

Kāinga Ora Homes and Communities
By Email

8 April 2024

Attention: s 9(2)(a)

Dear s 9(2)(a)

Report on April 2024 Visual Inspection

In accordance with the additional service requested under Project HB100013 for Hobsonville Seaplane Ramp, we carried out a visual inspection on Friday the 5th April 2024 at which time we also measured beam deflection at a previously installed fixed observation point and observed crack widths at previously installed crack gauges and did manual crack width measurements of some of the worst affected beams near the outer edge of the structure. The inspection was carried out by s 9(2)(a) who also did the last inspection and load test monitoring in 2023.

We have prepared a brief site visit report with a selection of photographs from this inspection and have included similar photographs taken in February 2023 and August 2021 to help identify any signs of progression of deterioration. Photographs are taken where access is reasonably safe and so do not capture some of severe deteriorated far from the outside edges of the ramp.

Some evidence obtained from this inspection is positive but other evidence is worrying. I will cover the positive evidence first. None of the crack gauges installed across significant cracks in November 2019 have moved since they were installed, and the vertical distance measured between the underside of span 3 eastern outer beam and a tight reference line has also not significantly changed since 2021. The vertical measurement aims to detect vertical movement of the beam at mid-span, where progressive sagging over several readings would indicate loss of flexural capacity and random fluctuation would indicate normal changes in thermal gradient. The latest measurement in one location is 2mm smaller than in 2023 and is the same as in 2021 and in another location is stable, so there is no indication of loss of flexural capacity.

However, of minor concern are observations that some spalls and cracks on the deck upper surface have visibly deteriorated and of greater concern is an observation that some of the widest longitudinal cracks on the underside of beams have significantly widened, and that some concrete is poorly attached.

It should be noted that as loss of reinforcing continues, the reliability of infrequent load test as proof of safety will decrease, because structural performance will become increasingly erratic as reinforcing loss approaches some critical level. Since no beams have been tested to failure, we do not know how close previous test load demands were to the current capacity of the beams, so do not know if eventual failure from ongoing loss of reinforcing is imminent or likely after many more years. Therefore, despite the successful load tests that were conducted in February 2023, and the latest observation that there has been relatively little overall change in the condition since then, we consider the widening of some cracks to be sufficient evidence for us to be unable to advise Kainga Ora that it remains safe to keep the ramp in limited use for another year. Therefore, we recommend that the ramp is removed from service in the near future.

There is also an increasing risk of concrete falling off the underside of the structure and pile cap ends, and we recommend that beach level access to the ramp is prevented.

Yours sincerely

s 9(2)(a)

Structural Engineering

on behalf of

Beca Limited

Phone Number: +64 9 s 9(2)(a)

Email: s 9(2)(a)@beca.com

Copy

s 9(2)(a) Beca

PROACTIVELY RELEASED

Site Visit Report N° 1

Project: Seaplane Ramp Asset Management
Principal: Kainga Ora
Contractor: not applicable

Area of site visited: Hobsonville Seaplane Ramp	Purpose of visit: Site inspection, existing defect
Date/Time of visit: 16/02/2023 at 10:00 am	Weather: Sunny
Beca personnel: s 9(2)(a)	Contractors representative accompanying Beca personnel: s 9(2)(a) – Over phone notification on site.
Health and Safety Observations: <ul style="list-style-type: none"> ■ Safe access provided for inspection over the ramp & eastern outer edge under the ramp. ■ No loads were present on site during the inspection. 	
Construction work in progress: N/A, Site inspection of existing Structure.	
Observations: <ul style="list-style-type: none"> ■ Deflection of the eastern beam at span 3 eastern outer girder was measured on site, no change was noticed from the preload. Confirmation of previous / existing defects to current condition – refer to the findings with photos below.	
Comments made to/by contractor's representative: Refer to the findings with photos below.	
Follow-up actions required: Refer to covering letter	
Attachments: Refer to the inspection photos below for defects identified on site.	
Report prepared by: s 9(2)(a)	Report reviewed by: s 9(2)(a)

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August 2021 Inspection

February 2023 Inspection

April 2024 Inspection

Pier Capping Beam at Gridline B East side



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August 2021 Inspection	February 2023 Inspection	April 2024 Inspection
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Longitudinal Deck Slab Girders (Span 2 at Gridline C end)



10mm- 20mm significant Longitudinal concrete cracks along existing P.C beams with severe induced corrosion of reinforcement bars.



15mm- 23mm significant Longitudinal concrete cracks along existing P.C beams with severe induced corrosion of reinforcement bars.

PROACTIVELY RELEASED

August 2021 Inspection

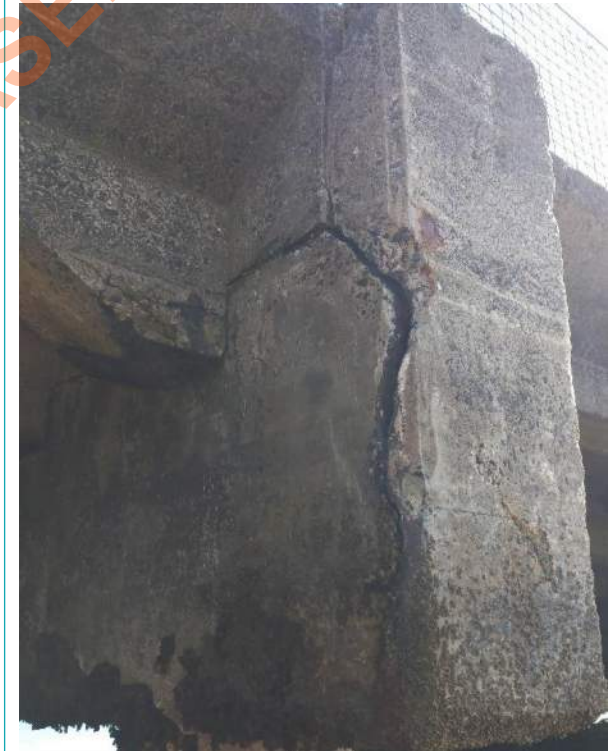
February 2023 Inspection

April 2024 Inspection

Pier Capping Beam at Gridline C



Severe concrete cracking of the capping beam upstand at the eastern end, approx 20mm wide.



Severe concrete cracking of the capping beam upstand at the eastern end, approx 23mm wide.

August 2021 Inspection

February 2023 Inspection

April 2024 Inspection

Transverse beam span 3 overhang Beam Units (Span 3)



Spalling of concrete with Existing transverse bottom reinforcement lost due to severe corrosion.



Existing transverse bottom reinforcement lost due to severe corrosion

PROACTIVELY RELEASED

August 2021 Inspection

February 2023 Inspection

April 2024 Inspection

Longitudinal Beam Units (Span 3), towards eastern side



10mm- 20mm significant Longitudinal concrete cracks along existing P.C beams with severe induced corrosion of reinforcement bars.

15mm- 22mm significant Longitudinal concrete cracks along existing P.C beams with severe induced corrosion of reinforcement bars.

August 2021 Inspection February 2023 Inspection April 2024 Inspection

Pier Capping Beam at Gridline D, Eastern Side



Capping beam eastern end upstand wall lost due to severe concrete spall and reinforcement corrosion.



Capping beam eastern end upstand wall, severe corrosion induced cracking of concrete.

August 2021 Inspection	February 2023 Inspection	April 2024 Inspection
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Longitudinal Beam Units (Span 4)



10mm- 20mm significant Longitudinal concrete cracks along existing P.C beams with severe induced corrosion of reinforcement bars.



15mm- 22mm significant Longitudinal concrete cracks along existing P.C beams with severe induced corrosion of reinforcement bars.

PROACTIVELY RELEASED

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Crack Gauge 1: Soffit of Span 3 Edge Girder at Midspan



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August 2021 Inspection

February 2023 Inspection

April 2024 Inspection

Crack Gauge 2: External Edge of Span 3 Edge Girder at Midspan



PROACTIVELY CLOSED

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Crack Gauge 3: Soffit of Span 4 Edge Girder Near Pier 3 (Landward End)



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February 2023 Inspection

April 2024 Inspection

Top surface – Cracking & spalling at joints above piers (Pier at Gridline E)



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February 2023 Inspection

April 2024 Inspection

Top surface – Cracking & spalling of grout between longitudinal girders (Span 6 – Grid F).



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February 2023 Inspection

April 2024 Inspection

Top surface –Spalling of grout in span 7 (Grid G) with timber planks wedged into place to fill the void.



PROACTIVELY RELEASED

February 2023 Inspection

April 2024 Inspection

Top surface - Spalling of grout between the first two girders at the ramp edges (Span 7 -Eastern Outer girder).



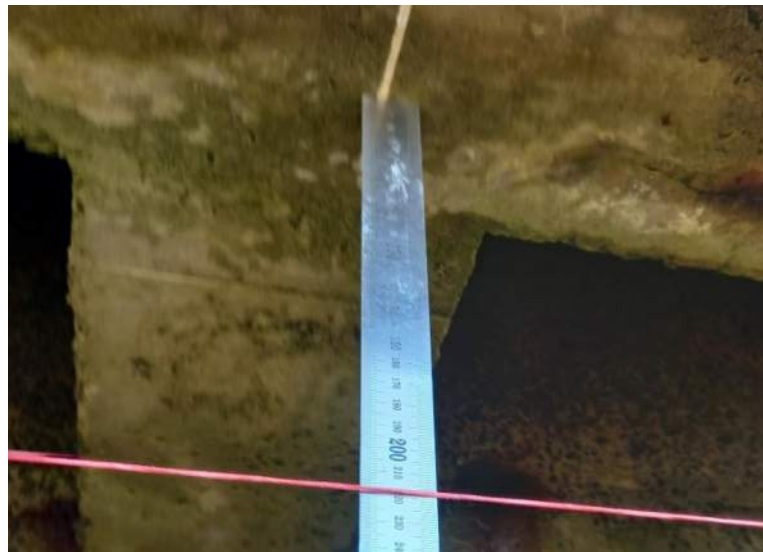
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August 2021 Inspection February 2023 Inspection April 2024 Inspection

Beam deflection check Span 3 Eastern Outer girder.



2021 inspection reading at the southeast outer girder = 218mm



2023 inspection reading at the southeast outer girder = 220mm



2024 inspection reading at the southeast outer girder = 218mm

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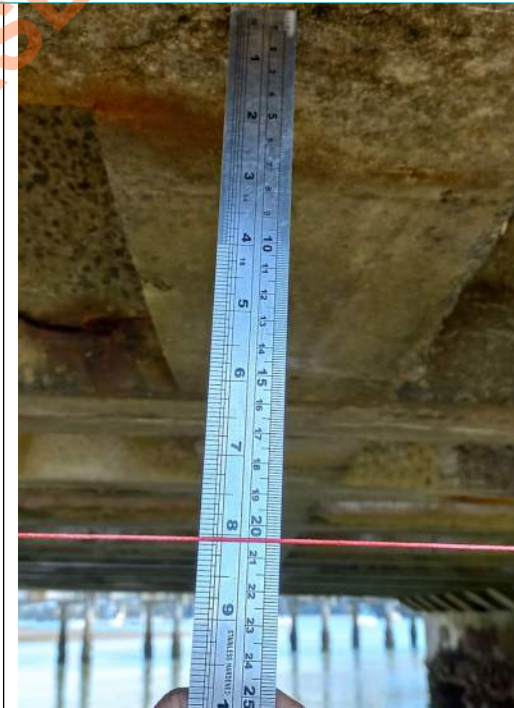
Beam deflection check Span 3 Eastern Outer girder.



2021 inspection reading at the northeast outer girder = 205mm



2023 inspection reading at the northeast outer girder = 205mm



2024 inspection reading at the northeast outer girder = 205mm

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