Integrated Water Management Plan

Byron Shire Central Hospital
Lot 100 DP 1140936
Ewingsdale Road, Ewingsdale

HEALTH SCIENCE ENVIROMENTAL EDUCATION
ENVIRONMENTAL AUDITOR

Integrated Water Management Plan

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1. Introduction

Tim Fitzroy & Associates has been engaged by Health Infrastructure to prepare an Integrated Water Management Plan for the proposed Byron Shire Central Hospital.

The Integrated Water Management Plan is required in response to the Secretary's Environmental Assessment Requirements which requires the proponent to:

> *Prepare an Integrated Water Management Plan detailing any proposed alternative water supply, proposed end users of potable and non-potable water, demonstration of water sensitive urban design and water conservation measures.*

This Integrated Water Management Plan combines the proposal scheme designs for the water supply, sewage management and stormwater management as detailed in the Scheme Design Report for Hydraulic and Fire Services (Donnelley Simpson Cleary, 2014) and the Schematic Design Report - Civil Engineering (Taylor Thomson Whitting, 2014).

1.1 Site Information

The site is located at Lot 100 DP 1140936, Ewingsdale Road, Ewingsdale. The site is approximately 5 km north west of the centre of Byron Bay and approximately 1 km east of the northern interchange with the Pacific Highway. The northern side faces and is parallel with Ewingsdale Road. Ewingsdale is a two lane rural road with grassed swales and road shoulders.

A site locality diagram is provided in **Illustration 1.1**.

The area of the proposed hospital grounds is in the order of 6 ha while the actual footprint of the building envelope is approximately 2.5 ha. The property is predominately 'green field' with the Byron Bay Ambulance Building located on the eastern side of the property.

The site terrain is gently undulating with a small unnamed creek along the eastern boundary of the site. The land falls at about 5% from west to the creek on the eastern boundary. The creek flows in a northerly direction to Simpsons Creek.

Land to the north of the subject site comprises dispersed rural settlement, with low-scale cattle grazing being the predominant agricultural use.

The rural residential area of Ewingsdale is located immediately to the south of the subject site. A school is located to the south-east of this rural-residential area.

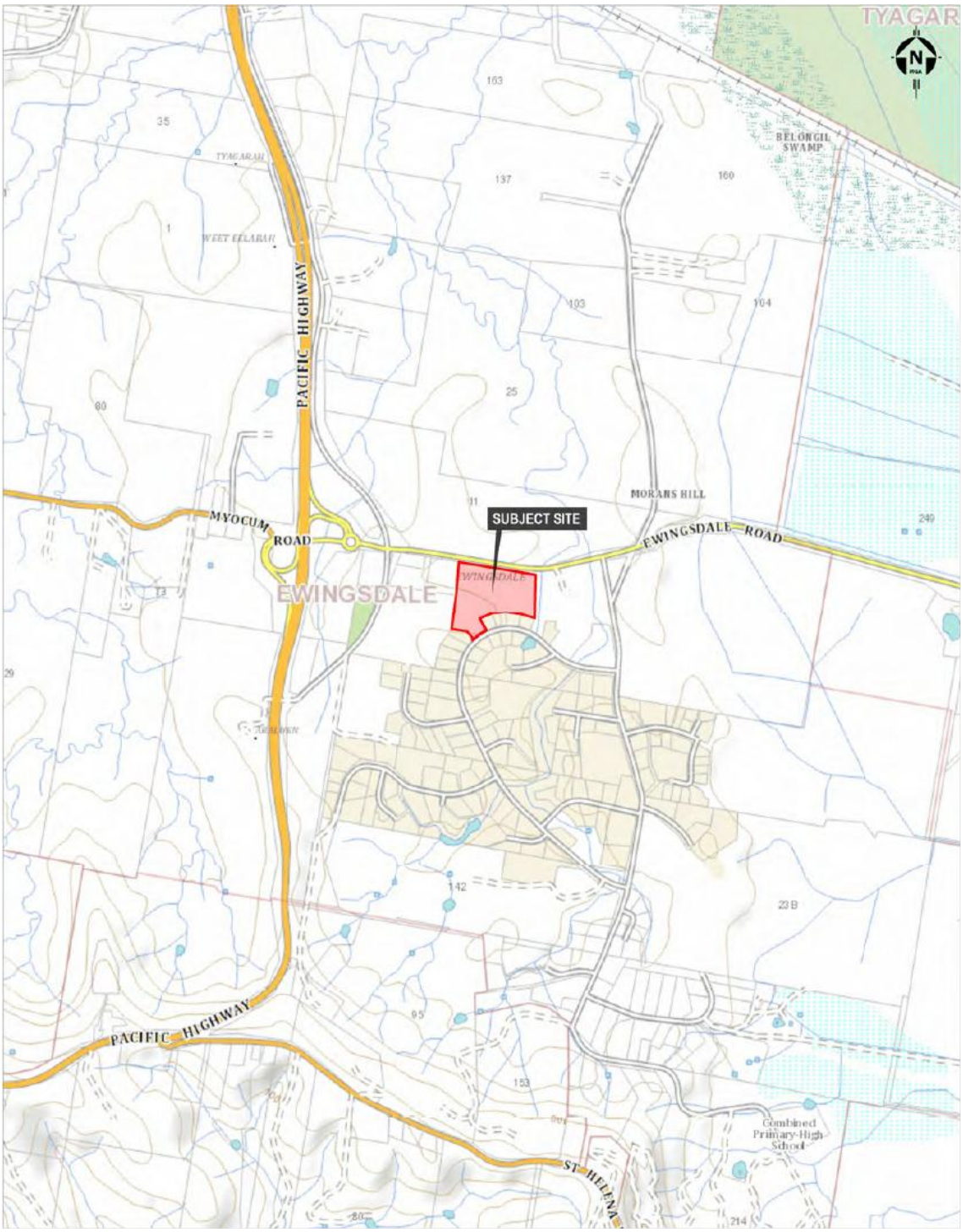


Illustration 1.1 Site Locality

1.2 Proposal

The proposal involves construction of a hospital including associated roadworks and carparking facilities, water storage facilities and other minor associated infrastructure. The proposal will integrate with the existing Byron Bay Ambulance Building located on the eastern side of the property. A plan of the proposal is shown in the proposed Stormwater Management Plan in **Appendix A**.

1.3 Existing Water Management Services

The ambulance station has a retention / detention dam, on-site wastewater treatment and irrigation system, rainwater reuse tanks and piped stormwater system.

The existing stormwater and retention / detention dam is located between the ambulance station and the eastern boundary.

There are 3x900mm diameter pipes that convey the Simpsons' Creek tributary under Ewingsdale Road. Ewingsdale Road is graded so as to sheet flow into grass swales that drain to Simpsons' Creek tributary. Other than pipes / head walls conveying the swale flow under driveways, there is no piped stormwater within the frontage of the hospital site.

1.4 Overview of Integrated Water Management Plan

The proposed water supply system involves provision of on-site storage tanks for 'drinking water' supply and fire-fighting purposes. The tanks will be connected to the supply authority water main in Ewingsdale Road. Pump assemblies will supply water to the development from the storage tanks.

An alternative water supply utilising recycled stormwater is not considered appropriate for any internal uses in the proposed hospital due to the sensitivity of the development to public health concerns.

The proposed sewage management system involves provision of a gravity sewer lines within the site that will connect to Councils sewer reticulation system by either: gravity connection to Council's future sewer system along Ewingsdale Road; or by construction of an on-site sewage pump station which will pump to Council's system.

The proposed stormwater management system involves stormwater capture and conveyance via pipe, swales, and overland flow to an on-site detention basin in the eastern portion of the site. The stormwater management system will capture runoff from roofs, roadways, carparks, hardstand areas and some adjoining pervious areas. The basin will provide sufficient detention of flows to maintain pre-development flow rates in the release to the creek. The stormwater management system will incorporate treatment measures as required to achieve stormwater quality objectives of maintaining or improving pre-development stormwater quality. The treatment measures will incorporate Water Sensitive Urban Design principles.

2. Water Supply

2.1 Overview

The proposed water supply system is detailed in the Scheme Design Report for Hydraulic and Fire Services (Donnelley Simpson Cleary, 2014). The system involves provision of a 100,000 litre storage tank and pressure pump assembly on the site. This assembly will supply the proposed development with a potable supply that satisfies minimum service pressure requirements.

It is proposed that the 100,000 litre storage tank is supplied via connection to the existing supply authority water main located in Ewingsdale Road. The storage tank has the capacity to provide 24 hours of supply in the event of a supply authority water main outage.

Illustration 2.1 Existing Water Mains

An alternative water supply utilising recycled stormwater is not considered appropriate for the proposed hospital due to the sensitivity of the development to public health concerns. Therefore rainwater reuse is not proposed.

Water conservation measures will be employed via standard water reduction fixtures.

The proposal also includes a fire hydrant water supply comprising a new 368,000 litre combined fire sprinkler/fire hydrant storage tank and dual pump assembly in accordance with current requirements. The system will incorporate a tank type booster assembly to enable Fire and Rescue NSW to draw water from the tank or the street main.

2.2 Prescriptive Measures for Water Supply

Council's Development Control Plan for Services (Byron Shire Council, 2014) provides a range of prescriptive measures for water supply to ensure provision of minimum requirements to adequately service development. The proposed water supply system for Byron Shire Central Hospital addresses the prescriptive measures as outlined below.

a) *Development shall be provided with an adequate water supply connection or have suitable arrangements in place for the provision of an adequate water supply service.*

   The proposed onsite 100,000 litre storage tank and associated pumping system fed by connection to a supply authority water main provides 24 hours of supply in the event of a supply authority water main outage. Provision of an on-site storage tank will also mitigate the proposals impact on peak demand on the supply authority system.

b) *Development requiring a water supply from off-site is to be connected to a reticulated water system where such a connection is practically available to the site. Note. alternate water sources may be provided in conjunction with reticulated services.*

   The proposed onsite 100,000 litre storage tank will be fed by connection to the supply authority water main located in Ewingsdale Road.

c) *For Reticulated Water, the following applies:*

   The water supply system must be located and designed to optimise the effective building envelope of each parcel of land designed for occupation, having regard to site constraints.

   All water mains within private property must be located within easements designed in accordance with Council's requirements.

   Pump Stations, Hydrants, Metering and other ancillary works must be located with due consideration to the amenity of the subdivision, adjacent developments, and the environment; and provide for the access and maintenance requirements of the Council.

   The above measures will be implemented as part of the design.

d) *Businesses or facilities (e.g. caravan parks, camping grounds, farm stay accommodation, educational establishments, restaurants or cafes) that supply people with drinking water from an independent water supply shall comply with the Private Water Supply Guidelines, published by NSW Health. This includes water pumped from rivers, creeks, bores, dams and rainwater tanks. It does not include supplies provided by water utilities or individual household supplies.*

The proposed on-site storage tank and pressure pump assembly is not considered an independent water supply.

e) *A business involved in the preparation or manufacture of food must use potable water for all activities associated with these activities. Non potable water may be used only where it can be demonstrated that it will not adversely affect the safety of the food handled by the business.*

A non-potable water supply is not proposed for the development. A non-potable water supply is not considered appropriate due to the sensitive nature of the development.

f) *Rural dwellings without reticulated water are to have a minimum domestic tank capacity of 40,000 litre …*

Not applicable to the development.

3. Sewage Management

3.1 Overview

The proposed sewage management system is described in the Scheme Design Report for Hydraulic and Fire Services (Donnelley Simpson Cleary, 2014). The proposed system involves provision of a gravity sewer lines within the site that drain to a low point adjacent to Ewingsdale Road. Connection to Councils sewer reticulation system will be facilitated by either:

- Gravity connection to a junction in Council's future sewerage system near the low point or
- Construction of an on-site sewage pump station adjacent to the existing ambulance building, which will pump to Council's system.

Further discussions between the NSW Health Infrastructure and Council are required to confirm the location and timing of the future Council sewerage infrastructure and the most appropriate connection strategy.

Trade waste provision will be made for the kitchen area and café of the proposed hospital in accordance with the local authority requirements to reduce the loading on Council's sewerage infrastructure. An in ground grease trap is proposed adjacent to each food preparation area/café.

3.2 Prescriptive Measures for Sewage Management

The proposed sewage management system for Byron Shire Central Hospital addresses the prescriptive measures in Council's Development Control Plan for Services as outlined below.

a) *Development shall be provided with an adequate reticulated sewer connection or have suitable arrangements in place for such a connection to be made where access to reticulated sewer is available.*

   As indicated above, connection to Councils sewer reticulation system will be facilitated by either gravity connection near the site boundary adjoining Ewingsdale Road or by provision of an on-site sewage pump station adjacent to the existing ambulance building, which will pump to Council's system.

b) *For reticulated sewer the following applies:*

   i) The system must be sized and designed in accordance with the Northern Rivers Development and Design Manual

   ii) Sewer reticulation for the proposed development must be constructed at the

proponent's cost by an approved contractor

iii) A sewer connection point must be provided to each parcel of land designed for separate occupation. The system must be designed to optimise the effective building envelope of each lot

iv) All sewer mains and rising mains must be located within easements designed in accordance with Council's requirements

v) Pump Stations, Wells, Access Chambers, Vents and other ancillary works must be located with due consideration to the amenity of the subdivision, of adjacent developments and the environment. Consideration must be given to noise, odours and the aesthetic impact of the system, and to access and maintenance requirements of the Council

The above measures will be implemented as part of the proposal design / construction. In respect to Item v) the potential on-site sewage pump station will be sited near Ewingsdale Road which will maximise the separation distance from existing residential areas.

c) *Where access to reticulated sewer is not available, arrangements must meet the requirements of Section B3.2.2 in relation to on-site sewage management.*

Not applicable – the proposal will connect to Council's reticulated sewer.

4. Stormwater Management

4.1 Overview

The proposed stormwater management system is described in the Schematic Design Report by Taylor Thomson Whitting (2014). The proposed system involves stormwater capture and conveyance via pipe, swales, and overland flow to an on-site detention (OSD) basin in the eastern portion of the site – refer to the Stormwater Management Plan in **Appendix A**.

The stormwater management system will capture runoff from roofs, roadways, carparks, hardstand areas and some adjoining pervious areas.

The OSD basin involves expansion of an existing OSD basin associated with the existing ambulance station on the site. The proposed OSD basin will maintain the discharge point at the Simpsons' Creek tributary. The basin is sized to provide sufficient detention of flows to maintain pre-development flow rates in the release to the creek.

The Schematic Design Report (Taylor Thomson Whitting, 2014) indicates that the stormwater management system will incorporate treatment measures as required to achieve stormwater quality objectives of maintaining or improving pre-development stormwater quality. The treatment measures will incorporate Water Sensitive Urban Design principles.

The Schematic Design Report indicates that the greatest potential for stormwater reuse would be in association with irrigation of landscaping and the cleaning of external surfaces as opposed to internal uses such as flushing toilets and laundry water. These latter uses are not considered favourable due to the high capital costs and maintenance costs. Also, the hydraulic services report (Donnelley Simpson Cleary, 2014) indicates that this type of rainwater reuse is not proposed due to the sensitivity of the development to public health concerns.

4.2 Prescriptive Measures for Stormwater Management

The proposed stormwater management system for Byron Shire Central Hospital addresses the prescriptive measures in Council's Development Control Plan for Services as outlined below.

1. *Development applications must contain sufficient information to assess whether the proposed stormwater system is effective and feasible, both within the site and in its connection to the public drainage system.*

   Details of the proposed system are contained in the Schematic Design Report by Taylor Thomson Whitting (2014). The schematic design and Stormwater

Management Plan show the system is feasible within the physical constraints of the site which provide sufficient opportunity for implementation of the required measures to achieve flow and quality objectives.

2. *Lands identified as containing or directly adjoining waterways may be subject to inundation (during the 1 in 100 year ARI storm event). Development applications must demonstrate that the proposal complies with the requirements of the Northern Rivers Development and Design Manual. Development proposals in close proximity to waterways or other areas of possible inundation must be accompanied by a hydrologic study submitted by an appropriately qualified person to demonstrate that the proposal or any future development will not interfere with the natural flowpath or be subject to flooding (refer to Chapter C2). Appropriate buffers to waterways must be provided as outlined in Chapter B1.*

   The proposed development is located more than 500mm above the 1 in 100 year ARI storm event flood extents. The 1 in 100 year ARI flood extents are located in the eastern portion of the site where the only proposed infrastructure relates to stormwater management measures. Section 6 of the Schematic Design Report by Taylor Thomson Whitting (2014) addresses flooding.

3. *Site drainage*

   Site drainage will be designed in accordance with the Northern Rivers Local Government Development Design and Construction Manuals, Byron Shire Council Comprehensive Guidelines for Stormwater Management and relevant Australian Standards.

   The proposed Stormwater Management Plan addresses: the capture and conveyance of all stormwater runoff from impervious areas including roofs, paved areas and driveways; areas subject to changes to natural ground level including excavation or filled areas; and areas where the natural or pre-development overland flow regime is disrupted to the potential detriment of an adjoining property.

   The proposal does not introduce, impede or divert stormwater runoff in such a manner as to increase stormwater flow across a boundary onto adjoining property.

4. *Lawful Point of Discharge*

   The proposed OSD basin will maintain the current discharge point at the Simpsons' Creek tributary.

5. *Easements*

   The proposal will satisfy the easement requirements of the DCP.

6. *On-site Stormwater Detention (OSD)*

   Section 4 of the Schematic Design Report by Taylor Thomson Whitting (2014) details the proposed design of the OSD basin which is in accordance with Byron Shire Council Onsite Detention Policy and Council's DCP. The OSD will reduce post-development flows to the pre-development flow rates for storms including the 5 year ARI up to the 100 year ARI.

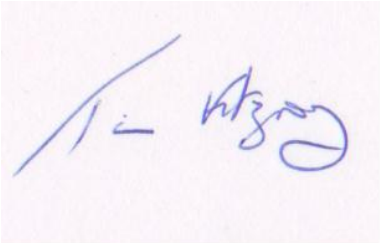
7. *Stormwater Quality and Treatment*

   The Schematic Design Report (Taylor Thomson Whitting, 2014) indicates that the stormwater management system will incorporate treatment measures as required to achieve stormwater quality objectives of maintaining or improving pre-development stormwater quality. The treatment measures will incorporate Water Sensitive Urban Design principles.

5. Conclusions

The Scheme Design Report for Hydraulic and Fire Services (Donnelley Simpson Cleary, 2014) and the Schematic Design Report - Civil Engineering (Taylor Thomson Whitting, 2014) detail the water supply, sewage management and stormwater management components of the Integrated Water Management Plan for the proposed Byron Shire Central Hospital. The reports satisfy the prescriptive measures for water, sewer and stormwater detailed in Council's Development Control Plan for Services (Byron Shire Council, 2014).

This report has been prepared by Tim Fitzroy of *Tim Fitzroy & Associates.*



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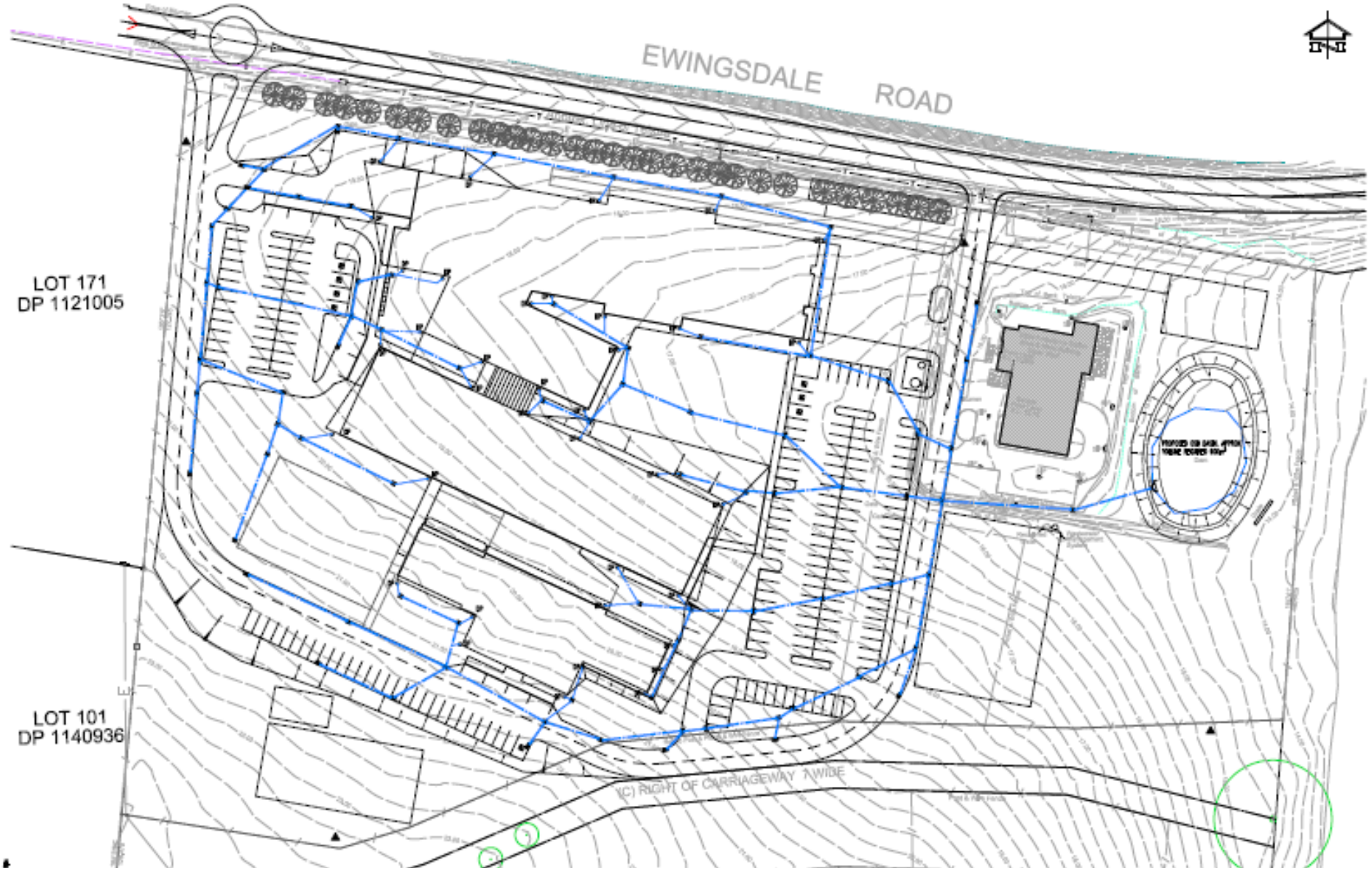
A Stormwater Management Plan



Source: Taylor Thomson Whitting, 2014.