

# Memorandum

**Date:** Wednesday, 28 September 2022

**To:** Wollondilly Shire Council

**From:** Troy Eyles

**Pages:** 8

**Copy:** Mirvac Homes (NSW)

**Ref:** 17-003293.01

**Subject:** Station St Menangle Pedestrian Bridge Crossing – Stormwater Memo

## Overview

This memo addresses Council's requirements to include the catchment for the proposed pedestrian bridge crossing at Station Street, Menangle. The pedestrian bridge crossing plan details are shown in plan set 17-003293.002.PED Rev04. The general arrangement and locality of the bridge crossing is shown in Figure 1 and Figure 2.

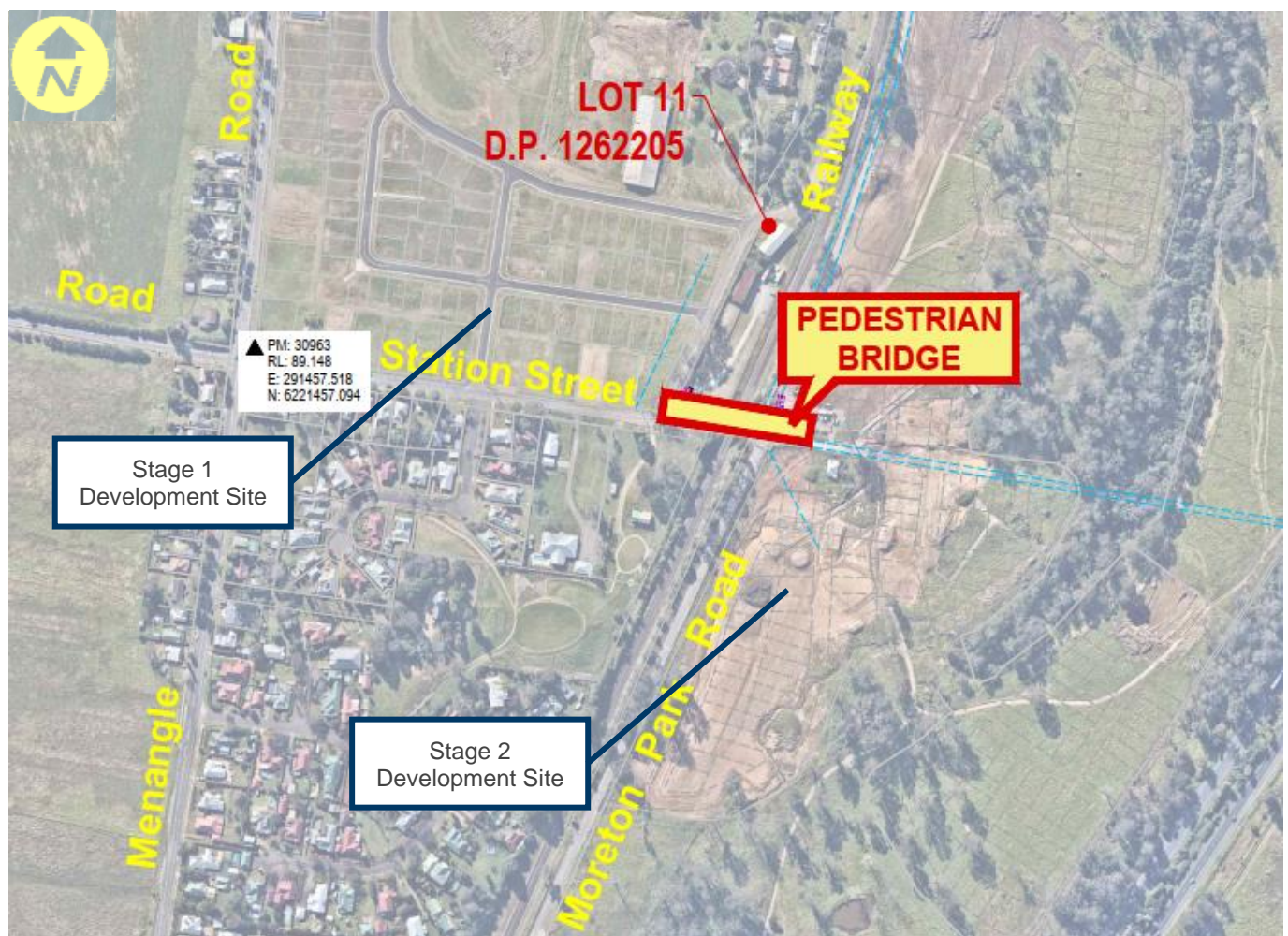


Figure 1 – Site locality

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## Station Street Menangle Pedestrian Bridge Crossing – Stormwater Memo

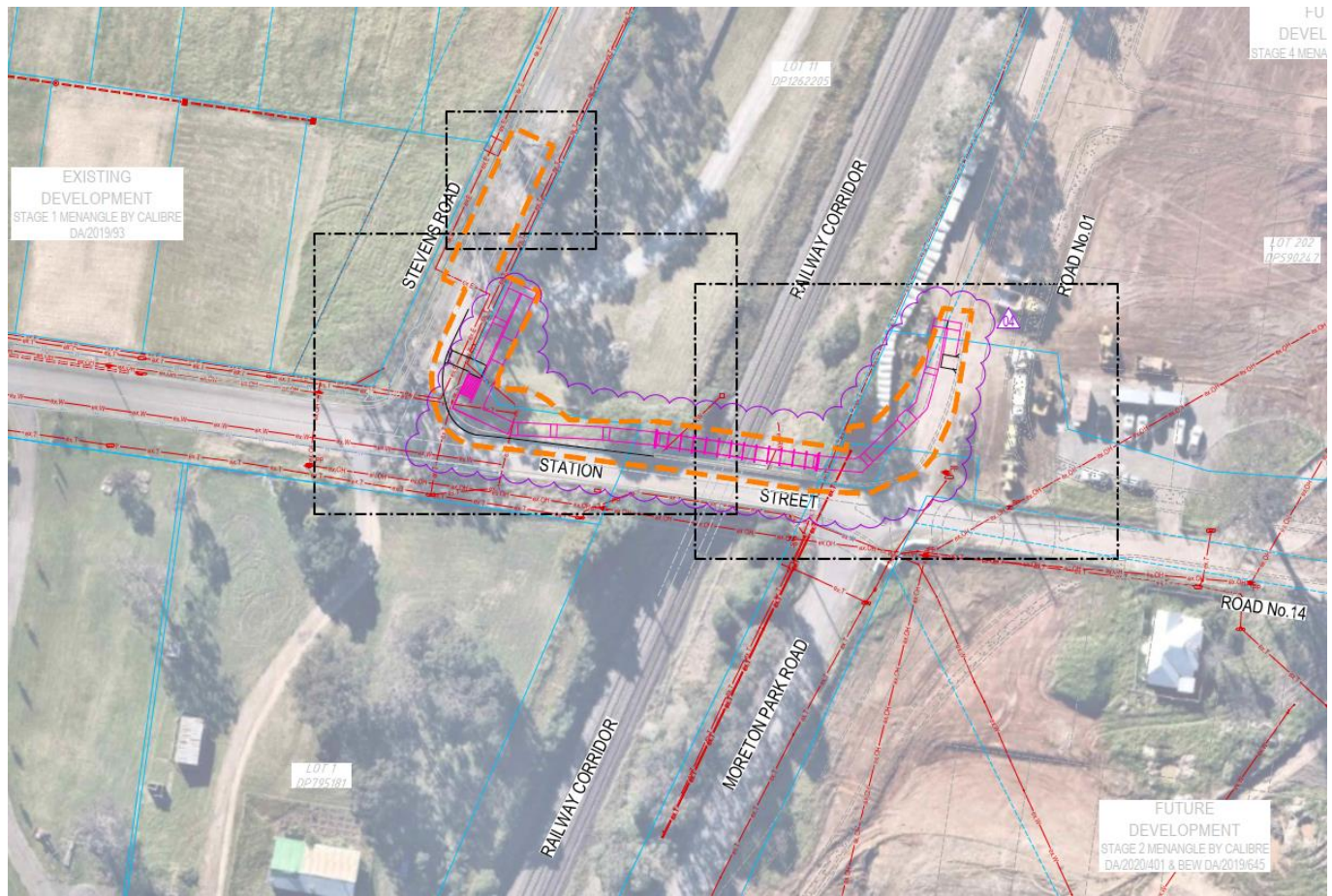


Figure 2 – Pedestrian Bridge Crossing General Arrangement

This memo is to be read in conjunction with approved Stormwater Concept Plan 17-003293 revision 03 dated 10/11/2019 by Calibre Consulting as approved under DA/2019/93/1, and the stormwater memo submitted with the approved Stage 1 Subdivision Works Certificate, dated 26/10/20. Details regarding the previous modelling done for Stage 2 can be found in the Stormwater Management Report submitted under DA/2020/401, dated 22/01/2022.

The MUSIC and DRAINS models for Stage 1 and Stage 2 have been updated to include the pedestrian bridge catchment, as presented in Figure 3 below.



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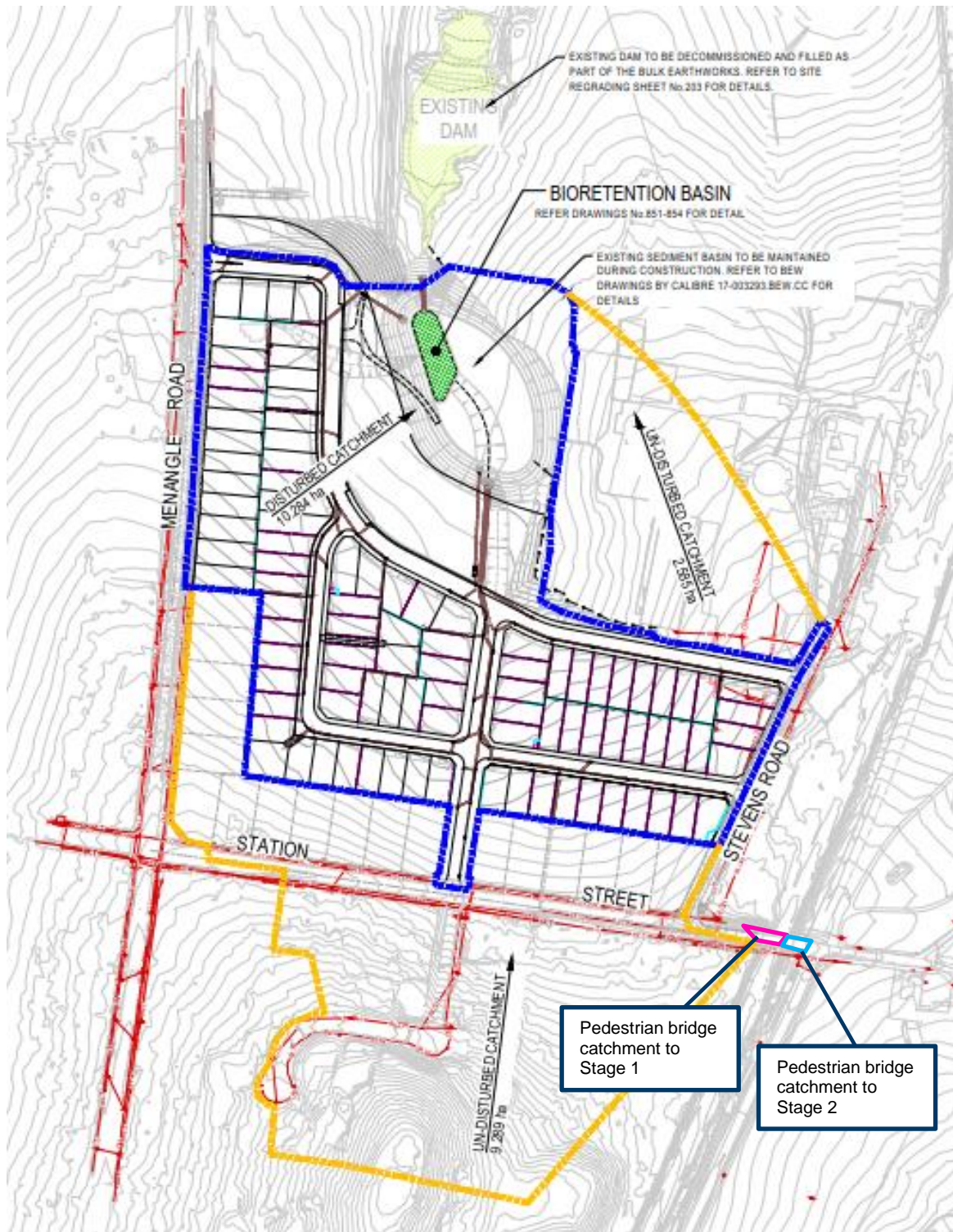


Figure 3 – Catchment Plan

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## Stage 1

The MUSIC model layout with the GPT's and pedestrian bridge catchment for Stage 1 is shown in Figure 4.

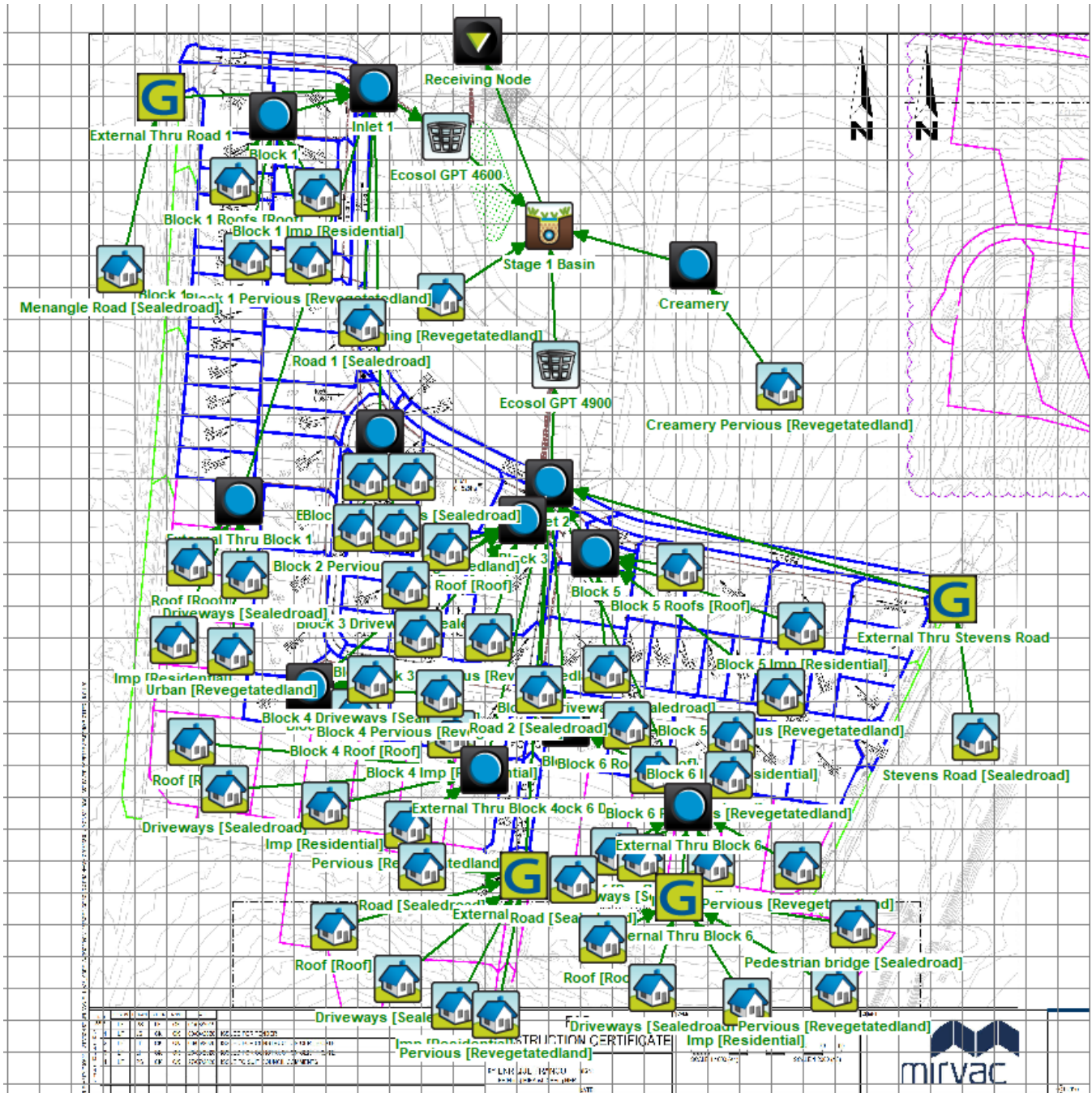


Figure 4 – Stage 1 MUSIC model layout

The results of this configuration are shown in Table 1. The targets are derived from the table shown on page D5-29 of WSC's 'Design Specification' (2016).



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Table 1 – Stage 1 MUSIC model performance (1,000m<sup>2</sup> filter area and two GPTs)

| Pollutant              | Source (kg/yr.) | Residual Load (kg/yr.) | Reduction (%) | Target (%) |
|------------------------|-----------------|------------------------|---------------|------------|
| Total Suspended Solids | 13500           | 1360                   | 89.9          | 80%        |
| Total Phosphorus       | 27.5            | 9                      | 67.3          | 45%        |
| Total Nitrogen         | 199             | 98.5                   | 50.4          | 45%        |
| Gross Pollutants       | 2290            | 0                      | 100           | 70%        |

Table 1 indicates that the treatment method previously approved under the Stage 1 Subdivision Works Certificate (SWC) will exceed performance targets even with the inclusion of the pedestrian bridge catchment.

The DRAINS model for Stage 1 has been updated to include the pedestrian bridge catchment. The current DRAINS model layout is shown in Figure 5.

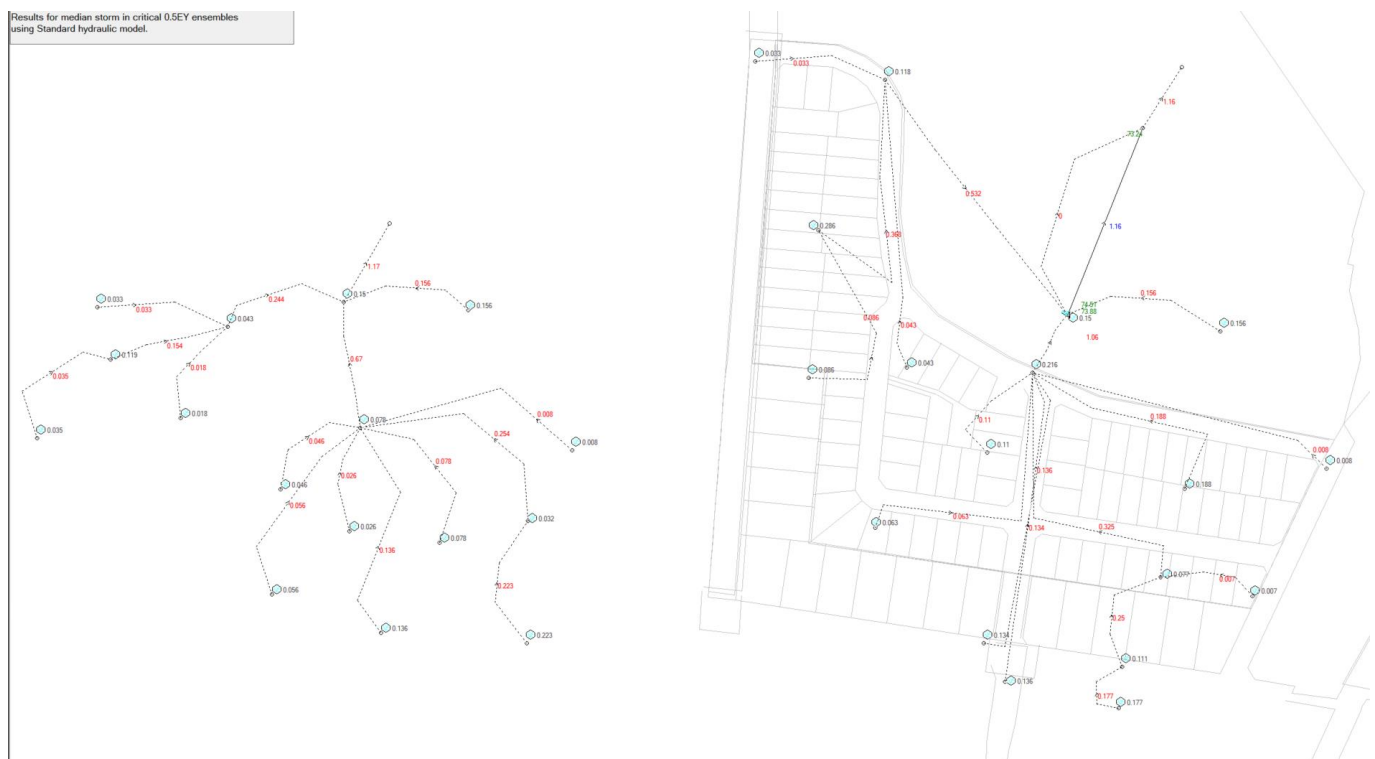


Figure 5 – Stage 1 DRAINS model layout

The impact from the addition of the bridge catchment to the hydrological modelling is shown in Table 2 below.

Table 2 – Stage 1 DRAINS model performance

| ARI | Permissible site discharge | Attenuated basin discharge | Basin Stage | Basin Storage |
|-----|----------------------------|----------------------------|-------------|---------------|
| 2   | 1.13                       | 1.13                       | 74.51       | 656.54        |
| 100 | 5.67                       | 3.04                       | 74.93       | 3375.91       |

Table 2 indicates that the current basin configuration as reflected in the Stage 1 SWC Engineering Plans is sufficient to attenuate the 2yr ARI storm as intended.

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### Stage 2

The MUSIC model layout with the pedestrian bridge catchment for Stage 2 is shown in Figure 6.

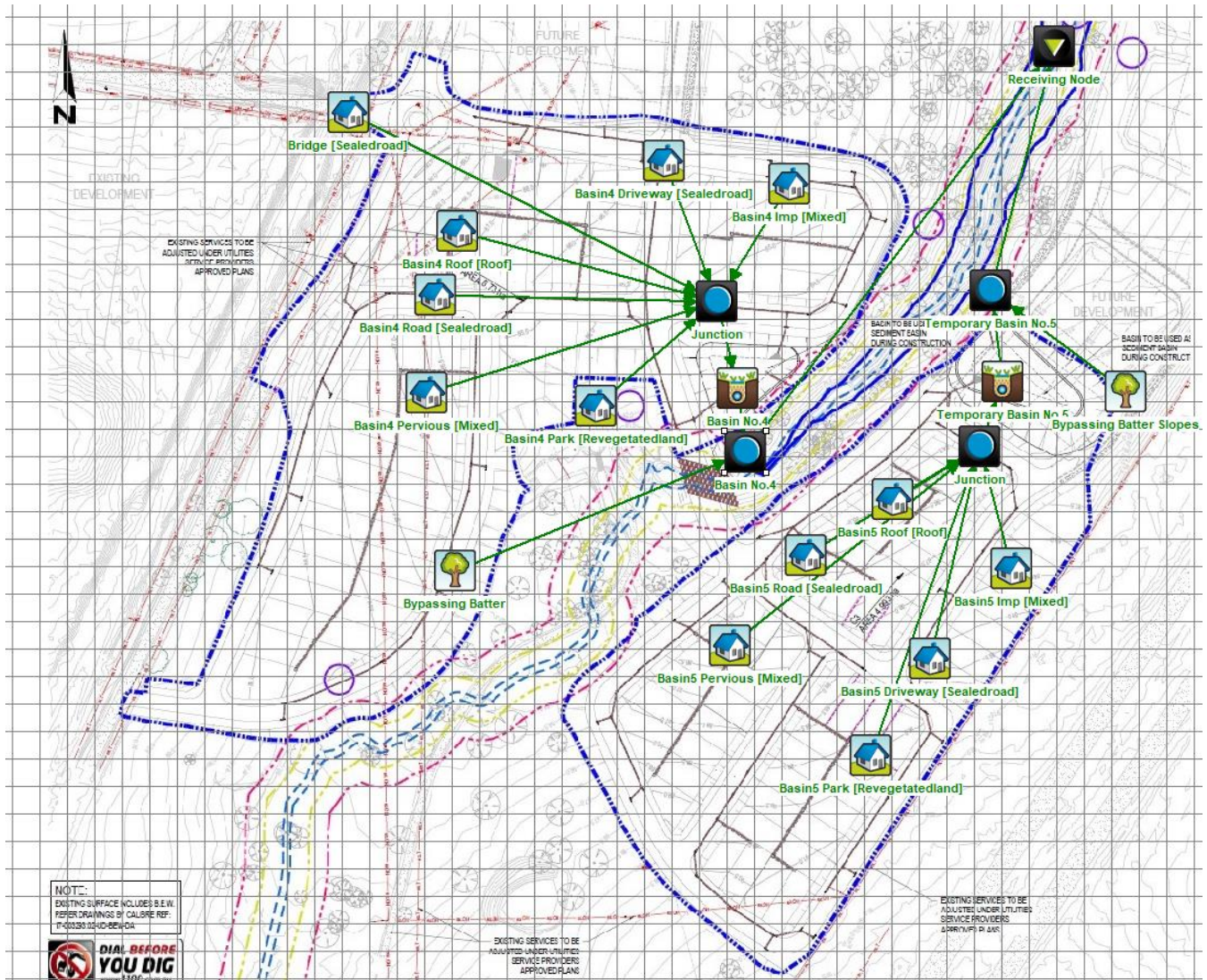


Figure 6 – Stage 2 MUSIC model layout

The results of this configuration for Basin 4 are shown in Table 3. The targets are derived from the table shown on page D5-29 of WSC's 'Design Specification' (2016).

Table 3 – Stage 2 MUSIC model performance

| Pollutant              | Source (kg/yr.) | Residual Load (kg/yr.) | Reduction (%) | Target (%) |
|------------------------|-----------------|------------------------|---------------|------------|
| Total Suspended Solids | 7,920           | 1,520                  | 80.8          | 80%        |
| Total Phosphorus       | 14.7            | 4.94                   | 66.5          | 45%        |
| Total Nitrogen         | 87.6            | 47.1                   | 46.2          | 45%        |
| Gross Pollutants       | 951             | 0                      | 100           | 70%        |



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## Station Street Menangle Pedestrian Bridge Crossing – Stormwater Memo

Table 3 indicates that the treatment method previously lodged under the Stage 2 DA will exceed performance targets even with the inclusion of the pedestrian bridge catchment.

The RAFTS model for Stage 2 has been updated to include the pedestrian bridge catchment. The layout of the updated RAFTS model is reflected in Figure 7. The proposed eastern approach ramp of the pedestrian bridge will discharge to Basin 4.

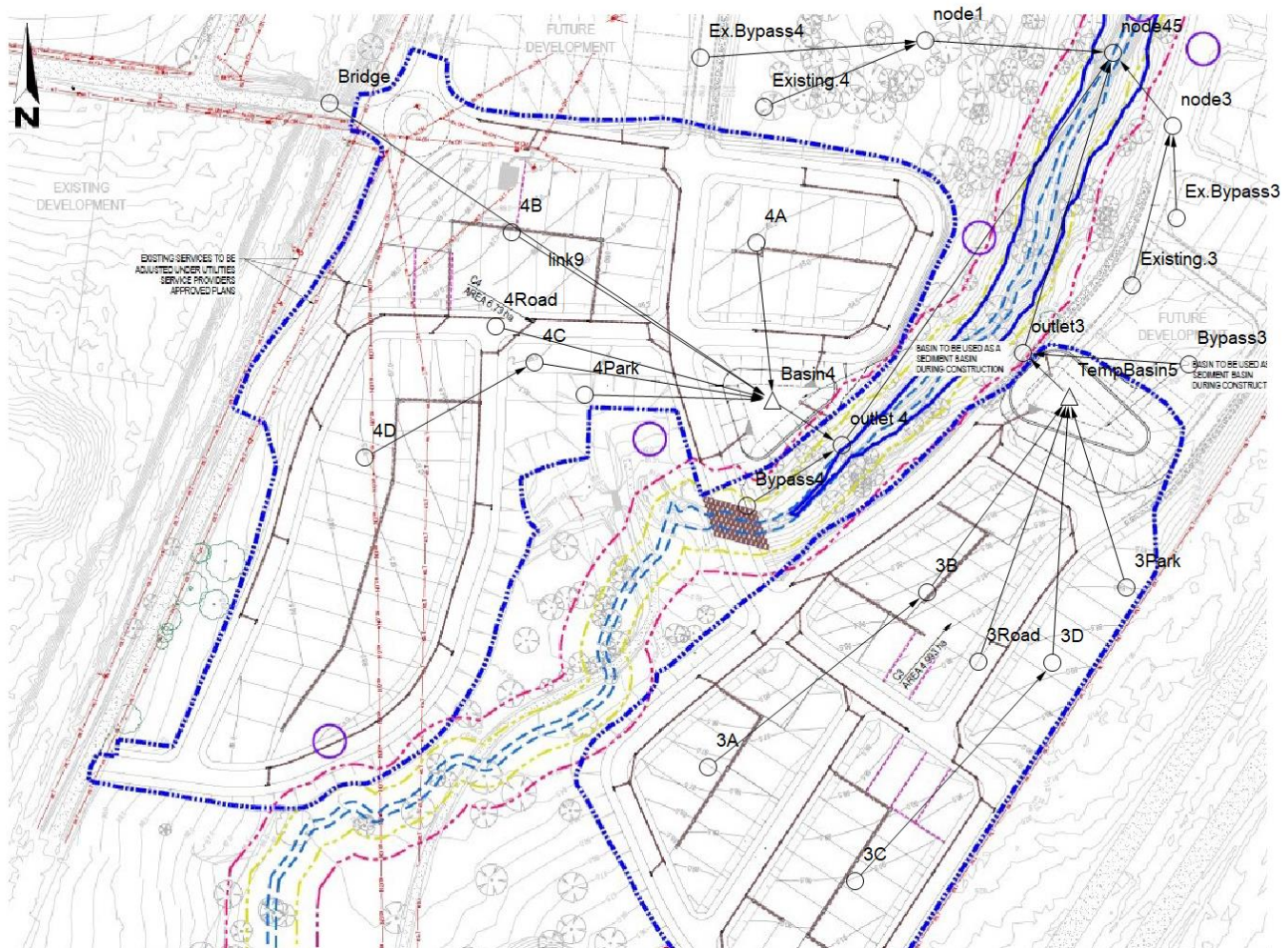


Figure 7 – Stage 2 RAFTS model layout

The results from the additional bridge catchment are shown in Table 4.

Table 4 – Stage 2 RAFTS model performance

| ARI | Permissible site discharge | Post-Development Site Discharge | Attenuated Basin Discharge | Total Outflow | Stage  | Storage |
|-----|----------------------------|---------------------------------|----------------------------|---------------|--------|---------|
| 2   | 0.527                      | 0.949                           | 0.373                      | 0.507         | 82.207 | 379     |

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Table 4 indicates that Basin 4 will be able to cater for the additional catchment area yielded by the pedestrian bridge crossing.

### Conclusion

Calibre has updated the modelling provided to Council for Stage 1 and 2 to include the pedestrian bridge catchment for the proposed development at Station Street, Menangle. The pedestrian bridge catchment has been included in the MUSIC models and the treatment objectives have been exceeded in accordance with the Design Specification. The DRAINS and RAFTS model has been updated with the latest catchment information, and still complies with the strategy as laid out in the approved stormwater reports and memos.