

# Memorandum

**To:** Zoe Avery – The Urbanist  
**From:** Crang Consulting Limited  
**cc:** Hari Hari, Goodland  
**Date:** July 13, 2023  
**Re:** Spedding Block Resource Consent – Informal S92 Response – Rev 1

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## 1.0 Introduction/Background

Abib (Oamaru) Ltd (the applicant) has submitted a Resource Consent application (BUN60406128) for a subdivision proposed at 2127 Kaipara Coast Highway, Kakanui. Auckland Council have requested further information in a letter dated 17 February 2023. This response letter has been prepared by Crang Consulting to address queries relating to civil engineering matters. All other queries will be responded to by the relevant specialists.

The following responses address items relevant to civil engineering matters within the RFI. The queries responded to herein are cited in italics for ease of reference, with the corresponding response below. Each question retains the same number and wording as in the letter for ease of reference.

## 2.0 Response to S92 Queries

### ▪ Planning Matters

**Query No. 3:** *Please provide a plan as detailed in E39.6.1.6 of the AUP(OP).*

Response:

*Please refer to Crangcivil's engineering plan C900 (Rev A) for the identified Significant Ecological Area in relation to the proposed development, and Ecological Impaction Assessment Appendix 2 prepared by Wildlands for information regarding vegetation, wetlands and streams.*

### ▪ Stormwater Matters

**Query No. 16:** *Please confirm whether that proposal is compliant with Section E8.6.4.1 (1), (3) and (4) for JOAL impervious areas.*

Response:

*Section E8.6.1 (1) – not applicable to the proposed development given there is no existing stormwater network;*

*Section E8.6.1 (2) – The proposed stormwater management includes compounded table drain to meet SMAF 1 detention and large-scale planting or replanting to meet SMAF 1 retention by reducing runoff from new impervious roading area into the receiving streams. See section 4 and drawings 400 and 451 in Appendix A of Crangcivil's Engineering report (Rev B) for more details.*



Section E8.6.1 (4) – The proposed development is expected to attract less than 5000 vehicles per day and have less than 30 vehicles in the parking area, hence any proposed roads, accessways and carpark within the development are not classified as high contaminant generating area under the AUP J1 and E9. Given the effects of contamination generated from traffic are considered less than minor, no specific stormwater treatment device is required. In spite of this, the proposed compounded table drain design not only has a primary function of stormwater conveyance and hydrology mitigation purposes (i.e SMAF 1 in this case), but also provides a certain degree of quality treatment as a supplementary function as water passing through the grass. See section 4 and Appendix A of Crangcivil's Engineering report (Rev B) for more details.

**Query No. 17:** Page 43 of the AEE identifies an increase in impermeable area on site. The stormwater calculations quantify post development peak runoff rates and volumes but does not provide pre-development peak runoff rates in the 10 year and 100 year storm event. Please provide peak flow rate comparison from the site in the pre and post development scenario for the 10 and 100 year storm events. Note that the 'hydraulic neutrality' calculation sheets have the address for 33 Brownhill Road.

- Please confirm whether detention for hydraulic neutrality in the 10 year storm event is proposed for on lot runoff.

Response:

Site address corrected in the spreadsheet.

No 10-yr detention control device is proposed for on lot runoff, this is because with the overall development proposal, the hydraulic neutrality of the overall site is achieved in the 2, 10 and 100 yr events, see Appendix B of the Crangcivil's engineering report (Rev B) for calculation details.

- Under E8.6.1, please confirm that runoff in the 1% AEP doesn't cause inundation of buildings on other properties in events up to the 1% AEP event

Response:

The 1% AEP inundation effects on buildings on other properties are expected to be less than minor, given that:

- The proposed buildings and roads are out of the predicted 1% AEP flood plains, see Crangcivil's engineering plan C904 (Rev A)
- The 1% AEP post-development flow does not exceed the pre-development condition, see Appendix B of Crangcivil's engineering report (Rev B)
- Where new road intercepts with existing stream, a culvert structure has been designed to convey 1% AEP peak flow with more than 0.5 m flooding freeboard to adjacent lots

**Query No. 18:** Please confirm that the proposed culvert at the accessway into the site will not result in increased conveyance downstream of the site and cause inundation of buildings/other properties. It is noted that the culvert diameter is TBC on the design drawings.

Response:

The inundation effects resulting from the revised culvert design at the accessway are expected to be less than minor, given that:

- The upstream catchment of the culvert remains as per pre-development,

*including both impervious and pervious areas.*

- *The proposed culvert designed to convey 1% AEP peak flow with sufficient freeboard.*

*Please refer to Crangcivil's engineering plan C471 (Rev A) for more details.*

**Query No. 19:** *There are several culverts proposed within the site. Please confirm that these are intended to be privately owned/maintained culverts to convey overland flow paths (100 year storm event) under blockage scenarios for safe egress during emergencies. An assessment for safe egress from the site in the 100 year storm event might be necessary to ensure this. The applicant notes that the new culverts will comply with fish passage requirements.*

Response:

*All proposed culverts will be private and designed to comply with fish passage requirements, as well as provide sufficient freeboard to the roads for safe egress during large storm events. See details shown in Crangcivil's engineering plan C470 to 475 (Rev A).*

*Detailed culvert calculations are included in Appendix C of Crangcivil's engineering report.*

**Query No. 20:** *The applicant notes that a BPO approach to on lot stormwater management is proposed including the following*

- o *Treatment swales for driveways in each lot, proposed roads/JOALS to meet treatment GD05 treatment requirements*
  - *No swale sizing calculations have been provided – Please provide a copy of the sizing calculations for the swale to ensure that residence times are met and those swales where check dams are required/proposed (where the longitudinal grade on the swale is greater than 5%)*

Response:

*The revised stormwater water management has proposed compounded table drain instead swale to provide SMAF 1 detention and conveyance for the runoff from the roads. The proposed development is expected to attract less than 5000 vehicles per day and have less than 30 vehicles in the parking area, hence any proposed roads, accessways and carpark within the development are not classified as high contaminant generating area under the AUP J1 and E9. Given the effects of contamination generated from traffic are considered less than minor, no specific stormwater treatment device is required. In spite of this, the proposed compounded table drain design also provides a water quality treatment function to a certain extent as a supplementary function as water passing through the grass and seeping into the ground. See section 4 and Appendix A of Crangcivil's Engineering report (Rev B) for more details.*

#### ▪ **Wastewater Matters**

**Query No. 23:** *The wetland assessment is not adequate for the proposed wastewater land disposal within 15m to be supportable based on the information presented. The applicant must demonstrate the site is developable under the NES-F and that a sensible nature of residential development within the identified building site would result in an acceptable level of effects upon any natural wetland within 100 metres. Again, the onus would be on the applicant to provide a high level of detail to demonstrate that the site is developable under the NES-FW. This should include the following:*

- a) Confirmation of the location and extent of the natural wetlands within 100m of any future discharge of wastewater (and any other discharges or proposed earthworks).

Response:

Please refer to KGA's response.

▪ Ecology Matters

**Query No. 29:** Please provide plans more clearly showing the 10m setbacks from wetlands and also the 20m riparian yards as they relate to areas of the site where new lots and the driveways are proposed.

Response:

Please refer to Crangcivil's engineering plan C901 and 903 (Rev A).

▪ Streamwork Matters

**Query No. 35:** The application reports that the culverts are a permitted activity. However insufficient information has been provided with the application to confirm this assessment. Please provide:

1.1.1 Culvert designs in plan form

Response:

Please refer to Crangcivil's engineering plan C470 (Rev A).

1.1.2 Culvert design calculations

Response:

See Appendix C of Crangcivil's engineering report (Rev B).

1.1.3 Stream information (for assessment against Regulation 70(2) of the NES:FW)

Response:

	1.1.1 the permitted activity condition of Regulation 70(2) of the NES:FW.	CULVERT 1	CULVERT 2	CULVERT 3	CULVERT 4	CULVERT 5
(a)	the culvert must provide for the same passage of fish upstream and downstream as would exist without the culvert, except as required to carry out the works to place, alter, extend, or reconstruct the culvert; and	YES	YES	YES	YES	YES
(b)	the culvert must be laid parallel to the slope of the bed of the river or connected area; and	YES	YES	YES	YES	YES
(c)	the mean cross-sectional water velocity in the culvert must be no greater than that in all immediately adjoining river reaches; and	YES	YES	YES	YES	YES
(d)	the culvert's width where it intersects with the bed of the river or connected area (s) and the width of the bed at that location (w), both measured in metres, must compare as follows: (i) where $w \leq 3$ , $s \geq 1.3 \times w$ ; (ii) where $w > 3$ , $s \geq (1.2 \times w) + 0.6$ ; and	YES	YES	YES	YES	YES
(e)	the culvert must be open-bottomed or its invert must be placed so that at least 25% of the culvert's diameter is below the level of the bed;	YES	YES	YES	YES	YES
(f)	the bed substrate must be present over the full length of the culvert and stable at the flow rate at or below which the water flows for 80% of the time; and	YES	YES	YES	YES	YES
(g)	the culvert provides for continuity of geomorphic processes (such as the movement of sediment and debris).	YES	YES	YES	YES	YES

1.1.4 The location of all culverts

Response:

Please refer to Crangcivil's engineering plan C470 (Rev A).

1.1.5 An assessment of each culvert against the permitted activity condition of Regulation 70(2) of

the NES:FW.

Response:

Same response as item 35, 1.1.3

1.1.6 An assessment of each culvert against the permitted activity standards associated with rule E3.4.1(A32).

Response:

1.1.1 the permitted activity standards associated with rule E3.4.1(A32).

	CULVERT 1	CULVERT 2	CULVERT 3	CULVERT 4	CULVERT 5
Culverts or fords less than 30m in length when measured parallel to the direction of water flow complying with the standards in E3.6.1.18					
1 The activity must comply with the standards in E3.6.1.14 above.	YES	YES	YES	YES	YES
2 The 1 per cent annual exceedance probability (AEP) flood shall be accommodated by the structure and/or by an overland flow path without E3 Lakes, rivers, streams and wetlands Auckland Unitary Plan Operative in part 22 significantly increasing flood levels up stream or downstream of the structure	YES	YES	YES	YES	YES
3 Culverts must be constructed of inert materials with a design life of at least 50 years.	YES	YES	YES	YES	YES

Standards for new structures and the associated bed disturbance or depositing any substance, diversion of water and incidental temporary damming of water		CULVERT 1	CULVERT 2	CULVERT 3	CULVERT 4	CULVERT 5
1	(1) Structure length must comply with all of the following: the total length of any extended structure must not exceed 30m measured parallel to the direction of water flow. This includes the length of any existing structure and the proposed extension but excludes erosion or scour management works;	YES	YES	YES	YES	YES
	(a) any required erosion or scour management works must not exceed 5m in length, either side of the extended structure. Such works protruding into the bed do not require a separate consent as they are authorised under this rule; and	YES	YES	YES	YES	YES
	(b) a new structure must not be erected or placed in individual lengths of 30m or less where this would progressively encase or otherwise modify the bed of a river or stream.	YES	YES	YES	YES	YES
	(c) During construction bed disturbance upstream or downstream of the structure must not exceed 10m either side, excluding the length of the structure.	YES	YES	YES	YES	YES
2	The structure must not prevent the passage of fish upstream and downstream in waterbodies that contain fish, except that temporary restrictions to fish passage may occur to enable construction work to be carried out.	YES	YES	YES	YES	YES
3	The structure must not cause more than minor bed erosion, scouring or undercutting immediately upstream or downstream.	YES	YES	YES	YES	YES
4	Construction material and ancillary structures must be removed from the bed following completion of the activity.	YES	YES	YES	YES	YES
5	Other than provided for by another rule, the activity must not increase the height or storage capacity of any existing dam.	YES	YES	YES	YES	YES
6	The 1per cent annual exceedance probability (AEP) flood shall be accommodated by the structure and/or by an overland flow path without increasing flood levels up stream or downstream of the structure, beyond the land or structures owned or controlled by the person undertaking the activity.	YES	YES	YES	YES	YES
7	Calculation of flow rates will be made using the Auckland Council Technical Publication 108: Guideline for stormwater runoff modelling in the Auckland Region, April 1999.	YES	YES	YES	YES	YES
8						

**Query No. 36:** The application material shows a number of stormwater outfalls that are proposed; however there is no design information to confirm that these outfalls can be designed to the permitted activity standards associated with rule E3.4.1(A39).

Response:

All the proposed stormwater outfalls have been assessed and shown compliance with the standards associated with rule E3.4.1 (A39), see detail below:

Standards for new structures and the associated bed disturbance or depositing any substance, diversion of water and incidental temporary damming of water		
1	Structure length must comply with all of the following: (a) the total length of any extended structure must not exceed 30m measured parallel to the direction of water flow. This includes the length of any existing structure and the proposed extension but excludes erosion or scour management works;	YES
	(b) any required erosion or scour management works must not exceed 5m in length, either side of the extended structure. Such works protruding into the bed do not require a separate consent as they are authorised under this rule; and	YES
	(c) a new structure must not be erected or placed in individual lengths of 30m or less where this would progressively encase or otherwise modify the bed of a river or stream	YES
	During construction bed disturbance upstream or downstream of the structure must not exceed 10m either side, excluding the length of the structure.	YES
2	The structure must not prevent the passage of fish upstream and downstream in waterbodies that contain fish, except that temporary restrictions to fish passage may occur to enable construction work to be carried out.	NA
3	The structure must not cause more than minor bed erosion, scouring or undercutting immediately upstream or downstream.	YES
4	Construction material and ancillary structures must be removed from the bed following completion of the activity.	YES
5	Other than provided for by another rule, the activity must not increase the height or storage capacity of any existing dam.	YES
6	The 1per cent annual exceedance probability (AEP) flood shall be accommodated by the structure and/or by an overland flow path without increasing flood levels up stream or downstream of the structure, beyond the land or structures owned or controlled by the person undertaking the activity.	NA
7	Calculation of flow rates will be made using the Auckland Council Technical Publication 108: Guideline for stormwater runoff modelling in the Auckland Region, April 1999.	YES
8		

**Query No. 37:** Please provide the necessary design calculations to confirm the outfalls are a permitted

activity; and a plan that shows the outfalls relative to the wetlands.

Response:

*Please refer to Crangcivil's engineering plan C400 series for engineering details of the proposed stormwater outfalls. More design details such as pipe size and grade will be provided at building consent stage.*

**Query No. 40:** Please provide a plan showing all of the outfalls from the swales and stormwater management devices

*This information is being requested to confirm the catchments to the wetlands are maintained as reported in the application material.*

Response:

*Please refer to Crangcivil's engineering plans C400 series showing all the proposed stormwater outfalls, and plan C440 for the wetland catchments in the wetland hydrology assessment report.*

*More details of wetland hydrology can be found in Crangcivil's memo – Wetland Hydrological Assessment to demonstrate stormwater discharge to the wetlands is similar in both pre and post development conditions.*

**Query No. 41:** The Engineer Report refers to 'rock weirs', please provided further detail of these structures. As written, concern is expressed that these maybe weirs and required further assessment under the provisions of both the AUP and NES:FW as such.

Response:

*To avoid terminology confusion, a different technical term "rock check damn" is used instead. The check damns are serving for the purpose of slowing down flows in the table drain to minimise erosion risk. Please refer to plan C451 (Rev A) for details.*

**Query No. 42:** The application material (AEE, Engineering Report and EclA) all refer to stormwater quality management in accordance with GD05. GD05 provides industry best practice guideline for erosion and sediment control for land disturbing activities. GD05 is not an appropriate reference document for stormwater quality management, nor does it contain many of the controls attributed to it in the aforementioned application material. Please provide the alternative.

Response:

*Terminology term revised. Stormwater Management Devices in the Auckland Region (GD01) has been referenced and used when selecting appropriate devices/controls for stormwater quality management. The document adopts principles and process of water sensitive design.*

**Query No. 43:** For all in-streamworks, please provide a streamworks methodology to confirm compliance with the relevant permitted activity standard that relates to such works being carried out in accordance with best practice erosion and sediment control measures to minimise any discharge of sediment.

Response:

*Please refer to Crangcivil's engineering plan C226 (Rev A) showing streamwork methodology on constructing stormwater outlet to stream, C477(Rev A) for temporary stream diversion works for culvert construction.*

▪ **Regional Earthwork Matters**

**Query No. 44:** *Further information is required with regards to the potential for the earthworks to dewater wetlands 1 and 17. The Wetland Earthworks Assessment, should be updated with a more detailed response that considers the cut depth near these wetlands.*

Response:

*Please see the revised Wetland Earthworks Assessment*

**Query No. 45:** *With regards to the earthworks near the wetlands, please provide further information as to how GD05 controls will protect the wetland, as reported in the Wetland Earthworks Assessment, where earthworks occur immediately adjacent to the wetland, where there may not be the physical room for their construction.*

Response:

*It is proposed to use super silt fence where earthworks are undertaken adjacent to the wetlands. Silt super fences are robust control devices to encourage deposition of sediment through settlement and protect the wetlands. Please refer to Crangcivil's engineering plans C224 (Rev B) and C227 (Rev A) for more details.*

**Query No. 46:** *Please provide a construction methodology for the Sediment Retention Ponds (SRPS), that addresses how these sediment controls will be physically constructed on-site, including how these areas will be accessed. From the review of the application material it would appear that the earthworks that the SRPs would provide sediment control to would need to be completed or substantially advanced prior to their construction. Please clarify how SRPs will be constructed, given the earthworks they would be controlling are needed for their construction?*

Response:

*Construction of SPR generally have of the following steps*

- *Construct diversion bunds around the earthwork areas to direct overland flows to SPRs*
- *Install silt at downstream of SPR to minimise sediments into the streams*
- *Form embankments using certified fill*
- *Construct the base of the SPR with a reverse slope*
- *Install drainage pipe works (i.e. T-bar decant system) and emergency spillway*
- *Construct forebay of the SPR*

*It is the proposal to have SRPs constructed prior to undertaking associated earthwork areas to provide robust sediment and erosion controls.*

**Query No. 47:** *Please confirm how the access ways will be stabilised upon completion.*

Response:

*Please refer to the stabilised construction entrance specifications given in Crangcivil's engineering plan C224 (Rev A).*

**Rodney Local Board Feedback**

*For your information, the following feedback has been received from the Rodney Local Board:*

- *Where other developments such as this have been modelled in Rodney, they have been designed using Water Sensitive Urban Design (WSUD) principles which this application does not appear to promote. The intensity of the proposal should be balanced with WSUD methods to overcome the adverse environmental effects.*

Response:

*The guidance from Stormwater Management Devices in the Auckland Region (GD01) has been adopted in designing the stormwater management for the proposed development. Similar design considerations to the principle and process outlined in Australia's WSUD and tailored to suit for Auckland area, GD01 encourages effective balance of protected natural environments and ecosystems while enabling development for community growth.*

Should you have any further queries on the above, please contact me.

Yours faithfully

**CRANG CIVIL**



Zibo Yang