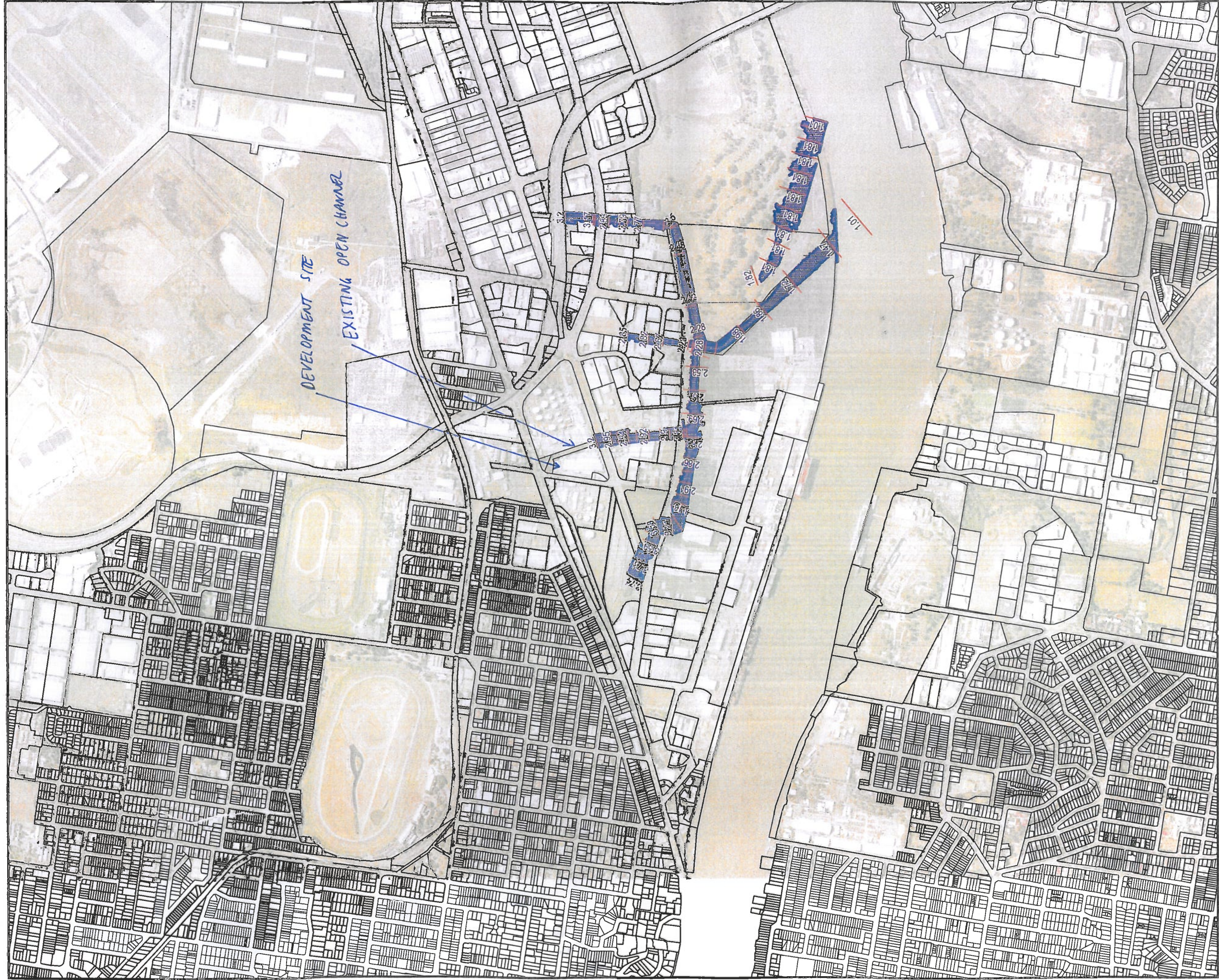
Large Allotment	This property is considered a Large Allotment as it is over 1000 square metres. The defined flood level (DFL) generally refers to the maximum height that flood water may reach; however flood levels may vary significantly across allotments of this size. The depth of flooding therefore may also vary considerably. If the report indicates your property is affected by flooding, further investigations may be warranted in determining the variation in DFL and the minimum habitable floor level across this site. For more information or advice, it is recommended you engage a Registered Professional Engineer of Queensland (RPEQ).
Waterway Corridor	This property is flagged as being wholly or partially within a waterway corridor. The Waterway Corridor indicates where building work and development are controlled to preserve environmental values. Further information is available on Council's website under Brisbane City Plan 2000 or by contacting a Development Assessment Customer Liaison Officer on 3403 8888.

FURTHER INFORMATION ABOUT FLOODING

Council's *Be FloodWise* program has a range of publications available that provide information on flooding in Brisbane, how to prepare your home and yard to reduce the impact of flooding and flooding considerations when buying or renting, or building or renovating. This information is available by visiting www.brisbane.qld.gov.au/floodwise or from the Contact Centre by phoning Council on (07) 3403 8888.

TERMS AND DEFINITIONS

Australian Height Datum (AHD)	The Australian Height Datum is the reference level for defining ground levels in Australia. The level of 0.0m AHD is approximately mean sea level.
Average Recurrence Interval (ARI)	The probability of experiencing a flood of a particular magnitude is expressed as an Average Recurrence Interval (ARI). ARI is a statistical estimate of the average period (in years) between the occurrences of a flood event of a given size or greater (based on long term averages). For example, a 5 Year ARI means that during a five-year period there is a chance that a flood event of this size or greater may occur at least once. The ARI gives no indication of when a flood of this size may occur next.
Defined flood level (DFL)	A water level derived through mathematical modelling of the defined flood event that is adopted by a local authority for management of development. The DFL does not indicate the full extent of flood-prone land. Generally the standard used is the 100 Year ARI. The DFL is used for determining the development levels for various types of development e.g. houses, subdivisions etc. For further information, refer to the House Code in <i>Brisbane City Plan 2000</i> , specifically Table 1: House Flood Immunity Levels for residential property. For all other development refer to Council's Subdivision and Development Guidelines.
Maximum Ground Level	The highest ground level on the property based on most recent ground level information. Check with a Registered Surveyor for further information.
Minimum Ground Level	The lowest ground level on the property based on most recent ground level information. Check with a Registered Surveyor for further information.
Minimum Habitable Floor	The minimum level at which habitable areas of development (generally including bedrooms, living rooms, kitchen, study, family and rumpus rooms) must be constructed.
Overland flow paths	The stormwater runoff which exceeds the capacity of the underground drainage system (if present) and which concentrates in surface depressions, yards and gullies as it flows down a catchment. Such flooding may result from a severe thunderstorm or periods of prolonged rain. Using the characteristics of areas for which detailed flood modelling and mapping has been collated, Council has developed computer generated mapping to indicate the potential for flooding in other areas. These are called overland flow paths. As this mapping is not derived from a study of individual geographical areas, it can only indicate the possibility of flooding rather than a depth.
Storm Tide	The water level which results from the rise above the normal tide level due to the combined effects of wind and atmospheric pressure caused by severe weather conditions such as tropical cyclones or storms. Such rises may lead to flooding in coastal and bayside areas of the city.
Waterway Corridor	The corridors are defined in <i>Brisbane City Plan 2000</i> , along waterways (being a river, creek or creek tributary) to protect water flow, water quality, biodiversity, and recreation values. The potential to build or extend a home situated within a waterway corridor is restricted.
Brisbane City Plan 2000	The <i>Brisbane City Plan 2000</i> is a planning scheme which directs all building and development in Brisbane. Council assesses proposed new development against the City Plan. The City Plan can be downloaded to your PC in an electronic version available from Council's website at http://www.brisbane.qld.gov.au



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Hamilton Lands West - Existing Case
100 Year ARI Peak Water Levels and Inundation Map
Figure 13C