Clarification note 25 November 2013

Re: Wellesley

Thank you for your queries and comments regarding our submission 22 November regarding the above and our subsequent telephone conversation. As discussed we offer the following responses:

Zone C 100 year and 100 year+30%CC runoff rates- we have found a rogue cell in the spreadsheet giving erroneous results for both the 100 year and 100 year+30%CC WITH MITIGATION. The values previously submitted for Zone C indicate that the discharge rate for existing permeable surfaces is the same for the WITHOUT MITIGATION scenario and the WITH MITIGATION scenario. Unfortunately the WITH MITIGATION data is a copy of the WITHOUT MITIGATION DATA, it should be a copy of the WITH MITIGATION data for the 30 year event (Table 3.S.4) That is the correct WITH MITIGATION data for Zone C should read

100 year event:

Zone Ref	Existing @ 100yr; 15 min	Proposed @ 100yr; 15 min NO MITIGATION	Proposed @ 100yr; 15 min WITH MITIGATION	
C	0.70	0.70	0.700	Permeable surfaces (C_V 0.3)
	1.81	1.81	1.206	Existing impermeable surfaces (CV 0.9), Q 30
		0.00	0.000	New Impermeable Surfaces (C_V 0.9) 2l/s/ha
	2.51	2.51	1.906	Total (m^3/s)

100 year+30%CC event

C	0.96	0.96	0.957	Permeable surfaces (C_V 0.3)
	2.48	2.48	1.206	Existing impermeable surfaces (CV 0.9), Q 30
		0.00	0.000	New Impermeable Surfaces (C_V 0.9) 2l/s/ha
	3.43	3.43	2.163	Total (m^3/s)

It can be seen from the above that the increased rate of runoff for the 100 year+30%CC event (vs the 100 year event) arises from the increased permeable surface runoff.

Change in results for Phase 1 flooding – We have amended the microdrainage model to address the flooding issues previously indicated. This amendment comprises two elements:

1) The hydro-brake upstream from PN 4.001 has been amended to 108mm diameter from 103mm diameter with the design flow increased to 7.7 l/s from 7.0 l/s.
2) The storage upstream from PN 4.001 has been amended from 5.9m x 61 m x 1.45m depth porous media (PF = 0.3) to 5.9m x 61 m x 1.0m depth porous media (PF = 0.3)with cellular storage (PF 0.95) under. This cellular storage comprises 2 x 3.0m x 61m x 0.45 cells flanking the permeable pavement. We have used an expedient method to model this by using a weighted porosity factor (PF) i.e. [(1.0m x 0.3PF + (0.45m x 0.95PF)]/1.45m = 0.5.

3) We would note that the analysis still indicates 36 cubic metres flood volume at PN 4.001. Given the extremity of the event and also as a porous pavement there is no necessity for cross-fall or longitudinal gradient on the surface. This flood volume would comprise $36m^3/(5.9m \times 61m) = 0.1m$ depth flood whereas the back of kerb will have an upstand greater than 0.125m; consequently we consider that the flood can be retained locally for the relatively short period required.

Thank you for your considerations regarding the 2l/s/ha lower boundary for flow control.

Extra discharge volumes arising from Climate Change – we have considered the FEH CD-ROM V.3 rainfall depths for various durations (Appendix D). The sixth column indicates the difference in rainfall depth between the Q30 event and the Q100 event. The eighth column indicates the difference in rainfall depth between the Q100 event and the Q100+30%CC event (254 yr RP). A comparison of these two columns indicates a marginal difference between the two data sets. The worst case scenario occurs for the 15 minute duration where the additional runoff equates to $10000m^2 \times 0.00143m$ depth = $14.3m^3$/ha. We consider that there is ample scope to provide storage for this additional runoff and also note that as the storm durations increase this additional volume decreases to 0 for the 525min (8.75 hr) duration.