**DRAINAGE CONCEPT REPORT**

# Proposed 51 Lot Subdivision

Lot 350 DP 1301003

# Tait St Crookwell

**Date: 29 Sept 2022**

**CDS Reference: 2124**

**Prepared on Behalf of: Darjeeling Pastoral Pty Limited**

| Revision No. | Date | Description | Prepared By: | Reviewed by: |
|---|---|---|---|---|
| 1 | 29/9/22 | Initial issue | R D Anderson | R D Anderson |
| 2 | 20/12/23 | Revisions for layout changes | R D Anderson | R D Anderson |
| 3 | 22/4/24 | Revision for layout changes and revised OSD arrangements | R D Anderson | R D Anderson |
| 4 | 25/10/24 | Revision for revised outlet arrangement at existing culvert in McDonald St | R D Anderson | R D Anderson |

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# Contents

# 1. Site and Development Summary

## *1.1 Site Description*

The site is known as lot 350 DP 1301003 and is 6.946Ha approximately in size.

The site is adjoined to the north by stage 3 & 4 of an approved subdivision. To the west is a large lot with a single residence and to the south is MacDonald St and to the East is Tait St

The site generally slopes from the West to the East and there are no watercourses or overland flow paths on the site.

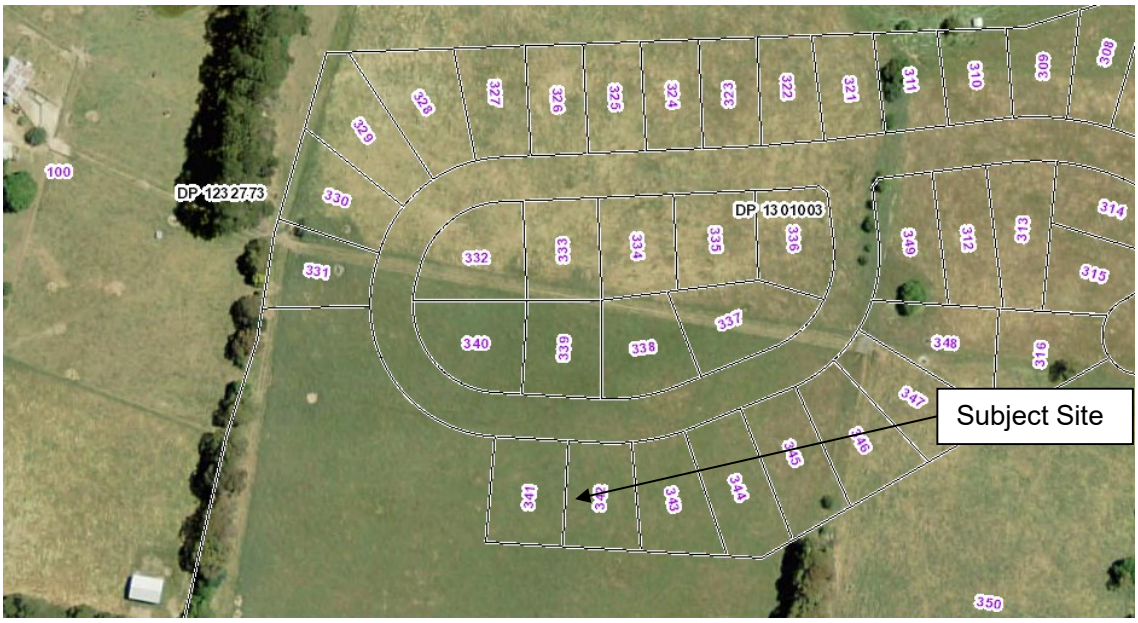


***Figure 1 Site Location (Six Maps)***

## *1.2 Proposed Development*

The development will contain:

- 50 residential lots.
- Community Reserve
- Drainage Reserve
- New Public Roads X 2

Refer plan of subdivision in figure 2.

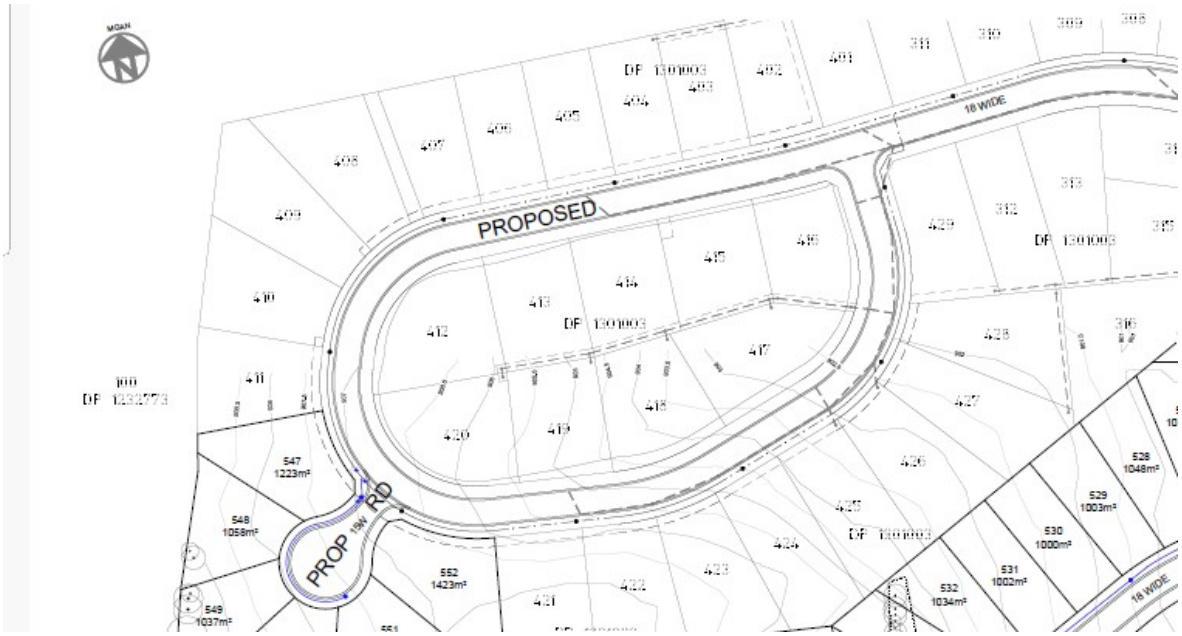


***Figure 2 – Site Layout***

## *1.3 Drainage Arrangements*

The proposed drainage arrangement is depicted on CDS drawing 2124-CE05 Iss A. Included in the proposal is the following:

- Kerb and gutter and piped drainage on the Northern side of MacDonald Street on the frontage of the development
- Utilise one existing culvert crossing on Macdonald Street on the eastern side of the proposed intersection with new proposed road
- Kerb and gutter and piped drainage for the Proposed Road No 1 and for MacDonald St (East of new road intersection) to discharge into a proposed basin on the corner of Tait and MacDonald St
- Kerb and gutter and piped drainage for the Proposed Road No 2 to discharge into an existing pit in Nicholson Cct
- Interallotment drainage to discharge into the proposed basin on the corner of Tait and MacDonald St
- Controlled outlet from the basin into an existing pit which then discharges into a 750mm pipe which outlets on the southern side of Tait St
- Controlled outlet from the pit to the existing 375 pipe that crosses McDonald St just east of the proposed road intersection *
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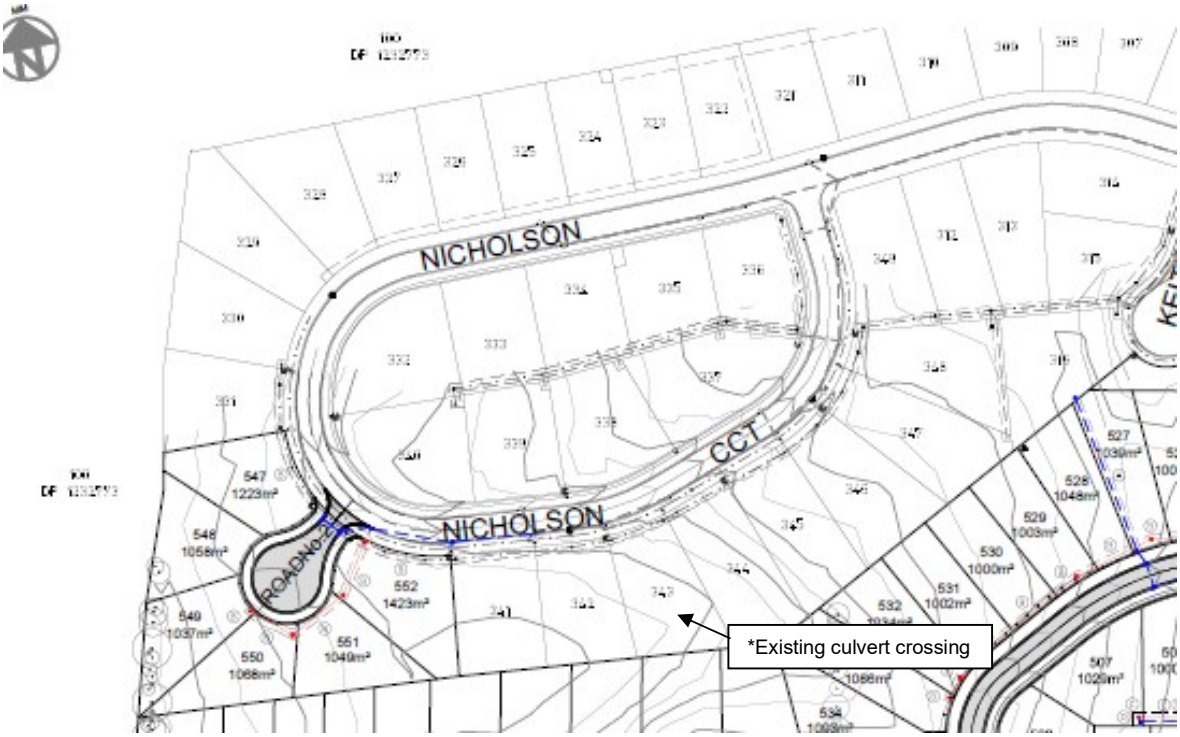


***Figure 3 Drainage Layout – discharge arrangement – pipes in blue***

## 2. Proposed On Site Detention Arrangement

It is proposed to restrict the flow from the basin into the piped system in Tait Street such that post developed flows do not exceed pre developed flows for the 1% AEP peak events for the site in order to comply with councils' policies for on-site detention. We have considered the follows from both the culvert outlet and the basin outlet combined to determine the total peak flow from the site

Since the previous version of this report was submitted council have now provided criteria for the on-site detention basin as follows:

- *Council requires consideration of WSUD with a design that is easily managed and maintained, which is safe and meets best practice design rather than a farm dam type design or deep depression*
- *Maximum depth of the above ground storage must not be over 300mm at full capacity;*
- *The maximum water level of the OSD systems storage at capacity must be at least 300mm below all habitable floor levels within the subdivision and 150mm below pedestrian entries and exit facilities*
- *The system is to be designed to maximise ease of maintenance and ensure safety;*
- *The OSD system must be able to store the run-off caused by a storm event up to the 100-year Average Recurrence Interval (ARI) and discharge the run-off at a controlled rate which downstream stormwater assets can handle*

A drainage design for the site and a corresponding DRAINS model has been completed to determine suitable size and depth of the detention storage in order to achieve these outcomes. – Refer figure 5

Based on the proposed levels for the outlet and the potential incoming flows pipe we have proposed a basin storage area as follows:

- Top Area - 775m2
- Floor Area – 490m2
- Batter slope - 1:5
- Overall depth – 500mm
- Max Depth of ponding - 280mm
- Control Orifice outlet diameter in discharge pit - 350mm

Sections of the basin design are included in the drawings and we believe this design achieves the criteria listed by council

1. The basin will be easily maintained being proposed as a grassed area with maximum 1:5 batters
2. The depth of the above ground storage does not exceed 300mm in the 1% AEP event – maximum predicted water level is 280mm
3. Maintenance can be easily carried out - the area can simply be mown. The discharge pit will be easily accessed within the basin
4. An emergency overflow weir in case of blockage is located adjacent to the low point and existing pits on Tait St

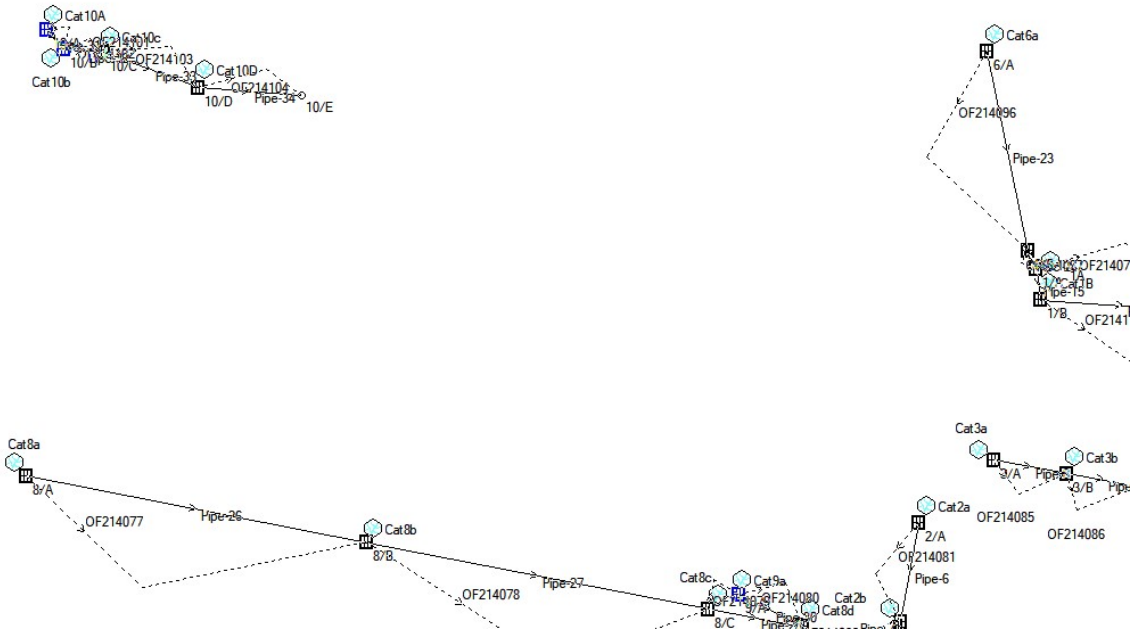


Figure 5 – DRAINS model

OVERALL
Predeveloped flow 1% AEP - 0.69 m3/sec

*Post Developed Flow 1% AEP with detention*
*Basin – 0.281m3/sec*
*Overland flow – 0.047m3/sec*
*Western Culvert on MacDonald St – 0.192m3/sec*
*Total - 0.52m3/sec*

EXISTING CULVERT UNDER MCDONALD ST
Predeveloped flow 1% AEP - 0.247 m3/sec

*Post Developed Flow 1% AEP with detention*
*Pipe – 0.192m3/sec*
*Overland Flow is zero as it will run down the northern side of Mc Donlad St and not across the road*

Storm events from the 5 minute up to the 48 storm event were analysed. The peak event with regards to depth of water in the basin and peak flow from the basin was found to be the 6hr Storm.

The water level graph for the basin is shown in figure 5 and the peak flow hydrograph for the outgoing pipe is shown in figure 6.

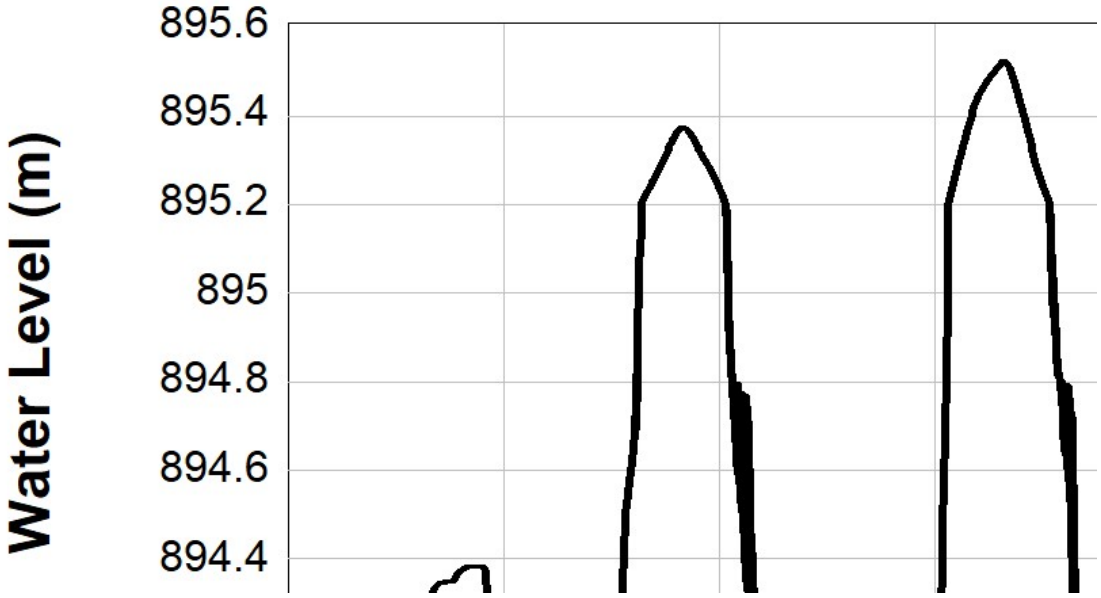


Figure 5 – Basin Water Level for 6hr stotm event

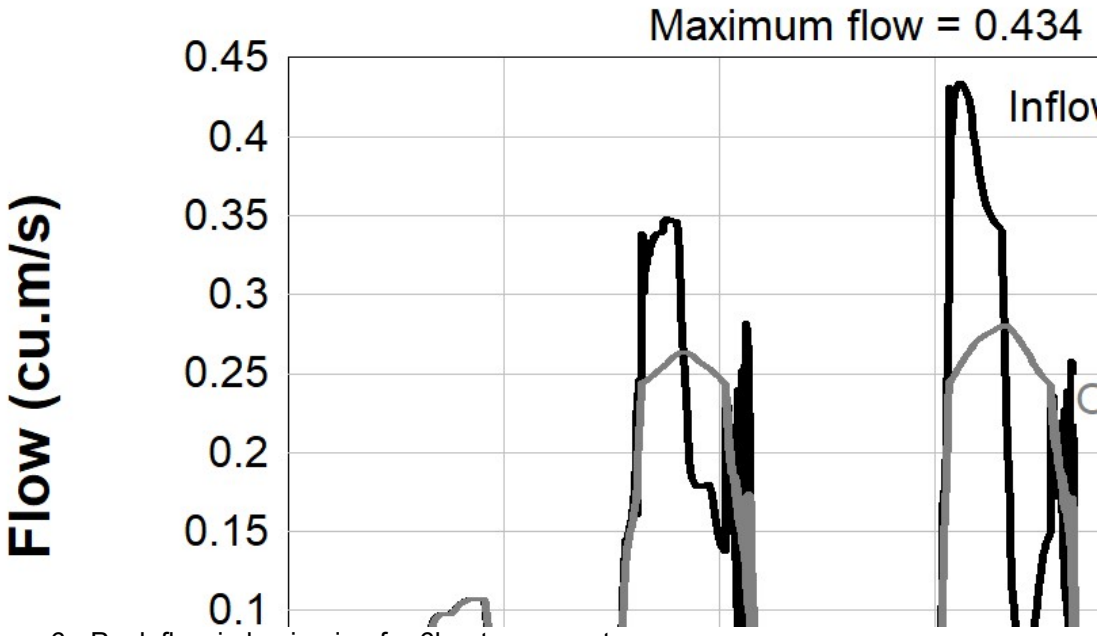


Figure 6 - Peak flow in basin pipe for 6hr storm event

The peak in flow to the basin is 0.424 m3/sec and the peak outflow from the basin outlet is 0.281m3/sec. We note that this flow can be accommodated in the 750mm diameter pipe which outlets from the receiving pit in Tait St and provides an overall peak flow which is less than the modelled pre-developed flow

The peak catchment flow modelled on the receiving pit in Tait St in the predeveloped model, which formed part of the stg 3 & 4 design, was 0.324m3/sec which is greater than the peak flow from the basin of 0.276m3/sec

## 3. Soil and Water Management, Pollutant Control

Prior to works commencing detailed drawings should be prepared in conjunction with the engineering design drawings to comply with “Landcom (2004), Managing Urban Stormwater, Soils and Construction Volume 1, 4th Edition”.

The following general measures are to be implemented to prevent erosion and transport of sediment from the site as a result of construction works:

- Upslope earth bank runoff diversion bunds for diversion of clean stormwater around disturbed / construction areas.
- Sediment fences downslope of disturbed areas
- Temporary soil stockpiling in nominated stockpiling areas with sediment fences located downhill of all stockpiles.
- Temporary stabilised access constructed at the entrance to the site
- Progressive stabilisation following completion of each work area.

A conceptual erosion and sediment control plan has been prepared to accompany the application – refer to CDS Drawing 2124-CE05 Iss C

Road design batters and lot cut and fill plan has been included in the concept engineering drawings 2124 – CE05 Iss C

Gross Pollutant traps are recommended at the outlet of the drainage system prior to discharge into the Tait St system and at the western culvert crossing of MacDonald St to treat stormwater from the development in accordance with councils requirements

## 4. Conclusion

The drainage concept plans prepared to accompany the application show how the conveyance of stormwater water from the site can be achieved and how on-site detention can be conceptually achieved within the development to meet council requirements for storage and flow restriction