

**From:** [Balaji Karnan](#)  
**To:** [Sarah Basheer](#)  
**Cc:** [Link Zhao](#); [Peter Reaburn](#); [Duncan Ross](#)  
**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review  
**Date:** Thursday, 7 September 2023 4:28:13 pm  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)  
[image005.png](#)  
[image006.jpg](#)  
[Kohe 2 - Further Information Requests Healthy Waters .docx](#)

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Hi Sarah,

Thank you for your response. We have indeed received the outstanding comments, including Item SW1 & SW7 as per the attachment. However, I thought these comments were issued prior to completing the review/verification process. Could you please confirm if the attached are the outstanding comments?

Also, regarding SW1 CN value, according to the site geotechnical investigation undertaken by Soil&Rock Consultants (dated March 2022), the soil comprises of a mix of tuff volcanic material as described in Group A (CN=39) and alluvial material as described in Group B (CN=61) in the vicinity. Hence, the permeable CN of 50 is used which is the average between the two soil groups found in the site. While a curve number of 98 was used for all impervious areas within the site.

Kind regards,

**Balaji Karnan (CPEng)** |  | **Senior Civil Engineer** | **M** +64 21 035 3766 | **W** [www.civix.co.nz](http://www.civix.co.nz)

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**From:** Sarah Basheer <[sarah.basheer@aucklandcouncil.govt.nz](mailto:sarah.basheer@aucklandcouncil.govt.nz)>  
**Sent:** Thursday, September 7, 2023 3:45 PM  
**To:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>; [sbasheer@tonkintaylor.co.nz](mailto:sbasheer@tonkintaylor.co.nz)  
**Cc:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>; Peter Reaburn <[peterr@catobolam.co.nz](mailto:peterr@catobolam.co.nz)>; Duncan Ross <[duncan@civix.co.nz](mailto:duncan@civix.co.nz)>  
**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Balaji,

I thought we had replied to this a while ago? The email you sent on the 23<sup>rd</sup> of August contained a list of outstanding items and SW1 highlights our latest question (regarding CN) has there been an update since then?

Kind regards  
Sarah

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**From:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>  
**Sent:** Wednesday, September 6, 2023 9:23 AM  
**To:** Sarah Basheer <[sarah.basheer@aucklandcouncil.govt.nz](mailto:sarah.basheer@aucklandcouncil.govt.nz)>; [sbasheer@tonkintaylor.co.nz](mailto:sbasheer@tonkintaylor.co.nz)  
**Cc:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>; Peter Reaburn <[peterr@catobolam.co.nz](mailto:peterr@catobolam.co.nz)>;

Duncan Ross <[duncan@civix.co.nz](mailto:duncan@civix.co.nz)>

**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Sarah,

I hope you're doing well.

I'm reaching out to inquire about the progress of your review or verification.

I'd be happy to arrange a meeting to discuss it if that suits you better .

Kind regards,

**Balaji Karnan (CPEng)** |  | **Senior Civil Engineer** | **M** +64 21 035 3766 |  
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**From:** Balaji Karnan

**Sent:** Wednesday, August 23, 2023 9:22 AM

**To:** 'Link Zhao' <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>; Sarah Basheer <[sarah.basheer@aucklandcouncil.govt.nz](mailto:sarah.basheer@aucklandcouncil.govt.nz)>; [sbasheer@tonkintaylor.co.nz](mailto:sbasheer@tonkintaylor.co.nz)

**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Thank you Link,

Hi Sarah,

Welcome to the project.

I received the attached comments from Peter R (Catobolam). Just wondering if there are any further comments at this stage. Thanks,

Kind regards,

**Balaji Karnan (CPEng)** |  | **Senior Civil Engineer** | **M** +64 21 035 3766 |  
**W** [www.civix.co.nz](http://www.civix.co.nz)

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**From:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>

**Sent:** Wednesday, August 23, 2023 9:09 AM

**To:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>

**Cc:** Sarah Basheer <[sarah.basheer@aucklandcouncil.govt.nz](mailto:sarah.basheer@aucklandcouncil.govt.nz)>; [sbasheer@tonkintaylor.co.nz](mailto:sbasheer@tonkintaylor.co.nz)

**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Balaji,

I have completed my review and provided my comments to Sarah, who has taken over Nimal's duties for the catchment.

She will be getting in touch with you. Alternatively, you can reach out to her to verify the progress.

Thanks!

Best,

**Link Zhao | Senior Healthy Waters Specialist**

**Healthy Waters | Infrastructure & Environmental Services**

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**From:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>

**Sent:** Wednesday, August 23, 2023 8:53 AM

**To:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>

**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Link,

Hope everything is going well at your end.

Just following up to know whether the review is completed. Kindly shoot out if there is any query.

Kind regards,

**Balaji Karnan (CPEng) |  | Senior Civil Engineer | M +64 21 035 3766 | W [www.civix.co.nz](http://www.civix.co.nz)**

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**From:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>

**Sent:** Tuesday, July 25, 2023 11:13 AM

**To:** Duncan Ross <[duncan@civix.co.nz](mailto:duncan@civix.co.nz)>; Nimal Gamage <[nimal.gamage@aucklandcouncil.govt.nz](mailto:nimal.gamage@aucklandcouncil.govt.nz)>; [sbasheer@tonkintaylor.co.nz](mailto:sbasheer@tonkintaylor.co.nz)

**Cc:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>; Nick Mattison <[nick@civix.co.nz](mailto:nick@civix.co.nz)>; Peter Reaburn <[peterr@catobolam.co.nz](mailto:peterr@catobolam.co.nz)>

**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Duncan,

Nimal retired last week, and Sarah is taking over Nimal's duties.

I'm still in the process of the updated model review. We will come back to you once I complete the review.

Best regards,

Link

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**From:** Duncan Ross <[duncan@civix.co.nz](mailto:duncan@civix.co.nz)>

**Sent:** Monday, July 24, 2023 4:00 PM

**To:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>; Nimal Gamage <[nimal.gamage@aucklandcouncil.govt.nz](mailto:nimal.gamage@aucklandcouncil.govt.nz)>

**Cc:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>; Nick Mattison <[nick@civix.co.nz](mailto:nick@civix.co.nz)>; Peter Reaburn <[peterr@catobolam.co.nz](mailto:peterr@catobolam.co.nz)>

**Subject:** FW: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Link / Nimal

Let us know an approx. timeframe for a rescheduled meeting please.

Cheers

Kind regards,

**Duncan Ross** |  | **Planner & Director** | **M** +64 27 405 9765 |  
**W** [www.civix.co.nz](http://www.civix.co.nz)

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**From:** Joshua Symons <[joshua@civix.co.nz](mailto:joshua@civix.co.nz)>

**Sent:** Monday, July 24, 2023 3:54 PM

**To:** Duncan Ross <[duncan@civix.co.nz](mailto:duncan@civix.co.nz)>

**Subject:** FW: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Duncan,

The flood modelling package, as sent to Council, is below.

Kind regards,

**Joshua Symons** |  | **Civil Designer** | **M** +64 22 691 4939 |  
**W** [www.civix.co.nz](http://www.civix.co.nz)

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**From:** Balaji Karnan

**Sent:** Friday, July 21, 2023 7:01 AM

**To:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>; Nimal Gamage <[nimal.gamage@aucklandcouncil.govt.nz](mailto:nimal.gamage@aucklandcouncil.govt.nz)>; Susan Andrews <[susan.andrews@aucklandcouncil.govt.nz](mailto:susan.andrews@aucklandcouncil.govt.nz)>

**Cc:** Duncan Ross <[duncan@civix.co.nz](mailto:duncan@civix.co.nz)>; Sam Blackbourn <[sam@civix.co.nz](mailto:sam@civix.co.nz)>; Nick Mattison <[nick@civix.co.nz](mailto:nick@civix.co.nz)>; [PeterR@catobolam.co.nz](mailto:PeterR@catobolam.co.nz)

**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Link & Nimal,

Thank you for your patience and understanding.

Latest TuFlow model, revised SMP, Flood Report and Concept Master Plan along with Flood Pond Catchment Plan and sizing calculations are available in the link below:

[230720 Cl23 Response to Council](#)

TuFlow Model has been incorporated with the suggested changes. Kindly review and let us know if there are any queries.

Also, attached the responses to Kohe 2 - Further Information Requests – SW Queries.

Kind regards,

**Balaji Karnan (CPEng)** |  | **Senior Civil Engineer** | **M** +64 21 035 3766 |  
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**From:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>  
**Sent:** Friday, June 2, 2023 9:21 AM  
**To:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>  
**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Balaji,

Yes, it is.

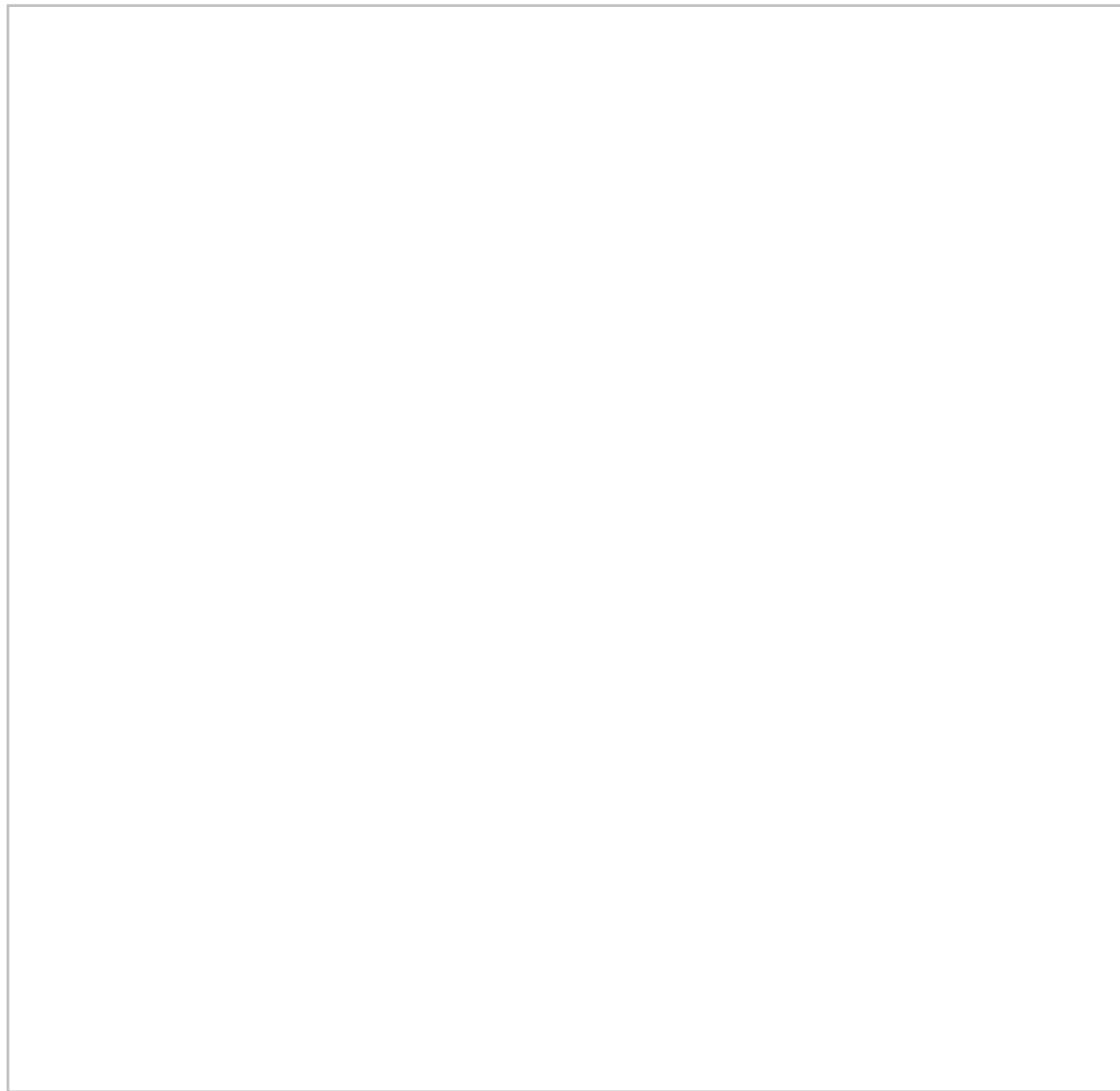
**Link Zhao | Senior Healthy Waters Specialist**  
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**From:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>  
**Sent:** Friday, June 2, 2023 9:19 AM  
**To:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>  
**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Link,

Are you able to provide a snip of exact section where the water level time series is provided. Is it as shown in the red line below:



Kind regards,

**Balaji Karnan (CPEng)** |  | **Senior Civil Engineer** | **M** +64 21 035 3766 | **W** [www.civix.co.nz](http://www.civix.co.nz)

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**From:** Link Zhao <[link.zhao@aucklandcouncil.govt.nz](mailto:link.zhao@aucklandcouncil.govt.nz)>

**Sent:** Friday, May 19, 2023 12:38 PM

**To:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>

**Cc:** Nimal Gamage <[nimal.gamage@aucklandcouncil.govt.nz](mailto:nimal.gamage@aucklandcouncil.govt.nz)>

**Subject:** RE: 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Balaji,

Please see the water level time series (downstream side of Valley Road) of 100yrsCC and 10yrsCC attached. The data was extracted from AC 2022 regionwide rural rapid flood model, which was also done by Tuflow.

In order to model it accurately, it may be necessary to make some adjustments to ensure that the peak flow of the model aligns with the boundary level provided.

Additionally, I would like to emphasize the importance of considering the 1800mm culvert located under Valley Road.

If you have any questions, please let me know.

Best regards,

**Link Zhao | Senior Healthy Waters Specialist**

**Healthy Waters | Infrastructure & Environmental Services**

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**From:** Nimal Gamage <[nimal.gamage@aucklandcouncil.govt.nz](mailto:nimal.gamage@aucklandcouncil.govt.nz)>

**Sent:** Wednesday, April 12, 2023 6:43 PM

**To:** Balaji Karnan <[Balaji@civix.co.nz](mailto:Balaji@civix.co.nz)>

**Subject:** 47 Golding Road and 50 Pukekohe East Road Model Review

Hi Balaji

Model review has identified the following issues. Could you rectify these issues and resubmit the model for review please.

### 1. Boundary

- There is a discrepancy between the modelled upstream inflows and Table 4 in the report. While the report shows 22 inflows, the model shows 25 inflows, and spot checks have revealed incorrect inflows for some locations. Therefore, it is necessary to review and update the inflow information.

We will update the table to the latest.

- The downstream boundary has been modelled as a free flow, which may underestimate the backwater effect and constraint. It's recommended to extend the boundary to the downstream side of Valley Road and applying HT boundary (level time series provided by Healthy Waters) for better accuracy.

Yes, we can extend the boundary. [Can you please provide the level time series?](#)

### 2. Mass balance error

- Mass balance errors vary from 0.91%~3.80%, which are slightly high. It is crucial to maintain a mass balance error of <=1%, and improvements should be made accordingly.

### 3. Roughness

- Building footprint roughness has been modelled as blocked out area. This approach may change the overland flow path in an incorrect way and underestimate the runoff because the cell would be inactive and excluded from the simulation. It's recommended to use high roughness  $n=1.00$  for the building footprints.
- Additionally, roughness values for grass and paved roads (Table 5 in the report) were slightly low, and we recommend using the following values instead:
  - Grass (low to high dense): 0.04~0.11
  - Roads/Impervious Areas: 0.02~0.025

#### 4. Culvert

- Culverts should be assumed to have total blockage where less than DN1500 and 50% blockage if greater than or equal to DN1500. (SW-CoP-v3, [4.3.9.8](#) Culverts)
- Pits node (SXL) was used for 1D/2D connection, which may underestimate the inlet/outlet loss. BMT is recommending to use 1D culvert connected with SX lines or polygons and use a 2D breakline for the road/rail embankment to control the flow over the top. Appropriate entry/exit loss should be applied using attributes of "1d\_nwk" layer.

Ngā Mihi | Kind regards

**Nimal Gamage**

**Senior Engineer**

**Healthy Waters | Infrastructure & Environmental Services**

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