

MEMORANDUM

To: Auckland Council: Michael Luong
From: Barker & Associates
Date: 30 April 2020
Re: Drury East Plan Change: Second RFI Response

Drury East Plan Change Request – Fulton Hogan Land Development (FHLD)

We write in response to your request dated 28 April 2020 for further information under Clause 23(1) to Schedule 1 of the Resource Management Act 1991 relating to the above private plan change request. This letter sets out our responses to the matters raised in your letter, and is supported by the following attachment prepared by the technical specialists supporting the plan change request:

- Attachment 1: Drury East Plan Change dated 30 April 2020
- Attachment 2: Response to Transport Request for Further Information (Stantec)
- Attachment 3: Stream Erosion Risk Assessment Tool Information (Tonkin & Taylor)

The requests and our responses are set out below.

1.0 STORMWATER

1.1 STREAM BANK EROSION

Request 1: *The RFI assessment provided concludes that it is difficult to determine if there will be significant impact from development on stream erosion. It is unclear from the information provided if the calculations for shear stress included events smaller than 2yr ARI; included an evaluation on what would happen if SMAF 1 applied; and accounted for the fact that future development is also likely to occur upstream in the future (based on current zoning and permitted activity rules) so cumulative shear stress may be greater than presented in RFI information. Please provide detail on the shear stress calculations.*

Tonkin & Taylor has provided the following response to this request:

Events smaller than the 2 year ARI (T+T)

The Modified Stream Erosion Assessment included in the T+T/Woods 6 April 2020 memo identifies changes in erosion potential at 10 locations during the 2, 10 and 100 year ARI design storm by quantifying the duration of exceedance of critical shear stress and comparing this for the pre-development and post-development scenarios. The assessment places emphasis on the 2 year ARI design storm event as smaller events strongly influence the geomorphology of the stream, especially the size of the main channel.

Design storm events smaller than the 2 year ARI were not considered for the following reasons:

- The 2, 10, 100 year ARI design storm events that were assessed are consistent with those included in the Auckland Council Stream Erosion Risk tool; and

- The hydraulic model has been based on predicting flood flows (in general accordance with Auckland Council Stormwater Modelling Specification) and these models have more uncertainty (are untested) for smaller events; and
- For the 2, 10 and 100 year ARI design storm events, we determined that there was small amounts of erosion predicted and uncertainty in the predictive ability (compared to observed erosion); and
- The greatest uncertainty in the assessments is the critical shear stress, which is very hard to describe as set out in T+T/Wood 6 April 2020. Further assessment of more storm events or mitigation measures does not overcome this problem; and
- Therefore, further modelling of events smaller than the 2 year ARI was not beneficial.

SMAF evaluation (T+T)

For the reasons given above, we have not run flood models or assessed the erosion potential that accounts for the proposed SMAF 1 hydrological mitigation for all impervious surfaces in the Plan Change Areas nor for the stream erosion mitigation measures recommended section 7 of the memo.

An assessment including the SMAF 1 hydrological mitigation would involve changing the flood model hydrology files to represent an effective rainfall which accounted for the SMAF 1 storage within hydrological mitigation devices.

The assessments done to date identified only very minor change between the pre-development and post-development scenarios for all three design storms (2, 10, 100 year ARI design storm events). It is expected that the application of SMAF 1 hydrological mitigation to those design storms would also result in very little to no change as the runoff stored through retention or detention volumes would be taken at beginning of the design storm and have no effect on the middle of the event, which is when the peak flows and peak shear stressed are typically experienced.

The benefit from SMAF 1 hydrological mitigation is conceptually clearer for smaller design storm events (i.e the 95th percentile design storm event) because the retention/detention volumes are a large proportion of the events.

Future development of the upstream catchment (T+T)

The post-development scenario includes the development of the Plan Change Areas in accordance with Table 2 of *Response to Auckland Council Further Information Request on Stormwater Matters for Drury East* prepared by Woods and Tonkin + Taylor on 25 March 2020 (relevant portion included below). It also allowed for future development of 60% imperviousness for the catchment within the Future Urban Zone and outside of the Plan Change Area.

Shear Stress calculations for the Modified Stream Erosion Assessment (T+T)

Please refer to Attachment 3, which is our spreadsheet model for the erosion assessment. Note the shear stress calculations are undertaken in the MIKE Flood hydraulic model.

1.2 MANAGEMENT METHODS

Request 2: The 'T and T' 6 April 2020 assessment concludes that the ecology and stormwater experts for Kiwi Property and Fulton Hogan recommend stream erosion mitigation measures for the Plan

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Change areas as follows... Can you please advise how those measures can be implemented? Is there a need for Precinct specific policies and measures?

The Plan Change proposes to manage stream erosion from a result of increased impervious area largely through applying SMAF 1 to reduce and manage stormwater runoff. The SMAF 1 rules require consent for the creation of impervious area greater than 50m². This rule would be triggered as part of any subdivision consent to redevelop land by virtue of the impervious surface created by roads. At this point, an assessment of the additional stormwater runoff, including future impervious area for any super lots created, would be assessed. The matters of discretion for the development of impervious surface greater than 50m² are set out in clause E10.7.2(1) of the AUP and specifically refers to policies E1.3(1)-(5), and (8)-(9). These policies provide clear scope and policy direction to manage the effects of stormwater runoff on stream health. We note the relevant extracts below and highlight the relevant sections:

Policy 2: Manage discharges, subdivision, use, and development that affect freshwater systems to:
(a) maintain or enhance water quality, flows, stream channels and their margins and other freshwater values, where the current condition is above National Policy Statement for Freshwater Management National Bottom Lines and the relevant Macroinvertebrate Community Index guideline in Table E1.3.1 below; or
(b) enhance water quality, flows, stream channels and their margins and other freshwater values where the current condition is below national bottom lines or the relevant Macroinvertebrate Community Index guideline in Table E1.3.1 below.

*Policy 8: Avoid as far as practicable, or otherwise minimise or mitigate, adverse effects of stormwater runoff from **greenfield development** on freshwater systems, freshwater and coastal water by:*
*(a) taking an **integrated stormwater management approach** (refer to Policy E1.3.10);*
*(b) **minimising the generation and discharge of contaminants**, particularly from high contaminant generating car parks and high use roads and into sensitive receiving environments;*
(c) minimising or mitigating changes in hydrology, including loss of infiltration, to:
*(i) **minimise erosion and associated effects on stream health and values;***
(ii) maintain stream baseflows; and
(iii) support groundwater recharge;
(d) where practicable, minimising or mitigating the effects on freshwater systems arising from changes in water temperature caused by stormwater discharges; and
(e) providing for the management of gross stormwater pollutants, such as litter, in areas where the generation of these may be an issue.

Further, any subdivision within the Drury East precinct will require resource consent as a restricted discretionary activity (at least). That activity will require assessment against a range of matters, including in particular Policies 17, 20 and 22 in E38. These policies will require the applicant to demonstrate that that future buildings on the site can be adequately served by stormwater network, and that the subdivision is in accordance with any approved Network Discharge Consent and associated SMP. Policy 22 is particularly relevant and is quoted below:

*Policy 22: **Require subdivision to be designed to manage stormwater:***
(a) in accordance with any approved stormwater discharge consent or network discharge consent;
*(b) in a manner **consistent with stormwater management policies in E1 Water quality and integrated management;***
*(c) by applying an **integrated stormwater management approach** to the planning and design of development in accordance with stormwater management policies in E1 Water quality and integrated management;*
*(d) to **protect natural streams** and maintain the conveyance function of overland flow paths;*

- (e) to maintain, or progressively improve, water quality;*
(f) to integrate drainage reserves and infrastructure with surrounding development and open space networks; and
(g) in an integrated and cost-effective way.

These policies provide clear direction to future consenting officers as to the matters that must be assessed through future resource consent applications for impervious area. It also provides sufficient scope to assess the effects of increased stormwater runoff on stream health as required by Policy 8(c)(i). It is also worth noting that the discharge of stormwater to an authorised network will require the SMP to be either adopted by Council into their Network Discharge Consent, or for FHL D to seek their own private discharge consent. The SMP will set the framework for assessment of development against the policies referenced above. In our view, there is no need to duplicate these policies in the precinct, unless there is an area-specific and evidence-based resource management issue that needs to be managed through a more enabling or restrictive policy or activity status. This approach is consistent with the approach to precincts throughout the Auckland Unitary Plan as detailed in the updated s32 report.

A riparian planting rule is also proposed along permanent and intermittent streams which will also contribute to managing stream bank erosion. Woods are continuing to analyse the extent of stream erosion that will result from development of the Plan Change area to determine if there is a need for further bank stabilisation / in stream works in addition to riparian planting and managing stormwater runoff. To ensure that the Plan Change includes a policy directive to manage stream bank erosion resulting from subdivision and development within the Plan Change area an additional policy is now proposed:

- (8) In addition to the matters in Policy E1.3(8), manage erosion and associated effects on stream health and values arising from development in the precinct, including parts of the Fitzgerald stream, and enable in-stream works to mitigate any effects.*

Applications for subdivision and development within the Plan Change area will need to demonstrate consistency with this policy direction. If any subsequent in stream works are required, these remain subject to the regional provisions of Chapter E3 of the AUP which are generally enabling of erosion control structures, however, we would like to continue working with you to explore potentially more enabling activity status for in-stream works where they are justified.

1.3 STREAM CORRIDORS

Request 3: *Please provide further clarification of the costs and benefits of mapping streams.*

Chapter E3 of the AUP effectively manages streams, and in our opinion, there is no resource management reason to spatially identify streams on a precinct plan given that it does not link with any specific method in the Drury East precinct. Furthermore, as stream alignments can vary over time, the introduction of a precinct plan which spatially defines streams could create uncertainty and potentially mislead future property owners. Despite these reasons we understand that the Council would still prefer streams to be spatially depicted for consistency with other greenfield precincts.

Some stream reclamation is likely to be required within Drury East to facilitate efficient urban development, including for the construction of supporting infrastructure. Therefore, to accurately map the future stream network within Drury East we need to undertake further work to understand the extent of this proposed reclamation and ensure that any mapped streams indicate areas where

potential reclamation may be necessary. An additional policy has been included within the precinct to signal this approach:

(9) In addition to the matters in Policy E.3.3(13), recognise that there may be no practicable alternative to stream works, including culverting, diversion and/or reclamation, where they are required to construct critical infrastructure.

We acknowledge that further work with Council is required to develop this policy and the supporting provision, and that further discussions with iwi will be required. We will continue to engage with Council and iwi regarding this and develop a supporting rule and assessment framework.

1.4 WATER QUALITY

Request 4: *Can you please confirm how SMAF 1 and water quality requirements will be met by communal devices?*

The Plan Change proposes to manage water quality through appropriately designed SMAF 1 devices and treatment of all roads (rather than just high use roads as required by Chapter E9 of the regional rules).

While some SMAF devices (particularly communal devices) are only effective as hydrological mitigation the devices that will be utilised as part of the Stormwater Management Toolbox offer both hydrological mitigation and water quality treatment. The matrix is compiled from the current Stormwater Management Plans (SMP) for each Plan Change and will form part of the updated SMP which the applicant will be seeking to have adopted into the Council's Network Discharge Consent (NDC). Given the SMP must be adopted by the Council to form part of the NDC, additional precinct provisions are not required to specify the SMAF devices that need to be utilised.

SMAF 1 and water quality can be met through use of communal devices such as "large rain gardens", these can be sized to ensure hydrology mitigation is met through the bio-retention media, treatment is sized based on the net surface area as per GD01, the use of multiple inlets to such devices would be adopted so flow is spread over the rain garden and not concentrated at a singular location. Devices such as wetlands could also be adopted, where detention and water quality are provided, retention would be required to be managed at source in this instance.

It is noted that as part of the Stormwater Management Toolbox offer both hydrological mitigation and water quality treatment. The matrix is compiled from the current Stormwater Management Plans (SMP) for each Plan Change and will form part of the updated SMP which the applicant will be seeking to have adopted into the Council's Network Discharge Consent (NDC). Given the SMP must be adopted by the Council to form part of the NDC additional precinct provisions are not required to specify the SMAF devices that need to be utilised.

We understand that Council is also concerned that the current drafting of Standard IX6.5. Stormwater Quality will exempt existing roads from stormwater treatment. The applicant has no control over stormwater treatment of existing roads as these are controlled by Auckland Transport. In our view, it is more appropriate to achieve this outcome through working with Auckland Transport through the development process rather than including a specific standard within the Drury East Precinct.

1.5 FLOODING

Request 5: Please confirm if flood modelling includes the assumption that the Fitzgerald culvert and culverts under Great South Road will be upgraded prior to subdivision or development in the plan change areas and if this has a material impact on the floodplain within and downstream of the plan change areas.

The post-development scenarios include the assumption that the Fitzgerald culvert and culverts under Great South Road/Railway/Flanagan Road have been upgraded to allow for pass-forward of additional runoff. However, it is noted that development could proceed in advance of these upgrades subject to assessment through the resource consent process. The scope of this assessment is detailed in our response to Request 6 below.

Request 6: If the flood model assumes upsized culverts, then please consider whether and how this requirement would be reflected in appropriate Precinct provisions.

The flood modelling has indicated that the Fitzgerald culvert and culverts under Great South Road will need to be upgraded to facilitate development within Drury East. It is anticipated that prior to a hearing the developers funding agreement will have confirmed the timing and funding of these upgrades. To recognise this required upgrade in the precinct, amendments are proposed to include an additional policy to address stormwater, water supply and wastewater infrastructure.

(6) Ensure that development in Drury East is coordinated with supporting stormwater, wastewater and water supply infrastructure, having particular regard to the capacity of the Fitzgerald culvert and culverts under Great South Road.

Assessment criteria H6.8.2(2)(J), H5.8.2(2)(H) and H4.8.2(2)(I) require an assessment for new dwellings (THAB) or four or more dwellings (MHU and MHS) to ensure there is adequate capacity in the existing or proposed public reticulated water supply, wastewater and stormwater network to service the proposed development:

(i) Whether there is adequate capacity in the existing stormwater and public reticulated water supply and wastewater network to service the proposed development.

(ii) Where adequate network capacity is not available, whether adequate mitigation is proposed.

1.6 RIPARIAN MARGINS

Request 7: Could you please clarify the various provisions relating to margins and planted strips as they apply to the range of circumstances that are likely to be encountered and within this context, review whether the proposed riparian planting standard and a riparian margin policy or standard should be re considered.

The table below provides an overview of the building setback and the minimum required planted riparian margin.

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Urban & Environmental

<i>Circumstance</i>	<i>Building Setback – Total Width</i>	<i>Riparian Planting</i>
<i>Intermittent streams (Note that Intermittent Streams can be greater or less than 3m)</i>	20m if the stream is 3 metres or more in width in accordance with Standard IX6.3 Riparian Margins 10m if the stream is less than 3m in width in accordance with Standard H4.6.7 Yards, H5.6.8 Yards or H4.6.9 Yards	10m in accordance with Standard IX6.3 Riparian Margins
<i>Stream of less than 3m in width, within a site that is not to be vested or otherwise subject to public access, or which forms part of a wider ecological corridor</i>	10m if the stream is less than 3m in width in accordance with Standard H4.6.7 Yards, H5.6.8 Yards or H4.6.9 Yards	10m in accordance with Standard IX6.3 Riparian Margins
<i>Stream less than 3m in width that will likely be vested, and/or form part of a wider ecological corridor</i>	10m if the stream is less than 3m in width in accordance with Standard H4.6.7 Yards, H5.6.8 Yards or H4.6.9 Yards	10m in accordance with Standard IX6.4 Riparian Margins
<i>Streams over 3m in width which are subject to Esplanade reserve requirements</i>	20m in accordance with Standard IX6.3 Riparian Margins	10m in accordance with Standard IX6.3 Riparian Margins

We understand that the Council would prefer a 20m building setback along the entire length of the Fitzgerald Stream regardless of the width of the stream to provide enough space for flood conveyance and re-establishment of natural meanders. The reasons for Council requesting this larger building setback are twofold. Firstly, the Council is concerned that from a natural hazards perspective more space is required between streams and buildings to provide space for additional conveyance in extreme rain events. The Council is also seeking a wider building setback for amenity reasons to enable provision for connected paths and cycle paths along streams.

An additional building setback from streams is not required to provide for additional conveyance during extreme rain events as Chapter E38 requires proposed subdivisions to respond to the presence of natural hazards. Floodplains will be modelled in detail as part of future subdivision consent applications to ensure the proposed layout can accommodate the 100 year ARI in a way that ensures development will not be impacted by flooding. This assessment is a more effective response to providing adequate space to manage flooding rather than a building setback.

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An additional building setback from streams is also not required from an amenity perspective as the precinct has been updated to include additional assessment criteria for roads to encourage the alignment of roads, cycle paths and footpaths with open space and streams, which will support the provision of public access in a manner more flexible than a rule:

- (b) Whether roads are aligned with the stream network, or whether pedestrian and/or cycle paths are provided along one or both sides of the stream network, where they would logically form part of an integrated open space network.*
- (c) Where pedestrian and/or cycle paths are proposed within proposed open spaces, whether they are located adjacent to, and not within the 10m planted riparian area.*

To ensure this policy intent is clear and to create a linkage to this assessment criteria amendments are proposed to Policy 2 with amendments shown underlined:

- (2) Ensure that development provides a local road network that achieves a highly connected street layout and integrates with the collector road network within the precinct, and the surrounding transport network, and supports the safety and amenity of the open space and stream network.*

In addition, we note that the subdivision policies (E28.3(25) in particular) include the ability to take an integrated approach to the assessment of esplanade reserve requirements. This policy recognises that a reduced width may be appropriate in some locations, where it can be offset by an increase in width in other locations that would result in a positive public benefit in terms of access and recreation. This would provide scope for some averaging to occur across the length of streams if parts of it triggers the requirement for an esplanade reserve. This approach is preferred, over a more inflexible setback requirements that does not respond to the specific characteristics of the site and development.

2.0 TRANSPORT

Please refer to the RFI response prepared by Stantec for the transport information requests, with the exception of Request 5 below.

2.1 FUNDING AGREEMENT INFRASTRUCTURE UPGRADES

Transport Request 5: Can you please advise on progress developing a funding agreement.

A funding agreement is being progressed however this cannot be finalised until we understand the Governments decisions regarding the funding of “shovel ready” projects and until we have an update from the Strategic Growth Alliance on the Drury Transport Implementation Programme. We will continue to update the Council about progress on this funding agreement.