

# Memorandum

**To:** Zoe Avery - The Urbanist  
**From:** Zibo Yang - Crang Consulting  
**cc:** Hari Hari - Goodland  
**Date:** January 31, 2024  
**Re:** 2127 Kaipara Coast Highway – Formal 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 two formal Section 92 (S92) letters - part 1 and part 2 dated 16/11/2023 and 5/12/2023 respectively. This memorandum 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 within the Section 92 request letters. 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 Part 1 Queries

### ▪ Planning Matters

**Query No.11:** *Please confirm that relevant standards in E11 and E12 are met. If not, please apply for the relevant consents.*

Response:

*The proposed civil works are in compliance with E11.6.2. general standards, E12.6.1 Accidental discovery rule and E12.6.2. general standards.*

**Query No. 15:** *Please provide a plan that identifies all natural features on the site, the proposed earthworks, lot boundaries and roads. Crang Civil Plan 900 and the Wildlands Appendices are noted however this request seeks to understand what works are proposed in relation to each specific feature, associated setbacks etc.*

Response:

*A new engineering plan 908 has been prepared to include the natural and proposed features such as proposed earthworks, boundaries, roads/accessways, as well as existing streams, wetlands, archaeology extents and associated setbacks from streams and wetlands. For other features such as vegetation habitat, please refer to Wildlands's drawings.*



## ▪ Ecology

**Query No. 53:** *Culvert 5 is proposed to be length of 12 metres. This is a wide length for one lot and much wider than the current crossing area. The width should be reduced particularly given the wetland located flush with the upstream end of the culvert which would likely be impacted by culvert of this length.*

*Please either amend the proposal or provide further justification and assessment of whats proposed.*

### Response:

*The length of culvert 5 is determined by the width of the accessway, which is measured in 12m from boundary to boundary. The current length and cross sectional area of the culvert are considered optimised to ensure it runs perpendicularly across the road in its shortest length to convey stormwater from upstream to downstream up to the 100 year storm event. The proposed design intends to maintain the current flow regime of the stream and reduce adverse potential water ponding effects upstream, therefore the effect on the wetland upstream is considered less than minor. Please refer to culvert calculations in Appendix C of the engineering report and wetland hydrological assessment memo for further details.*

## ▪ Landscape & Visual

**Query No. 57:** *What is the proposed materiality of the retaining walls?*

### Response:

*Retaining wall material is to be confirmed and approved at detailed design/building consent stage. The design will consider selecting material with recessive colour to enhance rural character of the site and minimise adverse visual effect.*

## ▪ Streamworks

**Query No. 62:** *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:*

- *Culvert designs in plan form*
- *Culvert design calculations*
- *Stream information (for assessment against Regulation 70(2) of the NES:FW)*
- *The location of all culverts*
- *An assessment of each culvert against the permitted activity condition of Regulation 70(2) of the NES:FW.*
- *An assessment of each culvert against the permitted activity standards associated with rule E3.4.1(A32).*

*This information is required to confirm the culverts are a permitted activity. Note that following the receipt of the requested information, should any individual culvert or the culverts cumulatively not meet the permitted activity rules, then an updated effects assessment will be required, and it is likely that measures would be required to address any identified effects.*

In preparing your response to the above, you are advised to refer to the definition of culvert in the AUP and NES:FW, which does not cover such structures that have an inlet/outlet to wetlands.

**Response:**

- a) Culvert designs in plan form and location of all culverts– plans C470 series
- b) Culvert design calculations – Crangcivil’s engineering report Appendix C
- c) Stream information (for assessment against Regulation 70(2) of the NES:FW – see summary table below

	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	NOTES
(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	Refer to plans 470 series and engineering report for details
(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	

- d) An assessment of each culvert against the permitted activity condition of Regulation 70(2) of the NES:FW - see summary table for item (c) above
- e) An assessment of each culvert against the permitted activity standards associated with rule E3.4.1(A32) based on the revised engineering design.

	1.1.1 the permitted activity standards associated with rule E3.4.1(A32).	CULVERT 1	CULVERT 2	CULVERT 3	CULVERT 4	CULVERT 5	Notes
1	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	Combined length of all culverts will exceed 30 m					Refer to Section 8.2 of Wildlands’ ecological impact assessment for details
2	The activity must comply with the standards in E3.6.1.14 above.	See separate summary table provided below					
3	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	Refer to plans 470 series and engineering report for details
4	Culverts must be constructed of inert materials with a design life of at least 50 years	YES	YES	YES	YES	YES	Culvert products such as humes and hydns generally have a design more than 50 years

	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	NOTES
(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;	Combined length of all culverts will exceed 30 m					Refer to Section 8.2 of Wildland’ ecological impact assessment for details
(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	YES	No	No	YES	Proposed rip rap length at the culvert outlet Culvert 3 - 9.0 m; Culvert 4 - 8.8 m
(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	YES	YES	YES	YES	
2	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	
3	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	
4	The structure must not cause more than minor bed erosion, scouring or undercutting immediately upstream or downstream	YES	YES	YES	YES	YES	
5	Construction material and ancillary structures must be removed from the bed following completion of the activity.	YES	YES	YES	YES	YES	
6	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	
7	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	Refer to plans 470 series and engineering report (appendix C) for details
8	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	

*Additional November 2023 comments: Multiple proposed culverts have inlets within wetlands. These structures are therefore inconsistent with the definition of a culvert from the AUP:OP and the NES:FW, and would therefore be considered as a pipe (and reclamation in terms of activity).*

*Notwithstanding the above point, the applicant's engineers have provided the requested assessment; however there is not the necessary supporting information to confirm compliance with the permitted activity condition of Regulation 70(2) of the NES:FW principally as the width of the streams has not been provided.*

Response:

*Wildland ecologist has conducted a site visit and confirmed all the streams shown on Wildland's drawings have a width of less than 3 m.*

*The collective length of the 'culvert' structures exceeds 30 m, this cumulative length, exceeds the permitted activity standard (E3.6.12(2)(a)) that relates to rule E3.4.1(A32) from the AUP:OP. IF these structure were to be considered as 'culverts' consent would therefore required under rule E3.4.1(A44). As a discretionary activity (for culverts) or non-complying (for new reclamation) under the AUP:OP it would be envisioned that a measure for address adverse effects is proposed as part of the application.*

*Response is required to these points and the various requests therein remain.*

Response:

*The effects of loss of permanent and intermittent stream habitat as a result of the proposed culverts is considered very low, please refer to Wildlands ecological impact assessment report (Section 8.2).*

**Query No. 63:** *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).*

*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*

*November 2023 comments: A location plan has been provided; however the length of the erosion protection at the outfall has not. Specific design information is required to support he response that has been provided by the applicant's engineers. As this relates to a reason for consent under the AUP:OP it is not considered appropriate to defer this detail to building consent stage.*

*Request remains.*

Response:

*Please refer to the revised drawings 470 series as well as the culvert calculations in Appendix C of the engineering report for the proposed erosion & sediment measures at the culvert outlets. An assessment of each culvert against the permitted activity standards associated with rule E3.4.1(A32) based on the revised engineering design, see the summary tables provided in query 62.*

**Query No. 65:** 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:

*Crangcivil's engineering plan C226 (Rev A) shows streamwork methodology for constructing stormwater outlet to stream.*

*November 2023 comments: Following the site visit it is considered this point needs to be considered in terms of the culvert removal and construction in respect to the potential to drain any up-gradient wetlands.*

*Request remains.*

Response:

*The existing culvert under the accessway to the farm dwelling will remain on site, no removal work is proposed as part of this application.*

*For new culvert installation, the proposed methodology is outlined below in sequence, note that the final details of the construction methodology will be determined and agreed between council and contractor on site prior to work commencement:*

- 1. Form a temporary cleanwater stream diversion channel around the proposed culvert construction area. Channel to be lined with geotextile to minimise risk of erosion;*
- 2. Construct clay filled coffer damn at the upstream and down stream ends. Pump and sandbag will be used when necessary to create a dry environment and prevent sediment into the construction area;*
- 3. Following that, contractor to muck out and backfill to form culvert foundation, lay culvert unit and rip rap*
- 4. Once the culvert is in place, contractor to hardfill backfill to designed accessway level on top of the culvert and remove all temporary devices*

*Crangcivil drawing C477(Rev A) illustrates the temporary stream diversion works for culvert construction mentioned above.*

#### ▪ Regional earthworks

**Query No. 66:** 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?

*November 2023 comments: The response does not address the main purpose of this request and has not considered how the areas where SRP are proposed will be accessed in a manner that reduces the potential for erosion to occur and that minimises sediment generation.*

*Request remains.*

Response:

*The drawings indicate potential locations for the SRPs following GD05 design guideline. After obtaining the resource consent, contractor shall liaise with Auckland council prior to work commencement to finalise the erosion and sediment management including SRP location. During earthwork, the SRPs will potentially be adjusted again to suit unforeseen site constraints upon agreement with sediment erosion control officer.*

*There are a few existing farm tracks, which the new roads are following as much as possible, they can be utilised for diggers and other machinery to access the SRPs, and haul road can be created for access if required by contractor.*

*Construction methodology of the SRPs was provided in the previous response (memo dated 13/7/2023). Temporary measures such as super silt fence, drop out pit and diversion bunds will be determined by contractor to control runoff before constructing the SRPs, those details will be confirmed and agreed between the contractor and council officer.*

**Query No. 67:** *Please confirm how the access ways will be stabilised upon completion.*

*November 2023 comments: The response does not address the main purpose of this request. The request relates to the stabilisation of the access ways upon completion; and not the erosion control structure 'stabilised access way'.*

Response:

*It is proposed to seal the accessways within the development site with asphaltic concrete, refer to engineering plan 321 for further details.*

### 3.0 Response to S92 Part 2 Queries

#### ▪ engineering

**Query No.1:** A large degree of common infrastructure is proposed. Please clarify specifically how these will be managed (it is noted that a residents group is proposed).

Please note maintenance manuals will need to be provided at s224c stage.

Response:

The new common infrastructures such as accessways and roads, grassed table drains, bioretention swales, stormwater pipes and culverts within the proposed road reserve on site will be managed and maintained by resident group. Other private infrastructure within each residential lot such as water tank and wastewater disposal field will be managed by individual lot owner.

Noted that relevant maintenance manuals will be provided at 224c stage.

**Query No. 2:** Please provide relevant information to show how road drainage will be collected and disposed. The information should include but may not be limited to: drainage plans to show swales/channels, catchment plans, hydrological calculations, swale/channel sizing, location of existing OLFPs and how runoff from road will tie into existing OLFPs.

Response:

Please refer to Crangcivil drawings 400 series and 906 for road drainage network and OLFPs respectively, relevant design calculations included in Appendix D to E of the Engineering report (Rev C).

**Query No. 3:** We understand the roadside swales are purely for treatment and conveyance of road runoffs. In this case, please clarify if upstream flows will be intercepted and diverted so they can be directed into bypass culverts.

Response:

For clarification purposes, the stormwater infrastructures proposed for road drainage have been renamed, see the revised legends on drawings 400 series, the primary design function of each device is listed below:

- grassed table drain, trapezoidal grass channel used to collect and convey stormwater on road
- bioretention swale, swale channel equipped with engineered media for water quality treatment and provided stormwater SMAF mitigation

Majority of the proposed new roads will be constructed along ridge lines of the stormwater catchment and have minimal interperion of the existing overland flows, as illustrated in drawing 400 906. Where there is a cross point between the new road and overland flow, a culvert will be provided to pass flow up to 100-year storm event, calculations and sizing of the culvert can be found in Appendix C of the Engineering report (Rev C).

**Query No. 4:** We acknowledge the proposed private roads and accessways are not related to high contaminate areas as defined in the AUP(OP). However, GD01 treatment still applies to achieve E8.6.1 requirements. We note there are a number of sections on roads and accessways that are in relatively steep gradients. Please clarify the following, with details on all treatment swales:

- a. how water quality velocity can be maintained,
- b. how 9 mins residence time can be achieved.

Response:

*As mentioned in the response for query 3 above, the grassed table drain is designed to serve primarily as stormwater device for conveyance, hence the 9-min residence time is not applicable. The GD01 treatment will take place in the bioretention swale where water filters through the engineered layers to triggers physical and chemical treatment reactions. Where there are steep gradients, check dams will be installed to maintain flow velocity as appropriate. see bioretention swale calculations in Engineering report Appendix D.*

**Query No. 5:** Please show indicative locations and details of stormwater dispersal system for all lots.

Response:

*Please refer to crangcivil drawings 400 series, each lot has been assigned with an indicative stormwater outlet.*

**Query No. 6:** We note there are a number of existing OLFP on site. Please provide a plan showing these and clarify if (and how) they will be affected by proposed works on site. If yes, please provide relevant plans (including catchment plan) and calculations to explain how they will be rerouted and how relevant permitted activity rules and standards will be met.

Response:

*An engineering plan 906 has been prepared to show existing OLFPs on site. On the western portion of the site, where the development is proposed, the Wildlands ecologist has conducted an assessment on site and depicts the overland flow paths as ephemeral, intermittent and permanent streams.*

*No rerouting of the existing OLFP is proposed, majority of the proposed new roads will be constructed along ridge lines of the stormwater catchment and have minimal interpterion of the existing overland flows, as illustrated in drawing 906. Where there is a crossing between the new road and upstream flow, a culvert will be provided to convey flow up to 100-year storm event. Relevant calculations and sizing of the culvert can be found in Appendix C the Engineering report (Rev C).*

**Query No. 7:** Please explain how firefighting water supply will be provided to achieve relevant requirements from SNZ PAS 4509.

Response:

*Under SNZ PAS 4509, the proposed residential dwelling is classified under FW1, which requires a minimum water storage volume of 7 m3. The current proposal is to have 2 of the 25 m3 tanks for each residential lot, which will meet the firefighting requirements.*

▪ **stormwater**

**Query No. 14:** Riparian/offset planting as means to not provide SMAF retention is not accepted by Council under E8. Please provide SMAF retention for the proposed impervious areas on site, noting the dwellings can be fitted with water reuse from the proposed tanks on site. Please include SMAF calculations in the response.

Response:

*The SMAF retention will be provided via bioretention swale for the proposed impervious areas on roads,*

*see bioretention calculations in Engineering report (Appendix D).*

*Each dwelling will be fitted with 2 of the 25 m<sup>3</sup> tanks for water supply, which is considered sufficient for meeting 5 mm of SMAF retention requirement.*

**Query No. 15:** *The private JOALS on site appear to exceed grades of 15%, please provide detailed calculations for the roadside swales with check dams, noting that detailed drawings have been provided as part of the engineering plans, calculations were not found in the appendices of the engineering report.*

*This is related to questions from the Development Engineer; one response could be provided to address both questions.*

Response:

*Please see the responses for queries 3 and 4. Design calculations of the bioretention swale can be found in Appendix D of the engineering report.*

**Query No. 16:** *Please provide calculations for outfall/rip rap apron sizing for the proposed impervious areas on site.*

Response:

*Design calculations are now included in Appendix E of the engineering report.*

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

Yours faithfully

**CRANG CIVIL**



Zibo Yang