GLADSTONE REGIONAL COUNCIL

Gladstone Regional Council
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Please address all correspondence to The Chief Executive Officer

Contact Officer: Helen McLaren-Greiss
Our Ref: DA/1/2018

16 May 2018

Evo Portables
C/- Sarah Camilleri
Zone Planning Group
PO Box 5332
GLADSTONE QLD 4680

Dear Madam

NOTICE OF DECISION
PLANNING ACT 2016 S63

DA/1/2018 - MATERIAL CHANGE OF USE - IMPACT LOW IMPACT INDUSTRY
58 HUGHES ROAD, WURDONG HEIGHTS QLD 4680
LOT 100 RP 620400, TOOLOOA

Reference is made to the above Development Application and the Confirmation Notice dated 12 January 2018.

I wish to advise that the application was considered by Council at its 15 May 2018 General Meeting where it was resolved to approve the application. The approval is supported by a Notice of Reasons and is subject to conditions as set out in the following Notice of Decision.

Should you have any questions or require further clarification in relation to any matters raised in the Notice of Decision, please do not hesitate to contact Council's Planning Officer, Helen McLaren-Greiss on 07 4977 6851.

Yours faithfully

H A ROBERTSON
MANAGER DEVELOPMENT SERVICES

GLADSTONE
REGIONAL COUNCIL

NOTICE OF DECISION - DA/1/2018
PLANNING ACT 2016 S63

Application:	Material Change of Use - Impact - Low Impact Industry
Applicant Name & Address:	Evo Portables C/- Zone Planning Group PO Box 5332 GLADSTONE QLD 4680
Owner:	Mr M A Higgins
Subject Land:	58 Hughes Road, WURDONG HEIGHTS QLD 4680
Location:	Lot 100 RP 620400, Toolooa
Zoning:	Rural
Site Area:	28.82 hectares
Definition of Use:	Premises used for industrial activities that include the manufacturing, producing, processing, repairing, altering, recycling, storing, distributing, transferring or treating of products and have one or more of the following attributes: • negligible impacts on sensitive land uses due to offsite emissions including aerosol, fume, particle, smoke, odour and noise • minimal traffic generation and heavy–vehicle usage • demands imposed upon the local infrastructure network consistent with surrounding uses • the use generally operates during the day (e.g. 7am to 6pm) • offsite impacts from storage of dangerous goods are negligible • the use is primarily undertaken indoors.
Submissions Received:	One Properly Made Submission
Application Received:	11 January 2018
Planning Scheme:	Our Place Our Plan Gladstone Regional Council Planning Scheme V 2

You are advised that your application was Approved in Full. The conditions relevant to this approval are attached. These conditions are clearly identified to indicate whether the assessment manager or a concurrence agency imposed them.

1. DETAILS OF THE APPROVAL

	Development Permit	Preliminary Approval
• **Material change of use** made assessable by the planning scheme	✓	x

2. BENCHMARKS APPLIED TO THE DEVELOPMENT

The following is a description of the assessment benchmarks applying to the development:

Benchmarks Applying to the Development	Benchmark Reference
State Planning Policy – July 2017	• *State Interest - Natural Hazards, Risk and Resilience*
Our Place Our Plan Gladstone Regional Council Planning Scheme Version 2	• Strategic Framework • Acid Sulfate Soils Overlay Code • Bushfire Hazard Overland Code • Regional Infrastructure Overlay Code • Rural Zone Code • Development Design Code • Landscaping Code

3. CURRENCY PERIOD FOR THE APPROVAL

The currency periods stated in section 85 of the *Planning Act 2016* apply to each aspect of development in this approval, as outlined below unless otherwise conditioned within this approval:-

✓ material change of use - 6 years

4. APPROVED PLANS

The approved plans and/or documents for this development approval are listed in the following table:

Drawing Number	Revision	Description	Author	Date
N/A	N/A	Your Shed	Shed Tech – Shed Alliance Gladstone	29/11/2017
SK-DA/01	B	Proposed Low Impact Industry Site Plan	Zone Planning Group	29/02/2018
PEG0380	03	Site Based Stormwater Management Plan	Pinnacle Engineering Group	22 January 2018

5. OTHER NECESSARY DEVELOPMENT PERMITS

Listed below are other development permits that are necessary to allow the development to be carried out:-

1. Building Works
2. Plumbing & Drainage Works

6. NOTICE OF REASONS

The following provides the Notice of Reasons under section 63(5) of the *Planning Act 2016:*

Description of the development:

The approved development is for a Material Change of use of Premises for a Low Impact Industry use.

Assessment Benchmarks:

Benchmarks Applying to the Development	Benchmark Reference
State Planning Policy – July 2017	• *State Interest - Natural Hazards, Risk and Resilience*
Our Place Our Plan Gladstone Regional Council Planning Scheme Version 2	• Strategic Framework • Acid Sulfate Soils Overlay Code • Bushfire Hazard Overland Code • Regional Infrastructure Overlay Code • Rural Zone Code • Development Design Code • Landscaping Code

Reasons for the Assessment Managers Decision:

1. The Application was properly made in accordance with the *Planning Act 2016* and the Development Assessment Rules;
2. The Application is deemed compliant with the relevant benchmarks of the *Our Place Our Plan Gladstone Regional Council Planning Scheme Version 2*; and
3. The development is located on a part lot which is immediately adjacent to significant water and electrical infrastructure. Given the existence of this infrastructure, the proposal will not be offensive to the surrounding area nor jeopardise the ability to use the balance of the lot for rural uses and pursuits.

Reasons for Approval despite any Non-compliance with certain Benchmarks:

Benchmark reference:	Reasons for the approval despite non-compliance with benchmark:
Strategic Framework – Theme 3.3 Gateway to the World - Strategic Outcome 3.3.1 (3)	*Compliance with Strategic Framework – Theme 3.3 Gateway to the World - Element 3.3.2 A Gateway for Industry*
Strategic Framework – Theme 3.3 Gateway to the World - Strategic Outcome 3.3.1 (12)	*No further geographical fragmentation is proposed.*
Strategic Framework – Theme 3.3 Gateway to the World – Element 3.3.2 A Gateway to Prosperous Rural Activities	*No further geographical fragmentation is proposed.*
Strategic Framework – Theme 3.8 Our Rural and Coastal Townships and Places - Strategic Outcome 3.8.1 (4)	*No further geographical fragmentation is proposed.*
Strategic Framework – Theme 3.8 Our Rural and Coastal Townships and Places - Strategic Outcome 3.8.1 (4)	*No further geographical fragmentation is proposed.*
Rural Zone Code Table 6.2.22.3.1 – Acceptable Outcome 3.2	*Compliance with Rural Zone Code Table 6.2.22.3.1 - Performance Outcome 3*
Rural Zone Code Table 6.2.22.3.1 – Performance Outcome 10	*Compliance with Rural Zone Code – Item 1 (b) of 6.2.22.2 Purpose*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 1.2 and Performance	*Compliance with Development Design Code via Conditions*

Outcome 1	
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 2.2 and Performance Outcome 2	*Compliance with Development Design Code via Conditions*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 5.1 and Performance Outcome 5	*Compliance with Development Design Code via Conditions*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 9	*Compliance with Development Design Code Table 9.3.2.3.1 – Performance Outcome 9*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcomes 11.1 and 11.2 and Performance Outcome 11	*Compliance with Development Design Code via Conditions*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 13 and Performance Outcome 13	*Compliance with Development Design Code Table 9.3.2.3.1 – Item 1(a) of 9.3.2.2 Purpose*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 15 and Performance Outcome 15	*Compliance with Development Design Code via Conditions*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 16 and Performance Outcome 16	*Compliance with Development Design Code via Conditions*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 18 and Performance Outcome 18	*Compliance with Development Design Code via Conditions*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 19 and Performance Outcome 19	*Compliance with Development Design Code via Conditions*
Development Design Code Table 9.3.2.3.1 – Acceptable Outcome 31 and Performance Outcome 31	*Compliance with Development Design Code via Conditions*
Landscaping Code Table 9.3.5.3.1	*Compliance with Landscaping Code via Conditions*

Relevant Matters under Section 45(5)(b) of the Act that the Development was Assessed Against:

1. The proposal is located within part of Lot 100 on RP 620400 with a usable area of approximately 4,200m^2. The part lot is bounded on the Northern side by the Hughes Road reserve and burdened by an easement in favor of the Gladstone Area Water Board. As such, the ability to use the part lot for rural pursuits is limited by these circumstances. The proposal provides an alternative land use which is in keeping with the surrounding area given the location of electricity and water infrastructure within immediate proximity

Matters raised in Submissions and Councils response in dealing with these matters:

Matters raised in Submission(s)	How the matters were dealt with
Concerns that the proposed development may negatively impact on water supply infrastructure located in the registered easements over the subject lot and Hughes Road.	All proposed construction, including accesses, is located outside the easement area. It is anticipated that most heavy or oversized vehicles will seek to travel between the site and Gladstone Benaraby Road rather than East towards the railway.

Matters raised in Submission(s)	How the matters were dealt with
Assurance requested that construction or operation will not result in inundation or erosion over easement area and that the pipelines are not damaged during construction or by increased traffic.	Subsequently, any increases in heavy vehicle traffic over the pipelines is expected to be negligible.

Matters prescribed by a Regulation:

Nil.

7. REFERRAL AGENCIES

The referral agencies applicable to this application are:-

- Department of State Development, Manufacturing, Infrastructure and Planning – Concurrence Agency (Ref: 1801-3419 SRA)
  Referral agency response dated 12 February 2018.

- Powerlink Queensland – Advice Agency (Ref: DA2787)
  Referral agency response dated 2 March 2018.

- Ergon Energy – Advice Agency (Ref: HBD 6005589359601)
  Referral agency response dated 7 February 2018.

8. SUBMISSIONS

There was one properly made submissions about the application. The name and address of the principal submitter for each properly made submission are as follows:-

Name of principal submitter	Address	Electronic Address
Gladstone Area Water Board	PO Box 466, Gladstone QLD 4680	gawb@gawb.qld.gov.au

9. APPEAL RIGHTS

Schedule 1 of the *Planning Act 2016* details your appeal rights and the appeal rights of any submitters regarding this decision.

10. WHEN THE DEVELOPMENT APPROVAL TAKES EFFECT

This development approval takes effect:-

- From the time the decision notice is given, if there is no submitter and the applicant does not appeal the decision to the court.

OR

- If there is a submitter and the applicant does not appeal the decision, the earlier date of either:

    - When the submitter's appeal ends; or

- The day the last submitter gives the assessment manager written notice that the submitter will not be appealing the decision.

OR

- Subject to the decision of the court, when the appeal is finally decided, if an appeal is made to the court.

This approval will lapse if:-

- for a material change of use, the first change of use under the approval does not start within the relevant period stated in section 3 of this Notice of Decision;
- for a reconfiguration, a plan for the reconfiguration is not given to the local government within the relevant period stated in section 3 of this Notice of Decision;
- for a development approval other than a material change of use or reconfiguration, the development does not substantially start within the relevant period stated in section 3 of this Notice of Decision.

Should you wish to discuss this matter further, please contact Council's Planning Officer, Helen McLaren-Greiss on 07 4977 6851.

Yours faithfully

H A ROBERTSON
MANAGER DEVELOPMENT SERVICES

Attached: **Conditions**
Appeal Rights
Approved Plans and Document
Referral Agency Responses

GLADSTONE
REGIONAL COUNCIL

ASSESSMENT MANAGER CONDITIONS - DA/1/2018

1. Development is to be carried out generally in accordance with the submitted application including the following plans and supporting documentation except where amendments are required to satisfy the conditions of this approval:

Drawing Number	Revision	Description	Author	Date
N/A	N/A	Your Shed	Shed Tech – Shed Alliance Gladstone	29/11/2017
SK-DA-01	B	Proposed Low Impact Industry Site Plan	Zone Planning Group	29/02/2018

And supporting documents

Document Number	Revision	Description	Author	Date
PEG0380	03	Site Based Stormwater Management Plan	Pinnacle Engineering Group	22 January 2018

Special Conditions

2. Upon commencement of the use of the site, the development is to be limited to the following hours of business:

    a. 7.00am to 7.00pm Monday to Friday;
    b. 7.00am to 1.00pm on Saturdays; and
    c. Closed on Sundays and public holidays

3. Upon commencement of the use of the site, noise levels must be maintained below background noise levels plus 5dbA measured at the property boundary and does not result in the unreasonable emission of noise to current or future noise sensitive areas. The development must achieve ongoing compliance with the acoustic quality objectives outlined in Schedule 1 of the *Environmental Protection (Noise) Policy 2008*.

4. The permitted maximum size of the vehicle accessing and exiting the property is restricted to Austroads Vehicle Class 9 – Six Axle Articulated vehicle at any stage of the development.

5. The permitted maximum number of heavy vehicles of Austroads Vehicle Class 3 to 9 utilizing Hughes Road which are generated by the proposed development at the operational stage shall be in accordance with the following:

a. Not more than twice in any one week for any vehicle classified as Austroads Vehicle Class 7 - Four Axle Articulated to Class 9 – Six Axle Articulated Vehicle.
b. Not more than twice in any one week for any vehicle classified as Austroads Vehicle Class 3 – Two Axle Truck of Bus to Class 6 – Three Axle Articulated Vehicle.

6. Prior to obtaining a development permit for Building Final for Building Works, the Applicant is required to construct and maintain a 2m high chain-wire fence along the Eastern border of Easement A RP611051 located within the property boundary of 58 Hughes Road, Wurdong Heights.

7. Prior to the commencement of the use of the site, all private structures that belong to the Owner of the lot and within Easement A RP611051, Easement B RP609040, Easement F RP620400, Easement C RP6114891 must be removed and the easements are to be reinstated to original state.

Building, Plumbing and Drainage Works

8. The Applicant is required to obtain a Development Permit and Building Final for Building Works in accordance with the *Planning Act 2016* for the removal of the existing Dwelling House and Secondary Dwelling (Granny Flat). The removal of the structure is to occur prior to any new Building Works for the approved Development.

9. The Applicant is required to obtain a Development Permit and Building Final for Building Works in accordance with the *Planning Act 2016*. Construction is to comply with the *Building Act 1975*, the National Construction Code and the requirements of other relevant authorities.

   Advisory Note: A Building Approval will be required for the removal of the Dwelling House and Secondary Dwelling and the construction of the proposed Industrial Shed.

10. Prior to the commencement of the use of the site, all plant and equipment (including air conditioners, exhaust fans and the like) are to be housed, screened and located so that these do not cause environmental nuisance or harm to any current or future residential uses in the surrounding area.

11. Details of the proposed colour scheme, materials and finishes for all external areas of the building are to be submitted to Council for approval prior to the issue of a Development Permit for Building Works.

12. As part of Building Works, all outdoor lighting is to comply with Australian Standard AS4282 – Control of the Obtrusive Effects of Outdoor Lighting.

13. Prior to the commencement of the use of the site, all lighting at ground level and associated with illuminating ground level areas must be focused downwards and be provided with hoods, shades or other permanent devices to direct illumination downwards and not allow upward lighting to adversely affect the residential uses on this site and the adjoining the sites.

Water Infrastructure

14. As part of the Building Works application, the Applicant must submit to and have approved by Council the supporting documentation certified by a relevant Registered

Professional Engineer of Queensland (RPEQ) that adequate potable water supply is available for the proposed development.

15. As part of the development permit for Building Works, the Applicant must demonstrate that existing rainwater tanks and proposed rainwater tanks must comply with *Public Health Regulation 2005.*

Sewerage Infrastructure

16. Prior to the commencement of the use of the site, the Applicant must provide an on-site sewerage system. The on-site sewerage system must be designed and constructed in accordance with *Plumbing and Drainage Act 2002*, AS/NZS 1547, AS/NZS 1546 set, and Queensland Plumbing and Wastewater Code. All design calculations, and design and as constructed drawings must be certified by a relevant qualified professional.

17. All on-site sewerage facilities must be located such that it does not have adverse impacts on the existing watercourse, stormwater overland flow, and open drainage channel/drain.

    Advisory Note: The treatment system for the on-site sewerage system should be sited above AEP 1% flood level.

Stormwater Infrastructure

18. Prior to the commencement of use of the site, the Applicant must install four 27,000L above-ground detention tanks in accordance with the approved Site Based Stormwater Management Plan (SWMP) prepared by Pinnacle Engineering.

19. Prior to the commencement of the use of the site, all stormwater runoff must be piped from roofed areas to proposed detention tanks and shall discharge to the existing table drain with an appropriate rock protection measure.

Transportation Services

20. As part of the Development Permit for the Building Works, the Applicant must submit to and have approved by Council an RPEQ certified sprayed seal design in accordance with Council's Engineering Standards, Austroads Guidelines, and available best engineering practices for the section of Hughes Road from the end of the existing seal near the intersection of Gladstone – Benaraby Road and Hughes Road to 5m past the proposed second driveway crossover located to the West and adjacent to the existing easements (approximately 255m).

    Advisory Note: Council's Engineering Standards are located within the Capricorn Municipal Development Guidelines – Drawings and Specifications at http://cmdg.com.au/Guidelines/GuidelinesHome.html.

21. Prior to the commencement of the use of the site, the Applicant must spray seal the section of Hughes Road from the end of the existing seal near the intersection of Gladstone – Benaraby Road and Hughes Road to 5m past the proposed second driveway crossover located to the West and adjacent to the existing easements (approximately 255m) in accordance with approved drawing(s) in Condition 20 of this Decision Notice.

22. Prior to the commencement of the spray seal of the section of Hughes Road from the end of the existing seal near the intersection of Gladstone – Benaraby Road and Hughes Road to 5m past the proposed second driveway crossover located to the West and adjacent to the existing easements (approximately 255m), the Applicant must invite the responsible Council Officer to attend the pre-seal inspection. The works are to be ready for inspection prior to attendance by Council Officers. A minimum of 24 hours notice by email is required by Council Officers.

23. Prior to the commencement of the use of the site, a total of 15 car parking spaces, including one Accessible (Disabled) Parking Space, are to be constructed on site generally in accordance with the approved plans, including designated disabled car parking spaces. These spaces and all vehicle movement areas are to be constructed, sealed, line marked, provided with wheel stops and maintained in accordance with the Engineering Design Planning Scheme Policy under the Our Place Our Plan Gladstone Regional Council Planning Scheme and AS2890.

24. Prior to the commencement of the use of the site, two Commercial Driveways are to be constructed in accordance with Council's Standard Drawing for Urban Commercial/Industrial Driveway with appropriately reinforced concrete pipes (RCPs) under each driveway crossover. An appropriate class of RCPs shall be selected based on loading on RCPs and available cover.

    Advisory Note: Council's Standard Drawing are located within the Capricorn Municipal Development Guidelines - Drawings and Specifications at http://www.cmdg.com.au/Guidelines/GuidelinesHome.html.

25. Prior to the construction of any works within Councils road reserve, the Applicant shall obtain a Works on a Council Road Approval in conformity with Council's Subordinate Local Law No. 1.15.

    Advisory Note: Council's Local Law No. 1.15 - Application to Construct (and maintain) a Driveway (vehicle crossover) is found at *http://www.gladstone.qld.gov.au/forms.*

Landscaping

26. Prior the commencement of the use of the site, a landscaping area a minimum of two meters in width is to be provided along the full frontage of Hughes Road other than within the easement area or where required to construct any driveway crossover(s). The landscaping area is to be in accordance with Table 9.3.4.3.2 - Plant Species List of the Landscaping Code of the *Our Place Our Plan Gladstone Regional Council Planning Scheme* and the Capricorn Municipal Development Guidelines - Landscaping C273 Construction Specification.

    Advisory Note: Council's Engineering Standards are located within the Capricorn Municipal Development Guidelines – Drawings and Specifications at http://cmdg.com.au/Guideliens/GuideliensHome.html.

27. Prior the commencement of the use of the site, street/shade trees are to be provided as follows:

    a. Within this landscaping area mentioned in the above condition, trees are to be provided at a rate of one tree per linear metre of available frontage.

b. Between the open car parking area and the boundary, one shade tree is to be provided at a rate of one tree per six car spaces.

28. Prior to the commencement of the use of the site, construction of a 1.8m high chain wire fence to all boundaries, the details of which are to be submitted with any Development Application for Building Works.

Waste Management

29. Prior to the commencement of the use, the waste storage area/s are to be sufficient in size to house all waste collection containers including recycling waste containers. The waste storage area/s must be suitably enclosed and imperviously paved, with a hose cock and hose fitted in close proximity to the enclosure to ensure the area can be easily and effectively cleaned.

30. Prior to the commencement of the use, open storage areas shall be adequately screened so as not to detract from the visual amenity of the area. One way of achieving compliance with this condition is as follows:

    a. Outdoor storage areas are situated in locations not visible from the street; and
    b. A 1.8m solid screen fence is located around storage areas.

Lawful Commencement

31. Prior to the commencement of this use, the Applicant is to request a Compliance Inspection be undertaken by Council to confirm that all conditions of this Development Permit are considered compliant.

32. Upon receipt of confirmation from Council that all conditions of this Development Permit are considered compliant, the Applicant is to notify Council within 20 business days that this approved use has lawfully commenced.

END OF CONDITIONS

Advice to Applicant:

Council provides a comprehensive certification service for any Building Certification requirements.

An Adopted Infrastructure Charge Notice in relation to the infrastructure charges applicable to this development will be provided separately.

(2) The person is taken to have engaged in the representative's conduct, unless the person proves the person could not have prevented the conduct by exercising reasonable diligence.

(3) In this section—

conduct means an act or omission.

representative means—

(a) of a corporation—an executive officer, employee or agent of the corporation; or

(b) of an individual—an employee or agent of the individual.

state of mind, of a person, includes the person's—

(a) knowledge, intention, opinion, belief or purpose; and

(b) reasons for the intention, opinion, belief or purpose.

Chapter 6 Dispute resolution

Part 1 Appeal rights

229 Appeals to tribunal or P&E Court

(1) Schedule 1 states—

(a) matters that may be appealed to—

(i) either a tribunal or the P&E Court; or

(ii) only a tribunal; or

(iii) only the P&E Court; and

(b) the person—

(i) who may appeal a matter (the ***appellant***); and

(ii) who is a respondent in an appeal of the matter; and

(iii) who is a co-respondent in an appeal of the matter; and

(iv) who may elect to be a co-respondent in an appeal of the matter.

(2) An appellant may start an appeal within the appeal period.

(3) The ***appeal period*** is—

(a) for an appeal by a building advisory agency—10 business days after a decision notice for the decision is given to the agency; or

(b) for an appeal against a deemed refusal—at any time after the deemed refusal happens; or

(c) for an appeal against a decision of the Minister, under chapter 7, part 4, to register premises or to renew the registration of premises—20 business days after a notice is published under section 269(3)(a) or (4); or

(d) for an appeal against an infrastructure charges notice—20 business days after the infrastructure charges notice is given to the person; or

(e) for an appeal about a deemed approval of a development application for which a decision notice has not been given—30 business days after the applicant gives the deemed approval notice to the assessment manager; or

(f) for any other appeal—20 business days after a notice of the decision for the matter, including an enforcement notice, is given to the person.

Note—

See the P&E Court Act for the court's power to extend the appeal period.

(4) Each respondent and co-respondent for an appeal may be heard in the appeal.

(5) If an appeal is only about a referral agency's response, the assessment manager may apply to the tribunal or P&E Court to withdraw from the appeal.

(6) To remove any doubt, it is declared that an appeal against an infrastructure charges notice must not be about—

(a) the adopted charge itself; or

(b) for a decision about an offset or refund—

(i) the establishment cost of trunk infrastructure identified in a LGIP; or

(ii) the cost of infrastructure decided using the method included in the local government's charges resolution.

230 Notice of appeal

(1) An appellant starts an appeal by lodging, with the registrar of the tribunal or P&E Court, a notice of appeal that—

(a) is in the approved form; and

(b) succinctly states the grounds of the appeal.

(2) The notice of appeal must be accompanied by the required fee.

(3) The appellant or, for an appeal to a tribunal, the registrar, must, within the service period, give a copy of the notice of appeal to—

(a) the respondent for the appeal; and

(b) each co-respondent for the appeal; and

(c) for an appeal about a development application under schedule 1, table 1, item 1—each principal submitter for the development application; and

(d) for an appeal about a change application under schedule 1, table 1, item 2—each principal submitter for the change application; and

(e) each person who may elect to become a co-respondent for the appeal, other than an eligible submitter who is not a principal submitter in an appeal under paragraph (c) or (d); and

Schedule 1 Appeals

section 229

1 Appeal rights and parties to appeals

(1) Table 1 states the matters that may be appealed to—

(a) the P&E court; or

(b) a tribunal.

(2) However, table 1 applies to a tribunal only if the matter involves—

(a) the refusal, or deemed refusal of a development application, for—

(i) a material change of use for a classified building; or

(ii) operational work associated with building work, a retaining wall, or a tennis court; or

(b) a provision of a development approval for—

(i) a material change of use for a classified building; or

(ii) operational work associated with building work, a retaining wall, or a tennis court; or

(c) if a development permit was applied for—the decision to give a preliminary approval for—

(i) a material change of use for a classified building; or

(ii) operational work associated with building work, a retaining wall, or a tennis court; or

(d) a development condition if—

(i) the development approval is only for a material change of use that involves the use of a building classified under the Building Code as a class 2 building; and

(ii) the building is, or is proposed to be, not more than 3 storeys; and

(iii) the proposed development is for not more than 60 sole-occupancy units; or

(e) a decision for, or a deemed refusal of, an extension application for a development approval that is only for a material change of use of a classified building; or

(f) a decision for, or a deemed refusal of, a change application for a development approval that is only for a material change of use of a classified building; or

(g) a matter under this Act, to the extent the matter relates to the Building Act, other than a matter under that Act that may or must be decided by the Queensland Building and Construction Commission; or

(h) a decision to give an enforcement notice—

(i) in relation to a matter under paragraphs (a) to (g); or

(ii) under the Plumbing and Drainage Act; or

(i) an infrastructure charges notice; or

(j) the refusal, or deemed refusal, of a conversion application; or

(l) a matter prescribed by regulation.

(3) Also, table 1 does not apply to a tribunal if the matter involves—

(a) for a matter in subsection (2)(a) to (d)—

(i) a development approval for which the development application required impact assessment; and

(ii) a development approval in relation to which the assessment manager received a properly made submission for the development application; or

(b) a provision of a development approval about the identification or inclusion, under a variation approval, of a matter for the development.

(4) Table 2 states the matters that may be appealed only to the P&E Court.

(5) Table 3 states the matters that may be appealed only to the tribunal.

(6) In each table—

(a) column 1 states the appellant in the appeal; and

(b) column 2 states the respondent in the appeal; and

(c) column 3 states the co-respondent (if any) in the appeal; and

(d) column 4 states the co-respondents by election (if any) in the appeal.

(7) If the chief executive receives a notice of appeal under section 230(3)(f), the chief executive may elect to be a co-respondent in the appeal.

(8) In this section—

storey see the Building Code, part A1.1.

Table 1
Appeals to the P&E Court and, for certain matters, to a tribunal

1. Development applications
For a development application other than an excluded application, an appeal may be made against—
(a) the refusal of all or part of the development application; or
(b) the deemed refusal of the development application; or
(c) a provision of the development approval; or
(d) if a development permit was applied for—the decision to give a preliminary approval.

Table 1
Appeals to the P&E Court and, for certain matters, to a tribunal

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The applicant	The assessment manager	If the appeal is about a concurrence agency's referral response—the concurrence agency	1 A concurrence agency that is not a co-respondent 2 If a chosen assessment manager is the respondent—the prescribed assessment manager 3 Any eligible advice agency for the application 4 Any eligible submitter for the application
2. Change applications For a change application other than an excluded application, an appeal may be made against— (a) the responsible entity's decision on the change application; or (b) a deemed refusal of the change application.			

Table 1
Appeals to the P&E Court and, for certain matters, to a tribunal

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
1 The applicant 2 If the responsible entity is the assessment manager—an affected entity that gave a pre-request notice or response notice	The responsible entity	If an affected entity starts the appeal—the applicant	1 A concurrence agency for the development application 2 If a chosen assessment manager is the respondent—the prescribed assessment manager 3 A private certifier for the development application 4 Any eligible advice agency for the change application 5 Any eligible submitter for the change application
3. Extension applications For an extension application other than an extension application called in by the Minister, an appeal may be made against— (a) the assessment manager's decision on the extension application; or (b) a deemed refusal of the extension application.			

Table 1
Appeals to the P&E Court and, for certain matters, to a tribunal

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
1 The applicant 2 For a matter other than a deemed refusal of an extension application—a concurrence agency, other than the chief executive, for the application	The assessment manager	If a concurrence agency starts the appeal—the applicant	If a chosen assessment manager is the respondent—the prescribed assessment manager
4. Infrastructure charges notices An appeal may be made against an infrastructure charges notice on 1 or more of the following grounds— (a) the notice involved an error relating to— (i) the application of the relevant adopted charge; or *Examples of errors in applying an adopted charge—* • the incorrect application of gross floor area for a non-residential development • applying an incorrect 'use category', under a regulation, to the development (ii) the working out of extra demand, for section 120; or (iii) an offset or refund; or (b) there was no decision about an offset or refund; or (c) if the infrastructure charges notice states a refund will be given—the timing for giving the refund; or (d) for an appeal to the P&E Court—the amount of the charge is so unreasonable that no reasonable relevant local government could have imposed the amount.			

Table 1 Appeals to the P&E Court and, for certain matters, to a tribunal			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The person given the infrastructure charges notice	The local government that gave the infrastructure charges notice	—	—
5. Conversion applications An appeal may be made against— (a) the refusal of a conversion application; or (b) a deemed refusal of a conversion application.			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The applicant	The local government to which the conversion application was made	—	—
6. Enforcement notices An appeal may be made against the decision to give an enforcement notice.			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The person given the enforcement notice	The enforcement authority	—	If the enforcement authority is not the local government for the premises in relation to which the offence is alleged to have happened—the local government

Table 2
Appeals to the P&E Court only

1. Appeals from tribunal

An appeal may be made against a decision of a tribunal, other than a decision under section 252, on the ground of—

(a) an error or mistake in law on the part of the tribunal; or

(b) jurisdictional error.

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A party to the proceedings for the decision	The other party to the proceedings for the decision	—	—

2. Eligible submitter appeals

For a development application or change application other than an excluded application, an appeal may be made against the decision to approve the application, to the extent the decision relates to—

(a) any part of the development application or change application that required impact assessment; or

(b) a variation request.

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
1 For a development application—an eligible submitter for the development application 2 For a change application—an eligible submitter for the change application	1 For a development application—the assessment manager 2 For a change application—the responsible entity	1 The applicant 2 If the appeal is about a concurrence agency's referral response—the concurrence agency	Another eligible submitter for the application

Table 2
Appeals to the P&E Court only

3. Eligible submitter and eligible advice agency appeals

For a development application or change application other than an excluded application, an appeal may be made against a provision of the development approval, or a failure to include a provision in the development approval, to the extent the matter relates to—

(a) any part of the development application or change application that required impact assessment; or

(b) a variation request.

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
1 For a development application—an eligible submitter for the development application 2 For a change application—an eligible submitter for the change application 3 An eligible advice agency for the development application or change application	1 For a development application—the assessment manager 2 For a change application—the responsible entity	1 The applicant 2 If the appeal is about a concurrence agency's referral response—the concurrence agency	Another eligible submitter for the application

4. Compensation claims

An appeal may be made against—

(a) a decision under section 32 about a compensation claim; or

(b) a decision under section 265 about a claim for compensation; or

(c) a deemed refusal of a claim under paragraph (a) or (b).

Table 2
Appeals to the P&E Court only

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person dissatisfied with the decision	The local government to which the claim was made	—	—

5. Registered premises

An appeal may be made against a decision of the Minister under chapter 7, part 4.

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
1 A person given a decision notice about the decision 2 If the decision is to register premises or renew the registration of premises—an owner or occupier of premises in the affected area for the registered premises who is dissatisfied with the decision	The Minister	—	If an owner or occupier starts the appeal—the owner of the registered premises

6. Local laws

An appeal may be made against a decision of a local government, or conditions applied, under a local law about—

(a) the use of premises, other than a use that is the natural and ordinary consequence of prohibited development; or

(b) the erection of a building or other structure.

Table 2
Appeals to the P&E Court only

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person who— (a) applied for the decision; and (b) is dissatisfied with the decision or conditions.	The local government	—	—

Table 3
Appeals to a tribunal only

1. Building advisory agency appeals

An appeal may be made against giving a development approval for building work to the extent the building work required code assessment against the building assessment provisions.

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A building advisory agency for the development application related to the approval	The assessment manager	The applicant	1 A concurrence agency for the development application related to the approval 2 A private certifier for the development application related to the approval

Table 3
Appeals to a tribunal only

2. Inspection of building work

An appeal may be made against a decision of a building certifier or referral agency about the inspection of building work that is the subject of a building development approval under the Building Act.

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
The applicant for the development approval	The person who made the decision	—	—

3. Certain decisions under the Building Act and the Plumbing and Drainage Act

An appeal may be made against—

(a) a decision under the Building Act, other than a decision made by the Queensland Building and Construction Commission, if an information notice about the decision was given or required to be given under that Act; or

(b) a decision under the Plumbing and Drainage Act, part 4 or 5, if an information notice about the decision was given or required to be given under that Act.

Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person who received, or was entitled to receive, an information notice about the decision	The person who made the decision	—	—

4. Local government failure to decide application under the Building Act

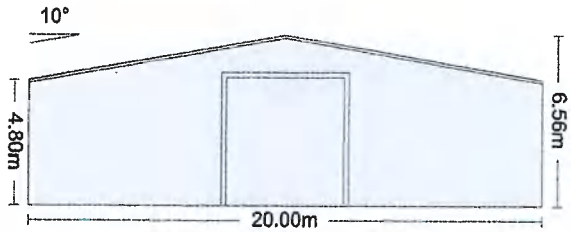
An appeal may be made against a local government's failure to decide an application under the Building Act within the period required under that Act.

Table 3 Appeals to a tribunal only			
Column 1 Appellant	Column 2 Respondent	Column 3 Co-respondent (if any)	Column 4 Co-respondent by election (if any)
A person who was entitled to receive notice of the decision	The local government to which the application was made	—	—

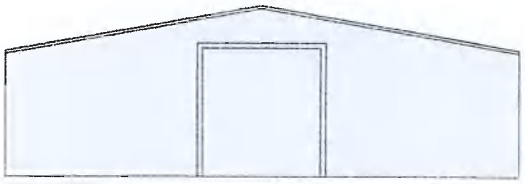
ShedTech

MARK EVO
QUOTE NO: 177354
DATE: 29/11/2017
VALID: 14 Days

SHED ALLIANCE GLADSTONE

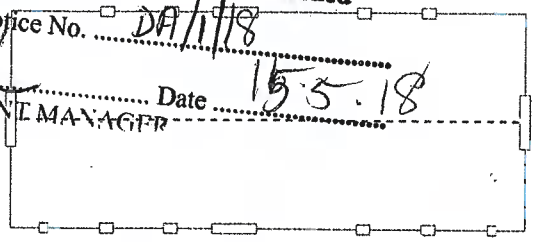


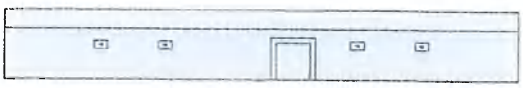
FRONT VIEW


REAR VIEW

FRONT ELEVATION

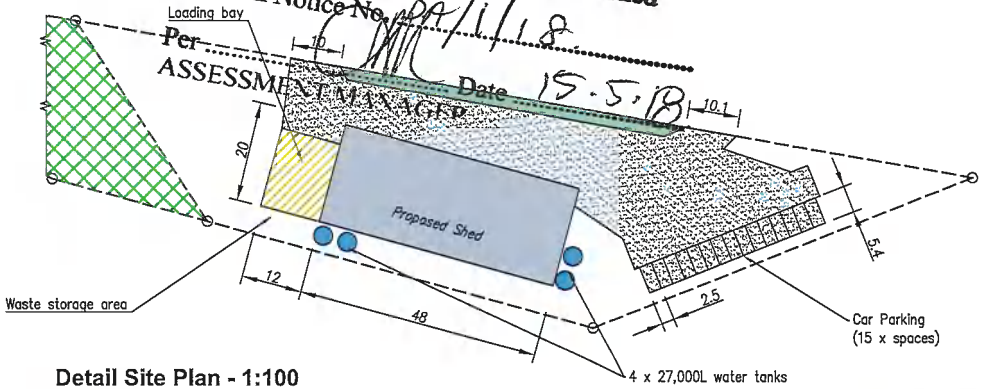
GLADSTONE REGIONAL COUNCIL
GLADSTONE OFFICE
This Plan is approved subject to the attached
Decision Notice No. DA/1178
Per ..... Date 15.5.18
ASSESSMENT MANAGER


PLAN VIEW


REAR ELEVATION

Context Site Plan - 1:1000

GLADSTONE REGIONAL COUNCIL
GLADSTONE OFFICE
This Plan is approved subject to the attached
Decision Notice No. DA/1118
Per
ASSESSMENT MANAGER
Date 15.5.18



Detail Site Plan - 1:100

Note
All dimensions and areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

The boundaries shown on this plan should not be used for final detailed engineers design.

Contours supplied by Terranean Mapping Technologies.

REVISION				
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	Origin		Comp By.	
			DWG Name.	Z17286 - A
			Local Authority	GLADSTONE REGIONAL COUNCIL
	Scale	Sheet	Locality	
	Refer dwg	A3	Job Reference	Z17286

CLIENT
MARK HIGGINS

PROPOSED
LOW IMPACT INDUSTRY
SITE PLAN

PROJECT
58 Hughes Road
Wurdong Heights

Plan Ref **SK-DA-01** | Rev **B**

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PINNACLE
ENGINEERING GROUP

SITE BASED STORMWATER MANAGEMENT PLAN

INDUSTRIAL WORKSHOP DEVELOPMENT

58 Hughes Road, Wurdong Heights QLD

MARK HIGGINS

FEBRUARY 2018

REVISION 03

Pinnacle Engineering Group
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In accordance with the requirements of the *Queensland Professional Engineers Act 2002*, this document was prepared under the supervision of, reviewed and approved by the following experienced Registered Professional Engineer of Queensland (RPEQ).

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PINNACLE ENGINEERING GROUP

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1 Introduction

Pinnacle Engineering Group (Pinnacle) was engaged by Mr. Mark Higgins to prepare a site based stormwater management plan (SBSMP) and associated investigations to provide supporting documentation for the proposed development application for an industrial workshop development located at 58 Hughes Road, Wurdong Heights QLD, within the local authority of the Gladstone Regional Council (GRC).

1.1 Scope of Investigation

This report addresses the proposed stormwater management strategy for the aforementioned development, including but not limited to the following elements:

- Pre and post development flows for various Average Recurrence Interval (ARI) design storm events;
- Nomination of the Lawful Point of Discharge for the site;
- Nomination of external catchment conveyance strategy;
- Details of stormwater quantity mitigation strategy for the site;
- Details of the stormwater quality strategy for the site; and
- Sediment and erosion control plan.

1.2 Site Description

1.2.1 Location

Street Address	-	58 Hughes Road, Wurdong Heights QLD
RP Description	-	Lot 100 on RP620400
Total Site Area	-	28.82 Hectares
Development Area	-	0.9257 Hectares
Current Zoning	-	Rural
Proposed Use	-	Industrial Workshop Development
Local Authority	-	GRC

Refer to Figure 1.1 for the site location.

1.2.2 Topography

A review of the topographic data sourced from Council's online mapping system has revealed that the portion of the subject site being developed (i.e. to the south of Hughes Road) is currently occupied by a number of sheds. Limited light vegetation is located along the western, southern and eastern site boundaries. A number of existing services easements are located within the western portion of the subject site. It is understood from the developer that all of the existing structures will be demolished as part of the proposed development.

The portion of the site being developed is effectively flat and falls gradually from the rear property boundaries towards the Hughes Road reserve to the north. The highest elevation of the subject site of approximately RL12.00m AHD is reached within the western portion of the subject site with the lowest elevation of approximately RL9.00m AHD reached within the northwest portion of the subject site.

Refer to Figure 1.2 for the existing aerial view of the site with the site plans and topographic survey included in Appendix B.

1.2.3 Proposed Development

The proposed development will deliver an industrial workshop development and associated on grade gravel car parking, hardstand and infrastructure over a small portion of the existing allotment. The proposed development will be accessed via the existing vehicular crossover from Hughes Road to the north.

The proposed development plans are included in Appendix A.

1.2.4 Existing Drainage System

Currently, the stormwater runoff from the subject site is conveyed via overland sheet flow to the northern property boundary and subsequently to the Hughes Road reserve.

No existing downstream stormwater network has been identified as part of this investigation.

1.2.5 Flood Assessment

A review of the GRC interactive mapping system has identified the subject site as being located outside of the mapped flood hazard area of Gladstone.

1.2.6 Acid Sulphate Soils

A review of the GRC interactive mapping system has identified the subject site as being located within the mapped acid sulphate soil area of Gladstone. As such, further advice from a geotechnical engineer may be required to formulate an acid sulphate soil management strategy for the site.

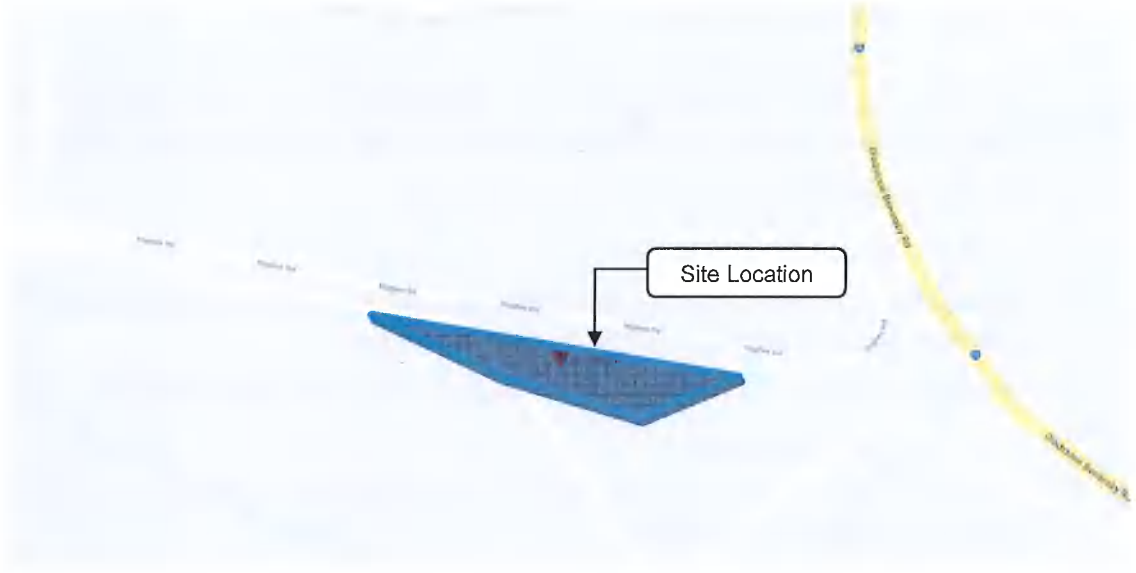

Figure 1.1: Site Map (Source: Google Maps)

Figure 1.2: Aerial View (Source: Google Maps)

2 Stormwater Quantity Assessment

2.1 Hydrologic Objectives

The hydrologic objectives for the site were set in accordance with the GRC Planning Scheme Policies, Capricorn Municipal Design Guidelines (CMDG) D5 Stormwater Drainage Design and the Queensland Urban Drainage Manual (QUDM). These objectives include but are not limited to:

- The proposed development shall ensure that all stormwater drainage is directed to the Lawful Point of Discharge in accordance with QUDM Section 3.02;
- Minor System Design for Q_5 ARI storm event;
- Major System Design for Q_{100} ARI storm event;
- No adverse impact on adjoining or downstream properties; and
- No increase in post-development flows, up to and including the Q_{100} ARI storm event.

For the purposes of this SBSMP, only the portion of the subject site being developed (i.e. to the south of Hughes Road) was analysed as the northern portion of the subject site retains its pre-development characteristics during the post-development scenario.

2.2 Lawful Point of Discharge

The Lawful Point of Discharge for the catchment is taken as the Hughes Road reserve to the north of the subject site.

2.3 Stormwater Quantity Analysis

The analysis of the surface water runoff from the site was performed using the non-linear program XP-Rafts.

2.3.1 Data Collation

The design rainfall Intensity Frequency Duration (IFD) data for the storm events up to 100 year ARI flood event was derived based on the CMDG D5 Stormwater Drainage Design and the AR&R.

The design IFD data for the catchment is summarised in Table 2.1 below.

Table 2.1: IFD Data for Gladstone

2 Year ARI Rainfall Intensities	50 Year ARI Rainfall Intensities	Skewness and Geographical Factors
$^{2}I_{1}$ = 46.73	$^{50}I_{1}$ = 87.33	Skewness, G = 0.21
$^{2}I_{12}$ = 9.12	$^{50}I_{12}$ = 20.40	Geographical Factor, F_2 = 4.27
$^{2}I_{72}$ = 2.83	$^{50}I_{72}$ = 8.11	Geographical Factor, F_{50} = 17.85

2.3.2 XP-Rafts Modelling Inputs

Rainfall loss parameters for each sub-catchment were applied using an initial and continuing rainfall loss model. The design loss parameters input into the XP-Rafts model are based on the guideline values recommended by Book 2 Section 3 of the AR&R, and other relevant industry standards.

The loss parameters adopted for this XP-Rafts model are tabulated below.

Table 2.2: Adopted XP-Rafts Initial and Continuing Loss Parameters

Storm Event	Pervious Areas		Impervious Areas	
ARI (years)	Initial Loss (mm)	Continuing Loss (mm)	Initial Loss (mm)	Continuing Loss (mm)
2-5	15	2.5	1	0
10-20	10	2.5	1	0
50-100	2.5	2.5	0	0

2.3.3 XP-Rafts Model Validation

The calibration of the XP-Rafts model was undertaken through the comparison of the XP-Rafts flow rates to the Rational Method calculations. The pre-development Rational Method calculations are included in Appendix D.

The Rational Method adopted a C_{10} coefficient of runoff of 0.66 for the pre-development catchment, in accordance with Table 4.05.3(b) of QUDM for poor grass cover. As detailed in Table 2.3 the flows calculated using the Rational Method are generally comparable to the results obtained from the XP-Rafts model. We can therefore reasonably adopt the flows generated from the XP-Rafts model.

2.3.4 Critical Duration Analysis

Storm durations ranging from 15 minutes to 720 minutes were simulated in the XP-Rafts model analysis to determine the design flows.

2.3.5 Existing Discharge Points

As outlined in the previous sections of this report the development site generally falls to the northern property boundary of the subject site and to the Hughes Road reserve. No existing downstream stormwater network was identified as part of this investigation. It is proposed to maintain the pre-development discharge locations during the post-development scenario.

2.4 Hydrologic Analysis

2.4.1 Pre-development Scenario

The results generated from the XP-Rafts model generally show that the critical storm duration throughout the catchment for all ARI flood events is the 90 minute storm event.

A percentage impervious area of 0.07 was calculated for the pre-development catchment (Catchment A) from aerial photography and the topographic data included in Appendix B.

The pre-development catchment discharges for the Q_5, Q_{10}, Q_{20}, Q_{50} and Q_{100} ARI events are detailed in Table 2.3 below.

Table 2.3: Pre-development Catchment Details and Discharges

Catchment	Area (ha)	Impervious Area (ha)	Average Slope (%)	XP-Rafts Results					Rational Method (C_{10} = 0.66)
				Q_5 (m^3/s)	Q_{10} (m^3/s)	Q_{20} (m^3/s)	Q_{50} (m^3/s)	Q_{100} (m^3/s)	Q_{100} (m^3/s)
A	0.9257	0.0612	1.0	0.130	0.171	0.210	0.274	0.319	0.373
Site Total	**0.9257**	**0.0612**	**1.0**	**0.130**	**0171**	**0.210**	**0.274**	**0.319**	**0.373**

2.4.2 Post-development Scenario – Unmitigated

The proposed development will deliver an industrial workshop development with associated on-grade gravel car parking located within the subject site. A fraction impervious of 0.10 was calculated for the portion of the site being developed during the post-development scenario (i.e. Catchment A) from the site layout provided. For the purposes of this analysis the post-development catchment has been further split into sub-catchments, being the development's roof and ground areas. No hardstand areas are proposed as part of the development.

A copy of the architectural drawings is included in Appendix A. The post-development catchment plan is included in Appendix C.

The impervious areas have been modelled using the second sub-catchment option within XP-Rafts. The total impervious area for each catchment is tabulated below. The results of the XP-Rafts post-development analysis indicate that the critical storm duration throughout the catchment for all ARI flood events is generally the 90 minute storm event.

Table 2.4 summarises the post-developed peak flow rates for post-development catchment.

Table 2.4: Post-development Catchment Details and Discharges (Unmitigated)

Catchment	Total Area (ha)	Average Slope (%)	Impervious Area (ha)	XP-Rafts Results				
				Q_5 (m^3/s)	Q_{10} (m^3/s)	Q_{20} (m^3/s)	Q_{50} (m^3/s)	Q_{100} (m^3/s)
A1 – Roof	0.0960	2.0	0.0960	0.038	0.043	0.050	0.052	0.059
A2 – Ground	0.8297	1.0	0.0000	0.118	0.159	0.193	0.239	0.277
A TOTAL	**0.9257**	**-**	**0.0960**	**0.156**	**0.202**	**0.243**	**0.291**	**0.336**

A comparison of the XP-Rafts results in Tables 2.3 and 2.4 shows increases of 0.026m^3/s, 0.031m^3/s, 0.033m^3/s, 0.017m^3/s and 0.018m^3/s for the Q_5, Q_{10}, Q_{20}, Q_{50} and Q_{100} ARI storm events for Catchment A.

This increase in discharge can be attributed to the increased impervious area observed during the post-development scenario.

2.5 Post Development Stormwater Mitigation Strategy

The following strategy is proposed to mitigate the post-development stormwater discharge to the site's pre-development discharge rates.

- Discharge the ground catchment of the subject site to the Lawful Point of Discharge via overland sheet flow as currently occurs;
- Attenuation of post-development storm discharge from the roof catchment of the subject site being developed through the use of aboveground tanks;
- Set the low flow outlet level high such that the bottom third of the proposed above ground tanks provide for potable water reuse onsite;
- Discharge of the proposed dual detention tanks to the Lawful Point of Discharge via piped (Q_5) and overland flow (up to Q_{100}); and
- Generally, maintain the existing drainage regimes and drainage discharge locations.

2.5.1 Detention Tank Design

Table 2.5 details the proposed detention tank characteristics with Table 2.6 detailing the tank storage/height relationship adopted.

The tanks were used to mitigate the flows discharging from Catchment A1 (Roof) as well as to provide for onsite reuse. In order to have a reuse component it is proposed to have the low flow detention outlet located above the base of the tank as detailed below.

Table 2.5: Detention Tank and Reuse Characteristics

Design Parameter	Details
4 x 27,000L Tanks	
Tank Outlets	Low-flow Outlet = 2 x Ø75mm PVC (one per balance tank set) (discharge to overland flow) High-flow Outlet = 2 x Ø150mm PVC (one per balance tank set) (discharge to overland flow)
Tank Geometry	Base Area = 50.52m^2 (12.63m^2 per tank) Storage Height = 1.50m (i.e. height above tank reuse zone) Total Storage Volume = 75.78m^3
Tank Modelling Summary	Q_5 Peak Outflow = 0.007m^3/s Q_5 Peak Stage = 0.755m (above low flow outlet invert level) Q_{100} Peak Outflow = 0.010m^3/s Q_{100} Peak Stage = 1.513m (above low flow outlet invert level)
Tank Reuse Summary	Base Area = 50.52m^2 (12.63m^2 per tank) Storage Height = 0.65m Total Storage Volume = 31.32m^3 (storage between base of tank and low flow outlet height of 0.65m above base of tanks)

Table 2.6: Height/Storage Relationship (4 x 27,000L Tanks)

Storage Height (m)	Storage (m^3)	Storage Height (m)	Storage (m^3)
0.0	0.00	1.2	60.62
0.1	5.05	1.3	65.67
0.2	10.10	1.4	70.72
0.3	15.16	1.5	75.78
0.4	20.21	1.6	80.83
0.5	25.26	1.7	85.88
0.6	30.31	1.8	90.93
0.7	35.36	1.9	95.98
0.8	40.41	2.0	101.03
0.9	45.47	2.1	106.09
1.0	50.52	2.2	111.14
1.1	55.57	-	-

2.5.1 Post-development Scenario – Mitigated

Table 2.7 details the attenuation of the Catchment A total discharge via the proposed detention tanks.

Table 2.7: Post-development Scenario (Mitigated)

ARI Storm	Catchment A		Difference (%)
	Pre (m^3/s)	Post (m^3/s)	
Q_5 Peak	0.130	0.126	-3.08%
Q_{10} Peak	0.171	0.169	-1.17%
Q_{20} Peak	0.210	0.199	-5.24%
Q_{50} Peak	0.274	0.262	-4.38%
Q_{100} Peak	0.319	0.300	-5.96%

The results presented above demonstrate that the proposed detention tanks successfully attenuate the post-development site discharge to pre-developed rates.

3 Stormwater Quality Assessment

3.1 Water Quality Objectives

Although the proposed development site has a total area greater than 2,500m^2, we note that the subject site serves rural rather than urban purposes and will not result in an impervious area greater than 25% of the net developable area. As such, the subject site does not trigger the requirements outlined in the Queensland State Planning Policy with the water quality impacts of the development able to be minimised through the use of Stormwater Quality Best Management Practice (SQBMP) treatment measures.

3.2 Proposed SQBMP Treatment Measures

The following techniques will be adopted within the development to promote SQBMP. In accordance with SQBMP, stormwater runoff from the development's impervious areas will be directed to the soft landscaping surrounding the development prior to being discharged from site wherever possible. The soft landscaping will promote infiltration, thus reducing pollutant runoff and aid in reducing the flows from the development's impervious areas.

A plan detailing the above is included in Appendix E. Further to the above the following strategies will be implemented during the construction and operational phases of the project to manage water quality.

3.2.1 Education

Education of workers though site inductions during the Construction phase and land owners during the Operational phase of the development will be implemented to reduce the likelihood of pollutant generation.

3.2.2 Grass Buffers and Soft Landscaping

Landscape buffers or grass strips shall be utilised across the site where possible, providing at source buffer treatment to runoff from adjacent impervious surfaces (pathways, car parks, etc.). Grass and landscape buffer strips are commonly used as an at source control measure. They are effective in the removal of coarse to medium sized sediments and minor removal of nitrogen and phosphorous.

3.2.3 Detention Tanks

The proposed stormwater detention tanks will provide secondary treatment to stormwater by allowing coarse pollutants to settle prior to discharge from site.

3.2.4 Erosion and Sediment Management

The Erosion and Sediment Management strategies for the site for the Construction and Operational phases are detailed in Section 4 below.

4 Erosion and Sediment Control Strategy

The objective of erosion and sediment management on construction sites is to minimise soil erosion and control silt and/or sediment discharge from the sites through the use of suitable control devices during the four primary phases of the project lifecycle being:

1. Pre-construction/Establishment Phase;
2. Change to Ground Level Phase;
3. Construction Phase; and
4. Post-development/Operational Phase.

Sections 4.2 and 4.3 below outline the typical and industry best practice erosion and sediment control measures that will be implemented throughout the life cycle of this project.

4.1 Development Lifecycle Erosion and Sediment Management

4.1.1 Pre-construction/Establishment Phase

Prior to the commencement of construction, during the site establishment phase of the works, the following sediment and erosion control measures will be implemented in order to minimise site disturbance and ensure that water quality is maintained.

- Silt/Sediment fences will be installed around the proposed bulk earthworks site (along the toe of the batter alignment) and any environmentally sensitive areas; and
- A construction vehicle entry/exit shakedown area will be installed and will comprise of a vibratory cattle grid or gravel/rock pad in accordance with the IEAust Guidelines.

4.1.2 Change to Ground Level Phase

Excavation during the bulk earthworks/change to ground level phase of the project will be staged in a manner that runoff will generally be directed towards sediment and erosion controls established during the pre-construction phase.

As applicable, sediment basins will be constructed within proposed park/open space areas generally in the location of the proposed bio-retention basins to ensure that all sediment runoff is intercepted and treated prior to discharging from site.

4.1.3 Construction Phase

During the construction phase of the project, the following erosion and sediment controls will be implemented to ensure water quality is maintained.

- Sediment fences will be erected at the base of all batters and stockpiles to prevent sediment transportation offsite;
- All sediment and erosion control structures will be maintained and inspected regularly as well as after each storm event to ensure the ongoing integrity is maintained. No structure is to accumulate sediment above 40% of its capacity; and
- Regular monitoring of water quality will be undertaken to determine the effectiveness of the sediment and erosion control measures. Testing may be required and shall be provided to the Local Authority on request.

4.1.4 Post-development/Operational Phase

Following the completion of the construction phase of the project and the development reaching 'Practical Completion' and/or 'On-maintenance', a monitoring program will be established for the stormwater treatment devices outlined previously within this report, where applicable. The monitoring program will ensure the ongoing integrity and effectiveness of these stormwater treatment devices following the completion of the construction phase of the project.

4.2 Dust Suppression and Erosion Control Measures

The time of disturbance onsite will be kept to a minimum by ensuring that the civil works are undertaken directly following the earthworks phase. Consideration to staging of the works shall be given in order to minimise the area of exposed earthworks at any given time.

Erosion control and dust suppression measures shall be applied to the exposed areas of the site as deemed necessary by the site supervisor in order to prevent the emission of dust from the site.

A number of erosion control measures are available inclusive of but not limited to the following:

- Water spraying (by water truck);
- Dust suppressants;
- Surface stabilisation; and
- Covering of exposed areas.

4.3 Sediment Control Measures

With reference to the IEAust Guidelines and Current Industry Best Practice, there are three (3) fundamental sediment control principles that have been identified for use during construction:

- Construction Vehicle Shakedown and/or Entry/Exit;
- Sediment Fences; and
- Sediment Barriers.

4.3.1 Construction Vehicle Shakedown and/or Entry/Exit

A dedicated construction vehicle shakedown will be installed at the site's entry/exit point for road and construction vehicles. This construction vehicle shakedown area will be established to facilitate the removal of soil, mud, dust and debris from the tyres of vehicles prior to leaving the construction site. The construction shakedown will comprise of a gravel/rock pad designed or a vibratory grid system constructed and maintained in accordance with the IEAust Guidelines. The advantages of the vibratory grid system include ease of movement and ability to reuse for several years at different construction sites.

4.3.2 Sediment Fences

Sediment fencing will be established at the bottom of slopes on any exposed earthworks batters where there is an established risk of contaminated water discharging from the site prior to clearing and earthworks commencing. Sediment fencing may be required at regular spacing down the disturbed slope to limit scour and rutting caused by channelising of stormwater discharge. Sediment fences will be used to protect any temporary stockpile sites as required. Sediment collected from sediment barriers will be regularly removed and either taken offsite as part of the earthworks phase or stockpiled for use during revegetation works.

4.3.3 Sediment Barriers

Sediment barriers will be constructed around all stormwater drainage gully pits and field inlets where contaminated water may enter the existing and proposed stormwater network. The provision of these sediment barriers will facilitate the settlement of sediments prior to entering the downstream stormwater drainage network. Sediment barriers will generally comprise of gravel wrapped in geotextile 'sausage', sediment fences around field inlets or similar approved products.

4.4 Monitoring and Maintenance

The site supervisor will be responsible for the following regular monitoring and maintenance activities during the various phases of the development:

1. Inspection of downstream stormwater network as well as sediment and erosion controls will be conducted at the end of each construction day and after each rainfall event greater than 25mm.
2. If any established complaints by neighbouring property owners and/or local authority or evidence of water quality deterioration is reported downstream of the works site the following actions are to be taken immediately:
    a. locate source of stormwater quality deterioration.
    b. construct temporary erosion and sediment controls to prevent the continuing short term stormwater quality deterioration.
    c. repair existing erosion and sediment controls, modify construction procedures or construct additional controls to prevent further deterioration.

5 Conclusions and Recommendations

This report outlines the stormwater management strategy developed to manage potential impacts due to the proposed industrial workshop development located at 58 Hughes Road, Wurdong Heights.

Following the investigation, the following stormwater design strategy has been adopted for the site:

- Discharge the ground catchment of the subject site to the Lawful Point of Discharge via overland sheet flow as currently occurs;
- Attenuation of post-development storm discharge from the roof catchment of the subject site being developed through the use of aboveground tanks;
- Set the low flow outlet level high such that the bottom third of the proposed above ground tanks provide for potable water reuse onsite;
- Discharge of the proposed dual detention tanks to the Lawful Point of Discharge via piped (Q_5) and overland flow (up to Q_{100});
- Best practice stormwater quality management techniques will be implemented to achieve water quality objectives by directing stormwater runoff from the development to pervious areas for treatment prior to discharge from site; and
- Implementation of typical erosion and sediment control devices during the four (4) primary phases of the proposed development.

Following the conclusion of this investigation we can conclude that the development site, with the implementation of the stormwater management strategy outlined in this report, will result in a 'no worsening' effect of the current stormwater discharge conditions upstream or downstream of the site.

6 Reference Documentation

GRC Planning Scheme Policies (GRC, 2015)

Capricorn Municipal Design Guidelines (CMDG, 2015)

Institution of Engineers, Australia (2001) "Australian Rainfall and Runoff – A Guide to Flood Estimation"

Neville Jones & Associates (2008) "Queensland Urban Drainage Design Manual (QUDM)", Edition 2

The State of Queensland: Department of State Development, Infrastructure and Planning, July 2017. State Planning Policy

Water by Design (2009) "MUSIC Modelling Guidelines for South-East Queensland" – Draft 01, December 2009

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Appendix A

Proposed Development Plans

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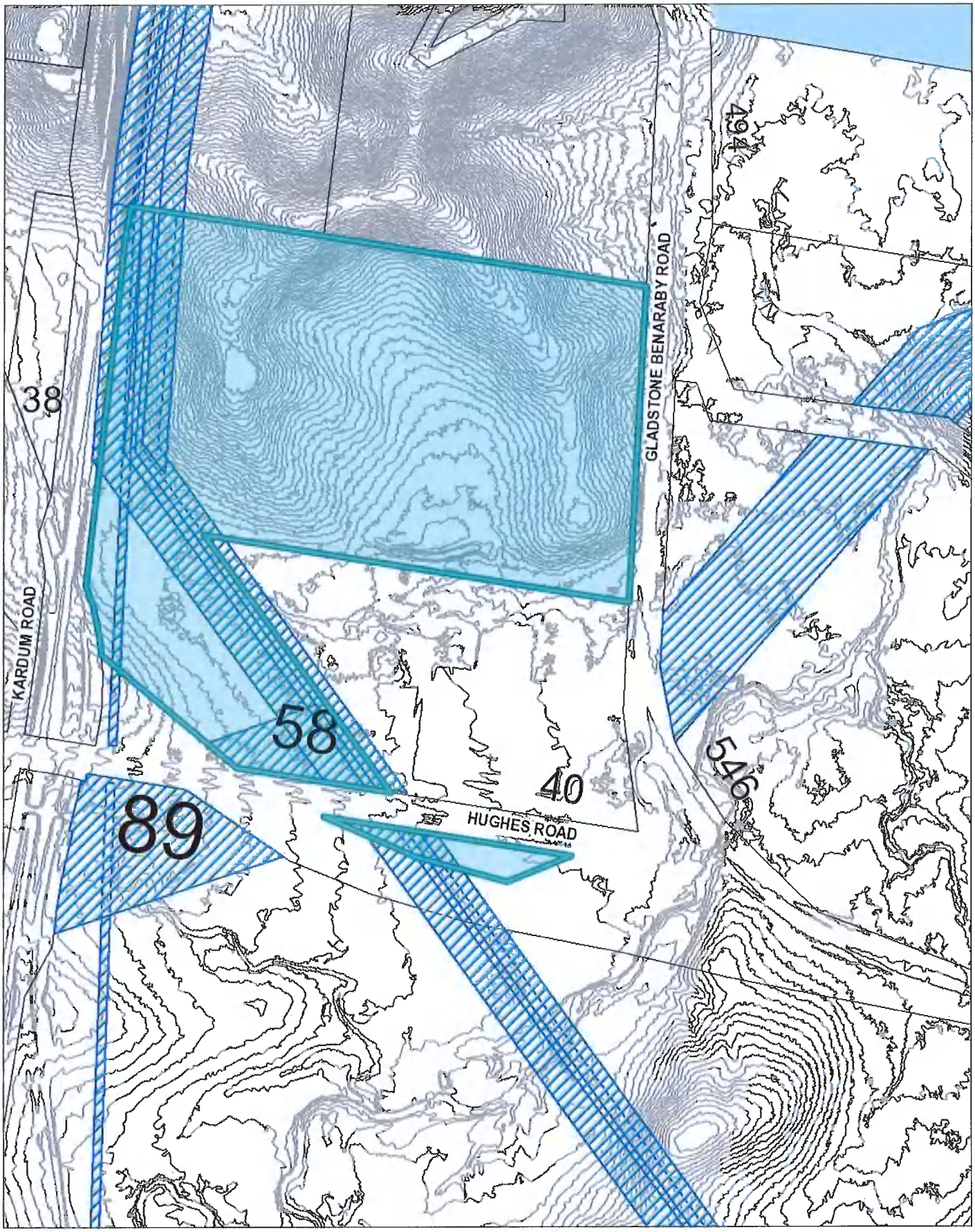
Appendix B

Topographic Data



GLADSTONE REGIONAL COUNCIL

GRC Contours 1m

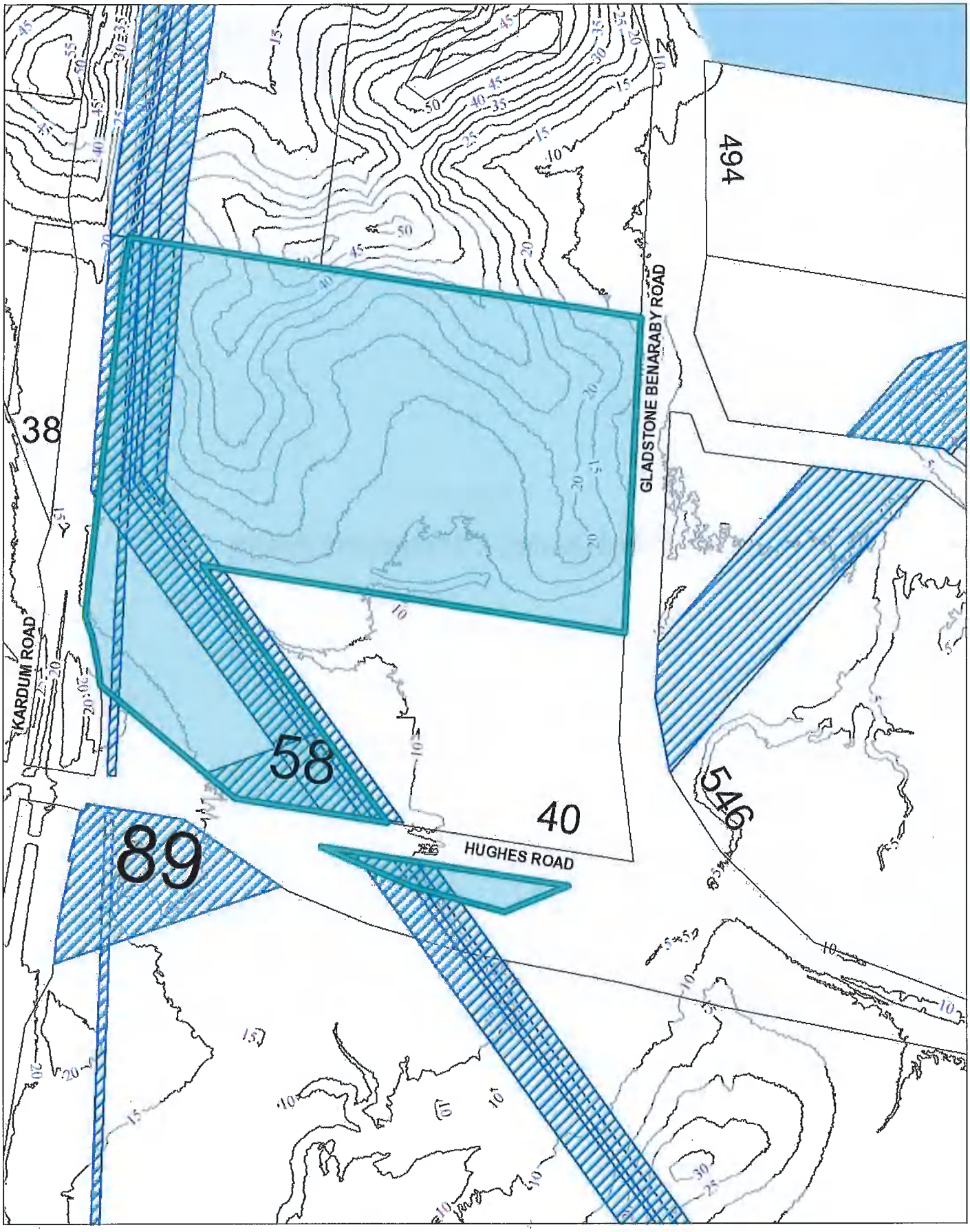
145.72 0 72.86 145.72 Meters

N

Printed: 18-Dec-2017

Map Scale 1:5,829

Original Size: A4



GLADSTONE REGIONAL COUNCIL

GRC Contours 5m

145.72 0 72.86 145.72 Meters

N

Printed: 18-Dec-2017

Map Scale 1:5,829

Original Size: A4

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Appendix C

Stormwater Catchment Plans

LEGEND

- EXISTING TELSTRA
- EXISTING OVERHEAD ELECTRICAL
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING BOUNDARY
- EXISTING NOMINAL KERB LINE
- WORKS SITE BOUNDARY
- EXISTING SURFACE CONTOURS (0.5m)
- ROOF / BUILDING HARDSTAND AREA
- CONCRETE DRIVEWAY / PAVED AREA
- PERVIOUS AREA
- OVERLAND FLOW DIRECTION
- CATCHMENT BOUNDARY
- A — CATCHMENT LABEL

CATCHMENT TABLE (PRE)	
CATCHMENT AREA - A	0.9257 ha

CATCHMENT DATA	A
BUILDING / ROOF AREA	0.0306 ha
HARDSTAND / DRIVEWAY	0.0306 ha
GARDEN / PERVIOUS AREA	0.8645 ha
TOTAL IMPERVIOUS AREA	0.0612 ha
TOTAL PERVIOUS AREA	0.8645 ha

NOTES

1. THE LOCATION OF THE EXISTING SERVICES HAS BEEN PLOTTED FROM RECORDS AND IS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
2. HISTORICAL AERIAL PHOTOGRAPHY HAS BEEN USED TO VALIDATE SURVEY DATA AND ESTABLISH PRE-DEVELOPMENT CATCHMENTS.

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REV	DESCRIPTION	DRAWN	DATE
A	DEVELOPMENT APPLICATION	M.B.	18.12.2017
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"
"	"	"	"

TASK	BY	INITIAL	DATE
REVIEW	BOGDAN POPA		18.12.2017
DESIGN	MICHAEL BINGER		18.12.2017
DRAWN	MICHAEL BINGER		18.12.2017

SCALE 10 0 10 20 1:500

(SCALE ABOVE DENOTES ORIGINAL SHEET SIZE - A1)

CLIENT: MARK HIGGINS
EVO PORTABLES PTY LTD

PROJECT: 58 HUGHES ROAD, WURDONG HEIGHTS QUEENSLAND 4680 (LOT 100 RP RP620400)

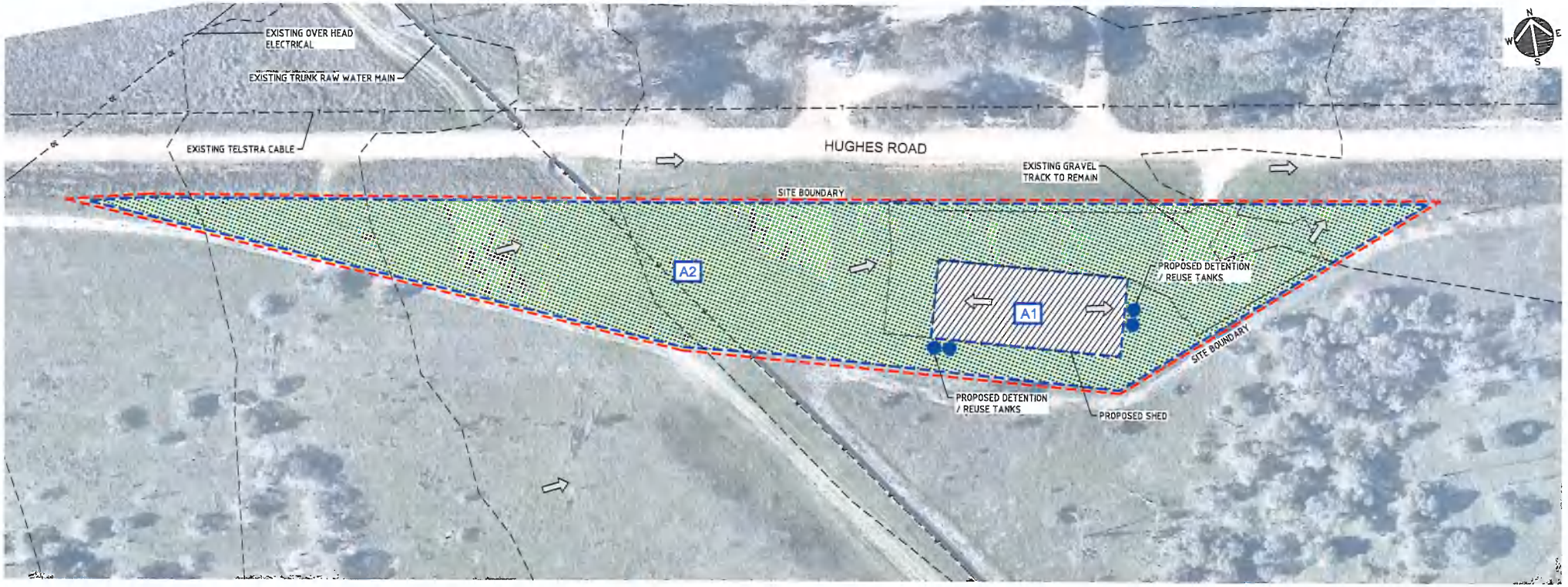
DRAWING TITLE: PRE DEVELOPMENT CATCHMENT LAYOUT

STATUS: PRELIMINARY (NOT TO BE USED FOR CONSTRUCTION)

APPROVED RPEQ No

DRAWING NUMBER: PEG0380-DA-SK01

REVISION: A



LEGEND

- EXISTING TELSTRA
- EXISTING OVERHEAD ELECTRICAL
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING BOUNDARY
- EXISTING NOMINAL KERB LINE
- WORKS SITE BOUNDARY
- EXISTING SURFACE CONTOURS (0.5m)
- ROOF / BUILDING HARDSTAND AREA
- CONCRETE DRIVEWAY / PAVED AREA
- PERVIOUS AREA
- OVERLAND FLOW DIRECTION
- CATCHMENT BOUNDARY
- A — CATCHMENT LABEL

CATCHMENT TABLE (PRE)

CATCHMENT AREA – A1 (ROOF/BUILDING)	0.0960 ha
CATCHMENT AREA – A2 (GROUND)	0.8297 ha

CATCHMENT DATA

CATCHMENT DATA	A1	A2
BUILDING / ROOF AREA	0.0960 ha	N/A
HARDSTAND / DRIVEWAY	N/A	N/A
GARDEN / PERVIOUS AREA	N/A	0.8297 ha
TOTAL IMPERVIOUS AREA	0.0960 HA	N/A
TOTAL PERVIOUS AREA	N/A	0.8297 HA

NOTES

1. THE LOCATION OF THE EXISTING SERVICES HAS BEEN PLOTTED FROM RECORDS AND IS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
2. HISTORICAL AERIAL PHOTOGRAPHY HAS BEEN USED TO VALIDATE SURVEY DATA AND ESTABLISH PRE-DEVELOPMENT CATCHMENTS.

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WWW.PINNACLEENG.COM.AU

REV	DESCRIPTION	DRAWN	DATE
A	DEVELOPMENT APPLICATION	M.B.	18.12.2017
B	LAYOUT REVISED	A.C.	21.12.2017
C	COUNCIL RFI RESPONSE	B.P.	22.02.2018

TASK	BY	INITIAL	DATE
REVIEW	BOGDAN POPA		18.12.2017
DESIGN	MICHAEL BINGER		18.12.2017
DRAWN	MICHAEL BINGER		18.12.2017

SCALE 10 0 10 20 1:500

(SCALE ABOVE DENOTES ORIGINAL SHEET SIZE - A1)

CLIENT: MARK HIGGINS
EVO PORTABLES PTY LTD

PROJECT: 58 HUGHES ROAD, WURDONG HEIGHTS QUEENSLAND 4680 (LOT 100 RP RP620400)

DRAWING TITLE: POST DEVELOPMENT CATCHMENT LAYOUT

STATUS: PRELIMINARY (NOT TO BE USED FOR CONSTRUCTION)

APPROVED

RPEQ No

DRAWING NUMBER: PEG0380-DA-SK02

REVISION: C

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Appendix D

Rational Method Calculations

RATIONAL METHOD CALCULATIONS

Project:	PEG0380_58 Hughes Road, Wurdong Heights
Date:	18-Dec-17
Designed:	B. Popa
Comments:	Catchment A - Pre-development

PARAMETERS	VALUE	
Catchment Name	A	
Catchment Size	0.926 ha	
C10 Coefficient of Runoff	0.66	(QUDM T4.05.3(b) (f_i = 0.0, $^1I_{10}$ = 66.42)) Light cover vegetation

Total Time of Concentration — QUDM Table 4.06.1

Total time of Conentration **(tc)** **20.0 mins**

Rational Method for Peak Catchment flow — $Q = 0.00278 \times C \times I \times A$

ARI	Rainfall Intensity (mm/h)	Rainfall Depth (mm)	Fy	Coefficient of Runoff	Discharge (m^3/s)
3 month					0.043
1	63.06	21.02	0.80	0.53	0.086
2	81.47	27.16	0.85	0.56	0.118
5	104.35	34.78	0.95	0.63	0.168
10	118.41	39.47	1.00	0.66	0.201
20	137.38	45.79	1.05	0.69	0.245
50	163.09	54.36	1.15	0.76	0.318
100	183.32	61.11	1.20	0.79	0.373

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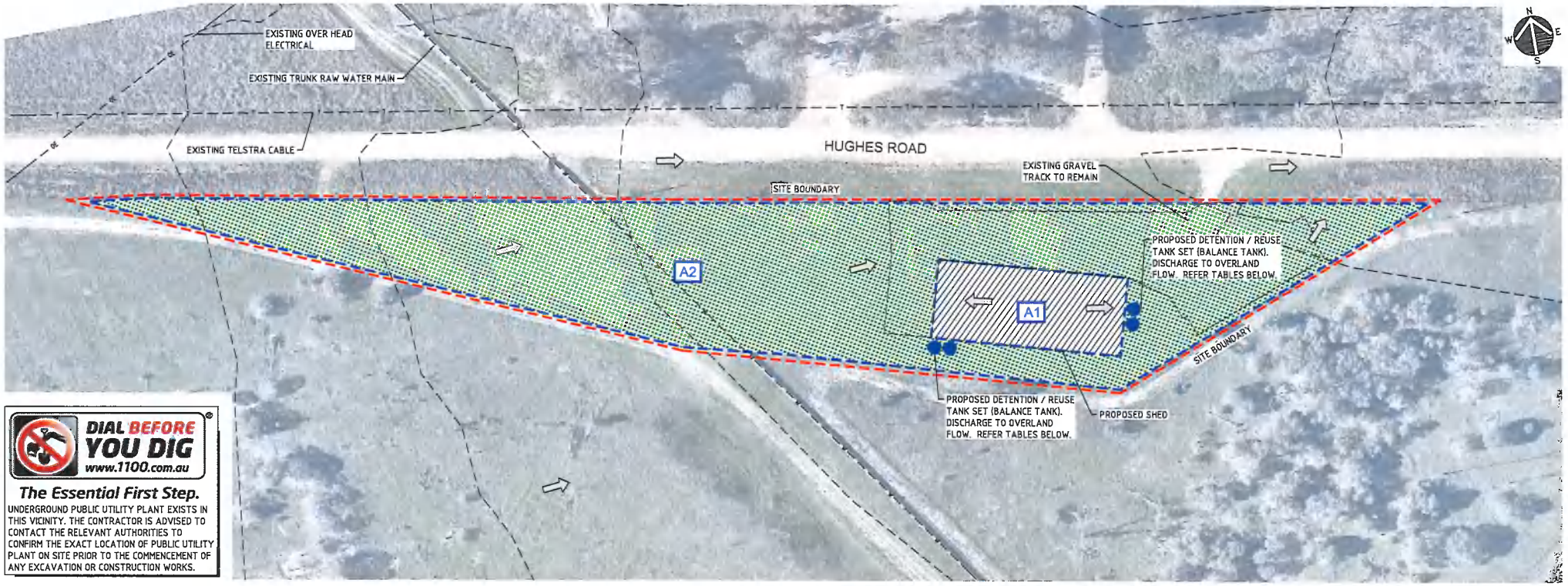
Appendix E

Stormwater Management Layout



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LEGEND

- EXISTING TELSTRA
- EXISTING OVERHEAD ELECTRICAL
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING BOUNDARY
- EXISTING NOMINAL KERB LINE
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- ROOF / BUILDING HARDSTAND AREA
- CONCRETE DRIVEWAY / PAVED AREA
- PERVIOUS AREA
- OVERLAND FLOW DIRECTION
- CATCHMENT BOUNDARY
- A — CATCHMENT LABEL

CATCHMENT TABLE (PRE)

CATCHMENT AREA – A1 (ROOF/BUILDING)	0.0960 ha
CATCHMENT AREA – A2 (GROUND)	0.8297 ha

CATCHMENT DATA

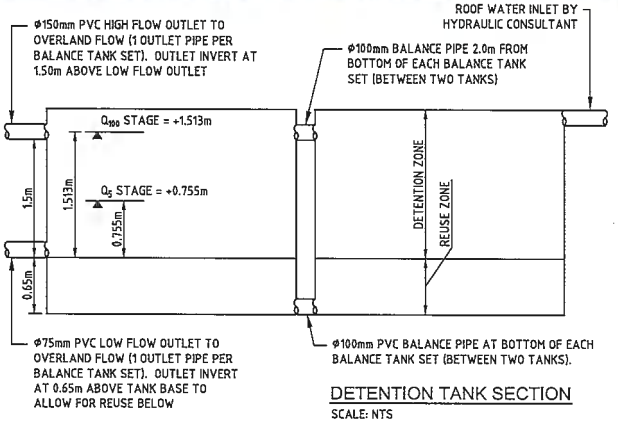
	A1	A2
BUILDING / ROOF AREA	0.0960 ha	N/A
HARDSTAND / DRIVEWAY	N/A	N/A
GARDEN / PERVIOUS AREA	N/A	0.8297 ha
TOTAL IMPERVIOUS AREA	0.0960 HA	N/A
TOTAL PERVIOUS AREA	N/A	0.8297 HA

NOTES

1. THE LOCATION OF THE EXISTING SERVICES HAS BEEN PLOTTED FROM RECORDS AND IS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
2. HISTORICAL AERIAL PHOTOGRAPHY HAS BEEN USED TO VALIDATE SURVEY DATA AND ESTABLISH PRE-DEVELOPMENT CATCHMENTS.

TABLE 1: DETENTION / REUSE DETAILS

PARAMETERS	TANK
TANK OUTLETS	
LOW FLOW OUTLET	= 2 x ϕ75mm PVC (1 PER TANK SET) DISCHARGE TO OVERLAND FLOW
LOW FLOW OUTLET LEVEL	= 0.65m ABOVE TANK BASE
HIGH FLOW OUTLET	= 2 x ϕ150mm PVC (1 PER TANK SET) DISCHARGE TO OVERLAND FLOW
HIGH FLOW OUTLET LEVEL	= 1.50m ABOVE LOW FLOW OUTLET
TANK GEOMETRY	
TANK BASE AREA	= 50.52m² (12.63m² PER TANK)
STORAGE HEIGHT	= 1.50m (HEIGHT ABOVE TANK REUSE ZONE)
STORAGE VOLUME	= 75.78m³ (ABOVE TANK REUSE ZONE)
TANK MODELING SUMMARY	
Q5 PEAK OUTFLOW	= 0.007m³/s
Q5 PEAK STAGE	= 0.755m ABOVE LOW FLOW OUTLET
Q100 PEAK OUTFLOW	= 0.010m³/s
Q100 PEAK STAGE	= 1.513m ABOVE LOW FLOW OUTLET
TANK REUSE SUMMARY	
TANK BASE AREA	= 50.52m² (12.63m² PER TANK)
STORAGE HEIGHT	= 0.65m ABOVE BASE OF TANK
TOTAL REUSE VOLUME	= 31.32m³ (STORAGE BETWEEN BASE OF TANKS AND LOW FLOW OUTLET I.L. OF 0.65m ABOVE TANK BASE



DETENTION TANK SECTION

SCALE: NTS

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REV	DESCRIPTION	DRAWN	DATE
A	DEVELOPMENT APPLICATION	M.B.	18.12.2017
B	LAYOUT REVISED	A.C.	21.12.2017
C	COUNCIL RFI RESPONSE	B.P.	22.02.2018

TASK	BY	INITIAL	DATE
REVIEW	BOGDAN POPA		18.12.2017
DESIGN	MICHAEL BINGER		18.12.2017
DRAWN	MICHAEL BINGER		18.12.2017

SCALE: 10 0 10 20 1:500

(SCALE ABOVE DENOTES ORIGINAL SHEET SIZE - A1)

CLIENT: MARK HIGGINS
EVO PORTABLES PTY LTD

PROJECT: 58 HUGHES ROAD, WURDONG HEIGHTS QUEENSLAND 4680 (LOT 100 RP RP620400)

DRAWING TITLE: STORMWATER MANAGEMENT LAYOUT

STATUS: PRELIMINARY (NOT TO BE USED FOR CONSTRUCTION)

APPROVED

RPEQ No

DRAWING NUMBER: PEG0380-DA-SK03

REVISION: C


PINNACLE
ENGINEERING GROUP
PINNACLE ENGINEERING GROUP
ABN: 80 608 431 625
PO Box 517, Paradise Point QLD 4216
www.pinnacleeng.com.au

RA6-N

Queensland Government

Department of
State Development, Manufacturing, Infrastructure and Planning

Our reference: 1801-3419 SRA
Your reference: DA/1/2018

12 February 2018

The Chief Executive Officer
Gladstone Regional Council
PO Box 29
Gladstone QLD 4680
info@gladstonerc.qld.gov.au

Attention: Rian Tait

Dear Sir/Madam

Referral agency response—with conditions
(Given under section 56 of the *Planning Act 2016*)

The development application described below was properly referred to the Department of State Development, Manufacturing, Infrastructure and Planning on 25 January 2018.

Applicant details

Applicant name:	Evo Portables
Applicant contact details:	PO Box 5332 Gladstone QLD 4680 eflett@zoneplanning.com.au

Location details

Street address:	58 Hughes Road, Wurdong Heights
Real property description:	100RP620400
Local government area:	Gladstone Regional Council

Application details

Development permit	Material change of use for low impact industry (industrial shed).

Referral triggers

The development application was referred to the department under the following provisions of the Planning Regulation 2017:

- 10.9.4.2.4.1 State transport corridors and future State transport corridors

Fitzroy/Central regional office
Level 2, 209 Bolsover Street,
Rockhampton
PO Box 113, Rockhampton QLD 4700

Conditions
Under section 56(1)(b)(i) of the *Planning Act 2016* (the Act), the conditions set out in Attachment 1 must be attached to any development approval.

Reasons for decision to impose conditions
The department must provide reasons for the decision to impose conditions. These reasons are set out in Attachment 2.

Approved plans and specifications
The department requires that the plans and specifications set out below and enclosed must be attached to any development approval.

Drawing/report title	Prepared by	Date	Reference no.	Version/issue
Aspect of development: Material change of use				
Site Based Stormwater Management Plan	Pinnacle Engineering Group	21 December 2017	PEG0380	02

A copy of this response has been sent to the applicant for their information.

For further information please contact Carl Porter, A/Principal Planning Officer, on 07 4924 2918 or via email RockhamptonSARA@dilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Anthony Walsh
Manager Planning

cc Evo Portables, eflett@zoneplanning.com.au

enc Attachment 1—Conditions to be imposed
Attachment 2—Reasons for decision to impose conditions
Approved plans and specifications

Attachment 1—Conditions to be imposed

No.	Conditions	Condition timing
Material change of use		
10.9.4.2.4.1—State transport corridors and future State transport corridors—The chief executive administering the *Planning Act 2016* nominates the Director-General of Department of Transport and Main Roads to be the enforcement authority for the development to which this development approval relates for the administration and enforcement of any matter relating to the following condition:		
1.	The development must be in accordance with sections 2, 3, 4 and 5 of the Site Based Stormwater Management Plan, prepared by Pinnacle Engineering Group, dated 21 December 2017, reference PEG0380, revision 02, in particular: - installation of 2 x 27,000L water tanks (in accordance with Detail Site Plan, prepared by Zone Planning Group, dated 6 December 2017, reference SK-DA-01, Revision A).	At all times

Attachment 2—Reasons for decision to impose conditions

The reasons for this decision are:

- To ensure that the impacts of stormwater events associated with development are minimised and managed to avoid creating any adverse impacts on the state-transport corridor.

GE78-N

Queensland Government

Department of State Development, Manufacturing, Infrastructure and Planning

Department of State Development, Manufacturing, Infrastructure and Planning
Statement of reasons for application 1801-3419 SRA
(Given under section 56 of the *Planning Act 2016*)

Departmental role:	Referral agency

Applicant details

Applicant name:	Evo Portables
Applicant contact details:	PO Box 5332 Gladstone QLD 4680 eflett@zoneplanning.com.au

Location details

Street address:	58 Hughes Road, Wurdong Heights
Real property description:	100RP620400
Local government area:	Gladstone Regional Council

Development details

Development permit	Material change of use for low impact industry (industrial shed)

Assessment matters

Aspect of development requiring code assessment	State Development Assessment Provisions, version 2.1 Applicable codes
1. Material change of use	State code 1: Development in a state-controlled road environment

Reasons for the department's response
The reasons for the response are the proposed development:

- Does not compromise the safe and efficient operation of the State-controlled road
- Can comply with State Code 1 with the application of a condition requiring management of stormwater impacts to the State-controlled road.

Response:

Nature of approval	Response details	Date of response
Development approval	Subject to conditions	12 February 2018

Relevant material:

- Development application
- State Development Assessment Provisions published by the Department of State Development, Manufacturing, Infrastructure and Planning
- Development Assessment Rules
- *Planning Act 2016*
- Planning Regulation 2017

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PINNACLE
ENGINEERING GROUP

SITE BASED STORMWATER MANAGEMENT PLAN

INDUSTRIAL WORKSHOP DEVELOPMENT
58 Hughes Road, Wurdong Heights QLD

MARK HIGGINS

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE
Queensland Government
SARA ref: 1801-3419 SRA
Date: 12 February 2018

DECEMBER 2017
REVISION 02

Pinnacle Engineering Group
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In accordance with the requirements of the *Queensland Professional Engineers Act 2002*, this document was prepared under the supervision of, reviewed and approved by the following experienced Registered Professional Engineer of Queensland (RPEQ).

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1 Introduction

Pinnacle Engineering Group (Pinnacle) was engaged by Mr. Mark Higgins to prepare a site based stormwater management plan (SBSMP) and associated investigations to provide supporting documentation for the proposed development application for an industrial workshop development located at 58 Hughes Road, Wurdong Heights QLD, within the local authority of the Gladstone Regional Council (GRC).

1.1 Scope of Investigation

This report addresses the proposed stormwater management strategy for the aforementioned development, including but not limited to the following elements:

- Pre and post development flows for various Average Recurrence Interval (ARI) design storm events;
- Nomination of the Lawful Point of Discharge for the site;
- Nomination of external catchment conveyance strategy;
- Details of stormwater quantity mitigation strategy for the site;
- Details of the stormwater quality strategy for the site; and
- Sediment and erosion control plan.

1.2 Site Description

1.2.1 Location

Street Address	-	58 Hughes Road, Wurdong Heights QLD
RP Description	-	Lot 100 on RP620400
Total Site Area	-	28.82 Hectares
Development Area	-	0.9257 Hectares
Current Zoning	-	Rural
Proposed Use	-	Industrial Workshop Development
Local Authority	-	GRC

Refer to Figure 1.1 for the site location.

1.2.2 Topography

A review of the topographic data sourced from Council's online mapping system has revealed that the portion of the subject site being developed (i.e. to the south of Hughes Road) is currently occupied by a number of sheds. Limited light vegetation is located along the western, southern and eastern site boundaries. A number of existing services easements are located within the western portion of the subject site. It is understood from the developer that all of the existing structures will be demolished as part of the proposed development.

The portion of the site being developed is effectively flat and falls gradually from the rear property boundaries towards the Hughes Road reserve to the north. The highest elevation of the subject site of approximately RL12.00m AHD is reached within the western portion of the subject site with the lowest elevation of approximately RL9.00m AHD reached within the northwest portion of the subject site.

Refer to Figure 1.2 for the existing aerial view of the site with the site plans and topographic survey included in Appendix B.

1.2.3 Proposed Development

The proposed development will deliver an industrial workshop development and associated on grade gravel car parking, hardstand and infrastructure over a small portion of the existing allotment. The proposed development will be accessed via the existing vehicular crossover from Hughes Road to the north.

The proposed development plans are included in Appendix A.

1.2.4 Existing Drainage System

Currently, the stormwater runoff from the subject site is conveyed via overland sheet flow to the northern property boundary and subsequently to the Hughes Road reserve.

No existing downstream stormwater network has been identified as part of this investigation.

1.2.5 Flood Assessment

A review of the GRC interactive mapping system has identified the subject site as being located outside of the mapped flood hazard area of Gladstone.

1.2.6 Acid Sulphate Soils

A review of the GRC interactive mapping system has identified the subject site as being located within the mapped acid sulphate soil area of Gladstone. As such, further advice from a geotechnical engineer may be required to formulate an acid sulphate soil management strategy for the site.

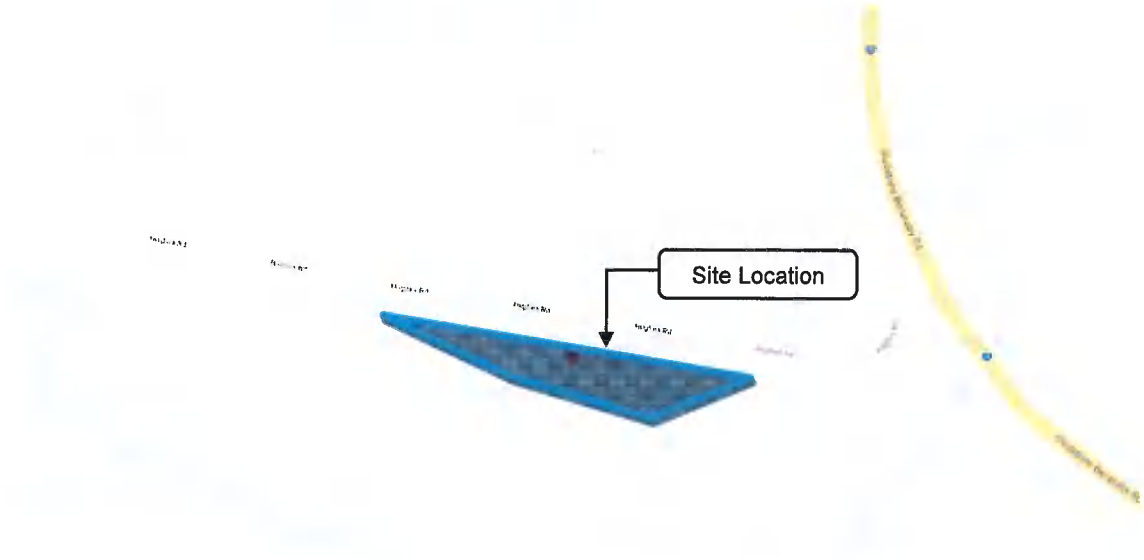

Figure 1.1: Site Map (Source: Google Maps)

Figure 1.2: Aerial View (Source: Google Maps)

2 Stormwater Quantity Assessment

2.1 Hydrologic Objectives

The hydrologic objectives for the site were set in accordance with the GRC Planning Scheme Policies, Capricorn Municipal Design Guidelines (CMDG) D5 Stormwater Drainage Design and the Queensland Urban Drainage Manual (QUDM). These objectives include but are not limited to:

- The proposed development shall ensure that all stormwater drainage is directed to the Lawful Point of Discharge in accordance with QUDM Section 3.02;
- Minor System Design for Q_5 ARI storm event;
- Major System Design for Q_{100} ARI storm event;
- No adverse impact on adjoining or downstream properties; and
- No increase in post-development flows, up to and including the Q_{100} ARI storm event.

For the purposes of this SBSMP, only the portion of the subject site being developed (i.e. to the south of Hughes Road) was analysed as the northern portion of the subject site retains itPs pre-development characteristics during the post-development scenario.

2.2 Lawful Point of Discharge

The Lawful Point of Discharge for the catchment is taken as the Hughes Road reserve to the north of the subject site.

2.3 Stormwater Quantity Analysis

The analysis of the surface water runoff from the site was performed using the non-linear program XP-Rafts.

2.3.1 Data Collation

The design rainfall Intensity Frequency Duration (IFD) data for the storm events up to 100 year ARI flood event was derived based on the CMDG D5 Stormwater Drainage Design and the AR&R.

The design IFD data for the catchment is summarised in Table 2.1 below.

Table 2.1: IFD Data for Gladstone

2 Year ARI Rainfall Intensities	50 Year ARI Rainfall Intensities	Skewness and Geographical Factors
$^{2}I_{1} = 46.73$	$^{50}I_{1} = 87.33$	Skewness, G = 0.21
$^{2}I_{12} = 9.12$	$^{50}I_{12} = 20.40$	Geographical Factor, $F_2 = 4.27$
$^{2}I_{72} = 2.83$	$^{50}I_{72} = 8.11$	Geographical Factor, $F_{50} = 17.85$

2.3.2 XP-Rafts Modelling Inputs

Rainfall loss parameters for each sub-catchment were applied using an initial and continuing rainfall loss model. The design loss parameters input into the XP-Rafts model are based on the guideline values recommended by Book 2 Section 3 of the AR&R, and other relevant industry standards.

The loss parameters adopted for this XP-Rafts model are tabulated below.

Table 2.2: Adopted XP-Rafts Initial and Continuing Loss Parameters

Storm Event	Pervious Areas		Impervious Areas	
ARI (years)	Initial Loss (mm)	Continuing Loss (mm)	Initial Loss (mm)	Continuing Loss (mm)
2-5	15	2.5	1	0
10-20	10	2.5	1	0
50-100	2.5	2.5	0	0

2.3.3 XP-Rafts Model Validation

The calibration of the XP-Rafts model was undertaken through the comparison of the XP-Rafts flow rates to the Rational Method calculations. The pre-development Rational Method calculations are included in Appendix D.

The Rational Method adopted a C_{10} coefficient of runoff of 0.66 for the pre-development catchment, in accordance with Table 4.05.3(b) of QUDM for poor grass cover. As detailed in Table 2.3 the flows calculated using the Rational Method are generally comparable to the results obtained from the XP-Rafts model. We can therefore reasonably adopt the flows generated from the XP-Rafts model.

2.3.4 Critical Duration Analysis

Storm durations ranging from 15 minutes to 720 minutes were simulated in the XP-Rafts model analysis to determine the design flows.

2.3.5 Existing Discharge Points

As outlined in the previous sections of this report the development site generally falls to the northern property boundary of the subject site and to the Hughes Road reserve. No existing downstream stormwater network was identified as part of this investigation. It is proposed to maintain the pre-development discharge locations during the post-development scenario.

2.4 Hydrologic Analysis

2.4.1 Pre-development Scenario

The results generated from the XP-Rafts model generally show that the critical storm duration throughout the catchment for all ARI flood events is the 90 minute storm event.

A percentage impervious area of 0.07 was calculated for the pre-development catchment (Catchment A) from aerial photography and the topographic data included in Appendix B.

The pre-development catchment discharges for the Q_5, Q_{10}, Q_{20}, Q_{50} and Q_{100} ARI events are detailed in Table 2.3 below.

Table 2.3: Pre-development Catchment Details and Discharges

Catchment	Area (ha)	Impervious Area (ha)	Average Slope (%)	XP-Rafts Results					Rational Method (C_{10} = 0.66)
				Q_5 (m^3/s)	Q_{10} (m^3/s)	Q_{20} (m^3/s)	Q_{50} (m^3/s)	Q_{100} (m^3/s)	Q_{100} (m^3/s)
A	0.9257	0.0612	1.0	0.130	0.171	0.210	0.274	0.319	0.373
Site Total	**0.9257**	**0.0612**	**1.0**	**0.130**	**0171**	**0.210**	**0.274**	**0.319**	**0.373**

2.4.2 Post-development Scenario – Unmitigated

The proposed development will deliver an industrial workshop development with associated on-grade gravel car parking located within the subject site. A fraction impervious of 0.10 was calculated for the portion of the site being developed during the post-development scenario (i.e. Catchment A) from the site layout provided. For the purposes of this analysis the post-development catchment has been further split into sub-catchments, being the development's roof and ground areas. No hardstand areas are proposed as part of the development.

A copy of the architectural drawings is included in Appendix A. The post-development catchment plan is included in Appendix C.

The impervious areas have been modelled using the second sub-catchment option within XP-Rafts. The total impervious area for each catchment is tabulated below. The results of the XP-Rafts post-development analysis indicate that the critical storm duration throughout the catchment for all ARI flood events is generally the 90 minute storm event.

Table 2.4 summarises the post-developed peak flow rates for post-development catchment.

Table 2.4: Post-development Catchment Details and Discharges (Unmitigated)

Catchment	Total Area (ha)	Average Slope (%)	Impervious Area (ha)	XP-Rafts Results				
				Q_5 (m^3/s)	Q_{10} (m^3/s)	Q_{20} (m^3/s)	Q_{50} (m^3/s)	Q_{100} (m^3/s)
A1 – Roof	0.0960	2.0	0.0960	0.038	0.043	0.050	0.052	0.059
A2 – Ground	0.8297	1.0	0.0000	0.118	0.159	0.193	0.239	0.277
A TOTAL	**0.9257**	**-**	**0.0960**	**0.156**	**0.202**	**0.243**	**0.291**	**0.336**

A comparison of the XP-Rafts results in Tables 2.3 and 2.4 shows increases of 0.026m^3/s, 0.031m^3/s, 0.033m^3/s, 0.017m^3/s and 0.018m^3/s for the Q_5, Q_{10}, Q_{20}, Q_{50} and Q_{100} ARI storm events for Catchment A.

This increase in discharge can be attributed to the increased impervious area observed during the post-development scenario.

2.5 Post Development Stormwater Mitigation Strategy

The following strategy is proposed to mitigate the post-development stormwater discharge to the site's pre-development discharge rates.

- Discharge the ground catchment of the subject site to the Lawful Point of Discharge via overland sheet flow as currently occurs;

- Attenuation of post-development storm discharge from the roof catchment of the subject site being developed through the use of aboveground tanks (2 x 27,000L);
- Discharge of the proposed dual detention tanks to the Lawful Point of Discharge via piped (Q_5) and overland flow (up to Q_{100}); and
- Generally maintain the existing drainage regimes and drainage discharge locations.

2.5.1 Detention Tank Design

Table 2.5 details the proposed detention tank characteristics with Table 2.6 detailing the tank storage/height relationship adopted. The tanks were used to mitigate the flows discharging from Catchment A1 (Roof).

Table 2.5: Detention Tank Characteristics

Design Parameter	Details
2 x 27,000L Tanks	
Tank Outlets	Low-flow Outlet = 2 x Ø75mm PVC (one per tank) (discharge to overland flow) High-flow Outlet = 2 x Ø150mm PVC (two per tank) (discharge to overland flow)
Tank Geometry	Base Area = 25.24m^2 (12.63m^2 per tank) Storage Height = 2.2m Total Storage Volume = 55.57m^3
Tank Modelling Summary	Q_5 Peak Outflow = 0.009m^3/s Q_5 Peak Stage = 1.327m (above base of tank) Q_{100} Peak Outflow = 0.037m^3/s Q_{100} Peak Stage = 2.149m (above base of tank)

Table 2.6: Height/Storage Relationship

Storage Height (m)	Storage (m^3)	Storage Height (m)	Storage (m^3)
0.0	0.00	1.2	30.31
0.1	2.53	1.3	32.84
0.2	5.05	1.4	35.36
0.3	7.58	1.5	37.89
0.4	10.10	1.6	40.41
0.5	12.63	1.7	42.94
0.6	15.16	1.8	45.47
0.7	17.68	1.9	47.99
0.8	20.21	2.0	50.52
0.9	22.73	2.1	53.04
1.0	25.26	2.2	55.57
1.1	27.78	-	-

2.5.1 Post-development Scenario – Mitigated

Table 2.7 details the attenuation of the Catchment A total discharge via the proposed detention tanks.

Table 2.7: Post-development Scenario (Mitigated)

ARI Storm	Catchment A		Difference (%)
	Pre (m^3/s)	Post (m^3/s)	
Q_5 Peak	0.130	0.128	-1.54%
Q_{10} Peak	0.171	0.169	-1.17%
Q_{20} Peak	0.210	0.204	-2.86%
Q_{50} Peak	0.274	0.273	-0.36%
Q_{100} Peak	0.319	0.319	-0.00%

The results presented above demonstrate that the proposed detention tanks successfully attenuate the post-development site discharge to pre-developed rates.

3 Stormwater Quality Assessment

3.1 Water Quality Objectives

Although the proposed development site has a total area greater than 2,500m^2, we note that the subject site serves rural rather than urban purposes and will not result in an impervious area greater than 25% of the net developable area. As such, the subject site does not trigger the requirements outlined in the Queensland State Planning Policy with the water quality impacts of the development able to be minimised through the use of Stormwater Quality Best Management Practice (SQBMP) treatment measures.

3.2 Proposed SQBMP Treatment Measures

The following techniques will be adopted within the development to promote SQBMP. In accordance with SQBMP, stormwater runoff from the development's impervious areas will be directed to the soft landscaping surrounding the development prior to being discharged from site wherever possible. The soft landscaping will promote infiltration, thus reducing pollutant runoff and aid in reducing the flows from the development's impervious areas.

A plan detailing the above is included in Appendix E. Further to the above the following strategies will be implemented during the construction and operational phases of the project to manage water quality.

3.2.1 Education

Education of workers though site inductions during the Construction phase and land owners during the Operational phase of the development will be implemented to reduce the likelihood of pollutant generation.

3.2.2 Grass Buffers and Soft Landscaping

Landscape buffers or grass strips shall be utilised across the site where possible, providing at source buffer treatment to runoff from adjacent impervious surfaces (pathways, car parks, etc.). Grass and landscape buffer strips are commonly used as an at source control measure. They are effective in the removal of coarse to medium sized sediments and minor removal of nitrogen and phosphorous.

3.2.3 Detention Tanks

The proposed stormwater detention tanks will provide secondary treatment to stormwater by allowing coarse pollutants to settle prior to discharge from site.

3.2.4 Erosion and Sediment Management

The Erosion and Sediment Management strategies for the site for the Construction and Operational phases are detailed in Section 4 below.

4 Erosion and Sediment Control Strategy

The objective of erosion and sediment management on construction sites is to minimise soil erosion and control silt and/or sediment discharge from the sites through the use of suitable control devices during the four primary phases of the project lifecycle being:

1. Pre-construction/Establishment Phase;
2. Change to Ground Level Phase;
3. Construction Phase; and
4. Post-development/Operational Phase.

Sections 4.2 and 4.3 below outline the typical and industry best practice erosion and sediment control measures that will be implemented throughout the life cycle of this project.

4.1 Development Lifecycle Erosion and Sediment Management

4.1.1 Pre-construction/Establishment Phase

Prior to the commencement of construction, during the site establishment phase of the works, the following sediment and erosion control measures will be implemented in order to minimise site disturbance and ensure that water quality is maintained.

- Silt/Sediment fences will be installed around the proposed bulk earthworks site (along the toe of the batter alignment) and any environmentally sensitive areas; and
- A construction vehicle entry/exit shakedown area will be installed and will comprise of a vibratory cattle grid or gravel/rock pad in accordance with the IEAust Guidelines.

4.1.2 Change to Ground Level Phase

Excavation during the bulk earthworks/change to ground level phase of the project will be staged in a manner that runoff will generally be directed towards sediment and erosion controls established during the pre-construction phase.

As applicable, sediment basins will be constructed within proposed park/open space areas generally in the location of the proposed bio-retention basins to ensure that all sediment runoff is intercepted and treated prior to discharging from site.

4.1.3 Construction Phase

During the construction phase of the project, the following erosion and sediment controls will be implemented to ensure water quality is maintained.

- Sediment fences will be erected at the base of all batters and stockpiles to prevent sediment transportation offsite;
- All sediment and erosion control structures will be maintained and inspected regularly as well as after each storm event to ensure the ongoing integrity is maintained. No structure is to accumulate sediment above 40% of its capacity; and
- Regular monitoring of water quality will be undertaken to determine the effectiveness of the sediment and erosion control measures. Testing may be required and shall be provided to the Local Authority on request.

4.1.4 Post-development/Operational Phase

Following the completion of the construction phase of the project and the development reaching 'Practical Completion' and/or 'On-maintenance', a monitoring program will be established for the stormwater treatment devices outlined previously within this report, where applicable. The monitoring program will ensure the ongoing integrity and effectiveness of these stormwater treatment devices following the completion of the construction phase of the project.

4.2 Dust Suppression and Erosion Control Measures

The time of disturbance onsite will be kept to a minimum by ensuring that the civil works are undertaken directly following the earthworks phase. Consideration to staging of the works shall be given in order to minimise the area of exposed earthworks at any given time.

Erosion control and dust suppression measures shall be applied to the exposed areas of the site as deemed necessary by the site supervisor in order to prevent the emission of dust from the site.

A number of erosion control measures are available inclusive of but not limited to the following:

- Water spraying (by water truck);
- Dust suppressants;
- Surface stabilisation; and
- Covering of exposed areas.

4.3 Sediment Control Measures

With reference to the IEAust Guidelines and Current Industry Best Practice, there are three (3) fundamental sediment control principles that have been identified for use during construction:

- Construction Vehicle Shakedown and/or Entry/Exit;
- Sediment Fences; and
- Sediment Barriers.

4.3.1 Construction Vehicle Shakedown and/or Entry/Exit

A dedicated construction vehicle shakedown will be installed at the site's entry/exit point for road and construction vehicles. This construction vehicle shakedown area will be established to facilitate the removal of soil, mud, dust and debris from the tyres of vehicles prior to leaving the construction site. The construction shakedown will comprise of a gravel/rock pad designed or a vibratory grid system constructed and maintained in accordance with the IEAust Guidelines. The advantages of the vibratory grid system include ease of movement and ability to reuse for several years at different construction sites.

4.3.2 Sediment Fences

Sediment fencing will be established at the bottom of slopes on any exposed earthworks batters where there is an established risk of contaminated water discharging from the site prior to clearing and earthworks commencing. Sediment fencing may be required at regular spacing down the disturbed slope to limit scour and rutting caused by channelising of stormwater discharge. Sediment fences will be used to protect any temporary stockpile sites as required. Sediment collected from sediment barriers will be regularly removed and either taken offsite as part of the earthworks phase or stockpiled for use during revegetation works.

4.3.3 Sediment Barriers

Sediment barriers will be constructed around all stormwater drainage gully pits and field inlets where contaminated water may enter the existing and proposed stormwater network. The provision of these sediment barriers will facilitate the settlement of sediments prior to entering the downstream stormwater drainage network. Sediment barriers will generally comprise of gravel wrapped in geotextile 'sausage', sediment fences around field inlets or similar approved products.

4.4 Monitoring and Maintenance

The site supervisor will be responsible for the following regular monitoring and maintenance activities during the various phases of the development:

1. Inspection of downstream stormwater network as well as sediment and erosion controls will be conducted at the end of each construction day and after each rainfall event greater than 25mm.
2. If any established complaints by neighbouring property owners and/or local authority or evidence of water quality deterioration is reported downstream of the works site the following actions are to be taken immediately:
    a. locate source of stormwater quality deterioration.
    b. construct temporary erosion and sediment controls to prevent the continuing short term stormwater quality deterioration.
    c. repair existing erosion and sediment controls, modify construction procedures or construct additional controls to prevent further deterioration.

5 Conclusions and Recommendations

This report outlines the stormwater management strategy developed to manage potential impacts due to the proposed industrial workshop development located at 58 Hughes Road, Wurdong Heights.

Following the investigation, the following stormwater design strategy has been adopted for the site:

- Discharge the ground catchment of the subject site to the Lawful Point of Discharge via overland sheet flow as currently occurs;
- Attenuation of post-development storm discharge from the roof catchment of the subject site being developed through the use of aboveground tanks (2 x 20,000L);
- Discharge of the proposed dual detention tanks to the Lawful Point of Discharge via piped (Q_5) and overland flow (up to Q_{100});
- Best practice stormwater quality management techniques will be implemented to achieve water quality objectives by directing stormwater runoff from the development to pervious areas for treatment prior to discharge from site; and
- Implementation of typical erosion and sediment control devices during the four (4) primary phases of the proposed development.

Following the conclusion of this investigation we can conclude that the development site, with the implementation of the stormwater management strategy outlined in this report, will result in a 'no worsening' effect of the current stormwater discharge conditions upstream or downstream of the site.

6 Reference Documentation

GRC Planning Scheme Policies (GRC, 2015)

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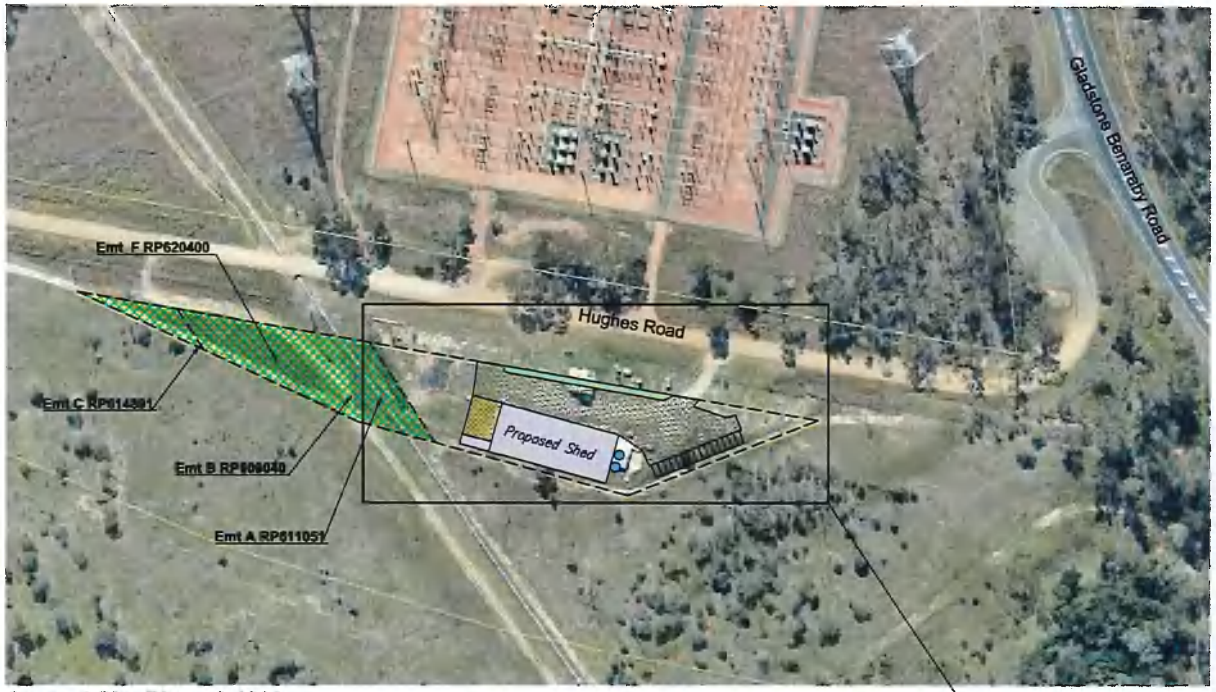
Appendix A

Proposed Development Plans



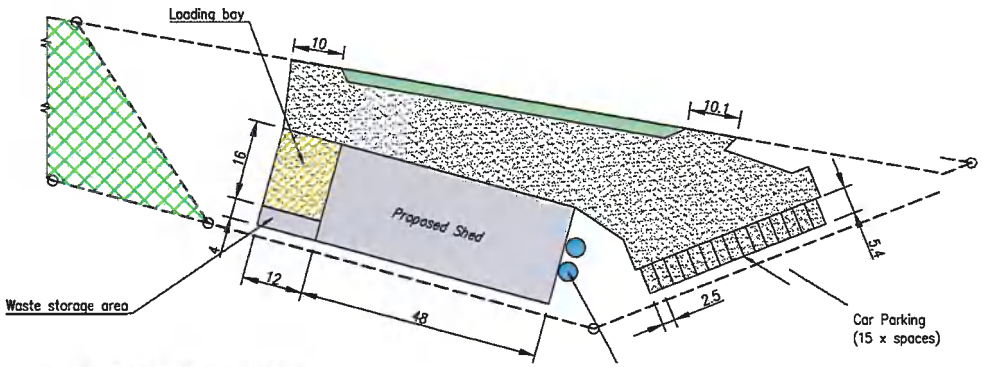
Context Site Plan - 1:1000

PLANS AND DOCUMENTS referred to in the REFERRAL AGENCY RESPONSE

Queensland Government

SARA ref: 1801-3419 SRA

Date: 8 February 2018



Detail Site Plan - 1:100

Note
All dimensions and areas are approximate only, and are subject to survey and Council approval.

Dimensions have been rounded to the nearest 0.1 metres.

The boundaries shown on this plan should not be used for final detail/engineers design.

Contours supplied by Terranean Mapping Technologies.

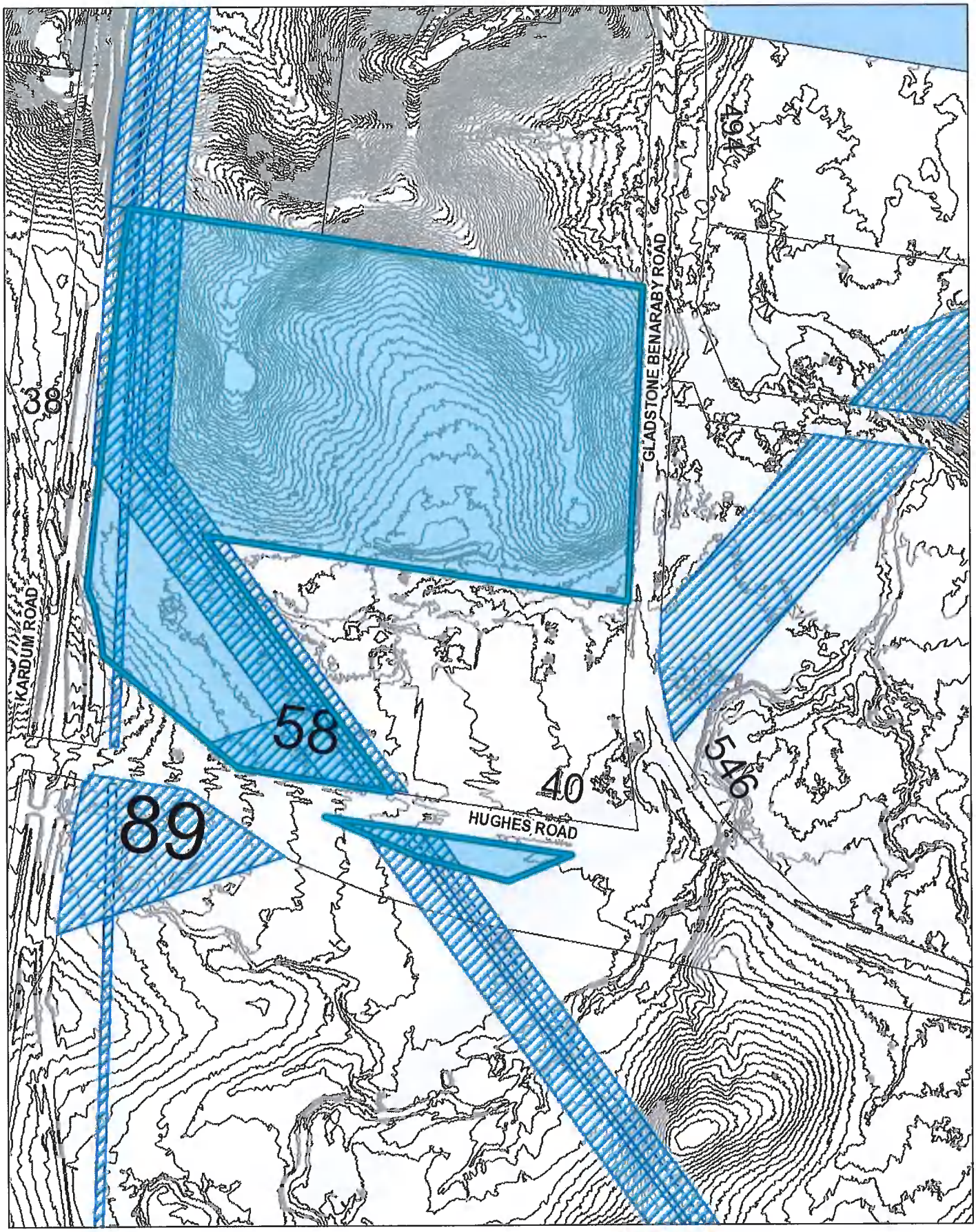
REVISION	Level Datum	Date 6 December 2017	CLIENT MARK HIGGINS
	Origin	Comp By.	PROPOSED LOW IMPACT INDUSTRY SITE PLAN
		DWG Name. Z17285 - A	PROJECT 58 Hughes Road Wurdong Heights
		Local Authority GLADSTONE REGIONAL COUNCIL	
	Scale Refer dwg	Sheet A3 / Locality / Job Reference Z17285	Plan Ref SK-DA-01 / Rev A

Zone Planning Group
Gladstone
Gold Coast

PINNACLE
ENGINEERING GROUP

Appendix B

Topographic Data



GLADSTONE REGIONAL COUNCIL

GRC Contours 1m

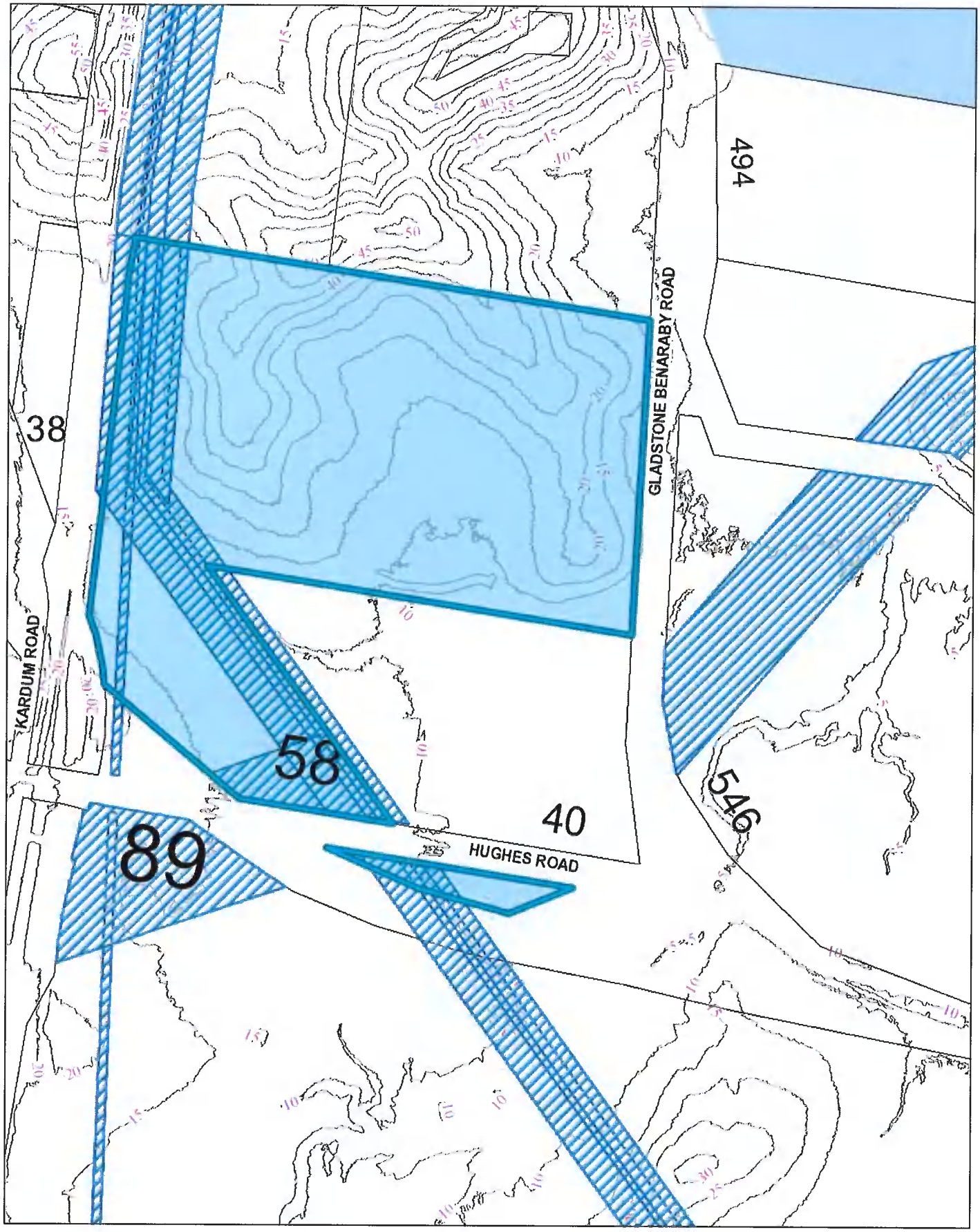
145.72 0 72.86 145.72 Meters

N

Printed: 18-Dec-2017

Map Scale 1:5,829

Original Size: A4



GLADSTONE REGIONAL COUNCIL

GRC Contours 5m

145.72 0 72.86 145.72 Meters

N

Printed: 18-Dec-2017

Map Scale 1:5,829

Original Size: A4

PINNACLE
ENGINEERING GROUP

Appendix C

Stormwater Catchment Plans

LEGEND

- EXISTING TELSTRA
- EXISTING OVERHEAD ELECTRICAL
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING BOUNDARY
- EXISTING NOMINAL KERB LINE
- WORKS SITE BOUNDARY
- EXISTING SURFACE CONTOURS (0.5m)
- ROOF / BUILDING HARDSTAND AREA
- CONCRETE DRIVEWAY / PAVED AREA
- PERVIOUS AREA
- OVERLAND FLOW DIRECTION
- CATCHMENT BOUNDARY
- A — CATCHMENT LABEL

CATCHMENT TABLE (PRE)	
CATCHMENT AREA - A	0.9257 ha

CATCHMENT DATA	A
BUILDING / ROOF AREA	0.0306 ha
HARDSTAND / DRIVEWAY	0.0306 ha
GARDEN / PERVIOUS AREA	0.8645 ha
TOTAL IMPERVIOUS AREA	0.0612 ha
TOTAL PERVIOUS AREA	0.8645 ha

NOTES

1. THE LOCATION OF THE EXISTING SERVICES HAS BEEN PLOTTED FROM RECORDS AND IS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
2. HISTORICAL AERIAL PHOTOGRAPHY HAS BEEN USED TO VALIDATE SURVEY DATA AND ESTABLISH PRE-DEVELOPMENT CATCHMENTS.

DIAL BEFORE YOU DIG www.1100.com.au

The Essential First Step.

UNDERGROUND PUBLIC UTILITY PLANT EXISTS IN THIS VICINITY. THE CONTRACTOR IS ADVISED TO CONTACT THE RELEVANT AUTHORITIES TO CONFIRM THE EXACT LOCATION OF PUBLIC UTILITY PLANT ON SITE PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION OR CONSTRUCTION WORKS.

PINNACLE ENGINEERING GROUP
PO BOX 517 PARADISE POINT, QUEENSLAND 4216
WWW.PINNACLEENG.COM.AU

REV	DESCRIPTION	DRAWN	DATE
A	DEVELOPMENT APPLICATION	M.B	18.12.2017

TASK	BY	INITIAL	DATE
REVIEW	BOGDAN POPA		18.12.2017
DESIGN	MICHAEL BINGER		18.12.2017
DRAWN	MICHAEL BINGER		18.12.2017

SCALE 10 0 10 20 1:500

(SCALE ABOVE DENOTES ORIGINAL SHEET SIZE - A1)

CLIENT: MARK HIGGINS
EVO PORTABLES PTY LTD

PROJECT: 58 HUGHES ROAD,
WURDONG HEIGHTS
QUEENSLAND 4680
(LOT 100 RP RP620400)

DRAWING TITLE: PRE DEVELOPMENT CATCHMENT LAYOUT

STATUS: PRELIMINARY
(NOT TO BE USED FOR CONSTRUCTION)

APPROVED RPEQ No

DRAWING NUMBER: PEG0380-DA-SK01

REVISION: A

LEGEND

- EXISTING TELSTRA
- EXISTING OVERHEAD ELECTRICAL
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING BOUNDARY
- EXISTING NOMINAL KERB LINE
- WORKS SITE BOUNDARY
- EXISTING SURFACE CONTOURS (0.5m)
- ROOF / BUILDING HARDSTAND AREA
- CONCRETE DRIVEWAY / PAVED AREA
- PERVIOUS AREA
- OVERLAND FLOW DIRECTION
- CATCHMENT BOUNDARY
- A — CATCHMENT LABEL

CATCHMENT TABLE (PRE)	
CATCHMENT AREA - A1 (ROOF/BUILDING)	0.0960 ha
CATCHMENT AREA - A2 (GROUND)	0.8297 ha

CATCHMENT DATA	A1	A2
BUILDING / ROOF AREA	0.0960 ha	N/A
HARDSTAND / DRIVEWAY	N/A	N/A
GARDEN / PERVIOUS AREA	N/A	0.8297 ha
TOTAL IMPERVIOUS AREA	0.0960 HA	N/A
TOTAL PERVIOUS AREA	N/A	0.8297 HA

NOTES

1. THE LOCATION OF THE EXISTING SERVICES HAS BEEN PLOTTED FROM RECORDS AND IS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
2. HISTORICAL AERIAL PHOTOGRAPHY HAS BEEN USED TO VALIDATE SURVEY DATA AND ESTABLISH PRE-DEVELOPMENT CATCHMENTS.

PINNACLE ENGINEERING GROUP
PO BOX 517 PARADISE POINT, QUEENSLAND 4216
WWW.PINNACLEENG.COM.AU

REV	DESCRIPTION	DRAWN	DATE
A	DEVELOPMENT APPLICATION	M.B.	18.12.2017
B	LAYOUT REVISED	A.C.	21.12.2017

TASK	BY	INITIAL	DATE
REVIEW	BOGDAN POPA		18.12.2017
DESIGN	MICHAEL BINGER		18.12.2017
DRAWN	MICHAEL BINGER		18.12.2017

SCALE 10 0 10 20 1:500

(SCALE ABOVE DENOTES ORIGINAL SHEET SIZE - A1)

CLIENT: MARK HIGGINS
EVO PORTABLES PTY LTD

PROJECT: 58 HUGHES ROAD, WURDONG HEIGHTS QUEENSLAND 4680 (LOT 100 RP RP620400)

DRAWING TITLE: POST DEVELOPMENT CATCHMENT LAYOUT

STATUS: PRELIMINARY (NOT TO BE USED FOR CONSTRUCTION)

APPROVED

RPEQ No

DRAWING NUMBER: PEG0380-DA-SK02

REVISION: B

PINNACLE
ENGINEERING GROUP

Appendix D

Rational Method Calculations

RATIONAL METHOD CALCULATIONS

Project:	PEG0380_58 Hughes Road, Wurdong Heights
Date:	18-Dec-17
Designed:	B. Popa
Comments:	Catchment A - Pre-development

PINNACLE ENGINEERING GROUP

PARAMETERS	VALUE	
Catchment Name	A	
Catchment Size	0.926 ha	
C10 Coefficient of Runoff	0.66	(QUDM T4.05.3(b) (f_i = 0.0, $^1I_{10}$ = 66.42)) Light cover vegetation

Total Time of Concentration — QUDM Table 4.06.1

Total time of Conentration **(tc)** **20.0 mins**

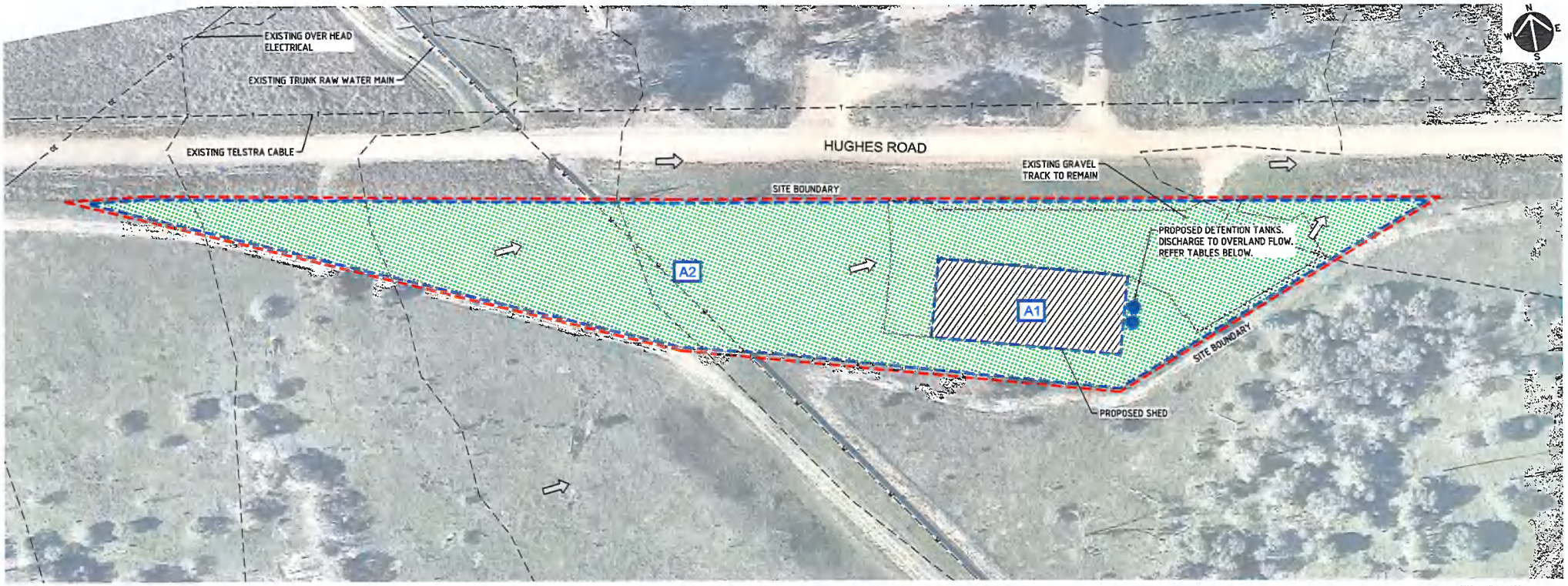
Rational Method for Peak Catchment flow — $Q = 0.00278 \times C \times I \times A$

ARI	Rainfall Intensity (mm/h)	Rainfall Depth (mm)	Fy	Coefficient of Runoff	Discharge (m^3/s)
3 month					0.043
1	63.06	21.02	0.80	0.53	0.086
2	81.47	27.16	0.85	0.56	0.118
5	104.35	34.78	0.95	0.63	0.168
10	118.41	39.47	1.00	0.66	0.201
20	137.38	45.79	1.05	0.69	0.245
50	163.09	54.36	1.15	0.76	0.318
100	183.32	61.11	1.20	0.79	0.373

PINNACLE
ENGINEERING GROUP

Appendix E

Stormwater Management Layout



LEGEND

- EXISTING TELSTRA
- EXISTING OVERHEAD ELECTRICAL
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING BOUNDARY
- EXISTING NOMINAL KERB LINE
- WORKS SITE BOUNDARY
- EXISTING SURFACE CONTOURS (0.5m)
- ROOF / BUILDING HARDSTAND AREA
- CONCRETE DRIVEWAY / PAVED AREA
- PERVIOUS AREA
- OVERLAND FLOW DIRECTION
- CATCHMENT BOUNDARY
- A — CATCHMENT LABEL

CATCHMENT TABLE (PRE)

CATCHMENT AREA - A1 (ROOF/BUILDING)	0.0960 ha
CATCHMENT AREA - A2 (GROUND)	0.8297 ha

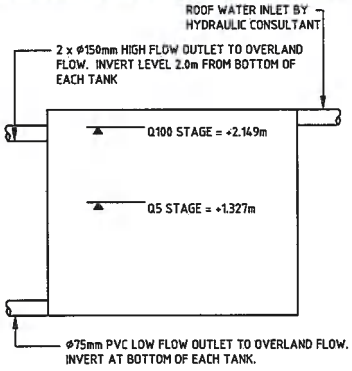
CATCHMENT DATA	A1	A2
BUILDING / ROOF AREA	0.0960 ha	N/A
HARDSTAND / DRIVEWAY	N/A	N/A
GARDEN / PERVIOUS AREA	N/A	0.8297 ha
TOTAL IMPERVIOUS AREA	0.0960 HA	N/A
TOTAL PERVIOUS AREA	N/A	0.8297 HA

NOTES

1. THE LOCATION OF THE EXISTING SERVICES HAS BEEN PLOTTED FROM RECORDS AND IS TO BE CONFIRMED PRIOR TO CONSTRUCTION.
2. HISTORICAL AERIAL PHOTOGRAPHY HAS BEEN USED TO VALIDATE SURVEY DATA AND ESTABLISH PRE-DEVELOPMENT CATCHMENTS.

TABLE 1: DETENTION DETAILS

PARAMETERS	TANK
TANK OUTLETS	
LOW FLOW OUTLET	= 2 x ø75mm ORIFICE (1 PER TANK) DISCHARGE TO OVERLAND FLOW
LOW FLOW OUTLET LEVEL	= AT BASE OF TANK
HIGH FLOW OUTLET	= 2 x ø150mm PVC (2 PER TANK) DISCHARGE TO OVERLAND FLOW
HIGH FLOW OUTLET LEVEL	= 2.0m ABOVE BASE OF TANK
TANK GEOMETRY	
TANK BASE AREA	= 25.24m² (12.63m² PER TANK)
STORAGE HEIGHT	= 2.2m ABOVE BASE OF TANK
STORAGE VOLUME	= 55.57m³
TANK MODELING SUMMARY	
Q5 PEAK OUTFLOW	= 0.009 m³/s
Q5 PEAK STAGE	= 1.327m ABOVE BASE OF TANK
Q100 PEAK OUTFLOW	= 0.037 m³/s
Q100 PEAK STAGE	= 2.149m ABOVE BASE OF TANK



DETENTION TANK SECTION
SCALE: NTS

PINNACLE ENGINEERING GROUP
PO BOX 517 PARADISE POINT, QUEENSLAND 4216
WWW.PINNACLEENG.COM.AU

REV	DESCRIPTION	DRAWN	DATE
A	DEVELOPMENT APPLICATION	M.B.	18.12.2017
B	LAYOUT REVISED	A.C.	21.12.2017

TASK	BY	INITIAL	DATE
REVIEW	BOGDAN POPA		18.12.2017
DESIGN	MICHAEL BINGER		18.12.2017
DRAWN	MICHAEL BINGER		18.12.2017

SCALE 10 0 10 20 1:500
(SCALE ABOVE DENOTES ORIGINAL SHEET SIZE - A1)

CLIENT: MARK HIGGINS
EVO PORTABLES PTY LTD

PROJECT: 58 HUGHES ROAD, WURDONG HEIGHTS QUEENSLAND 4680 (LOT 100 RP RP620400)

DRAWING TITLE: STORMWATER MANAGEMENT LAYOUT

STATUS: PRELIMINARY (NOT TO BE USED FOR CONSTRUCTION)

APPROVED | RPEQ No

DRAWING NUMBER: PEG0380-DA-SK03 | REVISION: B


PINNACLE
ENGINEERING GROUP
PINNACLE ENGINEERING GROUP
ABN: 80 608 431 625
PO Box 517, Paradise Point QLD 4216
www.pinnacleeng.com.au

420 Flinders Street, Townsville QLD 4810
PO Box 1090, Townsville QLD 4810
ergon.com.au

7th February 2018

Evo Portables
c/- Zone Planning Group
PO Box 5332
Gladstone, QLD 4680

Attention: Sarah Camilleri

cc Gladstone Regional Council
PO Box 29
Gladstone, QLD 4680

Attention: Rian Tait

Dear Sarah,

Development Application – Material Change of Use for Low Impact Industry located at 58 Hughes Road, Wurdong Heights, described as Lot 100 RP620400.
Applicant Ref: Z17286
Council Ref: DA/1/2018
Our Ref: HBD 6005589 359601

We refer to the above reference Development Application which has been referred to Ergon Energy in accordance with the *Planning Act 2016.*

In accordance with Schedule 10, Part 9, Division 2 of the *Planning Regulation 2017*, the application has been assessed against the purposes of the *Electricity Act 1994* and *Electrical Safety Act 2002*. The below response is provided in accordance with section 56(1) of the *Planning Act 2016.*

Should the Assessment Manager decide to approve the proposed Material Change of Use for Low Impact Industry, as an Advice Agency for the Application, Ergon requires any approval be consistent with the following submitted plans of development.

Approved Plans			
Title	**Plan Number**	**Issue**	**Date**
PROPOSED LOW IMPACT INDUSTRY SITE PLAN	SK-DA-01	A	06/12/2017

Any alterations to these plans before the development application is decided are to be resubmitted to Ergon for comment.

Should you require any further information on the above matter, please contact the undersigned on (07) 3664 5057.

Yours faithfully,

Angela Collins
Town Planner
T: (07) 3664 5057
E: angela.collins@energyq.com.au

2 March 2018

Our Ref: DA2787

Evo Portables
c/- Zone Planning Group
PO Box 5332
GLADSTONE QLD 4680

Via Email: info@zoneplanning.com.au

Attention: Sarah Camilleri Ref: Z17286

Chief Executive Officer
Gladstone Regional Council
PO Box 29
GLADSTONE QLD 4680

Via Email: info@gladstone.qld.gov.au

Attention: Rian Tait Ref: DA/1/2018

Dear Sir / Madam

Referral Agency Response (Advice)
(Given under section 9.2 of the Development Assessment Rules)

Transmission Infrastructure Impacted	
Transmission Corridor	Clarke Creek – Boyne Island Transmission Line Corridor
Easement ID	Easements E & F on RP620400 – Dealing No. 601072144
Location Details	
Street address	58 Hughes Road, Wurdong Heights
Real property description	Lot 100 on RP620400
Local government area	Gladstone Regional Council
Application Details	
Proposed development:	Material Change of Use – Impact – Low Impact Industry
Approval sought	Development Permit

We refer to the above referenced development application which has been referred to Powerlink Queensland in accordance with Section 54 *of the Planning Act 2016*.

In accordance with its jurisdiction under Schedule 10 Part 9 Division 2 of the *Planning Regulation 2016*, Powerlink Queensland is a **Referral Agency (Advice)** for the above development application.

Specifically, the application has been triggered for assessment by Powerlink Queensland because:

1. For **material change of use** – all or part of the premises are within 100m of a transmission substation site (Table 2 1a)
2. For **material change of use** – all or part of the premises are subject to a transmission entity easement which is part of the transmission supply network (Table 2 1b)

PLANS AND REPORTS ASSESSED

The following plans and reports have been reviewed by Powerlink Queensland and form the basis of our assessment. Any variation to these plans and reports may require amendment of our advice.

Table 1: Plans and Reports upon which the assessment is based

Drawing / Report Title	Prepared by	Dated	Reference No.	Version / Issue
Proposed Low Impact Industry Site Plan	Zone Planning Group	6 December 2017	SK-DA-01	Rev. A

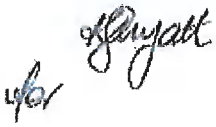
33 Harold Street, Virginia
PO Box 1193, Virginia, Queensland 4014, Australia
Telephone: (07) 3860 2111 Facsimile: (07) 3860 2100
Website: www.powerlink.com.au

Powerlink Queensland, acting as a Referral Agency (Advice) under the Planning Regulation 2017 provides its response to the application as attached **(Attachment 1)**.

Please treat this response as a properly made submission for the purposes of Powerlink being an eligible advice agency in accordance with the *Planning Act 2016*.

For further information please contact Kerrie Guyatt, Property Services Advisor, on (07) 3866 1313 or via email property@powerlink.com.au who will be pleased to assist.

Yours sincerely



Brandon Kingwill
MANAGER PROPERTY

ATTACHMENT 1 – REFERRAL AGENCY (ADVICE) RESPONSE

Powerlink Queensland **supports** this application subject to the inclusion of the following conditions in the Assessment Manager's Decision Notice.

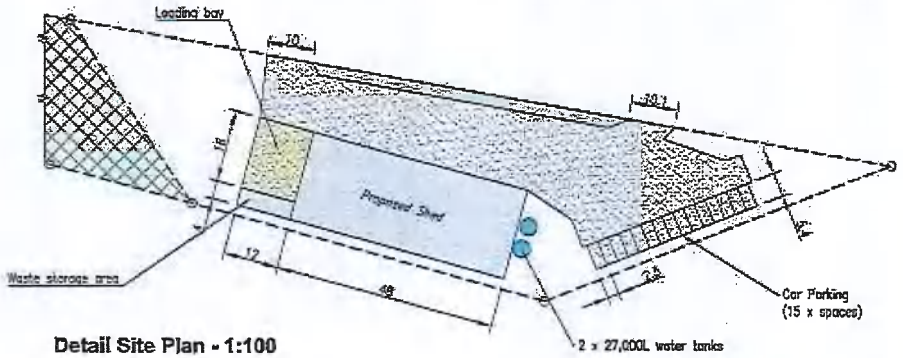
No.	Condition	Timing	Reason
1	Compliance with the terms and conditions of the easement dealing no. shown in the heading of this letter	At all times.	To ensure that the existing rights contained in the registered easement dealings are maintained.
2	Compliance with the generic requirements in respect to proposed works in the vicinity of Powerlink Queensland infrastructure as detailed in the enclosed Annexure "A".	At all times.	To ensure that the purpose of the *Electrical Safety Act 2002* is achieved and electrical safety requirements are met. To ensure the integrity of the easement is maintained.
3	The development must be carried out generally in accordance with the reviewed plans details in Table 1.	At all times.	To ensure that the development is carried out generally in accordance with the plans of development submitted with the application
4	The statutory clearance set the *Electrical Safety Regulation 2013* must be maintained during construction and operation. No encroachment within the statutory clearances is permitted.	At all times.	To ensure that the purpose of the *Electrical Safety Act 2002* is achieved and electrical safety requirements are met.

Advice to Council and the Applicant

1. Should any doubt exist in maintaining the prescribed clearance to electrical infrastructure the applicant is obliged under the *Electrical Safety Act 2002* to seek advice from Powerlink.
2. This response does not constitute an approval to commence any works within the easement. Prior written approval is required rom Powerlink Queensland before any work is undertaken within the easement areas. All works on easement (including but not limited to earthworks, drainage and detention basins; road construction, underground and overhead service installation) require detailed submissions, assessments and consent (or otherwise) by Powerlink.

ATTACHMENT 2 – ASSESSED PLANS

Context Site Plan - 1:1000



Detail Site Plan - 1:100

Note:
All dimensions and areas are approximate only, and are subject to survey and Council approval.

Drawings based upon information provided by client.

The development shown on this plan should not be used for detailed design purposes.

Contours supplied by Terranean Mapping Technologies.

REVISION	Level Datum:	Date: 6 December 2017	CLIENT	PROJECT	zone Planning Group
	Origin:	Comp By:	MARK HIGGINS	58 Hughes Road Wardong Heights	Gladstone Gold Coast
		DWG Name: Z17286-A	PROPOSED LOW IMPACT INDUSTRY SITE PLAN	Plan Ref: SK-DA-01 Rev: A	
	Scale: Refer dwg Sheet: A3	Local Authority: GLADSTONE REGIONAL COUNCIL			
		Locality: Job Reference: Z17286			

ANNEXURE A – GENERIC REQUIREMENTS

The conditions contained in this Annexure have been compiled to assist persons (the applicant) intending to undertake work within the vicinity of high-voltage electrical installations and infrastructure owned or operated by Powerlink. The conditions are supplementary to the provisions of the Electrical Safety Act 2002, Electrical Safety Regulation 2013 and the Terms and Conditions of Registered Easements and other forms of Occupational Agreements hereinafter collectively referred to as the "Easement". Where any inconsistency exists between this Annexure and the Easement, the Easement shall take precedence.

1. **POWERLINK INFRASTRUCTURE**
   You may not do any act or thing which jeopardises the foundations, ground anchorages, supports, towers or poles, including (without limitation) inundate or place, excavate or remove any soil, sand or gravel within a distance of twenty (20) metres surrounding the base of any tower, pole, foundation, ground anchorage or support.

2. **STRUCTURES**
   No structures should be placed within twenty (20) metres of any part of a tower or structure foundation or within 5m of the conductor shadow area. Any structures on the easement require prior written consent from Powerlink.

3. **EXCLUSION ZONES**
   Exclusion zones for operating plant are defined in Schedule 2 of the Electrical Safety Regulation 2013 for Untrained Persons. All Powerlink infrastructure should be regarded as "electrically live" and therefore potentially dangerous at all times.

   In particular your attention is drawn to Schedule 2 of the Electrical Safety Regulation 2013 which defines exclusion zones for untrained persons in charge of operating plant or equipment in the vicinity of electrical facilities. If any doubt exists in meeting the prescribed clearance distances from the conductors, the applicant is obliged under this Act to seek advice from Powerlink.

4. **ACCESS AND EGRESS**
   Powerlink shall at all times retain the right to unobstructed access to and egress from its infrastructure. Typically, access shall be by 4WD vehicle.

5. **APPROVALS (ADDITIONAL)**
   Powerlink's consent to the proposal does not relieve the applicant from obtaining statutory, landowner or shire/local authority approvals.

6. **MACHINERY**
   All mechanical equipment proposed for use within the easement must not infringe the exclusion zones prescribed in Schedule 2 of the Electrical Safety Regulation 2013. All operators of machinery, plant or equipment within the easement must be made aware of the presence of live high-voltage overhead wires. It is recommended that all persons entering the Easement be advised of the presence of the conductors as part of on site workplace safety inductions. The use of warning signs is also recommended.

7. EASEMENTS

All terms and conditions of the easement are to be observed. Note that the easement takes precedence over all subsequent registered easement documents. Copies of the easement together with the plan of the Easement can be purchased from the Department of Environment & Resource Management.

8. EXPENDITURE AND COST RECOVERY

Should Powerlink incur costs as a result of the applicant's proposal, all costs shall be recovered from the applicant.

Where Powerlink expects such costs to be in excess of $10 000.00, advanced payments may be requested.

9. EXPLOSIVES

Blasting within the vicinity (500 metres) of Powerlink infrastructure must comply with AS 2187. Proposed blasting within 100 metres of Powerlink infrastructure must be referred to Powerlink for a detailed assessment.

10. BURNING OFF OR THE LIGHTING OF FIRES

We strongly recommend that fires not be lit or permitted to burn within the transmission line corridor and in the vicinity of any electrical infrastructure placed on the land. Due to safety risks Powerlink's written approval should be sort.

11. GROUND LEVEL VARIATIONS

Overhead Conductors

Changes in ground level must not reduce statutory ground to conductor clearance distances as prescribed by the Electrical Safety Act 2002 and the Electrical Safety Regulation 2013.

Underground Cables

Any change to the ground level above installed underground cable is not permitted without express written agreement of Powerlink.

12. VEGETATION

Vegetation planted within an easement must not exceed 3.5 metres in height when fully matured. Powerlink reserves the right to remove vegetation to ensure the safe operation of the transmission line and, where necessary, to maintain access to infrastructure.

13. INDEMNITY

Any use of the Easement by the applicant in a way which is not permitted under the easement and which is not strictly in accordance with Powerlink's prior written approval is an unauthorised use. Powerlink is not liable for personal injury or death or for property loss or damage resulting from unauthorized use. If other parties make damage claims against Powerlink as a result of unauthorized use then Powerlink reserves the right to recover those damages from the applicant.

14. INTERFERENCE

The applicant's attention is drawn to s.230 of the Electricity Act 1994 (the "Act"), which provides that a person must not wilfully, and unlawfully interfere with an electricity entity's works. "Works" are defined in s.12 (1) of the Act. The maximum penalty for breach of s.230 of the Act is a fine equal to 40 penalty units or up to 6 months imprisonment.

15. REMEDIAL ACTION

Should remedial action be necessary by Powerlink as a result of the proposal, the applicant will be liable for all costs incurred.

16. OWNERS USE OF LAND

The owner may use the easement land for any lawful purpose consistent with the terms of the registered easement; the conditions contained herein, the Electrical Safety Act 2002 and the Electrical Safety Regulation 2013.

17. ELECTRIC AND MAGNETIC FIELDS

Electric and Magnetic Fields (EMF) occur everywhere electricity is used (e.g. in homes and offices) as well as where electricity is transported (electricity networks).

Powerlink recognises that there is community interest about Electric and Magnetic Fields. We rely on expert advice on this matter from recognised health authorities in Australia and around the world. In Australia, the Federal Government agency charged with responsibility for regulation of EMFs is the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). ARPANSA's *Fact Sheet – Magnetic and Electric Fields from Power Lines*, concludes:

"On balance, the scientific evidence does not indicate that exposure to 50Hz EMF's found around the home, the office or near powerlines is a hazard to human health."

Whilst there is no scientifically proven causal link between EMF and human health, Powerlink nevertheless follows an approach of "*prudent avoidance*" in the design and siting of new powerlines. This includes seeking to locate new powerline easements away from houses, schools and other buildings, where it is practical to do so and the added cost is modest.

The level of EMF decreases rapidly with distance from the source. EMF readings at the edge of a typical Powerlink easement are generally similar to those encountered by people in their daily activities at home or at work. And in the case of most Powerlink lines, at about 100 metres from the line, the EMF level is so small that it cannot be measured.

Powerlink is a member of the ENA's EMF Committee that monitors and compiles up-to-date information about EMF on behalf of all electricity network businesses in Australia. This includes subscribing to an international monitoring service that keeps the industry informed about any new developments regarding EMF such as new research studies, literature and research reviews, publications, and conferences.

We encourage community members with an interest in EMF to visit ARPANSA's website: www.arpansa.gov.au Information on EMF is also available on the ENA's website: www.ena.asn.au