

Memorandum

To: Zoe Avery - The Urbanist
From: Zibo Yang - Crang Consulting
cc: Hari Hari - Goodland
Date: August 26, 2024
Re: 2127 Kaipara Coast Highway – Formal S92 Response – Rev 1

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 Section 92 (S92) letter dated 27 June 2024. 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 in the S92 letter. 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.2: *Thank you for the letter from NZTA dated 30/4/2024. The letter refers to the retaining wall associated with the new vehicle crossing not being provided to date to NZTA and not included in the Geotechnical Investigation Report. Can you please clarify what is proposed, what plans show what is proposed and what investigations have been undertaken in relation to the retaining wall highlighted by NZTA.*

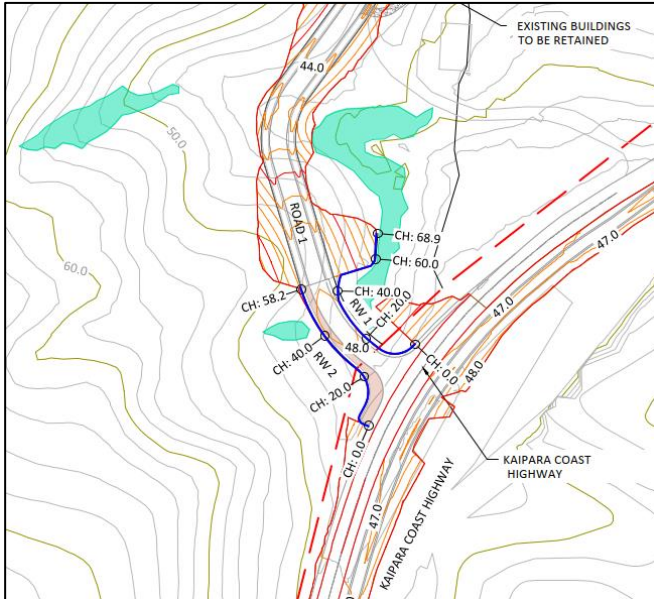
The letter from NZTA dated 30/4/2024 also does not appear to refer to the vegetation removal proposed within the legal road (as set out in your response to question 8). Do you have landowner approval in relation to these works?

Response:

The retaining walls associated with the new vehicle crossing are detailed in civil drawings C201 and C240, and labeled/named as Retaining wall 1 (RW 1) and Retaining wall 2 (RW 2), see snip below. The design indicates the required retaining heights to form the new vehicle crossing in cross-sections. NZTA has reviewed and approved the design with a condition to assess the detailed design prior to installation.

Please refer to the responses from other specialists for the remaining queries related to this item.





Query No.11: Please confirm that relevant standards in E11 and E12 are met. If not, please apply for the relevant consents. Can you please confirm that all parts of the Standards have been considered and demonstrate compliance in this regard. For example, it appears likely that E12.6.2(1) is infringed and it is unclear if standards related to floodplains and overland flow paths are met.

Response:

The assessment against E12.6.2(1) is summarised in the table below.

E 12.6.2(1) Land disturbance within riparian yards and coastal protection yards area limited to:		
	riparian yards*	Coastal protection yards**
(a) Operation, maintenance and repair (including network utilities);	NA	NA
(b) Less than 5m ² or 5m ³ , for general earthworks	Approx. 1810 m ²	Approx. 846 m ²
(c) Less than 10m ² or 5m ³ for the installation of new network utilities	New network utilities will be installed as part of the works in item (b)	
(d) Installation of fences and walking tracks; or	NA	NA
(e) Burial of marine mammals.	NA	NA

NOTE

NA = Not applicable

* Assume 20m yard setback from the edge of permanent and intermittent streams

** Assume 50 m yard setback from mean high water springs (approx. 1.9 mRL based on Auckland Vertical Datum 1946)

The assessment against E12 regarding floodplains and overland flow paths is summarized below.

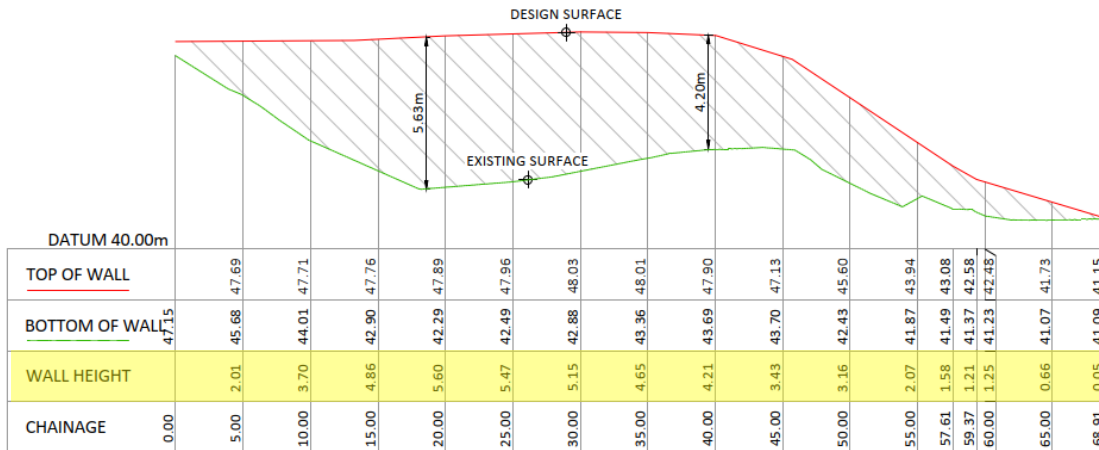
E12.6.2. General standards	Compliance	Non - Compliance
(11) Earthworks (including filling) within a 100 year annual exceedance probability (AEP) flood plain: a. (a) must not raise ground levels more than 300mm, to a total fill volume up to 10m ³ which must not be exceeded through multiple filling operations; and		Earthworks of Cut - 203m ³ and Fill - 866 m ³ are proposed for the construction of the new site entrance/ intersection with Kaipara Coast Highway within the 100 year AEP flood plain.
b. (b) must not result in any adverse changes in flood	The effects on the 100-year flood plains resulting from the	

<p>hazard beyond the site.</p> <p>Note1 This standard does not limit excavation and replacement of fill to form building platforms, where those works do not raise ground levels.</p>	<p>proposed earthworks are considered to be less than minor. This is based on the fact that the new intersection generally retains the existing road typology (single road crossfall) and geometry (localized longitudinal sag point), allowing the continued passage of overland flows.</p>	
<p>(12) Earthworks (including filling) within overland flow paths must maintain the same entry and exit point at the boundaries of a site and not result in any adverse changes in flood hazards beyond the site, unless such a change is authorised by an existing resource consent.</p>	<p>The proposed earthworks within the overland flow paths will retain the same entry and exit points as the existing layout, by maintaining the localised sag/low point at the intersection. Any potential adverse changes to flood hazard are expected to be less than minor.</p>	
<p>(13) Temporary land disturbance and stockpiling of soil and other materials within the one per cent annual exceedance probability (AEP) flood plain and/or overland flow path for up to a maximum of 28 days in any calendar year may occur as part of construction or maintenance activities.</p>	<p>This is not anticipated to be an issue. The construction methodology and timing for the proposed earthworks to establish the new vehicle entrance and intersection will be submitted to the Council in due course to ensure compliance.</p>	

Query No. 20: Please clearly identify on a plan what sections of the walls/ fencing meet the definition of building, the total height and appearance, and provide the relevant assessment under H19.

Response:

Please refer to civil drawings C240 to 242 for the proposed retaining wall heights, an example of where to locate this information is given in the snip below (yellow highlights). Kindly note that retaining walls that are up to 3 meters high in a rural zone do not require building consent under section 13.3 support structure of the building regulation, although they might fall under the definition of building under the AUP.



RETAINING WALL 1
SCALE 1H:2V

Refer to other specialists’ response regarding effect assessment of the total height and appearance.

Ecology

Query No. 53: No justification is provided for the proposed culvert length nor confirmation that earthworks within the wetland can be avoided during construction. The question remains outstanding.

Response:

The following response was provided in Crangcivil’s s92 response memo (dated 31/01/2024) regarding the length of culvert 5, can council please confirm review and confirm if this addresses the query?

“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.”

Streamworks

Query No. 62 The information provided by the applicant is considered to have address bullet points 1, 2 and 4.

Regarding bullet point 3, whilst the applicant’s engineers have provided previously a table summarising that all culverts meet the permitted activity condition of Regulation 70(2) of the NES:FW, what is required is sufficient information to independently confirm that this is the case.

i.e. no information has been provided on the stream’s width.

The ecologist has conducted a comprehensive site investigation of the streams and confirmed that no stream width exceeds 3 meters. Based on this information and the previously provided s92 response, we consider that the council has sufficient information required for their assessment.

It is also questioned, if the culverts meet with the NES:FW permitted activity conditions, whilst there is the need for spoiler baffles in these locations – and what has been used to inform the design of these standards which are different to those used in the New Zealand Fish Passage Guidelines (NIWA, 2018).

The design of the spoiler baffles is guided by the recommendations outlined in TR-2013/018 Hydraulic Energy Management to meet AUP requirements. Additionally, the New Zealand Fish Passage Guidelines also promotes for the use of spoiler baffles to enhance fish passage efficiency by reducing water velocity. The detailed design of culvert and spoil baffle will be submitted to the Council for approval during the building consent stage.

Regarding bullet point 6, collectively culverts have a length in excess of 30m and therefore they do not meet the permitted activity standards associated with rule E3.4.1(A32). The collective length of the 'culvert' structures exceeds 30m, 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 structures 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 to address adverse effects is proposed as part of the application, i.e an offset provided to account for the habitat modification as determined through the SEV/ECR calculation.

Based on the interpretation of AUP E3.6.1.14 - 1(a), (b), and (c), it is considered that the five proposed culverts should be assessed as individual, discrete structures to determine whether their lengths exceed 30 meters. The approximate lengths of each culvert are provided below for reference, confirming that none exceed the specified threshold requirement.

- *Culvert 1: 15m*
- *Culvert 2: 14m*
- *Culvert 3: 20m*
- *Culvert 4: 13m*
- *Culvert 5: 12m*

Please refer to ecologist and planner's response regarding SEV/ECR calculations.

It is also noted that the riprap outfall for culverts 2 and 3 is greater than 5 m. Another infringement of the standards. See sheet C470.

Council approval is required for Culverts 3 and 4 (as shown on sheet C470) to include riprap outfalls, with lengths of approximately 9 m and 8.8 m, respectively. This measure aims to dissipate energy effectively and minimise the potential risks of erosion and sedimentation.

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

Query No. 65: *Request remains as the applicant's response has not considered the effects on the wetland up- stream.*

Response:

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

Regarding the new culverts, the effects on the wetland up-stream are considered less than minor for the following reasons:

- The new culverts are designed to maintain the existing flow regime on site by providing a continuous flow channel where road / common accessway intersects with existing streams. This design ensures that all the existing wetlands, both upstream and downstream of culvert are protected and maintained as part of the proposed development.*
- The proposed culverts are considered small and short, and commonly used in practice. Therefore, the construction duration of each culvert can be easily controlled within a short period of time (i.e. 1-2 days), which further minimize effects on wetlands if any.*
- If deemed necessary, water can be manually supplied to keep wetlands hydrated during construction. Hydration methods will be determined by professional ecologist on site during construction.*

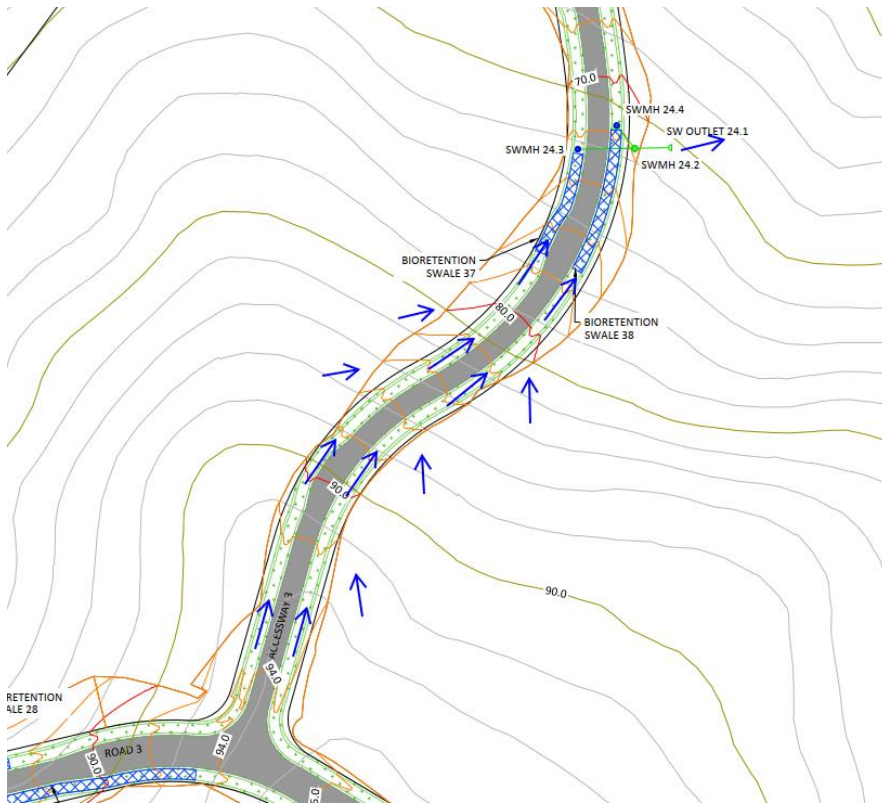
3.0 Response to S92 Request dated 5/12/2023

▪ engineering

Query No. 3: *The response is not consistent with roading typical cross sections. Please identify the areas where road is not built on ridge line and explain the influence on road drainage system due to runoff from additional catchment.*

Response:

For design of the roading drainage system roading, please refer to the typical cross section plans in conjunction with the drainage plans (i.e. C400 series). Where the roads/accessways are not proposed entirely along ridge lines, stormwater runoff from the adjacent catchments will be collected via the table drain on either side of the road and discharged through an outlet pipe. Snip below uses accessway 3 as an example, where blue arrows represent indicative flow direction.



Query No. 5: Private stormwater disposal outfalls should be located within the boundaries of the individual lots. The outfalls should be dispersal trench/level spreader in accordance with Countryside Living Toolbox to avoid concentrated flow. Please update the information accordingly.

Response:

The extent of private stormwater disposal outfalls have been revised and kept within the boundaries of the individual lots, please refer to civil drawing C400 series. Details of the private outfall structure will be designed and constructed by future lot owners through building consent application.

Query No. 6: Please provide OLFP plans as requested.

Response:

Please refer to civil drawing C906, which includes existing OLFP in vicinity of the proposed development and streams (also a form of OFLP).

Query No. 13: The Section 92 Response provides an updated assessment of gradients along the site access roads, to confirm compliance of maximum gradients along individual subdivision roads with the requirements of Unitary Plan Rule E27.6.4.4.1, which stipulates a maximum gradient of 1 in 5 (20%) for residential activities. While the Section 92 Response confirms that this is not achieved over a section of Accessway 1, it does not confirm the length or location of the section over which this non-compliance applies. Please clarify.

Please provide vertical profiling plans for the subdivision roads

Response:

The roading design of accessway 1 has been revised to have a longitudinal gradient less than 20%, please refer to civil drawing C315.

▪ **stormwater**

Query No. 14:

- *Drawing C450 and Appendix D (bioretention calculations in Engineering report) indicates that a storage layer has not been provided within the bioretention swale. Please explain how road/accessway retention volumes are achieved.*
- *The applicant claims that a bioretention swale is provided per 150m section of road, hence it is unclear why bioretention swales length vary significantly.*
- *Detention Calcs in App D are only for 35m swale length on roads and 23m swale lengths for accessways. Please explain how detention volumes can be achieved with swales with less of these lengths (i.e., swale 6, 12, 31, 32, 41,42, etc.).*

Response:

- *Drawing C450 and Appendix D have been revised to show the retention volumes allowed in the design to meet the SMAF approach.*
- *The design calculations provided in Appendix D are based on a 150 m section of road. This is used as a base reference in this preliminary design, the length of each bioretention swale is then prorated according to its designated roading catchment. For instance, bioretention swale 6, the total associated road length is approximately 56m, hence it is designed to be 13m ($35/150*56$) to meet both detention and retention requirements.*
- *Please see the response to the 2nd bullet point above, which explains the reason why some swales have length longer or less than 23m.*

Further detailed design will be provided to Auckland Council for review as part of the Engineering Approval process for the roads / common accessways design.

Query No. 15: *Please provide swale sizing with check dam calculation.*

Response:

To clarify, the proposed stormwater management approach does not include conventional swale (with check damn) to achieve a minimum 9 min hydraulic residence time for water quality treatment. All water quality treatment for the roads will be achieved through the implementation of bioretention swales.

The check damn indicated in civil drawing C451 is intended to reduce flow velocity in the grass table drain to minimize erosion only. As mentioned in the previous s92 response, the grassed table drain is designed to convey rainfall events up to 100yr ARI. A copy of calculations is included in Appendix F of the engineering report (Rev D), which demonstrates sufficient conveyance capacity for the most critical contributing catchment (i.e a 250 m road length).

As previously noted, detailed design will be submitted to Auckland Council for review as part of the Engineering Approval process for the roads / common accessways design.

Query No. 16:

- Please note that the TR-018 states that if the Froude number is greater than 3, hydraulic jump basins are required. SW Outlet 3.1, 4.1, 6.1, 14.1, 16.1, 18.1, 22.1 and 24.1 will likely require a hydraulic jump basin. Please assess and provide calculations.
- Please align median riprap diameter size to recommended minimum as per TR-018 where this threshold is not met.
- Please align riprap thickness to recommended minimum as per TR-018 where this threshold is not met.
- It is unclear why culvert 4 downstream velocity has decreased significantly for the 1% AEP peak flow rate. Consequently, riprap – culvert 4 outlet protection design appears to be under designed.
- TR-018 Baffle block design is not suitable where exit velocities are greater than 5m/s. Please refer to HEC 14 or provide alternative energy dissipater design for Culverts 1 & 5.

Response:

The proposed riprap sizing and thickness have been revised to meet TR-018 requirements (i.e. 150 mm minimum riprap size), see Appendix E of the engineering report (Rev D). Detailed design of the energy dissipater at the outlets will be provided to council at building consent stage for review and approval.

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

Yours faithfully

CRANG CIVIL



Zibo Yang