Level 1, 215 Pacific Highway
Charlestown NSW 2290
PO Box 180 Charlestown NSW 2290
02 4943 1777
newcastle@northrop.com.au
ABN 81 094 433 100

13 May 2021

NL200554

Huntlee Pty Ltd
Glenn Swan
PO Box 199
Branxton NSW 2335

Dear Glenn,

Re: Huntlee Residential Subdivision – Stage 1 Modification 14 (MP 10_0137 MOD14) - Detention Modelling

Northrop Consulting Engineers have prepared the following letter in response to the comment 7 made by Planning Industry and Environment's Biodiversity and Conservation Division (BCD) dated 13 January 2021 in review of the Huntlee Residential Subdivision Stage 1 Modification 14 Application (MP 10_0137 MOD 14).

BCD's Recommendation – Flooding and Flood Risk – dated 13 January 2021

7. The proponent should revise flood modelling using the broader Black Creek flood model to determine if on-site detention can be removed from the proposal without causing additional flood impacts.

Northrop have sourced and received the appropriate model files from Council to undertake this assessment.

As requested, we have run the catchment wide Black Creek flood study incorporating an allowance for the large lot subdivision to assess the impacts of the proposed development.

This has been undertaken as follows:

- An assessment of the impervious area has been undertaken. The total development area ~44.3 ha at 45% impervious results in a total impervious area of ~20ha. 86% of these falls within BC_DS_08 and 14% within BC_DC_C. The location of the development with respect to the catchments is presented below in Figure 1.
- The WBNM file for the 1%AEP, 36 hours has been amended to account for an increase in impervious fraction. BC_DS_08 impervious fraction increased from 0.00% to 3.46% and BC_DS_C impervious fraction increased from 0.00% to 0.58%.
- The WBNM was rerun to generate hydrograph inputs for the TUFLOW model.
- The TUFLOW model was rerun for the 1%AEP 36 hour.
- A comparison of the elevation rasters was undertaken.

		Date
Prepared by	GB	13/05/2021
Checked by	BB	13/05/2021
Admin	HB	13/05/2021

The results of the modelling are as follows:

- The peak hydrographs show a small decrease in peak flow downstream of the development (1105.3m³/s in the existing and 1105.13m³/s in the developed). This is as demonstrated in previous correspondence due to the impervious area responding earlier and disappearing before the regional peak.
- The elevation raster generated by TUFLOW shows negligible change +/- 3mm.
- The peak flow generated for TUFLOW reflects the WBNM result, showing a small reduction in flow at the peak of the hydrograph. This is presented below in Figure 2.

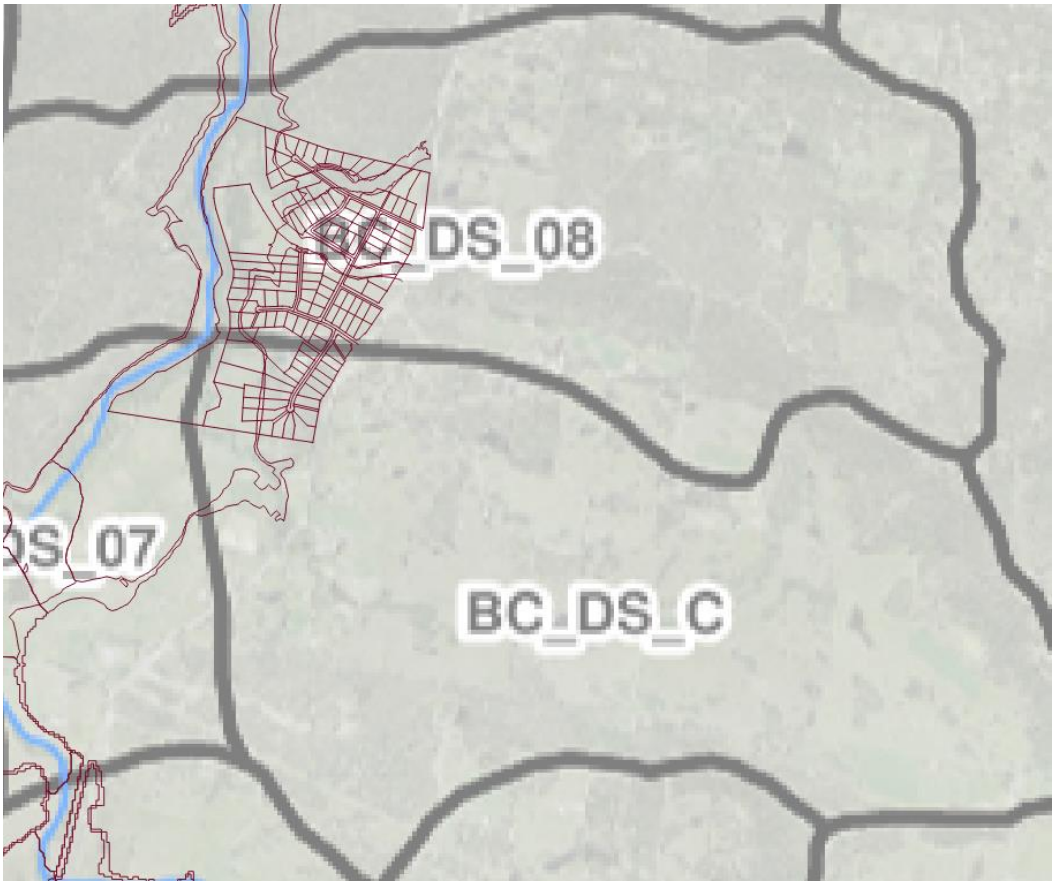

Figure 1 – Overlay of development footprint within the wider Black Creek Catchment.

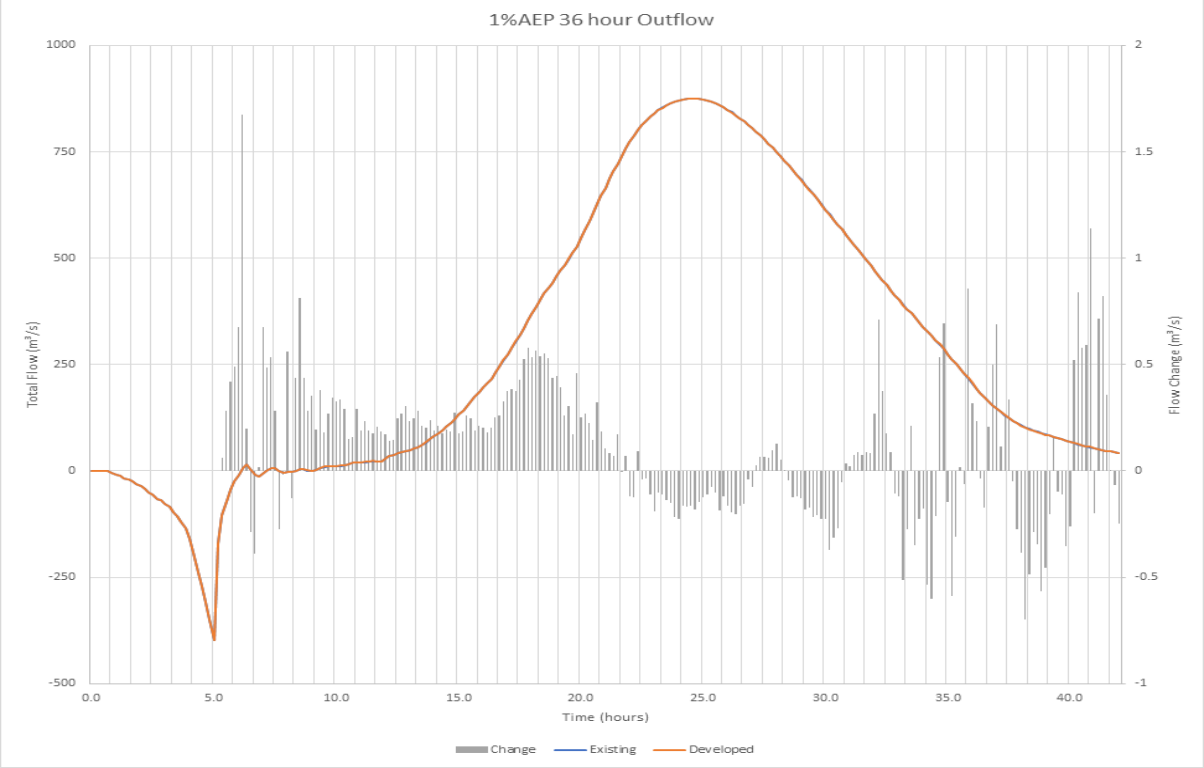

Figure 2 – Hydrograph of peak from 1% AEP 36-hour event

On this basis, we believe the omission of OSD for this development is appropriate.

We trust the above meets with your requirements at this stage, should you have any questions or require further information, please do not hesitate to contact the undersigned on (02) 4943 1777.

Yours sincerely,

Prepared by:

Angus Brien
Principal | Flooding Group Manager
BEng (Civil) MIEAust CPEng NER RPEQ

Reviewed by:

Brittany Balcombe
Civil/ Environmental Engineer
BEng (Environmental)