

Bowen Wharf

Refurbishment Study - Testing Report



In 2019 North Queensland Bulk Ports engaged global consultancy firm Arup to undertake condition assessment and refurbishment optioneering for the existing Bowen Wharf as part of the Bowen Wharf Future Options Assessment.

As part of these studies Arup carried out a range of physical testing and inspection on the timber elements, concrete headstocks and concrete piles.

The condition assessment, along with a load assessment formed the basis for Arup recommendations on timber replacement and strengthening works which were subsequently carried out between February and August 2021 as part of the Bowen Wharf Project.

The testing, dive survey and heat maps captured as part of the Bowen Wharf Future Options Assessment, Testing Report can be accessed as Appendix A to E.

The Timber Testing, presented as Appendix A and Heat Maps presented as Appendix E may not be representative of the current condition of the timber elements due to replacement and strengthening works carried out as part of the Bowen Wharf Project, 2021.

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Appendix A

Timber Testing

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Middle Wharf Stem	49-50	K	Landside	0	0	200	350	420	horizontal drill, void full of water	
Middle Wharf Stem	49-50	K	Midspan						not drilled as covered by rocks	
Middle Wharf Stem	49-50	K	Seaside	0	0	230	350	420	pipng void, drilled horizontal	150
Middle Wharf Stem	49-50	I	Landside	0	0			400	solid, good swath	
Middle Wharf Stem	49-50	I	Midspan	0	0			400	solid, good swath	
Middle Wharf Stem	49-50	I	Seaside	0	0			400	solid, good swath	0
Middle Wharf Stem	49-50	G	Landside	0	0			400	solid, good swath	
Middle Wharf Stem	49-50	G	Midspan	0	0			400	solid, good swath	
Middle Wharf Stem	49-50	G	Seaside	0	0			400	solid, good swath	0
Middle Wharf Stem	49-50	E	Landside	0	0	100	300	420	central void	
Middle Wharf Stem	49-50	E	Midspan	0	0	100		420	full void, drill from below	
Middle Wharf Stem	49-50	E	Seaside	0	0	100		420	full void	320
Middle Wharf Stem	49-50	C	Landside	0	0			400	solid, good swath	
Middle Wharf Stem	49-50	C	Midspan	0	0			400	solid, good swath	
Middle Wharf Stem	49-50	C	Seaside	0	0			400	solid, good swath	0
Middle Wharf Stem	50-51	K	Landside	0		120		400		
Middle Wharf Stem	50-51	K	Midspan	0	0	120	300	400	central void, horizontal drill 180-200mm	
Middle Wharf Stem	50-51	K	Seaside	0	0			400		280
Middle Wharf Stem	50-51	I	Landside	0	0	120		400	not able to drill	
Middle Wharf Stem	50-51	I	Midspan	0	0	90		400	full top void, with small 10-20mm hard drills	
Middle Wharf Stem	50-51	I	Seaside	0	0	80	120	400	40 gap after the 120 measure, last 60 was soft drilling	310
Middle Wharf Stem	50-51	G	Landside	0	0	30		430	split in timber with a full depth void, horizontal drill to confirm void	
Middle Wharf Stem	50-51	G	Midspan	0	0	60		430	split extends beyond the middle girder, full depth top void	
Middle Wharf Stem	50-51	G	Seaside	0	0			430	solid	400
Middle Wharf Stem	50-51	E	Landside	0	0	80	280	400	80 solid, then 200mm of small voids 20-30mm each, then solid to base. Drilled from below.	
Middle Wharf Stem	50-51	E	Midspan	0	0	100	250	400	100 solid, 150 void, then solid to base, drilled from below	
Middle Wharf Stem	50-51	E	Seaside	0	0	50	300	400	50mm solid, 250 void, then 100 solid, drilled from below.	250
Middle Wharf Stem	50-51	C	Landside	0	0			430	termite damage in the sap wood, solid	
Middle Wharf Stem	50-51	C	Midspan	0	0			430	termite damage in the sap wood, solid	
Middle Wharf Stem	50-51	C	Seaside	0	0			430	termite damage in the sap wood, solid	0
Middle Wharf Stem	51-52	K	Landside	0	0			420	solid drill, drilling from under on rock, sideways drilling	
Middle Wharf Stem	51-52	K	Midspan	0	0			420	solid drill, drilling from under on rock, sideways drilling	
Middle Wharf Stem	51-52	K	Seaside	0	0			420	solid drill, drilling from under on rock, sideways drilling	0
Middle Wharf Stem	51-52	I	Landside	0	0			420	soft drilling, cavity on outside of girder towards south of 20mm. Black sawdust present	
Middle Wharf Stem	51-52	I	Midspan	0	0			420	soft drilling, cavity on outside of girder towards south of 20mm. Black sawdust present	
Middle Wharf Stem	51-52	I	Seaside	0	0			420	soft drilling, cavity on outside of girder towards south of 20mm. Black sawdust present	0
Middle Wharf Stem	51-52	G	Landside	0	0			410	Solid, drilled from below	
Middle Wharf Stem	51-52	G	Midspan	0	0	210		410	minor splits/voids from 200mm to top, drilled from below	
Middle Wharf Stem	51-52	G	Seaside	0	0	180		410	230mm void at top, drilled from below	230
Middle Wharf Stem	51-52	E	Landside	0	0			400	Solid, drilled from below	
Middle Wharf Stem	51-52	E	Midspan	0	0			400	Solid, drilled from below	
Middle Wharf Stem	51-52	E	Seaside	0	0	150		400	250 void at top, drilled from below	250
Middle Wharf Stem	51-52	C	Landside	0	0			420	Solid, drilled from below	
Middle Wharf Stem	51-52	C	Midspan	0	0			420	Solid, drilled from below	
Middle Wharf Stem	51-52	C	Seaside	0	0			420	Solid, drilled from below	0
Middle Wharf Stem	52-53	K	Landside	0	0			430	solid drill. Drilled from underside	
Middle Wharf Stem	52-53	K	Midspan	0	0			430	solid drill. Drilled from underside	
Middle Wharf Stem	52-53	K	Seaside	0	0			430	solid drill. Drilled from underside	0
Middle Wharf Stem	52-53	I	Landside	0	0			400	Solid, drilled from below	
Middle Wharf Stem	52-53	I	Midspan	0	0	200		400	minor splits/voids from 200mm to top, drilled from below	
Middle Wharf Stem	52-53	I	Seaside	0	0	150		400	250mm void at top, drilled from below	250
Middle Wharf Stem	52-53	G	Landside	0	0			410	solid drill, underside drilling	
Middle Wharf Stem	52-53	G	Midspan	0	0			410	solid drill, underside drilling	
Middle Wharf Stem	52-53	G	Seaside	0	0	290		410	top void of 120mm	120
Middle Wharf Stem	52-53	E	Landside	0	0	250	300	420	void of 50mm	
Middle Wharf Stem	52-53	E	Midspan	0	0			420	solid drill, black saw dust present in hole.	
Middle Wharf Stem	52-53	E	Seaside	0	0	210	250	420	small void with black saw dust present.	50
Middle Wharf Stem	52-53	C	Landside	0	0			420	Solid, drilled from below	
Middle Wharf Stem	52-53	C	Midspan	0	0			420	Solid, drilled from below	
Middle Wharf Stem	52-53	C	Seaside	0	0			420	Solid, drilled from below	0
Middle Wharf Stem	53-54	K	Landside	0	0			450	boat drilling. Solid no voids	
Middle Wharf Stem	53-54	K	Midspan	0	0			450	boat drilling. Solid no voids	
Middle Wharf Stem	53-54	K	Seaside	0	0			450	boat drilling. Solid no voids	0
Middle Wharf Stem	53-54	I	Landside	1020	0	900	870	620	120mm top timber, 30mm void, then solid for rest	
Middle Wharf Stem	53-54	I	Midspan	1030	0	880	820	620	150mm top timber, 60mm void, then solid for rest	
Middle Wharf Stem	53-54	I	Seaside	1010	0	900	700	620	110mm top timber, 200mm void, then solid for rest	200
Middle Wharf Stem	53-54	G	Landside	820	0			420	solid drill	
Middle Wharf Stem	53-54	G	Midspan	830	0	800	570	420	top void	
Middle Wharf Stem	53-54	G	Seaside	830	0			430	solid drill	230
Middle Wharf Stem	53-54	E	Landside	990	0	900	820	580	90mm timber, 80mm void, then solid for rest	
Middle Wharf Stem	53-54	E	Midspan	1020	0	980	850	580	40mm top timber, 130mm void then solid for rest	
Middle Wharf Stem	53-54	E	Seaside	1020	0	1000	940	640	20mm top timber, 60mm void, then solid for rest	130
Middle Wharf Stem	53-54	C	Landside	820	0			430	polished hole could not drill	
Middle Wharf Stem	53-54	C	Midspan	830	0			430	solid drill	
Middle Wharf Stem	53-54	C	Seaside	830	0			420	solid called at 420	0
Middle Wharf Stem	54-55	K	Landside	0	0			450	boat drilling, solid no voids	
Middle Wharf Stem	54-55	K	Midspan	0	0			450	boat drilling, solid no voids	
Middle Wharf Stem	54-55	K	Seaside	0	0			450	boat drilling, solid no voids	0
Middle Wharf Stem	54-55	I	Landside	850	0	800	760	450	40mm void at top of girder	
Middle Wharf Stem	54-55	I	Midspan	850	0			450	Solid	
Middle Wharf Stem	54-55	I	Seaside	850	0			450	Solid	40
Middle Wharf Stem	54-55	G	Landside	1080	780			380	Solid	
Middle Wharf Stem	54-55	G	Midspan	1080	780	680		520	~160mm void from bottom of girder	
Middle Wharf Stem	54-55	G	Seaside	850	0	800		450	Solid	160
Middle Wharf Stem	54-55	E	Landside	1080	860			450	Solid	
Middle Wharf Stem	54-55	E	Midspan	1075	850			450	Solid	
Middle Wharf Stem	54-55	E	Seaside	1080	830			430	Solid	0
Middle Wharf Stem	54-55	C	Landside	820	0	690	530	420	large void in girder	
Middle Wharf Stem	54-55	C	Midspan	830	0	810	740	420	drill track down a crack	
Middle Wharf Stem	54-55	C	Seaside	820	0			-	drill tracking through cracks. Drill binding while in operation called at 500	160
Middle Wharf Stem	55-56	K	Landside	0	0			410	boat drilling, solid no voids	
Middle Wharf Stem	55-56	K	Midspan	0	0			410	boat drilling, solid no voids	
Middle Wharf Stem	55-56	K	Seaside	0	0			410	boat drilling, solid no voids	0
Middle Wharf Stem	55-56	I	Landside	1070	870			480	Solid	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Middle Wharf Stem	55-56	I	Midspan	1080	920			480	Solid, few minor cracks/splits	
Middle Wharf Stem	55-56	I	Seaside	1080	880			470	Solid, minor crack/void at base	0
Middle Wharf Stem	55-56	G	Landside	0	-			410		
Middle Wharf Stem	55-56	G	Midspan	0	-	20		410	Full Depth void with termite attack	
Middle Wharf Stem	55-56	G	Seaside	0	-			410		390
Middle Wharf Stem	55-56	E	Landside	850		820	690	450	Small void near top	
Middle Wharf Stem	55-56	E	Midspan	850		810	780	450	Additional small void from 680 - 660	
Middle Wharf Stem	55-56	E	Seaside	850		830	680	450	20mm void near bottom	150
Middle Wharf Stem	55-56	C	Landside	0				450	drilled into crack otherwise solid	
Middle Wharf Stem	55-56	C	Midspan	0				450	solid	
Middle Wharf Stem	55-56	C	Seaside	0				450	solid	0
Middle Wharf Stem	56-57	K	Landside	0	0			430	boat drilling, solid no voids.	
Middle Wharf Stem	56-57	K	Midspan	0	0			430	boat drilling, solid no voids.	
Middle Wharf Stem	56-57	K	Seaside	0	0			431	boat drilling, solid no voids.	0
Middle Wharf Stem	56-57	I	Landside	1080	880			450	Solid	
Middle Wharf Stem	56-57	I	Midspan	1080	870			420	Solid	
Middle Wharf Stem	56-57	I	Seaside	1080	870			450	Solid	0
Middle Wharf Stem	56-57	G	Landside	820	0	610	550	420	Central Void	
Middle Wharf Stem	56-57	G	Midspan	820	0	790	500	410	Central Void	
Middle Wharf Stem	56-57	G	Seaside	840	0			420	Central Void	290
Middle Wharf Stem	56-57	E	Landside	870				470	Solid	
Middle Wharf Stem	56-57	E	Midspan	870				470	Solid	
Middle Wharf Stem	56-57	E	Seaside	1080	860			470	Solid	0
Middle Wharf Stem	56-57	C	Landside	830	0			350	Solid	
Middle Wharf Stem	56-57	C	Midspan	820	0			340	Solid	
Middle Wharf Stem	56-57	C	Seaside	840	0			380	Solid	0
Middle Wharf Stem	57-58	K	Landside	0	0			400	boat drilling, solid no voids	
Middle Wharf Stem	57-58	K	Midspan	0	0			400	boat drilling, solid no voids	
Middle Wharf Stem	57-58	K	Seaside	0	0			400	boat drilling, solid no voids	0
Middle Wharf Stem	57-58	I	Landside	950	850			450	Solid	
Middle Wharf Stem	57-58	I	Midspan	950	850			450	Solid	
Middle Wharf Stem	57-58	I	Seaside	950	850	770	740	450	Void near top	30
Middle Wharf Stem	57-58	G	Landside	950	850	740	700	440	40mm hole, (drill bit cracked, could not assess bottom depth)	
Middle Wharf Stem	57-58	G	Midspan	950	840	660	640	440	20mm void	
Middle Wharf Stem	57-58	G	Seaside	950	850			440	Solid	40
Middle Wharf Stem	57-58	E	Landside	950	860			460	Solid	
Middle Wharf Stem	57-58	E	Midspan	1030	920			520	Solid (New measurement ref from here on, using wooden rod attached to drill)	
Middle Wharf Stem	57-58	E	Seaside	1030	920			520	Solid	0
Middle Wharf Stem	57-58	C	Landside	820	0			360	Solid	
Middle Wharf Stem	57-58	C	Midspan	840	0			370	Solid	
Middle Wharf Stem	57-58	C	Seaside	840	0			380	Solid	0
Middle Wharf Stem	58-59	K	Landside	0	0			430	solid termite damage on the outside, boat drill	
Middle Wharf Stem	58-59	K	Midspan	0	0			430	Solid, boat drill	
Middle Wharf Stem	58-59	K	Seaside	0	0			430	Solid, boat drill	0
Middle Wharf Stem	58-59	I	Landside	1130	920			520	Solid	
Middle Wharf Stem	58-59	I	Midspan	920	0			510	Solid	
Middle Wharf Stem	58-59	I	Seaside	1130	910			510	Solid	0
Middle Wharf Stem	58-59	G	Landside	0		300		410	top void	
Middle Wharf Stem	58-59	G	Midspan	0		300		410	top void	
Middle Wharf Stem	58-59	G	Seaside	0				410	solid	110
Middle Wharf Stem	58-59	E	Landside	1130	920			520	Solid	
Middle Wharf Stem	58-59	E	Midspan	1130	920	850	830	520	Small void near top	
Middle Wharf Stem	58-59	E	Seaside	910	0			510	Solid	20
Middle Wharf Stem	58-59	C	Landside	830	0			390	Solid	
Middle Wharf Stem	58-59	C	Midspan	840	0			410	Solid	
Middle Wharf Stem	58-59	C	Seaside	850	0			410	Solid	0
Middle Wharf Stem	59-60	K	Landside	0	0			450	solid, boat drill	
Middle Wharf Stem	59-60	K	Midspan	0	0			450	solid drill	
Middle Wharf Stem	59-60	K	Seaside	0	0			450	solid drill	0
Middle Wharf Stem	59-60	I	Landside	0	0			420	solid drill	
Middle Wharf Stem	59-60	I	Midspan	0	0			420	solid, black sawdust at top of girder	
Middle Wharf Stem	59-60	I	Seaside	0	0			420	solid drill	0
Middle Wharf Stem	59-60	G	Landside	1130	850			450	Solid	
Middle Wharf Stem	59-60	G	Midspan	1130	850			450	Solid	
Middle Wharf Stem	59-60	G	Seaside	1130	840			450	Solid	0
Middle Wharf Stem	59-60	E	Landside	900	0		500	500	full depth void likely a crack.	
Middle Wharf Stem	59-60	E	Midspan	900	0		500	500	crack all the way through.	
Middle Wharf Stem	59-60	E	Seaside	900	0		490	490	looked like crack drill bit started in a void by the looks of it	410
Middle Wharf Stem	59-60	C	Landside	1130	850			450	Solid	
Middle Wharf Stem	59-60	C	Midspan	1130	860			450	Solid	
Middle Wharf Stem	59-60	C	Seaside	1130	850			450	Solid	0
Middle Wharf Stem	60-61	K	Landside	0	0			420	solid drill black swath noted at the top	
Middle Wharf Stem	60-61	K	Midspan	0	0			420	solid drill	
Middle Wharf Stem	60-61	K	Seaside	0	0			420	solid drill	0
Middle Wharf Stem	60-61	I	Landside	0	0	120		420	void top void 300mm	
Middle Wharf Stem	60-61	I	Midspan	0	0			420	solid 50mm of top black saw dust	
Middle Wharf Stem	60-61	I	Seaside	0	0			420	solid drill	300
Middle Wharf Stem	60-61	G	Landside	1130	860			460	Solid	
Middle Wharf Stem	60-61	G	Midspan	1130	840			440	Solid	
Middle Wharf Stem	60-61	G	Seaside	1130	860			460	Solid	0
Middle Wharf Stem	60-61	E	Landside	1130	850			500	Difficulty drilling, drill bound up, likely in split. Got close to bottom of girder	
Middle Wharf Stem	60-61	E	Midspan	1130	850			500	Drill bit broken here, solid until 280mm depth when bit broke.	
Middle Wharf Stem	60-61	E	Seaside	1130	850			500	New drill bit #4	0
Middle Wharf Stem	60-61	C	Landside	1130	860			430	Solid	
Middle Wharf Stem	60-61	C	Midspan	1130	850			420	Solid	
Middle Wharf Stem	60-61	C	Seaside	1130	850			430	Solid	0
Middle Wharf Stem	61-62	K	Landside	0	0			450	solid drill	
Middle Wharf Stem	61-62	K	Midspan	0	0			450	solid drill	
Middle Wharf Stem	61-62	K	Seaside	0	0			450	solid drill	0
Middle Wharf Stem	61-62	I	Landside	0	0			420	solid drill	
Middle Wharf Stem	61-62	I	Midspan	0	0			420	solid drill	
Middle Wharf Stem	61-62	I	Seaside	0	0			420	solid drill	0
Middle Wharf Stem	61-62	G	Landside	850	0	780	580	420	Big void, drill then tracking through crack afterwards, final depth not read	
Middle Wharf Stem	61-62	G	Midspan	850	0			420	Drill tracking through crack	
Middle Wharf Stem	61-62	G	Seaside	850	0			420	Drill tracking through crack downwards (around 200mm depth)	200
Middle Wharf Stem	61-62	E	Landside	850			520	480	started in cavity, possible crushing failure on top.	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Middle Wharf Stem	61-62	E	Midspan	850			530	490	same as above but drill went through crack to bottom.	
Middle Wharf Stem	61-62	E	Seaside	850			750	460	same as above but drill went through crack to bottom.	330
Middle Wharf Stem	61-62	C	Landside	850	0			420	Solid	
Middle Wharf Stem	61-62	C	Midspan	850	0			430	Solid, first drill through 'pre-drilled' holes through deck	
Middle Wharf Stem	61-62	C	Seaside	850	0	730	700	420	Small void, otherwise solid.	30
Middle Wharf Stem	62-63	K	Landside	0	0			430	solid, boat drill	
Middle Wharf Stem	62-63	K	Midspan	0	0			430	solid, boat drill	
Middle Wharf Stem	62-63	K	Seaside	0	0			430	solid, boat drill	0
Middle Wharf Stem	62-63	I	Landside	0	0	170		430	top void until girder depth from top of 260	
Middle Wharf Stem	62-63	I	Midspan	0	0			430	top 30mm of solid then full depth void	
Middle Wharf Stem	62-63	I	Seaside	0	0	130		430	top void of 300mm, boat drill	300
Middle Wharf Stem	62-63	G	Landside	850	0	730	630	420	~100mm void found	
Middle Wharf Stem	62-63	G	Midspan	840	0			420	Solid	
Middle Wharf Stem	62-63	G	Seaside	840	0	650	580	420	70mm void detected	100
Middle Wharf Stem	62-63	E	Landside	770	0			420	good but spongy on top of girder. Possible crushing failure	
Middle Wharf Stem	62-63	E	Midspan	770	0		500	420	soft top to the girder, cracks through the girder, possible full depth voids	
Middle Wharf Stem	62-63	E	Seaside	770	0		560	420	very soft and little resistance to drill	270
Middle Wharf Stem	62-63	C	Landside	860	0			420	Solid	
Middle Wharf Stem	62-63	C	Midspan	850	0			430	Solid	
Middle Wharf Stem	62-63	C	Seaside	860	0			420	Solid	0
Middle Wharf Stem	63-64	K	Landside	0	0			460	solid drill, boat drill	
Middle Wharf Stem	63-64	K	Midspan	0	0			460	solid drill, boat drill	
Middle Wharf Stem	63-64	K	Seaside	0	0			460	solid drill, boat drill	0
Middle Wharf Stem	63-64	I	Landside	0	0			460	solid drill, boat drill	
Middle Wharf Stem	63-64	I	Midspan	0	0			460	solid drill, boat drill	
Middle Wharf Stem	63-64	I	Seaside	0	0			460	solid drill, boat drill	0
Middle Wharf Stem	63-64	G	Landside	840	0			390	Solid	
Middle Wharf Stem	63-64	G	Midspan	840	0			400	Solid	
Middle Wharf Stem	63-64	G	Seaside	850	0			400	Solid. No sudden drop but felt soft.	0
Middle Wharf Stem	63-64	E	Landside	910	0			500	Solid	
Middle Wharf Stem	63-64	E	Midspan	910	0			500	Solid	
Middle Wharf Stem	63-64	E	Seaside	910	0	830	800	500	Void around 30mm (small crack/void)	30
Middle Wharf Stem	63-64	C	Landside	840	0			420	Solid	
Middle Wharf Stem	63-64	C	Midspan	840	0			420	Solid, drill bit bending, not drilled for full depth	
Middle Wharf Stem	63-64	C	Seaside	840	0			420	Solid	0
Middle Wharf Stem	64-65	K	Landside	0	0			450	drilled from boat, solid	
Middle Wharf Stem	64-65	K	Midspan	0	0			450	drilled from boat, solid	
Middle Wharf Stem	64-65	K	Seaside	0	0			450	drilled from boat, solid	0
Middle Wharf Stem	64-65	I	Landside	0	0	260		410	drill from boat, top soft drill/void	
Middle Wharf Stem	64-65	I	Midspan	0	0	210	320	410	central void	
Middle Wharf Stem	64-65	I	Seaside	0	0	180		410	top void	230
Middle Wharf Stem	64-65	G	Landside	840	0	840	640	400	200mm void from top of girder. Could be wide crack.	
Middle Wharf Stem	64-65	G	Midspan	850	0	820	600	430	Void, then soft solid for bottom 200mm	
Middle Wharf Stem	64-65	G	Seaside	840	0	820	620	440	May small crack towards bottom	220
Middle Wharf Stem	64-65	E	Landside	710	0	700	620	480	small void at top of the girder, very solid after void	
Middle Wharf Stem	64-65	E	Midspan	900	0	710	610	480	small void in top of girder, very solid after void. No dowel	
Middle Wharf Stem	64-65	E	Seaside	860	0	800	480	480	full depth void. No dowel.	320
Middle Wharf Stem	64-65	C	Landside	840	0			400	Solid, felt soft through middle	
Middle Wharf Stem	64-65	C	Midspan	850	0			400	First 300mm felt soft, then last bit felt harder. No voids	
Middle Wharf Stem	64-65	C	Seaside	850	0			400	Soft for 200mm, then harder for next 200mm. No voids	0
Middle Wharf Stem	65-66	K	Landside	0	0			470	drilled from boat, deeper girder, drilled into a small crack 10-15mm	
Middle Wharf Stem	65-66	K	Midspan	0	0			470	drilled from boat, solid	
Middle Wharf Stem	65-66	K	Seaside	0	0			470	drilled from boat	0
Middle Wharf Stem	65-66	I	Landside	0	0			430	drilled from boat, solid drill	
Middle Wharf Stem	65-66	I	Midspan	0	0			430	drilled from boat, solid drill	
Middle Wharf Stem	65-66	I	Seaside	0	0	230	340	430	drilled from boat	110
Middle Wharf Stem	65-66	G	Landside	850	0	830	720	550	110mm void just under top, then another 100mm void at bottom	
Middle Wharf Stem	65-66	G	Midspan	850	0	840	600	470	Big void, ~240mm, then finished around 40mm early indicating bottom void	
Middle Wharf Stem	65-66	G	Seaside	840	0	830	600	430	Big void. Timber felt normal in between. Seemed like all along this girder there was a very small amount of timber at the top, with big voids directly under crack through girder, drill followed crack	240
Middle Wharf Stem	65-66	E	Landside	900	0			480	crack through girder, drill followed crack	
Middle Wharf Stem	65-66	E	Midspan	880	0			490	solid girder	
Middle Wharf Stem	65-66	E	Seaside	870	0			450	solid girder	0
Middle Wharf Stem	65-66	C	Landside	860	0			430	Start of day 4, continuing with drill bit #4. Solid girder	
Middle Wharf Stem	65-66	C	Midspan	860	0			420	Felt like small cracks around 800-700mm, small jumps. Otherwise solid	
Middle Wharf Stem	65-66	C	Seaside	860	0			430	Soft for first 200mm, then harder. Solid throughout.	0
Middle Wharf Stem	66-67	K	Landside	0	0			480	drilled from boat, solid	
Middle Wharf Stem	66-67	K	Midspan	0	0			480	drilled from boat, solid	
Middle Wharf Stem	66-67	K	Seaside	0	0			480	drilled from boat, solid	0
Middle Wharf Stem	66-67	I	Landside	0	0	190	230	430	drilled from boat, void	
Middle Wharf Stem	66-67	I	Midspan	0	0			430	drilled from boat, solid	
Middle Wharf Stem	66-67	I	Seaside	0	0			430	drilled from boat, solid	40
Middle Wharf Stem	66-67	G	Landside	840	0			420	Hard 100mm at top, then soft for rest. Solid.	
Middle Wharf Stem	66-67	G	Midspan	840	0	800	780	420	Soft for first 150mm, small jumps around 20-30mm. Hard for rest.	
Middle Wharf Stem	66-67	G	Seaside	850	0	820	800	430	Seemingly tracking through cracks at top, hard to tell if voids. Hard for rest.	20
Middle Wharf Stem	66-67	E	Landside	905	0			500	Solid throughout. Seemed to come out slightly early compared to others around it	
Middle Wharf Stem	66-67	E	Midspan	915	0			520	Solid throughout	
Middle Wharf Stem	66-67	E	Seaside	910	0			520	Crack at top, drill tracking significantly. Stopped drilling to save drill. Got down around 100mm before stopping.	0
Middle Wharf Stem	66-67	C	Landside	850	0	780	750	420	Crack around 70mm depth, only around 30mm. Some jumps through cracks noticed.	
Middle Wharf Stem	66-67	C	Midspan	840	0			420	Solid throughout	
Middle Wharf Stem	66-67	C	Seaside	840	0			430	Solid, hard.	30
Middle Wharf Stem	67-68	K	Landside	0	0			440	drill from boat, solid	
Middle Wharf Stem	67-68	K	Midspan	0	0			440	drill from boat solid	
Middle Wharf Stem	67-68	K	Seaside	0	0	220	290	440	drill from boat, solid, apart from small void and small 30mm top void	70
Middle Wharf Stem	67-68	I	Landside	0	0	310		420	drill from boat top soft drilling for 90 mm	
Middle Wharf Stem	67-68	I	Midspan	0	0	280	340	420	drill from boat	
Middle Wharf Stem	67-68	I	Seaside	0	0			420	drill from boat	110
Middle Wharf Stem	67-68	G	Landside	850	0			440	Hit crack at top, stopped drilling to save drill.	
Middle Wharf Stem	67-68	G	Midspan	850	0			440	Solid throughout	
Middle Wharf Stem	67-68	G	Seaside	850	0	0	640	430	130mm void from top, then another 80mm void after only 10mm in-between. Could be the save crack/void.	210
Middle Wharf Stem	67-68	E	Landside	870	0			460	very strong no cracks	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Middle Wharf Stem	67-68	E	Midspan	860				470	solid girder	
Middle Wharf Stem	67-68	E	Seaside	880				460	solid girder	0
Middle Wharf Stem	67-68	C	Landside	850	0			420	Solid throughout	
Middle Wharf Stem	67-68	C	Midspan	850	0			420	Hard for first 100mm, then soft for 200mm, then hard for final 100	
Middle Wharf Stem	67-68	C	Seaside	850	0	530	500	430	Hole/crack at 500mm, otherwise solid. Only small, maybe 20-30mm	30
Middle Wharf Stem	68-69	K	Landside	0	0			450	Drill from the boat, top void	
Middle Wharf Stem	68-69	K	Midspan	0	0			450	solid	
Middle Wharf Stem	68-69	K	Seaside	0	0			450	solid	0
Middle Wharf Stem	68-69	I	Landside	0	0	260		420	top void	
Middle Wharf Stem	68-69	I	Midspan	0	0			420	solid	
Middle Wharf Stem	68-69	I	Seaside	0	0			420	solid	160
Middle Wharf Stem	68-69	G	Landside	850	0	830	530	420	300mm void/crack just under top of girder. Last 100mm solid.	
Middle Wharf Stem	68-69	G	Midspan	830	0	820	610	440	Felt soft at start, then void. Went through bottom slightly early/quickly.	
Middle Wharf Stem	68-69	G	Seaside	850	0	830	500	450	Big void/crack, then another one at bottom of girder.	330
Middle Wharf Stem	68-69	E	Landside	900	0			470	solid girder	
Middle Wharf Stem	68-69	E	Midspan	910	0			480	solid girder	
Middle Wharf Stem	68-69	E	Seaside	910	0			470	solid girder drift pin stuck while dowel and was pinched to below deck level.	0
Middle Wharf Stem	68-69	C	Landside	850	0			430	Soft till 350mm mark, then hard. Solid throughout	
Middle Wharf Stem	68-69	C	Midspan	850	0			420	Soft till 350mm mark, then hard. Solid throughout	
Middle Wharf Stem	68-69	C	Seaside	850	0			420	Soft, drill tracking. Really soft through 250-300mm. Solid throughout	0
Middle Wharf Stem	69-70	K	Landside	0	0			430	solid	
Middle Wharf Stem	69-70	K	Midspan	0	0			430	solid	
Middle Wharf Stem	69-70	K	Seaside	0	0			430	solid	0
Middle Wharf Stem	69-70	I	Landside	910	0	700	650	510	Small void, middle 100 felt soft.	
Middle Wharf Stem	69-70	I	Midspan	840	0	820	700	510	Void present, little resistance. Solid for 200mm after this.	
Middle Wharf Stem	69-70	I	Seaside	860	0	840	740	510	2 separate voids. Soft, 100mm void then went through early. (80mm bottom void)	120
Middle Wharf Stem	69-70	G	Landside	850	0			430	Solid, went about 40mm from the bottom indicating there could be a crack/void on/near the bottom of the girder.	
Middle Wharf Stem	69-70	G	Midspan	870	0			440	Solid through, decently hard	
Middle Wharf Stem	69-70	G	Seaside	860	0	750	680	450	70mm void/crack. Then solid.	70
Middle Wharf Stem	69-70	E	Landside	850	0			400	Girder split right the way through. This is the girder that has rolled off the corbel. Can see straight through to water. Not even drilled.	
Middle Wharf Stem	69-70	E	Midspan	850	0	0	500	400	Void from top until 350, then solid timber for last 100mm.	
Middle Wharf Stem	69-70	E	Seaside	870	0			420	Full length void/crack	440
Middle Wharf Stem	69-70	C	Landside	860	0			430	Solid throughout	
Middle Wharf Stem	69-70	C	Midspan	870	0			420	Soft for first 300mm, then hard (solid)	
Middle Wharf Stem	69-70	C	Seaside	860	0			420	Soft for 300mm, then hard. Solid	0
Middle Wharf Stem	70-71	K	Landside	0	0			430	solid	
Middle Wharf Stem	70-71	K	Midspan	0	0			430	solid	
Middle Wharf Stem	70-71	K	Seaside	0	0			430	solid	0
Middle Wharf Stem	70-71	I	Landside	0	0	180	240	420	central void	
Middle Wharf Stem	70-71	I	Midspan	0	0			420	solid	
Middle Wharf Stem	70-71	I	Seaside	0	0			420	solid	60
Middle Wharf Stem	70-71	G	Landside	850	0	750	600	440	150mm void, otherwise solid.	
Middle Wharf Stem	70-71	G	Midspan	850	0	830	540	450	290mm void, then soft solid after.	
Middle Wharf Stem	70-71	G	Seaside	850	0	830	560	440	270mm void, then soft solid afterwards until end.	290
Middle Wharf Stem	70-71	E	Landside	900	0			460	crack all way through.	
Middle Wharf Stem	70-71	E	Midspan	630	0			470	spongy on top	
Middle Wharf Stem	70-71	E	Seaside	870	0	790	590	440	large void solid girder after void	200
Middle Wharf Stem	70-71	C	Landside	850	0	820	770	420	50mm crack/void. Drill bit slightly bent here, tracked through crack. Location was not finished to save drill bit.	
Middle Wharf Stem	70-71	C	Midspan	850	0	600	550	420	50mm void then solid after	
Middle Wharf Stem	70-71	C	Seaside	860	0	640	600	430	Small 40mm void, otherwise solid.	50
Middle Wharf Stem	71-72	K	Landside	0	0			460	solid boat drill	
Middle Wharf Stem	71-72	K	Midspan	0	0			460	solid boat drill	
Middle Wharf Stem	71-72	K	Seaside	0	0			460	solid boat drill	0
Middle Wharf Stem	71-72	I	Landside	0	0	200		420	top void, boat drill	
Middle Wharf Stem	71-72	I	Midspan	0	0	110		420	top void all the way to the top	
Middle Wharf Stem	71-72	I	Seaside	0	0	110	300	420	void in middle, boat drilling	310
Middle Wharf Stem	71-72	G	Landside	610	0			210	Solid throughout	
Middle Wharf Stem	71-72	G	Midspan	590	0	0	500	190	Crack till 90mm, felt like the drill was in a crack until 300. Unable to finish drill location.	
Middle Wharf Stem	71-72	G	Seaside	590	0	0	540	190	50mm crack at top. Tracking into crack until 290. Solid otherwise.	90
Middle Wharf Stem	71-72	E	Landside	900	0			480	Crack through bottom of girder	
Middle Wharf Stem	71-72	E	Midspan	900	0			460	solid girder	
Middle Wharf Stem	71-72	E	Seaside	910	0			460	solid girder	0
Middle Wharf Stem	71-72	C	Landside	850	0	800	550	420	250mm void/crack. Drill cracked in this location. End of day 4. Start of day 6, new drill (new ref) being used. Drill location unable to be completed	
Middle Wharf Stem	71-72	C	Midspan	620	0			220		
Middle Wharf Stem	71-72	C	Seaside	600	0			220	Felt solid until 300, then bit got stuck. Stopped drilling to save bit	250
Middle Wharf Stem	72-73	K	Landside	0	0			430	solid, drilled from boat	
Middle Wharf Stem	72-73	K	Midspan	0	0			430	solid, drilled from boat	
Middle Wharf Stem	72-73	K	Seaside	0	0			430	solid drill	0
Middle Wharf Stem	72-73	I	Landside	0	0			410	solid drilled from boat	
Middle Wharf Stem	72-73	I	Midspan	0	0	250		410	solid drill, top half of girder soft with black swath	
Middle Wharf Stem	72-73	I	Seaside	0	0			410	solid drill	160
Middle Wharf Stem	72-73	G	Landside	610	0			210	Solid throughout	
Middle Wharf Stem	72-73	G	Midspan	605	0			220	Seemed very solid, swath coming out was looking good.	
Middle Wharf Stem	72-73	G	Seaside	605	0			210	10mm jump of around 105	0
Middle Wharf Stem	72-73	E	Landside	600	0	0	550	220	Crack at top around 50mm depth, drill was tracking so hole was not finished to save the drill	
Middle Wharf Stem	72-73	E	Midspan	640	0	670	630	220	~40mm void, felt soft afterwards, also felt like the drill may have been in a crack	
Middle Wharf Stem	72-73	E	Seaside	650	0	390	370	240	Small 20mm void, otherwise solid	50
Middle Wharf Stem	72-73	C	Landside	610	0			210	Solid throughout. New drill bit.	
Middle Wharf Stem	72-73	C	Midspan	620	0			200	Solid throughout	
Middle Wharf Stem	72-73	C	Seaside	630	0	410	340	150	80mm void found. Felt like girder was a bit deeper than others around it.	70
Middle Wharf Stem	73-74	K	Landside	0	0			430	drilled from boat, solid	
Middle Wharf Stem	73-74	K	Midspan	0	0			430	drilled from boat, solid	
Middle Wharf Stem	73-74	K	Seaside	0	0			430	drilled from boat, solid	0
Middle Wharf Stem	73-74	I	Landside	0	0			420	drilled from boat, solid	
Middle Wharf Stem	73-74	I	Midspan	0	0			420	drilled from boat, solid	
Middle Wharf Stem	73-74	I	Seaside	0	0	120		420	drilled from boat, drilled into top void with soft drilling and black swath all the way through	300
Middle Wharf Stem	73-74	G	Landside	620	0	490	430	190	70mm void found, otherwise timber found to be hard.	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Middle Wharf Stem	73-74	G	Midspan	610	0			190	Solid throughout	
Middle Wharf Stem	73-74	G	Seaside	590	0			200	Solid throughout	60
Middle Wharf Stem	73-74	E	Landside	900	0	880	520	480	larger void, solid girder after void	
Middle Wharf Stem	73-74	E	Midspan	830	0			460	solid girder	
Middle Wharf Stem	73-74	E	Seaside	860	0	840	610	480	large void solid girder after void	360
Middle Wharf Stem	73-74	C	Landside	610	0			200	Solid throughout	
Middle Wharf Stem	73-74	C	Midspan	610	0			190	10mm crack/jump at 260. Otherwise solid throughout	
Middle Wharf Stem	73-74	C	Seaside	600	0			180	Solid throughout	0
Middle Wharf Stem	74-75	K	Landside	0	0			460	solid, drilled from boat	
Middle Wharf Stem	74-75	K	Midspan	0	0			460	solid, drilled from boat	
Middle Wharf Stem	74-75	K	Seaside	0	0			460	solid, drilled from boat	0
Middle Wharf Stem	74-75	I	Landside	0	0			420	solid, drilled from boat	
Middle Wharf Stem	74-75	I	Midspan	0	0			420	solid, drilled from boat, top 100mm softer drill with black swath	
Middle Wharf Stem	74-75	I	Seaside	0	0			420	solid, drilled from boat	0
Middle Wharf Stem	74-75	G	Landside	605	0	430	400	190	Small 30mm jump/crack found. Otherwise solid	
Middle Wharf Stem	74-75	G	Midspan	610	0	490	390	190	~100mm void found. Otherwise solid	
Middle Wharf Stem	74-75	G	Seaside	610	0			190	Solid throughout	100
Middle Wharf Stem	74-75	E	Landside	870	0			450	solid girder	
Middle Wharf Stem	74-75	E	Midspan	890	0			460	solid girder	
Middle Wharf Stem	74-75	E	Seaside	710	0			-	Drill tracked through girder through a vertical crack. Unable to determine the girder depth.	0
Middle Wharf Stem	74-75	C	Landside	620	0			190	Hard timber, struggled to get through. Drill swapped.	
Middle Wharf Stem	74-75	C	Midspan	620	0			190	Solid throughout	
Middle Wharf Stem	74-75	C	Seaside	620	0			170	Solid throughout	0
Middle Wharf Stem	75-75	K	Landside	0	0			450	solid ALL THE WAY THROUGH	
Middle Wharf Stem	75-76	K	Midspan	0	0			450	solid ALL THE WAY THROUGH	
Middle Wharf Stem	75-76	K	Seaside	0	0			450	solid ALL THE WAY THROUGH	0
Middle Wharf Stem	75-75	I	Landside	0	0	180		430	void	
Middle Wharf Stem	75-76	I	Midspan	0	0	180		430	void	250
Middle Wharf Stem	75-76	I	Seaside	0	0	180		430	void	
Middle Wharf Stem	75-76	G	Landside	620	0	0	320	190	Large void found until 300 (around 300mm depth). Last 80-100mm solid	
Middle Wharf Stem	75-76	G	Midspan	590	0	0	400	190	Large void/crack, bit was tracking and hole was not completed	
Middle Wharf Stem	75-76	G	Seaside	590	0	0	360	160	Big void at top, similar to landside location. Solid for last 200mm	300
Middle Wharf Stem	75-76	E	Landside	660	0			250	Solid throughout	
Middle Wharf Stem	75-76	E	Midspan	660	0			250	Solid throughout	
Middle Wharf Stem	75-76	E	Seaside	660	0			260	Solid throughout	0
Middle Wharf Stem	75-76	C	Landside	610	0	520	420	190	2x 20-30mm jumps detected, then larger 100mm void.	
Middle Wharf Stem	75-76	C	Midspan	620	0			170	Solid throughout	
Middle Wharf Stem	75-76	C	Seaside	620	0			180	Solid throughout	100

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Outer Wharf Stem	76-77	A	Landside						FD - Tested in the initial testing with a visible void	
Outer Wharf Stem	76-77	A	Midspan						FD - Tested in the initial testing with a visible void	
Outer Wharf Stem	76-77	A	Seaside						FD - Tested in the initial testing with a visible void	400
Outer Wharf Stem	76-77	H	Landside	770	0	750	480	370	Shoja start here. Large void found from top	
Outer Wharf Stem	76-77	H	Midspan	770	0		500	400	Large void at top again, timber in middle and then small (30mm ish) void at the bottom, where it felt the drill left early.	
Outer Wharf Stem	76-77	H	Seaside	680	0		450	310	230mm void at top, then 60-70mm void towards bottom.	270
Outer Wharf Stem	76-77	J	Landside	720	0			300	Solid throughout, swath visible - looked good	
Outer Wharf Stem	76-77	J	Midspan	700	0			300	Solid throughout, swath visible - looked good	
Outer Wharf Stem	76-77	J	Seaside	690	0			310	Solid throughout, swath visible, - looked good	0
Outer Wharf Stem	76-77	L	Landside	0				400	solid drilling, boat drilling	
Outer Wharf Stem	76-77	L	Midspan	0				400	solid drilling, boat drilling	
Outer Wharf Stem	76-77	L	Seaside	0				400	solid drilling, boat drilling	0
Outer Wharf Stem	76-77	N	Landside	0		50		440	full depth void, boat drilling	
Outer Wharf Stem	76-77	N	Midspan	0		90	320	440	large void, boat drilling	
Outer Wharf Stem	76-77	N	Seaside	0		90	320	440	large void, boat drilling	390
Outer Wharf Stem	77-78	A	Landside	950				550	VERY STROG, TOOK A WHILE TO DRILL THROUGH.	
Outer Wharf Stem	77-78	A	Midspan	880				500	VERY STROG, TOOK A WHILE TO DRILL THROUGH.	
Outer Wharf Stem	77-78	A	Seaside	890				530	strong solid girder	0
Outer Wharf Stem	77-78	B	Landside	950				560	drill tracked through crack in girder	
Outer Wharf Stem	77-78	B	Midspan	950				540	very solid	
Outer Wharf Stem	77-78	B	Seaside	960		800	710	550	void but vey solid otherwise	90
Outer Wharf Stem	77-78	H	Landside	820	0		500	380	Void at top down to 320mm level, then solid after.	
Outer Wharf Stem	77-78	H	Midspan	810	0			380	Big crack at top of girder, drill tracking. Drill not completed	
Outer Wharf Stem	77-78	H	Seaside	810	0		540	400	Void at top till 270 level, then solid afterwards.	320
Outer Wharf Stem	77-78	J	Landside	810	0	560	500	400	Void starting at 250 for about 60mm, then solid till end	
Outer Wharf Stem	77-78	J	Midspan	810	0	580	560	400	20mm jump at 230mm, drop again at 320. Found water in this hole at the 390mm mark, drill noticeably wet, swath coming up very wet as well.	
Outer Wharf Stem	77-78	J	Seaside	810	0	710	650	410	60mm jump at 100, small jump at 290. Rest solid	60
Outer Wharf Stem	77-78	L	Landside	0		30		430	full depth void, boat drilled	
Outer Wharf Stem	77-78	L	Midspan	0		50		430	full depth void, boat drilled	
Outer Wharf Stem	77-78	L	Seaside	0		100	200	430	void in middle, boat drilled	400
Outer Wharf Stem	77-78	N	Landside	0				300	solid girder. Boat drilled, Box girder.	
Outer Wharf Stem	77-78	N	Midspan	0				300	solid girder. Boat drilled, Box girder.	
Outer Wharf Stem	77-78	N	Seaside	0				300	solid girder. Boat drilled, Box girder.	0
Outer Wharf Stem	78-79	A	Landside	820				630	Solid.	
Outer Wharf Stem	78-79	A	Midspan	860				620	Solid	
Outer Wharf Stem	78-79	A	Seaside	870				610	Solid	0
Outer Wharf Stem	78-79	B	Landside	700	0			300	Slight jump at 180, soft from 100-200.	
Outer Wharf Stem	78-79	B	Midspan	700	0			320	Solid throughout	
Outer Wharf Stem	78-79	B	Seaside	700	0			320	Solid throughout	0
Outer Wharf Stem	78-79	H	Landside	720	0			320	Solid throughout	
Outer Wharf Stem	78-79	H	Midspan	760	0			340	Solid throughout	
Outer Wharf Stem	78-79	H	Seaside	760	0			340	Solid throughout	0
Outer Wharf Stem	78-79	J	Landside	690	0			350	Solid throughout, seemed to leave girder early indicating potential void at bottom.	
Outer Wharf Stem	78-79	J	Midspan	700	0	650	550	340	Crack from around 50-150. Solid for remainder. seemed to leave girder early indicating potential void at bottom.	
Outer Wharf Stem	78-79	J	Seaside	700	0			320	Solid throughout. seemed to leave girder early indicating potential void at bottom.	100
Outer Wharf Stem	78-79	L	Landside	0				400	solid drilling, boat drilling	
Outer Wharf Stem	78-79	L	Midspan	0		250		400	solid drilling top void from 250 in to the top. Boat drilling	
Outer Wharf Stem	78-79	L	Seaside	0				400	reasonably solid drilling, boat drill	150
Outer Wharf Stem	78-79	N	Landside	0		70		250	full depth void, All rotted wood on the inside. Boat drilling	
Outer Wharf Stem	78-79	N	Midspan	0		120		250	top void until 120 deep in from top. Boat drilling	
Outer Wharf Stem	78-79	N	Seaside	0				250	solid drill, boat drill	180
Outer Wharf Stem	79-80	A	Landside	990				540	strong wood	
Outer Wharf Stem	79-80	A	Midspan	910				540	cracked from 600 through to the bottom.	
Outer Wharf Stem	79-80	A	Seaside	950				540	cracked through entire girder until bottom.	0
Outer Wharf Stem	79-80	A-B	Landside	910				540	strong girder	
Outer Wharf Stem	79-80	A-B	Midspan	880				580	strong no cracks identified	
Outer Wharf Stem	79-80	A-B	Seaside	860				540	strong girder	0
Outer Wharf Stem	79-80	B	Landside	690	0			310	Solid throughout	
Outer Wharf Stem	79-80	B	Midspan	690	0			300	Solid throughout	
Outer Wharf Stem	79-80	B	Seaside	710	0			300	Felt soft for about 100mm, from 160 to 260.	0
Outer Wharf Stem	79-80	B-H	Landside	860		850	710	560	top void and very soft girder	
Outer Wharf Stem	79-80	B-H	Midspan	880				540	no voids solid drill	
Outer Wharf Stem	79-80	B-H	Seaside	1000				550	may have been drilling through some deck at start however did not feel the drop between deck and girder.	140
Outer Wharf Stem	79-80	H	Landside	740	0			300	Solid throughout	
Outer Wharf Stem	79-80	H	Midspan	700	0			300	Solid throughout	
Outer Wharf Stem	79-80	H	Seaside	660	0		550	310	Void from top down to 110, then felt soft until bottom	110
Outer Wharf Stem	79-80	J	Landside	0				420	solid drilling, boat drilling	
Outer Wharf Stem	79-80	J	Midspan	0				420	solid drilling, boat drilling	
Outer Wharf Stem	79-80	J	Seaside	0				420	solid drilling, boat drilling	0
Outer Wharf Stem	79-80	L	Landside	0		240		430	top void until 240, boat drilling	
Outer Wharf Stem	79-80	L	Midspan	0		100		430	top void until 100, boat drilling	
Outer Wharf Stem	79-80	L	Seaside	0				430	solid drilling, boat drilling	330
Outer Wharf Stem	79-80	N	Landside	0		50		250	top void until 50 from bottom, boat drilling	
Outer Wharf Stem	79-80	N	Midspan	0		50		250	top void until 50 from bottom, boat drilling	
Outer Wharf Stem	79-80	N	Seaside	0		180		250	top void, boat drilling.	200
Outer Wharf Stem	80-81	A1	Landside	970		800		540	full depth void from 800.	
Outer Wharf Stem	80-81	A1	Midspan	920			860	530	top void to 860. appears to be cracked but drill still drilling through.	
Outer Wharf Stem	80-81	A1	Seaside	970				540	appears to be a crack through girder.	260
Outer Wharf Stem	80-81	A	Landside	980				590	cracked from 600 down.	
Outer Wharf Stem	80-81	A	Midspan	980				580	fairly good condition	
Outer Wharf Stem	80-81	A	Seaside	1000				580	cracked through top half of the girder	0
Outer Wharf Stem	80-81	B	Landside	690	0			300	Small jump from 150 to 170, felt soft in parts	
Outer Wharf Stem	80-81	B	Midspan	690	0			300		
Outer Wharf Stem	80-81	B	Seaside	690	0			300	170-180 small jump, likely a crack. Solid for rest	0
Outer Wharf Stem	80-81	F	Landside	690	0			290	Solid throughout	
Outer Wharf Stem	80-81	F	Midspan	790	0			300	300-310 small jump, solid otherwise	
Outer Wharf Stem	80-81	F	Seaside	760	0			290	360-370 felt like small jump through crack	0
Outer Wharf Stem	80-81	B2	Landside	0				400	20mm void/jump in the middle of the girder. Boat drill.	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Outer Wharf Stem	80-81	B2	Midspan	0		200	350	400	void in top 3rd of girder. Fairly solid drilling. Boat drill	
Outer Wharf Stem	80-81	B2	Seaside	0				400	solid drilling, boat drilling	150
Outer Wharf Stem	80-81	H1	Landside	0		100	250	430	void at 100 girder depth, boat drilling.	
Outer Wharf Stem	80-81	H1	Midspan	0		200	400	430	wet timber from 200 depth up to top, solid cap to the girder. Boat drilling	
Outer Wharf Stem	80-81	H1	Seaside	0				430	solid drill, boat drill	200
Outer Wharf Stem	80-81	H	Landside	690	0	600	320	300	Big void at top of girder	
Outer Wharf Stem	80-81	H	Midspan	780	0	710	520	340	Big void at top, similar to landside location.	
Outer Wharf Stem	80-81	H	Seaside	680	0	610	490	320	Void continues through whole girder, changes heights slightly	280
Outer Wharf Stem	80-81	J	Landside	0		270	300	420	crack of 30mm from depth of 300. boat drilling.	
Outer Wharf Stem	80-81	J	Midspan	0				420	solid drill, boat drill	
Outer Wharf Stem	80-81	J	Seaside	0				420	solid drilling, boat drilling	30
Outer Wharf Stem	80-81	L	Landside	0		300		430	top void until 300 depth of girder, boat drilling.	
Outer Wharf Stem	80-81	L	Midspan	0				430	solid drill, boat drill.	
Outer Wharf Stem	80-81	L	Seaside	0				430	solid drill, boat drill	130
Outer Wharf Stem	80-81	N	Landside	0		10		250	full depth top void with last 10mm remaining, boat drill.	
Outer Wharf Stem	80-81	N	Midspan	0		110		250	full depth top void with last 110mm remaining, boat drill.	
Outer Wharf Stem	80-81	N	Seaside	0		80		250	top void, boat drill.	240
Outer Wharf Stem	81-82	A	Landside	1000				610	fairly good condition	
Outer Wharf Stem	81-82	A	Midspan	1000		980	800	610	top crack/void along girder.	
Outer Wharf Stem	81-82	A	Seaside	1000			750	600	top void and through a crack.	250
Outer Wharf Stem	81-82	D	Landside	800	0	600	500	400	Void from around 200 to 300, then soft after.	
Outer Wharf Stem	81-82	D	Midspan	660	0			300	Void at top, drill tracking significantly down to 550. Stopped drilling to save drill	
Outer Wharf Stem	81-82	D	Seaside	700	0	530		300	Small jump from 170 to 190. Otherwise solid	100
Outer Wharf Stem	81-82	E	Landside	800	0		510	310	Solid	
Outer Wharf Stem	81-82	E	Midspan	720	0			310	Solid throughout	
Outer Wharf Stem	81-82	E	Seaside	690	0			320	Solid throughout	0
Outer Wharf Stem	81-82	F	Landside	790	0			320	Solid throughout	
Outer Wharf Stem	81-82	F	Midspan	800	0			340	150-170 small jump, then solid but felt solid.	
Outer Wharf Stem	81-82	F	Seaside	790	0	700	650	310	90-140 jump, felt a bit soft. Black swath noted, may be some rot happening	50
Outer Wharf Stem	81-82	H1	Landside	0		230		400		
Outer Wharf Stem	81-82	H1	Midspan	0		230		400	top void, full depth, boat drill.	
Outer Wharf Stem	81-82	H1	Seaside	0		170		400	top void, full depth, boat drill.	230
Outer Wharf Stem	81-82	H2	Landside	0		160		400	top void, boat drill	
Outer Wharf Stem	81-82	H2	Midspan	0		40		400	top void, boat drill	
Outer Wharf Stem	81-82	H2	Seaside	0		80		400	top void, boat drill.	360
Outer Wharf Stem	81-82	E	Landside	0		140		400	top void, rotten wood from the top. Boat drill	
Outer Wharf Stem	81-82	E	Midspan	0		180		400	top void, boat drill	
Outer Wharf Stem	81-82	E	Seaside	0		200		400	top void, boat drill	260
Outer Wharf Stem	81-82	G	Landside	0		40		400	top void, all rotten wood, full depth void.	
Outer Wharf Stem	81-82	G	Midspan	0		180		400	top void, rotten wood from top down to 180. boat drill.	
Outer Wharf Stem	81-82	G	Seaside	0		200	250	400	void in middle of girder. Boat drill.	360
Outer Wharf Stem	81-82	I	Landside	0		240		410	top void, black rotten wood at the top. boat drill	
Outer Wharf Stem	81-82	I	Midspan	0		150		410	top void, boat drill	
Outer Wharf Stem	81-82	I	Seaside	0		250	350	410	middle void, boat drill	260
Outer Wharf Stem	81-82	K	Landside	0		220	240	300	small void, boat drill.	
Outer Wharf Stem	81-82	K	Midspan	0				300	solid drill, boat drill.	
Outer Wharf Stem	81-82	K	Seaside	0				300	solid drill, boat drill.	
Outer Wharf Stem	82-83	E	Landside	640	0			250	Solid	20
Outer Wharf Stem	82-83	E	Midspan	640	0			270	Solid	
Outer Wharf Stem	82-83	E	Seaside	640	0			280	Solid	0
Outer Wharf Stem	82-83	G	Landside	0				400	30mm top rot, easy drilling on last 30mm. Boat drilling	
Outer Wharf Stem	82-83	G	Midspan	0				400	solid drill, boat drill. Top 50mm easy drilling, black dust.	
Outer Wharf Stem	82-83	G	Seaside	0				400	solid drill, boat drill	0
Outer Wharf Stem	82-83	I	Landside	0		170		420	top void, full depth. Boat drilling	
Outer Wharf Stem	82-83	I	Midspan	0		20		420	top void, full depth. Boat drilling	
Outer Wharf Stem	82-83	I	Seaside	0		60		420	top void, full depth. Boat drilling	400
Outer Wharf Stem	82-83	K	Landside	0		110		290	top void, boat drill	
Outer Wharf Stem	82-83	K	Midspan	0		50		290	top void, boat drill	
Outer Wharf Stem	82-83	K	Seaside	0		50	150	290	void in the middle of the girder. Boat drill	240
Outer Wharf Stem	83-84	E	Landside	650	0			270	solid	
Outer Wharf Stem	83-84	E	Midspan	640	0			270	solid	
Outer Wharf Stem	83-84	E	Seaside	650	0	500	470	270	Small void	30
Outer Wharf Stem	83-84	G	Landside	0		100		410	top void, capping layer of 30mm. Boat drill.	
Outer Wharf Stem	83-84	G	Midspan	0		90		410	top void, boat drill	
Outer Wharf Stem	83-84	G	Seaside	0		60		410	top void, boat drill	350
Outer Wharf Stem	83-84	I	Landside	0				430	solid drill, boat drill	
Outer Wharf Stem	83-84	I	Midspan	0				430	solid drill, boat drill	
Outer Wharf Stem	83-84	I	Seaside	0				430	solid drill, boat drill	0
Outer Wharf Stem	83-84	K	Landside	0		190		300	top void, boat drill. Chamfer cut to 280	
Outer Wharf Stem	83-84	K	Midspan	0		110		300	top void, boat drill. Chamfer cut to 280	
Outer Wharf Stem	83-84	K	Seaside	0		240		300	60mm top void, boat drill, chamfer cut to 280	190
Outer Wharf Stem	84-85	E	Landside	650	0			270	solid Drill	
Outer Wharf Stem	84-85	E	Midspan	630	0	600	300	250	void	
Outer Wharf Stem	84-85	E	Seaside	600	0		430	250	Void at the top of girder/ drilling stopped due to binding/tracking of bit into a crack	300
Outer Wharf Stem	84-85	G	Landside	0				430	solid drill, boat drill	
Outer Wharf Stem	84-85	G	Midspan	0				430	solid drill, boat drill	
Outer Wharf Stem	84-85	G	Seaside	0				430	solid drill, boat drill	0
Outer Wharf Stem	84-85	I	Landside	0		130		430	top void, full depth. Boat drill	
Outer Wharf Stem	84-85	I	Midspan	0		280		430	top void, boat drill	
Outer Wharf Stem	84-85	I	Seaside	0		200		430		300
Outer Wharf Stem	84-85	K	Landside	0		230		310	top void, boat drill	
Outer Wharf Stem	84-85	K	Midspan	0				310	50mm of spongy top, boat drill	
Outer Wharf Stem	84-85	K	Seaside	0		210		310	top void, boat drill.	100
Outer Wharf Stem	85-86	E	Landside	0		170		420	top void, boat drill.	
Outer Wharf Stem	85-86	E	Midspan	0		230		420	top void, boat drill.	
Outer Wharf Stem	85-86	E	Seaside	0		130	200	420	void, boat drill	250
Outer Wharf Stem	85-86	G	Landside	0				420	solid drill, boat drill	
Outer Wharf Stem	85-86	G	Midspan	0				420	solid drill, boat drill	
Outer Wharf Stem	85-86	G	Seaside	0				420	solid drill, boat drill	0
Outer Wharf Stem	85-86	I	Landside	0				430	solid drill, boat drill	
Outer Wharf Stem	85-86	I	Midspan	0				430	solid drill, boat drill	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Outer Wharf Stem	85-86	I	Seaside	0				430	solid drill, boat drill	0
Outer Wharf Stem	85-86	K	Landside	0				290	solid drill, boat drill	
Outer Wharf Stem	85-86	K	Midspan	0		200		290	top void, boat drill	
Outer Wharf Stem	85-86	K	Seaside	0		200		290	top void, boat drill	90
Outer Wharf Stem	86-87	D	Landside	640	0			220	Drill Binding, drilling not completed	
Outer Wharf Stem	86-87	D	Midspan	640	0			220	solid	
Outer Wharf Stem	86-87	D	Seaside	650	0			220	Solid	0
Outer Wharf Stem	86-87	F	Landside	620	0			220	Solid	
Outer Wharf Stem	86-87	F	Midspan	620	0			220	Solid	
Outer Wharf Stem	86-87	F	Seaside	620	0			220	Solid	0
Outer Wharf Stem	86-87	H	Landside	0				410	solid drill, boat drill	
Outer Wharf Stem	86-87	H	Midspan	0		130	320	410	void present, boat drill	
Outer Wharf Stem	86-87	H	Seaside	0		200	310	410	void present, boat drill	190
Outer Wharf Stem	87-88	D	Landside	630	0			280	solid	
Outer Wharf Stem	87-88	D	Midspan	640	0	600	560	280	Tracking into crack, Drilling stopped to save drill	
Outer Wharf Stem	87-88	D	Seaside	630	0			280	Solid	40
Outer Wharf Stem	87-88	F	Landside	0				380	no present voids but clear evidence of insect damage in sap wood. Boat drill	
Outer Wharf Stem	87-88	F	Midspan	0		150		380	top void, clear evidence of insect damage. Boat drill	
Outer Wharf Stem	87-88	F	Seaside	0		120	260	380	void present, Boat drill	230
Outer Wharf Stem	87-88	H	Landside	0				410	solid drill, boat drill	
Outer Wharf Stem	87-88	H	Midspan	0		150	340	410	drilling black near termites in top section of girder. Boat drill	
Outer Wharf Stem	87-88	H	Seaside	0		110		410	top void, boat drill	300
Outer Wharf Stem	88-89	D	Landside	640	0			280	solid	
Outer Wharf Stem	88-89	D	Midspan	640	0			280	solid	
Outer Wharf Stem	88-89	D	Seaside	640	0			280	solid	0
Outer Wharf Stem	88-89	F	Landside	0		190		410	top void, boat drill	
Outer Wharf Stem	88-89	F	Midspan	0		100		410	top void, boat drill	
Outer Wharf Stem	88-89	F	Seaside	0		110		410	top void, boat drill	310
Outer Wharf Stem	88-89	H	Landside	0				430	solid drill, boat drill	
Outer Wharf Stem	88-89	H	Midspan	0				430	solid drill, boat drill	
Outer Wharf Stem	88-89	H	Seaside	0				430	solid drill, boat drill	0
Outer Wharf Stem	89-90	D	Landside	640	0	600	510	260	80 to 100 mm void at the top with the drill tracking into cracks and binding, Drilling stopped to save drill	
Outer Wharf Stem	89-90	D	Midspan	640	0		520	260	81 to 100 mm void at the top with the drill tracking into cracks and binding, Drilling stopped to save drill	
Outer Wharf Stem	89-90	D	Seaside	640	0		520	260	82 to 100 mm void at the top with the drill tracking into cracks and binding, Drilling stopped to save drill	120
Outer Wharf Stem	89-90	F	Landside	0		210		400	top void, boat drill	
Outer Wharf Stem	89-90	F	Midspan	0				400	solid drill, boat drill	
Outer Wharf Stem	89-90	F	Seaside	0		230	350	400	void just under top, boat drill	190
Outer Wharf Stem	89-90	H	Landside	0		130		400	top void, boat drill	
Outer Wharf Stem	89-90	H	Midspan	0		180		400	top void, fine black swath, boat drill	
Outer Wharf Stem	89-90	H	Seaside	0		110		400	top void, boat drill	290
Outer Wharf Stem	90-91	D	Landside	640	0	0	400	260	Large void into crack where the drill bound up, Drilling ceased	
Outer Wharf Stem	90-91	D	Midspan	640	0	0	400	260	Large void into crack where the drill bound up, Drilling ceased	
Outer Wharf Stem	90-91	D	Seaside	640	0	0	500	260	Large void into crack where the drill bound up, Drilling ceased	240
Outer Wharf Stem	90-91	F	Landside	0				400	solid drill, boat drill	
Outer Wharf Stem	90-91	F	Midspan	0				400	solid drill, boat drill	
Outer Wharf Stem	90-91	F	Seaside	0				400	solid drill, boat drill	0
Outer Wharf Stem	90-91	H	Landside	0		160	350	410	void present, boat drill	
Outer Wharf Stem	90-91	H	Midspan	0				410	solid drill, boat drill	
Outer Wharf Stem	90-91	H	Seaside	0		60		410	top void, saw dust at the start, boat drill	350
Outer Wharf Stem	91-92	D	Landside	620	0			280	Drill bound drilling not completed	
Outer Wharf Stem	91-92	D	Midspan	620	0			280	Solid Throughout	
Outer Wharf Stem	91-92	D	Seaside	620	0	600	420	250	Internal void of 180mm	180
Outer Wharf Stem	91-92	F	Landside	620	0		300	260	Large top void of 320mm, bottom drill was soft	
Outer Wharf Stem	91-92	F	Midspan	640	0		350	260	large top void of 290mm, Bottom drill tracked through a crack	
Outer Wharf Stem	91-92	F	Seaside	620	0		330	250	large top void of 290mm	320
Outer Wharf Stem	91-92	H	Landside	0		100		400	top void, black rot inside girder. Boat drill	
Outer Wharf Stem	91-92	H	Midspan	0		110	350	400	central void, boat drill	
Outer Wharf Stem	91-92	H	Seaside	0		220		400	top void, boat drill	300
Outer Wharf Stem	92-93	D	Landside	650	0		380	260	large void at top solid bottom drill	
Outer Wharf Stem	92-93	D	Midspan	650	0	580	430	260	Internal void of 150 mm	
Outer Wharf Stem	92-93	D	Seaside	650	0		320	260	large void at top solid bottom drill for 50mm	
Outer Wharf Stem	92-93	F	Landside	0		100	200	400	drilled from boat	
Outer Wharf Stem	92-93	F	Midspan	0				400	solid	
Outer Wharf Stem	92-93	F	Seaside	0		150		400	top void, drilled from boat.	250
Outer Wharf Stem	92-93	H	Landside	0				400	solid	
Outer Wharf Stem	92-93	H	Midspan	0				400	solid	
Outer Wharf Stem	92-93	H	Seaside	0		170		400	top void, drilled from boat	230
Outer Wharf Stem	93-94	D	Landside	650	0		410	250	drill tracking and binds up	
Outer Wharf Stem	93-94	D	Midspan	650	0	0	250	250	Void all the way through	
Outer Wharf Stem	93-94	D	Seaside	650	0	0	250	250	Void all the way through	400
Outer Wharf Stem	93-94	F	Landside	0				410	solid	
Outer Wharf Stem	93-94	F	Midspan	0		210	320	410	central void, boat drill	
Outer Wharf Stem	93-94	F	Seaside	0		170	320	410	central void, boat drill	150
Outer Wharf Stem	93-94	H	Landside	0				400	solid, drilled from boat	
Outer Wharf Stem	93-94	H	Midspan	0				400	solid, drilled from boat	
Outer Wharf Stem	93-94	H	Seaside	0		220	330	400	central void, drilled from boat	110
Outer Wharf Stem	94-95	D	Landside	640	0			250	Drill tracking into crack again, stopped at 400	
Outer Wharf Stem	94-95	D	Midspan	640	0			250	Drill tracking into crack again, stopped to preserve bit	
Outer Wharf Stem	94-95	D	Seaside	640	0			250	Drill tracking into crack again, stopped to preserve bit	0
Outer Wharf Stem	94-95	F	Landside	0		230		420		
Outer Wharf Stem	94-95	F	Midspan	0		280		420		
Outer Wharf Stem	94-95	F	Seaside	0		200		420		220
Outer Wharf Stem	94-95	H	Landside	0				410		
Outer Wharf Stem	94-95	H	Midspan	0		140	270	410		
Outer Wharf Stem	94-95	H	Seaside	0				410		130
Outer Wharf Stem	95-96	D	Landside	0				390	solid, drilled from boat	
Outer Wharf Stem	95-96	D	Midspan	0				390	solid, drilled from boat	
Outer Wharf Stem	95-96	D	Seaside	0				390	solid, drilled from boat	0
Outer Wharf Stem	95-96	F	Landside	0				400	solid, drilled from boat	
Outer Wharf Stem	95-96	F	Midspan	0				400	solid, drilled from boat	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Outer Wharf Stem	95-96	F	Seaside	0				400	solid, drilled from boat	0
Outer Wharf Stem	95-96	H	Landside	0				410	solid, drilled from boat	
Outer Wharf Stem	95-96	H	Midspan	0				410	solid, drilled from boat	
Outer Wharf Stem	95-96	H	Seaside	0				410	solid, drilled from boat	0
Outer Wharf Stem	96-97	D	Landside	620	0	500	400	230	large void 120 from the top of 100mm	
Outer Wharf Stem	96-97	D	Midspan	620	0			230	Drill tracked into a crack and bound up.	
Outer Wharf Stem	96-97	D	Seaside	620	0	490	390	230	Internal void of 100mm otherwise solid	100
Outer Wharf Stem	96-97	F	Landside	660	0		360	250	top voids	
Outer Wharf Stem	96-97	F	Midspan	660	0		400	250	top voids	
Outer Wharf Stem	96-97	F	Seaside	660	0		300	250	top voids	360
Outer Wharf Stem	96-97	H	Landside	0		220		420	top void drilled from boat	
Outer Wharf Stem	96-97	H	Midspan	0				420	solid	
Outer Wharf Stem	96-97	H	Seaside	0				420	solid	200
Outer Wharf Stem	97-98	D	Landside	640				240	solid	
Outer Wharf Stem	97-98	D	Midspan	640				240	solid	
Outer Wharf Stem	97-98	D	Seaside	640	0	500	460	240	Void from 140-180, solid for rest	40
Outer Wharf Stem	97-98	F	Landside	0				410	solid, drilled from boat	
Outer Wharf Stem	97-98	F	Midspan	0				410	solid, drilled from boat	
Outer Wharf Stem	97-98	F	Seaside	0				410	solid, drilled from boat	0
Outer Wharf Stem	97-98	H	Landside	0				400	solid drilled from boat	
Outer Wharf Stem	97-98	H	Midspan	0				400	solid drilled from boat	
Outer Wharf Stem	97-98	H	Seaside	0				400	solid drilled from boat	0
Outer Wharf Stem	98-99	D	Landside	640	0	600	520	250	Void from 40-120, solid for 100mm, solid rest	
Outer Wharf Stem	98-99	D	Midspan	640	0	550	420	250	Void from 90-220, then solid for rest	
Outer Wharf Stem	98-99	D	Seaside	640			360	250	Black, wet swath visible out of hole	280
Outer Wharf Stem	98-99	F	Landside	0				390	Solid, drilled from boat	
Outer Wharf Stem	98-99	F	Midspan	0				390	solid, drilled from boat	
Outer Wharf Stem	98-99	F	Seaside	0				390	solid, drilled from boat	0
Outer Wharf Stem	98-99	H	Landside	0		180	300	400	solid, drilled from boat	
Outer Wharf Stem	98-99	H	Midspan	0		210	250	400	void	
Outer Wharf Stem	98-99	H	Seaside	0		230	340	400	void	120
Outer Wharf Stem	99-100	D	Landside	630	0			250	Soft from 80-180, black swath noted	
Outer Wharf Stem	99-100	D	Midspan	630	0			250	Solid throughout	
Outer Wharf Stem	99-100	D	Seaside	630	0			250	Solid throughout	0
Outer Wharf Stem	99-100	F	Landside	0		350		400	top void	
Outer Wharf Stem	99-100	F	Midspan	0				400	solid	
Outer Wharf Stem	99-100	F	Seaside	0				400	solid	50
Outer Wharf Stem	99-100	H	Landside	0		170		430	top void	
Outer Wharf Stem	99-100	H	Midspan	0				430	solid	
Outer Wharf Stem	99-100	H	Seaside	0		190	280	430	solid, drilled by boat	260
Outer Wharf Stem	100-101	D	Landside	630	0			240	Soft at top for 150mm, then solid after	
Outer Wharf Stem	100-101	D	Midspan	630	0		480	240	Big void at top, solid for rest	
Outer Wharf Stem	100-101	D	Seaside	630	0		580	240	Big void at top, jump from 130-170. Solid rest	150
Outer Wharf Stem	100-101	F	Landside	0		170	0	420	top void, boat drill	
Outer Wharf Stem	100-101	F	Midspan	0		220	330	420	middle void, boat drill.	
Outer Wharf Stem	100-101	F	Seaside	0		190	300	420	middle void, boat drill	250
Outer Wharf Stem	100-101	H	Landside	0				410	solid drill, boat drill.	
Outer Wharf Stem	100-101	H	Midspan	0				410	solid drill, boat drill	
Outer Wharf Stem	100-101	H	Seaside	0				410	solid drill, boat drill	0
Outer Wharf Stem	101-102	D	Landside	620				240	drilled to 300mm then drill tracked into crack and bound up	
Outer Wharf Stem	101-102	D	Midspan	620	0			240	Solid, possible void at bottom or open crack	
Outer Wharf Stem	101-102	D	Seaside	630	0			240	possible void at bottom or open crack	0
Outer Wharf Stem	101-102	F	Landside	640	0		300	240	Large Void	
Outer Wharf Stem	101-102	F	Midspan	640	0		530	230	void at top solid throughout	
Outer Wharf Stem	101-102	F	Seaside	640	0			220	solid	340
Outer Wharf Stem	101-102	H	Landside	0				410	solid drill, boat drill.	
Outer Wharf Stem	101-102	H	Midspan	0				410	solid drill, boat drill	
Outer Wharf Stem	101-102	H	Seaside	0				410	solid drill, boat drill	0
Outer Wharf Stem	102-103	D	Landside	680	0			280	Solid throughout	
Outer Wharf Stem	102-103	D	Midspan	680	0			280	Solid throughout	
Outer Wharf Stem	102-103	D	Seaside	680	0			280	Solid throughout	0
Outer Wharf Stem	102-103	F	Landside	0		100	150	390	middle void, boat drill	
Outer Wharf Stem	102-103	F	Midspan	0		0	0	390	solid drill, boat drill	
Outer Wharf Stem	102-103	F	Seaside	0				390	solid drill, boat drill	50
Outer Wharf Stem	102-103	H	Landside	0		110	0	410	top void boat drill	
Outer Wharf Stem	102-103	H	Midspan	0		0	0	410	solid drill, boat drill	
Outer Wharf Stem	102-103	H	Seaside	0				410	end cracked from top down to bottom. Boat drill	300
Outer Wharf Stem	103-104	D	Landside	620	0			220	crack or void all the way through	
Outer Wharf Stem	103-104	D	Midspan	620	0			220	Crack or void all the way through	
Outer Wharf Stem	103-104	D	Seaside	620	0			220	Crack or void all the way through	0
Outer Wharf Stem	103-104	F	Landside	0		180	0	410	top void, boat drill	
Outer Wharf Stem	103-104	F	Midspan	0		180	300	410	middle void, boat drill	
Outer Wharf Stem	103-104	F	Seaside	0		180	250	410	middle void, boat drill	230
Outer Wharf Stem	103-104	H	Landside	0				410	solid drill, boat drill	
Outer Wharf Stem	103-104	H	Midspan	0		130	0	410	top void, boat drill	
Outer Wharf Stem	103-104	H	Seaside	0		0	0	410	solid drill	280
Outer Wharf Stem	104-105	D	Landside	620	0			240	Solid	
Outer Wharf Stem	104-105	D	Midspan	620	0			240	Solid	0
Outer Wharf Stem	104-105	D	Seaside	620	0			240	Solid	
Outer Wharf Stem	104-105	F	Landside						From previous report	
Outer Wharf Stem	104-105	F	Midspan							200
Outer Wharf Stem	104-105	F	Seaside							
Outer Wharf Stem	104-105	H	Landside	0		0	0	400	solid drill, boat drill	
Outer Wharf Stem	104-105	H	Midspan	0		0	0	400	solid drill, boat drill	
Outer Wharf Stem	104-105	H	Seaside	0		0	0	400	solid drill, boat drill	0
Outer Wharf Stem	105-106	D	Landside	620	0			230	Solid	
Outer Wharf Stem	105-106	D	Midspan	620	0			220	Solid	
Outer Wharf Stem	105-106	D	Seaside	620	0			220	Solid	0
Outer Wharf Stem	105-106	F	Landside	0		50	350	400	middle void, boat drill	
Outer Wharf Stem	105-106	F	Midspan	0		180	0	400	top void, boat drill	
Outer Wharf Stem	105-106	F	Seaside	0		80	0	400	top void, boat drill	320
Outer Wharf Stem	105-106	H	Landside	0		0	0	410	solid drill, boat drill	
Outer Wharf Stem	105-106	H	Midspan	0		130	0	410	top void, boat drill	
Outer Wharf Stem	105-106	H	Seaside	0		0	0	410	solid drill, boat drill	280

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Outer Wharf Stem	106-107	D	Landside	640	0			230	Solid	
Outer Wharf Stem	106-107	D	Midspan	640	0			240	Solid	
Outer Wharf Stem	106-107	D	Seaside	640	0			230	Solid	0
Outer Wharf Stem	106-107	F	Landside	620	0	500	360	240	Internal void 140mm	
Outer Wharf Stem	106-107	F	Midspan	620	0		300	240	Top void 320mm	
Outer Wharf Stem	106-107	F	Seaside	620	0			240	Solid	320
Outer Wharf Stem	106-107	H	Landside	0		140	340	410	middle void, boat drill	
Outer Wharf Stem	106-107	H	Midspan	0		150	0	410	top void, boat drill	
Outer Wharf Stem	106-107	H	Seaside	0		200	0	410	top void, boat drill	260
Outer Wharf Stem	107-108	D	Landside	620	0			220	Solid	
Outer Wharf Stem	107-108	D	Midspan	630	0			230	Solid	
Outer Wharf Stem	107-108	D	Seaside	630	0			230	Solid	0
Outer Wharf Stem	107-108	F	Landside	0		0	0	400	solid drill, boat drill	
Outer Wharf Stem	107-108	F	Midspan	0		200	350	400	middle void, boat drill	
Outer Wharf Stem	107-108	F	Seaside	0		170	0	400	top void, boat drill	230
Outer Wharf Stem	107-108	H	Landside	0		1	0	400	full depth void, boat drill	
Outer Wharf Stem	107-108	H	Midspan	0		100	0	400	middle void, boat drill	
Outer Wharf Stem	107-108	H	Seaside	0		50	350	400	middle void, boat drill	399
Outer Wharf Stem	108-109	D	Landside	630	0			230	Solid	
Outer Wharf Stem	108-109	D	Midspan	630	0			230	Solid	
Outer Wharf Stem	108-109	D	Seaside	640	0			230	Solid	0
Outer Wharf Stem	108-109	F	Landside	0		0	0	470	solid drill, boat drill	
Outer Wharf Stem	108-109	F	Midspan	0		250	0	470	top void filled with water. A fair bit of water came out when top void was punctured. Boat drill	
Outer Wharf Stem	108-109	F	Seaside	0		0	0	470	solid drill, boat drill, top 70mm isn't drilled	220
Outer Wharf Stem	108-109	H	Landside	0		0	0	410	solid drill, boat drill	
Outer Wharf Stem	108-109	H	Midspan	0		0	0	410	solid drill, boat drill	
Outer Wharf Stem	108-109	H	Seaside	0		100	0	410	top void, drilled from boat, a lot of spongy top.	310
Outer Wharf Stem	109-110	D	Landside	640	0			240	Solid	
Outer Wharf Stem	109-110	D	Midspan	630	0			230	Solid	
Outer Wharf Stem	109-110	D	Seaside	630	0			230	Solid	0
Outer Wharf Stem	109-110	F	Landside	0		0	0	420	solid drill, boat drill	
Outer Wharf Stem	109-110	F	Midspan	0		0	0	420	solid drill, boat drill	
Outer Wharf Stem	109-110	F	Seaside	0		130	0	420	top void, boat drill	290
Outer Wharf Stem	109-110	H	Landside	0		0	0	400	solid drill, boat drill	
Outer Wharf Stem	109-110	H	Midspan	0		0	0	400	solid drill, boat drill	
Outer Wharf Stem	109-110	H	Seaside	0		250	0	400	top void, boat drill	150
Outer Wharf Stem	110-111	D	Landside	630	0			230	Cover Plate No access	
Outer Wharf Stem	110-111	D	Midspan	630	0			230	solid	
Outer Wharf Stem	110-111	D	Seaside	630	0			230	solid	0
Outer Wharf Stem	110-111	F	Landside	0		60	0	420	full depth void, Boat drill	
Outer Wharf Stem	110-111	F	Midspan	0		60	380	420	middle void, full depth, boat drill	
Outer Wharf Stem	110-111	F	Seaside	0		120	0	420	top void, boat drill.	360
Outer Wharf Stem	110-111	H	Landside	0		0	0	470	solid drill, boat drill	
Outer Wharf Stem	110-111	H	Midspan	0		0	0	470	solid drill, bat drill	
Outer Wharf Stem	110-111	H	Seaside	0		0	0	470	solid drill, boat drill	0
Outer Wharf Stem	110-111	J	Landside	0		150	0	300	box girder of 300mm. Boat drill	
Outer Wharf Stem	110-111	J	Midspan	0		150	0	300	box girder of 300mm. Boat drill	
Outer Wharf Stem	110-111	J	Seaside	0		0	0	300	solid drill, boat drill	150
Outer Wharf Stem	111-112	D	Landside	640	0			230	solid	
Outer Wharf Stem	111-112	D	Midspan	640	0			230	wet black swath ? Rot, visual inspection from boat indicates a black layer on the timber ? Preservative	
Outer Wharf Stem	111-112	D	Seaside	640	0		540	240	initially soft for 100mm then solid drilling	100
Outer Wharf Stem	111-112	F	Landside	620	0		420	240	Void, then bound into a crack	
Outer Wharf Stem	111-112	F	Midspan	620	0	600	400	240	void	
Outer Wharf Stem	111-112	F	Seaside	620	0		480	240	Large void at top and bottom of the girder	200
Outer Wharf Stem	111-112	H	Landside	20		0	0	400	full depth void, Boat drill	
Outer Wharf Stem	111-112	H	Midspan	50		0	0	400	full depth void, boat drill	
Outer Wharf Stem	111-112	H	Seaside	100		0	0	400		380
Outer Wharf Stem	111-112	J	Landside	100		0	0	290	drilled into a crack with void 100 in. boat drill	
Outer Wharf Stem	111-112	J	Midspan	0		0	0	290	solid drill, boat drill	
Outer Wharf Stem	111-112	J	Seaside	0		0	0	290	soft drilling in the top 100mm. Boat drill	190
Outer Wharf Stem	112-113	B	Landside	1		0	0	290	full depth crack/void, Boat drill	
Outer Wharf Stem	112-113	B	Midspan	1		0	0	290	full depth crack with a visible void, boat drill	
Outer Wharf Stem	112-113	B	Seaside	70		290	290	290	outside of this girder has termite damage and longitudinal splitting	289
Outer Wharf Stem	112-113	D	Landside	640	0			240	void all the way through	
Outer Wharf Stem	112-113	D	Midspan	640	0		480	250	Void at the top, soft drilling for the rest	
Outer Wharf Stem	112-113	D	Seaside	640	0		400	250	Void at the top, soft drilling for the rest	240
Outer Wharf Stem	112-113	F	Landside			100	300	390	middle void, boat drill	
Outer Wharf Stem	112-113	F	Midspan	250		300	390	390	middle void boat drill, top 150 filled with tar	
Outer Wharf Stem	112-113	F	Seaside	0		0	0	390	50mm drilled into a crack, boat drill	200
Outer Wharf Stem	112-113	H	Landside	0		0	0	450	solid drill, boat drill	
Outer Wharf Stem	112-113	H	Midspan	250		0	0	450	250 soft drilling, then void and into a crack after the soft drilling	
Outer Wharf Stem	112-113	H	Seaside	300		0	0	450	TOP 100MM VOID, BOAT DRILL	200
Outer Wharf Stem	112-113	J	Landside	150		0	0	400	full depth, top void, boat drill	
Outer Wharf Stem	112-113	J	Midspan	160		0	0	400	top void, boat drill	
Outer Wharf Stem	112-113	J	Seaside	90		0	0	400	top void, boat drill	310
Outer Wharf Stem	113-114	B	Landside			0	0	310	top void, boat drill	
Outer Wharf Stem	113-114	B	Midspan			210	0	310	top void, bat drill	
Outer Wharf Stem	113-114	B	Seaside			0	0	310	solid drill, bat drill	180
Outer Wharf Stem	113-114	D	Landside	630	0		440	250	Soft Drill at the top, swath not visible	
Outer Wharf Stem	113-114	D	Midspan	630	0			250	Soft drill all the way through with limited resistance	
Outer Wharf Stem	113-114	D	Seaside	630	0		350	250	Large void into a soft drill for 50 mm	280
Outer Wharf Stem	113-114	F	Landside			0	0	400	solid drill, boat drill	
Outer Wharf Stem	113-114	F	Midspan	170		250	0	400	middle void, boat drill	
Outer Wharf Stem	113-114	F	Seaside	0		0	0	400	solid drill, boat drill	80
Outer Wharf Stem	113-114	H	Landside	220		340	420	420	middle vid until 340 drill, then soft drilling all the way	
Outer Wharf Stem	113-114	H	Midspan	100		350	420	420	middle void, boat drill	
Outer Wharf Stem	113-114	H	Seaside	120		360	420	420		250
Outer Wharf Stem	113-114	J	Landside	0		0	0	420	solid drill, boat drill, soft drilling in last 100mm	
Outer Wharf Stem	113-114	J	Midspan	0		0	0	420	soft drilling in the top 100mm. Boat drill	
Outer Wharf Stem	113-114	J	Seaside	50		70	420	420	small void but otherwise the girder is solid.	20
Outer Wharf Stem	113-114	J1	Landside	0		0	0	410	solid girder, boat drill	
Outer Wharf Stem	113-114	J1	Midspan	0		0	0	410	solid girder, boat drill	
Outer Wharf Stem	113-114	J1	Seaside	0		0	0	410	solid girder, boat drill	0
Outer Wharf Stem	114-115	B	Landside			50	0	280	top void, bat drill	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Outer Wharf Stem	114-115	B	Midspan			120	0	280	top void, boat drill	
Outer Wharf Stem	114-115	B	Seaside			100	150	280	middle small vid, then top void as well of 50mm.	230
Outer Wharf Stem	114-115	D	Landside	670	0	620	410	330	Large void	
Outer Wharf Stem	114-115	D	Midspan	670	0			340	soft drill all the way through	
Outer Wharf Stem	114-115	D	Seaside	670	0	530	480	340	Soft drilling with void	210
Outer Wharf Stem	114-115	F	Landside			0	0	390	solid drill, boat drill	
Outer Wharf Stem	114-115	F	Midspan			180	200	390	small middle void of about 20mm, boat drill	
Outer Wharf Stem	114-115	F	Seaside			340	0	390	small top void, boat drill	50
Outer Wharf Stem	114-115	H	Landside			0	0	390	soft drilling for last 200mm, boat drill	
Outer Wharf Stem	114-115	H	Midspan			0	0	390	solid drill, boat drill	
Outer Wharf Stem	114-115	H	Seaside			0	0	390	soft drilling for last 200mm, boat drill	0
Outer Wharf Stem	114-115	J	Landside			0	0	470	solid drill, boat drill	
Outer Wharf Stem	114-115	J	Midspan			250	0	470	top void had wet soft timber with running water coming out. Boat drill	
Outer Wharf Stem	114-115	J	Seaside			0	0	470	solid drill, boat drill	220
Outer Wharf Stem	114-115	J1	Landside			0	0	390	solid drill, soft wood drill for the last 200mm	
Outer Wharf Stem	114-115	J1	Midspan			0	0	390	solid drill, soft wood drill for the last 200mm	
Outer Wharf Stem	114-115	J1	Seaside			0	0	390	solid drill, boat drill	0
Outer Wharf Stem	114-115	J2	Landside			0	0	390	solid drill, boat drill	
Outer Wharf Stem	114-115	J2	Midspan			150	0	390	top void, boat drill	
Outer Wharf Stem	114-115	J2	Seaside			120	0	390	top void, boat drill	270
Outer Wharf Stem	115-116	B	Landside			20	0	300	longitudinal cracks visual from the outside, boat drill	
Outer Wharf Stem	115-116	B	Midspan			10	0	300	longitudinal cracks visual from the outside, boat drill	
Outer Wharf Stem	115-116	B	Seaside			80	0	300	longitudinal cracks visual from the outside, boat drill	290
Outer Wharf Stem	115-116	D	Landside	670	0	620	430	320	Black swath noted, drill tracked into a crack and drilling stopped	
Outer Wharf Stem	115-116	D	Midspan	670	0		520	320	void at top otherwise solid	
Outer Wharf Stem	115-116	D	Seaside	670	0			320	Solid drill	190
Outer Wharf Stem	115-116	F	Landside				0	400	soft drilling the entire girder, Boat drill	
Outer Wharf Stem	115-116	F	Midspan			160	370	400	middle void with top 30mm after the top of the void very soft with black timber coming out of drill bit.	
Outer Wharf Stem	115-116	F	Seaside			10	0	400	bottom void/full depth void, boat drill, boat drill	390
Outer Wharf Stem	115-116	H	Landside			0	0	390	solid drilling, Boat drill	
Outer Wharf Stem	115-116	H	Midspan			0	0	390	top 100mm was soft drilling, boat drill	
Outer Wharf Stem	115-116	H	Seaside			0	0	390	soft drilling, Boat drill	0
Outer Wharf Stem	115-116	J	Landside			110	380	420	top void with a 20mm capping layer, boat drill	
Outer Wharf Stem	115-116	J	Midspan			240	0	420	top void but filled with soft timber/slush. Boat drill	
Outer Wharf Stem	115-116	J	Seaside			90	0	420	top void, 90mm in then dropped for 20mm then void after.	330
Outer Wharf Stem	115-116	J1	Landside			120	0	410	top void, boat drill	
Outer Wharf Stem	115-116	J1	Midspan			160	0	410	top void, with a 20mm cap to the girder, Boat drill	
Outer Wharf Stem	115-116	J1	Seaside			150	0	410	top void with a 20mm cap to the void, boat drill	290
Outer Wharf Stem	116-117	B	Landside			70	220	300	middle void, boat drill	
Outer Wharf Stem	116-117	B	Midspan			90	0	300	top void, boat drill	
Outer Wharf Stem	116-117	B	Seaside			60	280	300	20mm cap on middle void, boat drill	220
Outer Wharf Stem	116-117	D	Landside	620	0			250	solid	
Outer Wharf Stem	116-117	D	Midspan	620	0	550	450	300	Internal Void with crack at the bottom	
Outer Wharf Stem	116-117	D	Seaside	620	0		420	230	wet swath soft drilling with soft/void material	200
Outer Wharf Stem	116-117	F	Landside							
Outer Wharf Stem	116-117	F	Midspan						Girder Missing	
Outer Wharf Stem	116-117	F	Seaside							0
Outer Wharf Stem	116-117	H	Landside			0	0	520	Solid drill, boat drill, drilled to the 400mm marker on the drill bit all solid	
Outer Wharf Stem	116-117	H	Midspan			0	0	520	Solid drill, boat drill, drilled to the 400mm marker on the drill bit all solid	
Outer Wharf Stem	116-117	H	Seaside			0	0	520	Solid drill, boat drill, drilled to the 400mm marker on the drill bit all solid	0
Outer Wharf Stem	116-117	J	Landside			0	0	420	solid drill, boat drill	
Outer Wharf Stem	116-117	J	Midspan			0	0	420	solid drill, boat drill	
Outer Wharf Stem	116-117	J	Seaside			350	0	420	small top void, boat drill	70
Outer Wharf Stem	116-117	J1	Landside			0	0	300	solid drill, boat drill	
Outer Wharf Stem	116-117	J1	Midspan			0	0	30	solid drill, boat drill	
Outer Wharf Stem	116-117	J1	Seaside			0	0	300	solid drill,	0
Outer Wharf Stem	117-118	B	Landside	0		120		295		
Outer Wharf Stem	117-118	B	Midspan	0				295	solid	
Outer Wharf Stem	117-118	B	Seaside	0		160		295		175
Outer Wharf Stem	117-118	D	Landside	660	0		460	350	Top void	
Outer Wharf Stem	117-118	D	Midspan	720	0			340	realigned	
Outer Wharf Stem	117-118	D	Seaside	720	0		560	340	Soft drilling at the top	200
Outer Wharf Stem	117-118	F	Landside							
Outer Wharf Stem	117-118	F	Midspan						Girder Missing	
Outer Wharf Stem	117-118	F	Seaside							0
Outer Wharf Stem	117-118	H	Landside	0				400	solid	
Outer Wharf Stem	117-118	H	Midspan	0		200	300	400		
Outer Wharf Stem	117-118	H	Seaside	0		200	320	400	central void	120
Outer Wharf Stem	117-118	J	Landside	0		200		390	top void	
Outer Wharf Stem	117-118	J	Midspan	0		130		390	poor material, void	
Outer Wharf Stem	117-118	J	Seaside	0		60		390		330
Outer Wharf Stem	117-118	J1	Landside	0		150		380	top void	
Outer Wharf Stem	117-118	J1	Midspan	0		100		380	void	
Outer Wharf Stem	117-118	J1	Seaside	0		110		380	void	280
Outer Wharf Stem	117-118	J2	Landside	0				390	solid	
Outer Wharf Stem	117-118	J2	Midspan	0		220		390	top void	
Outer Wharf Stem	117-118	J2	Seaside	0		330		390	top void	170
Outer Wharf Stem	118-119	B	Landside	0				300	Solid	
Outer Wharf Stem	118-119	B	Midspan	0				300	Solid	
Outer Wharf Stem	118-119	B	Seaside	0				300	Solid	0
Outer Wharf Stem	118-119	D	Landside	720	0		520	340	Soft drilling at the top	
Outer Wharf Stem	118-119	D	Midspan	720	0		580	340	Soft drilling to for 140mm	
Outer Wharf Stem	118-119	D	Seaside	720	0				Drilling not completed	200
Outer Wharf Stem	118-119	F	Landside							
Outer Wharf Stem	118-119	F	Midspan						Girder Missing	
Outer Wharf Stem	118-119	F	Seaside							0
Outer Wharf Stem	118-119	H	Landside	0				390	solid	
Outer Wharf Stem	118-119	H	Midspan	0		190	340	390	centre void	
Outer Wharf Stem	118-119	H	Seaside	0		240	300	390	central void	150
Outer Wharf Stem	118-119	J	Landside	0		130		380	void	
Outer Wharf Stem	118-119	J	Midspan	0		90	350	380	void	
Outer Wharf Stem	118-119	J	Seaside	0		140	370	380	void	260
Outer Wharf Stem	118-119	J1	Landside	0		30		400	fd void	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Outer Wharf Stem	118-119	J1	Midspan	0		20		400	fd void	
Outer Wharf Stem	118-119	J1	Seaside	0		20		400	fd void	380
Outer Wharf Stem	118-119	J2	Landside	0		130	280	410	central void	
Outer Wharf Stem	118-119	J2	Midspan	0				410	solid	
Outer Wharf Stem	118-119	J2	Seaside	0				410	solid	150
Outer Wharf Stem	119-120	B	Landside	0				300		
Outer Wharf Stem	119-120	B	Midspan	0		80		300	Top void	
Outer Wharf Stem	119-120	B	Seaside	0		100		300	Top void	220
Outer Wharf Stem	119-120	D	Landside	680	0	580	420	300	internal void	
Outer Wharf Stem	119-120	D	Midspan	680	0		400	310	Soft drilling for 280 mm	
Outer Wharf Stem	119-120	D	Seaside	680	0		380	350	Soft drilling	300
Outer Wharf Stem	119-120	F	Landside	0		80		410	fd void	
Outer Wharf Stem	119-120	F	Midspan	0		10		410	fd void	
Outer Wharf Stem	119-120	F	Seaside	0		50		410	fd void	400
Outer Wharf Stem	119-120	H	Landside	0		50		410	fd void	
Outer Wharf Stem	119-120	H	Midspan	0		100		410	fd void	
Outer Wharf Stem	119-120	H	Seaside	0		70		410	fd void	360
Outer Wharf Stem	119-120	J	Landside	0				400	soft top 100 drill with black swath	
Outer Wharf Stem	119-120	J	Midspan	0		320		400		
Outer Wharf Stem	119-120	J	Seaside	0				400	solid	80
Outer Wharf Stem	119-120	J1	Landside	0		150		430	Large void	
Outer Wharf Stem	119-120	J1	Midspan	0		280		430	Large void	
Outer Wharf Stem	119-120	J1	Seaside	0		160		430	Large void	280
Outer Wharf Stem	119-120	J2	Landside	0				410	solid	
Outer Wharf Stem	119-120	J2	Midspan	0		350		410	top void	
Outer Wharf Stem	119-120	J2	Seaside	0		170	270	410	central void	100
Outer Wharf Stem	120-121	B	Landside	0		60		300	Large void	
Outer Wharf Stem	120-121	B	Midspan	0		10		300	Large void	
Outer Wharf Stem	120-121	B	Seaside	0		80		300	large crack and void obvious for full depth.	290
Outer Wharf Stem	120-121	D	Landside	680	0	560	470	340	Soft drilling with a small jump	
Outer Wharf Stem	120-121	D	Midspan	620	0	580	520	340	Soft drilling at the top with harder drilling at the bottom	
Outer Wharf Stem	120-121	D	Seaside	620	0		400	360	Drilling into a crack/void	220
Outer Wharf Stem	120-121	F	Landside	0		130	360	420	Large void	
Outer Wharf Stem	120-121	F	Midspan	0		120		420	Large void	
Outer Wharf Stem	120-121	F	Seaside	0		100		420	Large void	320
Outer Wharf Stem	120-121	H	Landside	0				420	solid	
Outer Wharf Stem	120-121	H	Midspan	0				420	solid	
Outer Wharf Stem	120-121	H	Seaside	0				420	solid	0
Outer Wharf Stem	120-121	J	Landside	0		20		420	fd void	
Outer Wharf Stem	120-121	J	Midspan	0		90		420	fd void	
Outer Wharf Stem	120-121	J	Seaside	0		30		420	fd void	400
Outer Wharf Stem	120-121	J1	Landside	0		140		400	void	
Outer Wharf Stem	120-121	J1	Midspan	0		110	350	400	void	
Outer Wharf Stem	120-121	J1	Seaside	0		340		400	void	260
Outer Wharf Stem	120-121	J2	Landside	0		340		440	top void	
Outer Wharf Stem	120-121	J2	Midspan	0				440	solid	
Outer Wharf Stem	120-121	J2	Seaside	0		330		440	top void	110
Outer Wharf Stem	120-121	J3	Landside	0		100		450	fd void	
Outer Wharf Stem	120-121	J3	Midspan	0		90		450	fd void	
Outer Wharf Stem	120-121	J3	Seaside	0		70		450	fd void	380
Outer Wharf Stem	121-122	B	Landside	0				400	20-50mm jumps consistent with longitudinal cracks horizontally through the girder..	
Outer Wharf Stem	121-122	B	Midspan	0		180	350	400	Internal void	
Outer Wharf Stem	121-122	B	Seaside	0		160	320	400	Internal void	170
Outer Wharf Stem	121-122	D	Landside	640	0			330	Hard drilling	
Outer Wharf Stem	121-122	D	Midspan	620				310	Hard drilling	
Outer Wharf Stem	121-122	D	Seaside						No access, cover plate	0
Outer Wharf Stem	121-122	F	Landside	0				400	solid	
Outer Wharf Stem	121-122	F	Midspan	0		180		400	void	
Outer Wharf Stem	121-122	F	Seaside	0		30		400	void	370
Outer Wharf Stem	121-122	H	Landside	0		180		420	void	
Outer Wharf Stem	121-122	H	Midspan	0		130		420	void, visible void in the bottom 100mm of girder	
Outer Wharf Stem	121-122	H	Seaside	0		100		420	void	320
Outer Wharf Stem	121-122	J	Landside	0		100		420	void	
Outer Wharf Stem	121-122	J	Midspan	0		180		420	void	
Outer Wharf Stem	121-122	J	Seaside	0		190		420	void	320
Outer Wharf Stem	121-122	J1	Landside	0		50	180	420	bottom void 130m, drilled top 230 then void to top 190mm, likely drilled through a large void with heartwood intact	
Outer Wharf Stem	121-122	J1	Midspan	0				420	solid	
Outer Wharf Stem	121-122	J1	Seaside	0		180	390	420	central void	210
Outer Wharf Stem	121-122	J2	Landside	0		200		410	top voids	
Outer Wharf Stem	121-122	J2	Midspan	0		160		410	top voids	
Outer Wharf Stem	121-122	J2	Seaside	0		200		410	top voids	250
Outer Wharf Stem	121-122	J3	Landside	0		170		390	large crack landside	
Outer Wharf Stem	121-122	J3	Midspan	0		140		390	top voids	
Outer Wharf Stem	121-122	J3	Seaside	0		150		390	top voids	250

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	7-8	L	Landside	0				400	260mm top void	
Coal Pier Stem	7-8	L	Midspan	0				400	150mm then void then 70mm	
Coal Pier Stem	7-8	L	Seaside	0				400	10mm in then full depth void.	0
Coal Pier Stem	7-8	J	Landside	0				450	solid drill, boat drill.	
Coal Pier Stem	7-8	J	Midspan	0				450	solid drill, boat drill.	
Coal Pier Stem	7-8	J	Seaside	0				450	solid drill, boat drill.	0
Coal Pier Stem	7-8	I	Landside	670			410	310	Large void down to 260, then solid.	
Coal Pier Stem	7-8	I	Midspan	700				300	Drill tracking badly through crack, drill not completed	
Coal Pier Stem	7-8	I	Seaside	700		680	580	300	10-20mm crack at top, then ~100mm void and soft after	260
Coal Pier Stem	7-8	G	Landside	0		100		410	Large Void	
Coal Pier Stem	7-8	G	Midspan	0		160		410	Large Void	
Coal Pier Stem	7-8	G	Seaside	0		190		410	Large Void	310
Coal Pier Stem	7-8	E	Landside	730	0	640	530	310	Soft before void, black swath visible. Void from around 90 to 200.	
Coal Pier Stem	7-8	E	Midspan	680	0	540	520	300	Black swath at top, 20mm jump to 160.	
Coal Pier Stem	7-8	E	Seaside	710	0			310	Around 10mm jump from 170-180, probably a crack	110
Coal Pier Stem	7-8	D	Landside	990			670	590	top void, and be classified as full depth	
Coal Pier Stem	7-8	D	Midspan	980				590	drilled through a crack from top to bottom.	
Coal Pier Stem	7-8	D	Seaside	970		810	700	550		320
Coal Pier Stem	8-9	L	Landside	0				450	Solid. note for L - large 700mm haunch on headstock 9 side of span	
Coal Pier Stem	8-9	L	Midspan	0				450	Solid. note for L - large 700mm haunch on headstock 9 side of span	
Coal Pier Stem	8-9	L	Seaside	0				450	Solid. note for L - large 700mm haunch on headstock 9 side of span	0
Coal Pier Stem	8-9	J	Landside	0				410	top void, 150mm from bottom of girder to bottom of void.	
Coal Pier Stem	8-9	J	Midspan	0				410	Solid	
Coal Pier Stem	8-9	J	Seaside	0				410	Solid	0
Coal Pier Stem	8-9	I	Landside	790	0			340	Black swath found at top, solid throughout	
Coal Pier Stem	8-9	I	Midspan	790	0			330	Small 10mm jump from 150 to 160, solid otherwise	
Coal Pier Stem	8-9	I	Seaside	750	0			320	Felt soft at top, solid throughout	0
Coal Pier Stem	8-9	G	Landside	690	0		620	330	Estimated 50-70mm void at top of girder, very soft and then drill tracked at about 140 to 360. Not completed to bottom	
Coal Pier Stem	8-9	G	Midspan	690	0			310	Solid throughout	
Coal Pier Stem	8-9	G	Seaside	750	0			340	Solid throughout	70
Coal Pier Stem	8-9	E	Landside	990				710	looks to be a void/cracks through this drill	
Coal Pier Stem	8-9	E	Midspan	1000				600	looks to be a void/cracks through this drill	
Coal Pier Stem	8-9	E	Seaside	990				700	looks to be a void/cracks through this drill	0
Coal Pier Stem	9-10	L	Landside	0		30		420	drill from boat, full depth void	
Coal Pier Stem	9-10	L	Midspan	0		200		420	top void 200mm	
Coal Pier Stem	9-10	L	Seaside	0		120		420	top void	390
Coal Pier Stem	9-10	J	Landside	680	0			320	Small jump through crack at 140, otherwise solid	
Coal Pier Stem	9-10	J	Midspan	640	0			330	Solid throughout	
Coal Pier Stem	9-10	J	Seaside	690	0	580	560	310	Small void from 110-130, solid otherwise	20
Coal Pier Stem	9-10	I	Landside	780	0			320	solid throughout	
Coal Pier Stem	9-10	I	Midspan	780	0			320	Solid throughout	
Coal Pier Stem	9-10	I	Seaside	780	0			320	Solid throughout	0
Coal Pier Stem	9-10	G	Landside	690	0			300	Solid throughout	
Coal Pier Stem	9-10	G	Midspan	690	0			310	Solid throughout	
Coal Pier Stem	9-10	G	Seaside	690	0	640	600	310	Small void found, solid for rest	40
Coal Pier Stem	9-10	E	Landside	980				550	top void of about 40mm	
Coal Pier Stem	9-10	E	Midspan	1000				550	GOD CONDITION	
Coal Pier Stem	9-10	E	Seaside	990				580	crack located halfway	0
Coal Pier Stem	9-10	D	Landside	1000		810	690	600	girder has void	
Coal Pier Stem	9-10	D	Midspan	990				610	top void of 60mm, crack located half way through	
Coal Pier Stem	9-10	D	Seaside	850		800	720	580	looks to be void at top of girder,	120
Coal Pier Stem	10-11	L	Landside	0		130	200	400	void present, boat drill.	
Coal Pier Stem	10-11	L	Midspan	0				400	solid drill	
Coal Pier Stem	10-11	L	Seaside	0				400	full depth split girder rolling off timber bearing. Split extends to mid span.	70
Coal Pier Stem	10-11	J	Landside	780	0	750	700	300	Big void from 30 to 80, solid for rest	
Coal Pier Stem	10-11	J	Midspan	790	0	740	700	310	Void from 50 to 90, likely continuation, solid for rest	
Coal Pier Stem	10-11	J	Seaside	790	0			310	solid	50
Coal Pier Stem	10-11	I	Landside	0				410	solid drilled from boat, end is solid with a vertical split, suit pinning	
Coal Pier Stem	10-11	I	Midspan	0				410	solid drilled from boat	
Coal Pier Stem	10-11	I	Seaside	0				410	solid drilled from boat	0
Coal Pier Stem	10-11	G	Landside	710	0	650	540	300	Large void from 60-170, solid for rest	
Coal Pier Stem	10-11	G	Midspan	710	0			300	Solid, quite hard to drill through, drilled through almost all the girder and stopped due to drill being blunt	
Coal Pier Stem	10-11	G	Seaside	690	0	520	500	300	Drop from 170-190, felt soft for 150mm after this. Solid for rest	110
Coal Pier Stem	10-11	E	Landside	930				560	crack located near bottom of girder	
Coal Pier Stem	10-11	E	Midspan	900				570	good condition	
Coal Pier Stem	10-11	E	Seaside	910				510	good condition	0
Coal Pier Stem	10-11	D	Landside	1000		920	800	610	void in middle fairly good condition otherwise	
Coal Pier Stem	10-11	D	Midspan	980		960	890	590	top void otherwise fairly good condition	
Coal Pier Stem	10-11	D	Seaside	980				580	top void of 40mm	120
Coal Pier Stem	11-12	L	Landside	0		200		430	top void for 200 mm	
Coal Pier Stem	11-12	L	Midspan	0		10		430	full depth void	
Coal Pier Stem	11-12	L	Seaside	0		10		430	full depth void	420
Coal Pier Stem	11-12	J-I	Landside	0		10		400	full depth void	
Coal Pier Stem	11-12	J-I	Midspan	0		20		400	full depth void	
Coal Pier Stem	11-12	J-I	Seaside	0		20		400	full depth void	390
Coal Pier Stem	11-12	J	Landside	0				430	solid	
Coal Pier Stem	11-12	J	Midspan	0				430	solid	
Coal Pier Stem	11-12	J	Seaside	0				430	solid	0

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	11-12	I	Landside	790	0	600	520	360	Felt like a couple of small cracks before the void, seemed to punch through slightly early, potentially indicating a bottom crack or void	
Coal Pier Stem	11-12	I	Midspan	780	0	740	700	350	140-180 crack also, punched through slightly early	
Coal Pier Stem	11-12	I	Seaside	780	0			320	Soft from 130 to 180, some black swath visible	80
Coal Pier Stem	11-12	G	Landside	790	0	740	660	310	70-80mm crack/void from 50 to 130, then another small drop from 300-320	
Coal Pier Stem	11-12	G	Midspan	790	0	580	560	310	Small jump from 240-260 also, solid after	
Coal Pier Stem	11-12	G	Seaside	770	0	580	560	320	Small jump from 220-240, solid afterwards	80
Coal Pier Stem	11-12	E	Landside	1000				610	fairly good condition	
Coal Pier Stem	11-12	E	Midspan	990				590	good condition	
Coal Pier Stem	11-12	E	Seaside	970				540	spongy on drill at the 800 depth mark.	0
Coal Pier Stem	11-12	D	Landside	1000				590	fairly good condition	
Coal Pier Stem	11-12	D	Midspan	940		920	820	590	top void	
Coal Pier Stem	11-12	D	Seaside	990				610	crack at top 200mm of the girder. Very easy to drill the rest.	100
Coal Pier Stem	12-13	L	Landside	540				110		
Coal Pier Stem	12-13	L	Midspan	540		500	410	110	2 voids, second at 300 - 230.	
Coal Pier Stem	12-13	L	Seaside	500			270	110	top void	230
Coal Pier Stem	12-13	J	Landside	0		80		410	top void drilled from boat	
Coal Pier Stem	12-13	J	Midspan	0		80		410	top void drilled from boat	
Coal Pier Stem	12-13	J	Seaside	0		90		410	top void, drilled from boat	330
Coal Pier Stem	12-13	I	Landside	750	0	720	500	390	Major void from 720-500, then another separate void from 420-390, didn't finish hole as hit steel	
Coal Pier Stem	12-13	I	Midspan	780	0	770	650	390	Major void from 770-650, then another separate void from 630 to 500, stopped at 460 as drill was blunt	
Coal Pier Stem	12-13	I	Seaside	790	0	750	650	390	Major void at 750-650, felt like crack. Solid for rest.	220
Coal Pier Stem	12-13	G	Landside	690	0		310	290	Void from top of girder all the way to 310. Then only small bit of girder left at bottom. Didn't feel like a sudden drop, so likely there were bits of timber through the void.	
Coal Pier Stem	12-13	G	Midspan	610	0	550	410	310	Void at 550, then solid, then drill punched through bottom of girder slightly early indicating a small void/crack at bottom	
Coal Pier Stem	12-13	G	Seaside	610	0	600	450	340	Estimated void at top due to low start level, then another void from 600-450.	380
Coal Pier Stem	12-13	E	Landside	780	0	600	510	310	Crack/void at 600, solid afterwards	
Coal Pier Stem	12-13	E	Midspan	780	0	600	500	310	Crack/void at 600, solid afterwards	
Coal Pier Stem	12-13	E	Seaside	700	0	550	460	300	Small jump from 570 to 550, then ~90mm void from 550-460.	
Coal Pier Stem	12-13	D	Landside	0				380	Then another void from 460-350.	100
Coal Pier Stem	12-13	D	Midspan	0		170		410	full depth void	
Coal Pier Stem	12-13	D	Seaside	0		50		410	top void	
Coal Pier Stem	13-14	L	Landside	540				110	top void drilled from boat	360
Coal Pier Stem	13-14	L	Midspan	540		500	410	110		
Coal Pier Stem	13-14	L	Seaside	500			270	110	2 voids, second at 300 - 230.	
Coal Pier Stem	13-14	J	Landside	0		80		410	top void	230
Coal Pier Stem	13-14	J	Midspan	0		80		410	top void drilled from boat	
Coal Pier Stem	13-14	J	Seaside	0		90		410	top void, drilled from boat	330
Coal Pier Stem	13-14	I	Landside	670	0			400	Solid, maybe a small crack at top of 20-30mm max	
Coal Pier Stem	13-14	I	Midspan	640	0	630	530	360	~100mm void, wasn't able to be fully completed, but after 140 was solid	
Coal Pier Stem	13-14	I	Seaside	740	0	720	540	380	Crack just under top of girder, solid after void	180
Coal Pier Stem	13-14	G	Landside	660	0	470	420	300	Small void around 190, some black swath noticed	
Coal Pier Stem	13-14	G	Midspan	700	0			370	Girder seemed slightly shallow, otherwise solid	
Coal Pier Stem	13-14	G	Seaside	700	0			320	Solid throughout	50
Coal Pier Stem	13-14	E	Landside	930				520	top void,	
Coal Pier Stem	13-14	E	Midspan	930			750	510	top void,	
Coal Pier Stem	13-14	E	Seaside	930			780	530	top void,	180
Coal Pier Stem	13-14	D	Landside	0		140	300	420	to be drilled by boat,	
Coal Pier Stem	13-14	D	Midspan	930			720	520		
Coal Pier Stem	13-14	D	Seaside	930			650	520	top void,	280
Coal Pier Stem	14-15	H	Landside	0		200		430	solid	
Coal Pier Stem	14-15	H	Midspan	0		140		430	top void , drilled from boat, 430-140 = 300 , black swath	
Coal Pier Stem	14-15	H	Seaside	0				430	secondary drill from the seaside 500mm from previous drill has a 100mm top void	290
Coal Pier Stem	14-15	F	Landside	0				420	previously drilled prior to assessment 300 mm	
Coal Pier Stem	14-15	F	Midspan	0				420	drilled from boat, 200mm then soft black swath to the top	
Coal Pier Stem	14-15	F	Seaside	0				420	soft drilling in the top 200 of girder with 2x 50mm voids	0
Coal Pier Stem	14-15	E	Landside	780	0	550	500	380	Bit soft from 130-280, void from 230-280	
Coal Pier Stem	14-15	E	Midspan	780	0	770	660	350	Big void at top, then solid	
Coal Pier Stem	14-15	E	Seaside	750	0	710	410	360	Big void just under top, then solid to bottom	300
Coal Pier Stem	14-15	D	Landside	700	0		430	300	Void from top, top reading not recorded exactly. Void around 250-270mm in depth	
Coal Pier Stem	14-15	D	Midspan	700	0				Not drilled	
Coal Pier Stem	14-15	D	Seaside	700	0		550	300	Big void from top of girder to 150 (around 150 depth). 10mm of timber afterwards then another void below.	270
Coal Pier Stem	14-15	B	Landside	930		810	660	520	internal void,150	
Coal Pier Stem	14-15	B	Midspan	930			710	520	top void, 220	
Coal Pier Stem	14-15	B	Seaside	930			650	520	top void, 280	280
Coal Pier Stem	15-16	H	Landside	0		110		410	top void, drilled from boat	
Coal Pier Stem	15-16	H	Midspan	0		150	290	410	Central void, drilled from boat	
Coal Pier Stem	15-16	H	Seaside	0				410	Solid	300
Coal Pier Stem	15-16	H-F	Landside	520		390	190	100	top void at 330 to 300 included	
Coal Pier Stem	15-16	H-F	Midspan	540			290	140	top void	
Coal Pier Stem	15-16	H-F	Seaside	560		420	190	140	void	250
Coal Pier Stem	15-16	F	Landside	0				400	Drilled from boat, solid	
Coal Pier Stem	15-16	F	Midspan	0				400	Drilled from boat, solid	
Coal Pier Stem	15-16	F	Seaside	0				400	Drilled from boat, solid	0
Coal Pier Stem	15-16	E	Landside	790	0			320	Solid throughout	
Coal Pier Stem	15-16	E	Midspan	770	0			350	Solid, last 50mm not done as drill was getting stuck/bending	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	15-16	E	Seaside	790	0			350	Solid throughout	0
Coal Pier Stem	15-16	D	Landside	700	0	530	500	300	Soft from 200-250. Crack/void from 170-200. New drill with screw used in this location.	
Coal Pier Stem	15-16	D	Midspan	710	0			310	Solid throughout	
Coal Pier Stem	15-16	D	Seaside	620	0		620	310	Void at top, estimated 60-70mm, then soft below	30
Coal Pier Stem	15-16	B-D	Landside	950				540	solid	
Coal Pier Stem	15-16	B-D	Midspan	950				540	solid	
Coal Pier Stem	15-16	B-D	Seaside	950				540	solid	0
Coal Pier Stem	15-16	B	Landside	930				520	full depth void	
Coal Pier Stem	15-16	B	Midspan	930				520	drill snapped in crack	
Coal Pier Stem	15-16	B	Seaside	930		870	740	520	central void	130
Coal Pier Stem	16-17	H	Landside	560		540	410	140	top void	
Coal Pier Stem	16-17	H	Midspan	550		410	300	130	void	
Coal Pier Stem	16-17	H	Seaside	550		0	290	140	top void	260
Coal Pier Stem	16-17	F	Landside	0		80	320	400	Drilled from boat	
Coal Pier Stem	16-17	F	Midspan	0		40		400	full depth	
Coal Pier Stem	16-17	F	Seaside	0		20		400	Drilled from boat	380
Coal Pier Stem	16-17	E	Landside	760	0	750	530	300	10mm of timber at top then large void, solid after	
Coal Pier Stem	16-17	E	Midspan	720	0			350	Solid throughout	
Coal Pier Stem	16-17	E	Seaside	720	0			330	Solid throughout	220
Coal Pier Stem	16-17	D	Landside	690	0		580	290	Estimated 100-150mm void at top, solid after	
Coal Pier Stem	16-17	D	Midspan	690	0		600	300	Estimated 100mm void at top, solid after	
Coal Pier Stem	16-17	D	Seaside	690	0			300	Solid throughout	110
Coal Pier Stem	16-17	B	Landside	950				510	full depth crack/void	
Coal Pier Stem	16-17	B	Midspan	950		790	680	510	drilling into crack, central void	
Coal Pier Stem	16-17	B	Seaside	950		859	600	520	central void	259
Coal Pier Stem	17-18	H	Landside	940				520	solid	
Coal Pier Stem	17-18	H	Midspan	520		490	330	120	Central Void	
Coal Pier Stem	17-18	H	Seaside	560		420	210	130	void	210
Coal Pier Stem	17-18	F	Landside	0		300		410	Drilled from boat	
Coal Pier Stem	17-18	F	Midspan	0				410	Drilled from boat, solid	
Coal Pier Stem	17-18	F	Seaside	0		290		410	Drilled from boat	120
Coal Pier Stem	17-18	E	Landside	760	0	720	540	340	Big void from 40-220, then second void from 340 down through the bottom of girder	
Coal Pier Stem	17-18	E	Midspan	750	0	650	600	340	Big void starting at 100. Solid after	
Coal Pier Stem	17-18	E	Seaside	760	0	630	540	390	~110mm void, then solid after	180
Coal Pier Stem	17-18	D	Landside	650	0	620	540	320	Void in middle, then second void from 110-220	
Coal Pier Stem	17-18	D	Midspan	670	0	650	530	330	Void/crack near top, then solid	
Coal Pier Stem	17-18	D	Seaside	660	0	620	580	330	Small crack/void found, the solid after	120
Coal Pier Stem	17-18	B	Landside	950		900	590	520	central void	
Coal Pier Stem	17-18	B	Midspan	950		0	750	620	top and bottom void	
Coal Pier Stem	17-18	B	Seaside	950		900	720	520	central void	310
Coal Pier Stem	18-19	H	Landside	520		320	290	100	Central small void	
Coal Pier Stem	18-19	H	Midspan	520		440	290	110	Central Void	
Coal Pier Stem	18-19	H	Seaside	530			240	120	Top Void	290
Coal Pier Stem	18-19	F	Landside	0				400	Solid	
Coal Pier Stem	18-19	F	Midspan	0		250		400	Top Void	
Coal Pier Stem	18-19	F	Seaside	0				400	Solid	150
Coal Pier Stem	18-19	E	Landside	760	0			310	Drill tracking into crack again, stopped at 160 depth.	
Coal Pier Stem	18-19	E	Midspan	750	0			310	Solid throughout	
Coal Pier Stem	18-19	E	Seaside	630	0	630	530	340	Void from top to 110, solid afterwards	100
Coal Pier Stem	18-19	D	Landside	680	0			310	Small crack at top, then solid throughout	
Coal Pier Stem	18-19	D	Midspan	630	0			310	Solid throughout	
Coal Pier Stem	18-19	D	Seaside	700	0	630	540	310	Void from 70-160, solid after. Not completed due to drill tracking into crack (estimated that it was stopped 50mm from bottom of girder)	90
Coal Pier Stem	18-19	B	Landside	950			700	520	top void	
Coal Pier Stem	18-19	B	Midspan	950		900	730	530	drill bound in crack	
Coal Pier Stem	18-19	B	Seaside	950			700	530	solid	250
Coal Pier Stem	19-20	H	Landside	550			400	130	top void	
Coal Pier Stem	19-20	H	Midspan	550			410	130	top void	
Coal Pier Stem	19-20	H	Seaside	650				200	Solid	150
Coal Pier Stem	19-20	F	Landside	0		300		420	Top Void	
Coal Pier Stem	19-20	F	Midspan	0		230		420	Top Void	
Coal Pier Stem	19-20	F	Seaside	0		270	340	420	Central Void	190
Coal Pier Stem	19-20	E	Landside	750	0			320	Solid throughout, some black swath noted	
Coal Pier Stem	19-20	E	Midspan	760	0	610	540	320	Big void found, 150-220, then another small drop from 220-240.	
Coal Pier Stem	19-20	E	Seaside	670	0	620	550	330	Solid after	
Coal Pier Stem	19-20	D	Landside	700	0			310	Void from 50-120. Solid afterwards	70
Coal Pier Stem	19-20	D	Midspan	670	0	630	600	310	Solid throughout, stopped drilling 40mm from end as drill was jamming	
Coal Pier Stem	19-20	D	Seaside	670	0			310	40-70 small drop, solid after	
Coal Pier Stem	19-20	B	Landside	950			680	520	not drilled	30
Coal Pier Stem	19-20	B	Midspan	950				520	crack/void generally full depth	
Coal Pier Stem	19-20	B	Seaside	950				520	drilling into crack	
Coal Pier Stem	19-20	B	Seaside	950				520	drilled using a short first then long	270
Coal Pier Stem	20-21	H	Landside	950				550	knot hole noted in the top of girder otherwise hard drilling	
Coal Pier Stem	20-21	H	Midspan	950		480	280	540	void	
Coal Pier Stem	20-21	H	Seaside	950				550	Solid	200
Coal Pier Stem	20-21	F	Landside	0				410	Solid	
Coal Pier Stem	20-21	F	Midspan	0				410	Solid	
Coal Pier Stem	20-21	F	Seaside	0		30	380	410	Large Void in middle of girder.	350
Coal Pier Stem	20-21	E	Landside	700	0	740	630	340	Top void, solid after. Drill not completed as it was tracking/bending	
Coal Pier Stem	20-21	E	Midspan	760	0			340	Solid throughout	
Coal Pier Stem	20-21	E	Seaside	760	0	640	620	330	Small drop from 220-240, solid afterwards. START OF DAY 9 - Heavy wind and rain	110
Coal Pier Stem	20-21	D	Landside	640	0	440	400	300	Void from 200-240, then solid after	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	20-21	D	Midspan	680	0	550	500	300	Void from 130-180. Then solid after	
Coal Pier Stem	20-21	D	Seaside	680	0		570	320	Void from top down to 100. Second void from 150-270. Solid after	110
Coal Pier Stem	20-21	B	Landside	930		400	320	550	central void	
Coal Pier Stem	20-21	B	Midspan	930				550	large crack noted - 30mm wide	
Coal Pier Stem	20-21	B	Seaside	930		490	420	570	small void	80
Coal Pier Stem	21-22	H	Landside	950				550	no data	
Coal Pier Stem	21-22	H	Midspan	950				550	drilling into crack, with solid drill for remainder	
Coal Pier Stem	21-22	H	Seaside	950				550	solid with drilling into a crack in the lower portion	0
Coal Pier Stem	21-22	F	Landside	0		60	300	420	large void in middle of girder.	
Coal Pier Stem	21-22	F	Midspan	0		260	350	420	small vid in middle of the girder.	
Coal Pier Stem	21-22	F	Seaside	0		140		420	full depth void, boat drilling	280
Coal Pier Stem	21-22	E	Landside	630	0	600	560	200	Small void from 30-70, then a crack all the way from 180 through to bottom	
Coal Pier Stem	21-22	E	Midspan	730	0		520	310	Big crack all the way through to 210, drill tracking into a crack	
Coal Pier Stem	21-22	E	Seaside	730	0		500	310	Big crack all the way through 230, drill tracking into a crack	230
Coal Pier Stem	21-22	D	Landside	760	0	700	600	330	Tracking into a big crack, drilling stopped. Crack estimated at 100mm depth	
Coal Pier Stem	21-22	D	Midspan	710	0	700	530	310	Tracking into crack, same as previous (likely same crack along girder). Drilling stopped to save drill	
Coal Pier Stem	21-22	D	Seaside	720	0	630	470	310	Drill going through crack/void, also another small drop from 260-270. Drill tracking and bending so not completed	170
Coal Pier Stem	21-22	B	Landside	950		840	790	530	small void	
Coal Pier Stem	21-22	B	Midspan	560			350	530	crack in top of girder, drilling into and through the crack	
Coal Pier Stem	21-22	B	Seaside	950				530	crack in top of girder, drilling beside the crack	210
Coal Pier Stem	22-23	H	Landside	0		180		420	top void	
Coal Pier Stem	22-23	H	Midspan	0				420	solid	
Coal Pier Stem	22-23	H	Seaside	960		920	840	580	drill tracked through a crack into the void. Bent drill bit and had a small void from 720-700.	240
Coal Pier Stem	22-23	F	Landside	0		200	250	420	small void from 200 to 250. 50mm void. Boat drilling	
Coal Pier Stem	22-23	F	Midspan	0		250		420	hard drill until 250 then soft drilling followed by to void. Boat drilled	
Coal Pier Stem	22-23	F	Seaside	0				420	Solid drill, but 30mm wide vertical crack from bottom. Boat drill.	170
Coal Pier Stem	22-23	E	Landside	740	0	650	520	310	Void at 90 down to 220, solid afterwards	
Coal Pier Stem	22-23	E	Midspan	730	0	640	600	340	Void at 90 to 130, then solid after	
Coal Pier Stem	22-23	E	Seaside	740	0	700	560	350	Void from 40-180, then solid after	140
Coal Pier Stem	22-23	D	Landside	720	0		500	310	Big crack/VOID from top of girder down to 220, drill tracking through cracks	
Coal Pier Stem	22-23	D	Midspan	720	0		520	310	Big crack from top of girder down to 200, solid after	
Coal Pier Stem	22-23	D	Seaside	720	0		540	290	Big crack from top of girder down to 180, solid after	220
Coal Pier Stem	22-23	B	Landside	930				600	drill had small voids from 820 - 800. fairly easy drill after. Went through a crack.	
Coal Pier Stem	22-23	B	Midspan	970		920	830	590	small middle void	
Coal Pier Stem	22-23	B	Seaside	970				590	2 small voids of 20mm from 800 - 750.	90
Coal Pier Stem	23-24	H	Landside	960				580	full depth void.	
Coal Pier Stem	23-24	H	Midspan	970		840	780	580	drill tracked through a crack which made it hard to accurately determine the bottom of girder.	
Coal Pier Stem	23-24	H	Seaside	970		890	790	590	top void and drill tracked out in a crack	100
Coal Pier Stem	23-24	F	Landside	0				400	Solid	
Coal Pier Stem	23-24	F	Midspan	0				400	Solid	
Coal Pier Stem	23-24	F	Seaside	0				400	Solid	0
Coal Pier Stem	23-24	E	Landside	730	0	540	520	300	Jump from 190-210, solid after	
Coal Pier Stem	23-24	E	Midspan	730	0			320	Solid throughout	
Coal Pier Stem	23-24	E	Seaside	740	0			320	Soft between 190-340 (black swath visible). Solid	20
Coal Pier Stem	23-24	D	Landside	720	0		500	310	Void all the way down to 220, solid for rest	
Coal Pier Stem	23-24	D	Midspan	720	0		580	310	Void all the way down to 140, solid for rest	
Coal Pier Stem	23-24	D	Seaside	720	0	640	610	320	Soft at top, black swath noted. Solid after 110	220
Coal Pier Stem	23-24	B	Landside	970				590	2 voids of 30mm each one from 800 - 770 the other 740 - 710.	
Coal Pier Stem	23-24	B	Midspan	960			890	590	small top void	
Coal Pier Stem	23-24	B	Seaside	990			780	580	top void	210
Coal Pier Stem	24-25	H	Landside	970		960	710	590	drill went through void into a crack.	
Coal Pier Stem	24-25	H	Midspan	970				610	drill tracked through a crack the whole way	
Coal Pier Stem	24-25	H	Seaside	960				610	solid no voids	250
Coal Pier Stem	24-25	F	Landside	0		110	270	480	central void	
Coal Pier Stem	24-25	F	Midspan	0		240	380	480	central void	
Coal Pier Stem	24-25	F	Seaside	0		180		480	drilled to the extent of 400mm bit	300
Coal Pier Stem	24-25	E	Landside	740	0	620		390	Drilled to 240, drill tracking into crack so not completed	
Coal Pier Stem	24-25	E	Midspan	750	0	740	520	390	Void/crack from 10 to 230	
Coal Pier Stem	24-25	E	Seaside	750	0	560	540	380	Crack visible, was avoided during drilling of this hole	220
Coal Pier Stem	24-25	D	Landside	780	0	650	550	320	100mm void near top.	
Coal Pier Stem	24-25	D	Midspan	720	0			380	No voids in middle, void towards bottom (60-70mm est.)	
Coal Pier Stem	24-25	D	Seaside	700	0	650	540	310	Void from 50-160	110
Coal Pier Stem	24-25	B	Landside	970		900	790	600	drilled next to a crack, drill tracked into the crack which had the void.	
Coal Pier Stem	24-25	B	Midspan	970		950	820	600	top void, and tracked through a crack until bottom.	
Coal Pier Stem	24-25	B	Seaside	960				600	solid no voids	130
Coal Pier Stem	25-26	R	Landside	530		390	200	140	Large central void	
Coal Pier Stem	25-26	R	Midspan	550			190	150	top void until 190.	
Coal Pier Stem	25-26	R	Seaside	520		420		150	bottom void from 420 onwards	360
Coal Pier Stem	25-26	K	Landside	0				410	solid	
Coal Pier Stem	25-26	K	Midspan	0		110		410	Large void	
Coal Pier Stem	25-26	K	Seaside	0		100		410	Large void	310
Coal Pier Stem	25-26	D	Landside	720	0	650	440	320	Large crack through girder	
Coal Pier Stem	25-26	D	Midspan	650	0		430	330	Large crack at top until 290, then solid after	
Coal Pier Stem	25-26	D	Seaside	650	0			330	Solid throughout, however soft from 150-250	220

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	25-26	C	Landside	530				170	Solid	
Coal Pier Stem	25-26	C	Midspan	550		490	470	120	small central void	
Coal Pier Stem	25-26	C	Seaside	550				100	Solid	20
Coal Pier Stem	25-26	B	Landside	720	0	700	500	470	Void/crack for most of depth.	
Coal Pier Stem	25-26	B	Midspan	720	0			320	Void at top (start height), soft throughout	
Coal Pier Stem	25-26	B	Seaside	720	0	710	500	410	Large crack through girder	210
Coal Pier Stem	25-26	A	Landside	550		430	330	120	hard drill	
Coal Pier Stem	25-26	A	Midspan	540			230	130	crack in top of the girder	
Coal Pier Stem	25-26	A	Seaside	550			130	130	full depth void.	410
Coal Pier Stem	26-27	R	Landside	540			400	120	top void	
Coal Pier Stem	26-27	R	Midspan	540				100	solid drill	
Coal Pier Stem	26-27	R	Seaside	530			170	140	TOP VOID CLASSIFIED AS FULL DEPTH	360
Coal Pier Stem	26-27	K	Landside	0		100	280	410	central void	
Coal Pier Stem	26-27	K	Midspan	0		250		410	Top Void	
Coal Pier Stem	26-27	K	Seaside	0		360		410	Top Void	180
Coal Pier Stem	26-27	D	Landside	790	0			320	Solid throughout	
Coal Pier Stem	26-27	D	Midspan	780	0			300	Solid throughout	
Coal Pier Stem	26-27	D	Seaside	760	0	640	600	320	Black swath visible, solid apart from small void/crack	40
Coal Pier Stem	26-27	C	Landside	820	0	760	590	340	Big void, solid after	
Coal Pier Stem	26-27	C	Midspan	760	0		580	340	Large void, solid after	
Coal Pier Stem	26-27	C	Seaside	760	0			320	Solid throughout	180
Coal Pier Stem	26-27	B	Landside	600	0	450	410	230	Void 150 to 190	
Coal Pier Stem	26-27	B	Midspan	720	0	590	480	320	Large void from 130-240, solid after	
Coal Pier Stem	26-27	B	Seaside	760	0	580	490	310	Large void from 180 to 270, solid after	110
Coal Pier Stem	26-27	A	Landside	540		500	270	130	large crack at the bottom of the girder	
Coal Pier Stem	26-27	A	Midspan	540		450	430	110	central void	
Coal Pier Stem	26-27	A	Seaside	540			320	110	Top void	230
Coal Pier Stem	27-28	R	Landside	530				120	solid drill	
Coal Pier Stem	27-28	R	Midspan	540				130	Solid	
Coal Pier Stem	27-28	R	Seaside	550		310	220	120	crack through girder	90
Coal Pier Stem	27-28	J	Landside	0				400	Solid	
Coal Pier Stem	27-28	J	Midspan	0		200		400	Top Void	
Coal Pier Stem	27-28	J	Seaside	0				400	solid	200
Coal Pier Stem	27-28	K	Landside	0				410	solid	
Coal Pier Stem	27-28	K	Midspan	0		260		410	Top Void	
Coal Pier Stem	27-28	K	Seaside	0				410	solid drill	150
Coal Pier Stem	27-28	D	Landside	720	0		510	320	Void at top down to 180, then solid after	
Coal Pier Stem	27-28	D	Midspan	720	0	690	580	310	Visible crack at top, solid for rest	
Coal Pier Stem	27-28	D	Seaside	730	0			320	Felt soft, black swath visible, solid	210
Coal Pier Stem	27-28	C	Landside	610	0			300	Soft throughout girder, no voids noticed	
Coal Pier Stem	27-28	C	Midspan	690	0	520	490	300	Soft throughout girder	
Coal Pier Stem	27-28	C	Seaside	690	0		620	340	Void at top down to 80, then solid after	70
Coal Pier Stem	27-28	B	Landside	690	0			300	Felt soft, no voids found	
Coal Pier Stem	27-28	B	Midspan	720	0	600	540	320	Void at 120-180, then solid	
Coal Pier Stem	27-28	B	Seaside	720	0			320	Black swath visible, solid	60
Coal Pier Stem	27-28	A	Landside	510		330	260	120	Central Void	
Coal Pier Stem	27-28	A	Midspan	520		500	310	110	Central Void	
Coal Pier Stem	27-28	A	Seaside	510				130	Solid	190
Coal Pier Stem	28-29	R	Landside	0		110		410	Large top void	
Coal Pier Stem	28-29	R	Midspan	0		170	380	410	Large central Void	
Coal Pier Stem	28-29	R	Seaside	0		150		410	Large top void	300
Coal Pier Stem	28-29	K	Landside	0		170	320	410	Large central Void	
Coal Pier Stem	28-29	K	Midspan	0		240		410	Large top void	
Coal Pier Stem	28-29	K	Seaside	0		130	350	410	Large central Void	220
Coal Pier Stem	28-29	J	Landside	740	0		680	310	Black swath visible, solid	
Coal Pier Stem	28-29	J	Midspan	720	0			320	Solid throughout	
Coal Pier Stem	28-29	J	Seaside	720	0			380	Solid throughout	60
Coal Pier Stem	28-29	J1	Landside	540				100	Solid	
Coal Pier Stem	28-29	J1	Midspan	520				110	Solid	
Coal Pier Stem	28-29	J1	Seaside	520				150	Solid	0
Coal Pier Stem	28-29	D	Landside	690	0			290	Solid throughout	
Coal Pier Stem	28-29	D	Midspan	690	0	620	590	290	Void/crack at 70-100, solid for rest. Some black swath visible	
Coal Pier Stem	28-29	D	Seaside	690	0		640	300	Soft till 50, solid after	50
Coal Pier Stem	28-29	C	Landside	540				110	crack half way through from 300 to 200	
Coal Pier Stem	28-29	C	Midspan	510			400	140	top void	
Coal Pier Stem	28-29	C	Seaside	520		450	360	130	Central void	110
Coal Pier Stem	28-29	B	Landside	500			330	100	large crack in girder.	
Coal Pier Stem	28-29	B	Midspan	570				110	Solid	
Coal Pier Stem	28-29	B	Seaside	550				110	Solid	170
Coal Pier Stem	28-29	A	Landside	540				120	Solid	
Coal Pier Stem	28-29	A	Midspan	540				130	Solid	
Coal Pier Stem	28-29	A	Seaside	530				110	soft drilling from 370 to 300	0
Coal Pier Stem	29-30	R	Landside	950			800	540	top void	
Coal Pier Stem	29-30	R	Midspan	950		800	690	550		
Coal Pier Stem	29-30	R	Seaside	940		870	820	560	second jump noticed from 650 - 600	150
Coal Pier Stem	29-30	K	Landside	0		110		410	top void	
Coal Pier Stem	29-30	K	Midspan	0		140	340	40	central void	
Coal Pier Stem	29-30	K	Seaside	0		310		410	top void	300
Coal Pier Stem	29-30	J	Landside	730	0		450	300	Big void at top, drill tracking into crack. Solid after	
Coal Pier Stem	29-30	J	Midspan	730	0			310	Soft from halfway through	
Coal Pier Stem	29-30	J	Seaside	730	0		520	300	Big void at top, drill tracking into crack. Solid after	280
Coal Pier Stem	29-30	I	Landside	930			700	620	Top Void	
Coal Pier Stem	29-30	I	Midspan	950				570	SOLID DRILL	
Coal Pier Stem	29-30	I	Seaside	970				510	SOLID DRILL	230
Coal Pier Stem	29-30	H	Landside	970		630		530	bottom void	
Coal Pier Stem	29-30	H	Midspan	980				530	Solid DRILL	
Coal Pier Stem	29-30	H	Seaside	970		900	710	620	Central Void	190
Coal Pier Stem	29-30	D	Landside	890					full depth void, could possibly be an already drilled hole.	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	29-30	D	Midspan	900				490	Solid	
Coal Pier Stem	29-30	D	Seaside	950				510	Solid	0
Coal Pier Stem	29-30	C	Landside	550				120	Solid	
Coal Pier Stem	29-30	C	Midspan	930		870	790	510	Central Void	
Coal Pier Stem	29-30	C	Seaside	950			750	500	top void until 750 deep	200
Coal Pier Stem	29-30	B	Landside	540			300	130	top void until 300	
Coal Pier Stem	29-30	B	Midspan	530		520	340	130	top void	
Coal Pier Stem	29-30	B	Seaside	540		410	330	160	could possibly be a bottom void	240
Coal Pier Stem	30-31	R	Landside	940		840	590	550	Large Central Void	
Coal Pier Stem	30-31	R	Midspan	930			580	550	top void	
Coal Pier Stem	30-31	R	Seaside	940		830	790	540	small void	350
Coal Pier Stem	30-31	Q	Landside	0		0	0	410	solid drill, boat drill.	
Coal Pier Stem	30-31	Q	Midspan	0		0	0	410	solid drill boat drill	
Coal Pier Stem	30-31	Q	Seaside	0		270	0	410	top void, boat drill	140
Coal Pier Stem	30-31	K	Landside	950				530	Solid	
Coal Pier Stem	30-31	K	Midspan	950				540	Solid	
Coal Pier Stem	30-31	K	Seaside	950				540	drilling into a crack	0
Coal Pier Stem	30-31	J	Landside	700	0			320	Solid throughout	
Coal Pier Stem	30-31	J	Midspan	690	0			290	Solid throughout	
Coal Pier Stem	30-31	J	Seaside	690	0			300	Solid throughout	0
Coal Pier Stem	30-31	I	Landside	700	0			310	Soft for first 200mm, then harder. Solid throughout	
Coal Pier Stem	30-31	I	Midspan	700	0			340	Solid throughout	
Coal Pier Stem	30-31	I	Seaside	740	0	690	630	340	Crack at top, solid for rest	60
Coal Pier Stem	30-31	H	Landside	710	0		620	340	Soft, big void found at top	
Coal Pier Stem	30-31	H	Midspan	710	0			340	Black swath at top, solid	
Coal Pier Stem	30-31	H	Seaside	700	0			320	Black swath at top, solid	90
Coal Pier Stem	30-31	D	Landside	990				550	Solid	
Coal Pier Stem	30-31	D	Midspan	950				520	Solid	
Coal Pier Stem	30-31	D	Seaside	950				510	Solid	0
Coal Pier Stem	30-31	C	Landside			0	0	420	Solid	
Coal Pier Stem	30-31	C	Midspan			150	350	420	start to it water at 150. refer to photo on the 21st at 10:24, wet drilling central void from the wet drilling.	
Coal Pier Stem	30-31	C	Seaside			300	0	420	top void, boat drill	200
Coal Pier Stem	30-31	B	Landside	940		800	680	530	Central Void	
Coal Pier Stem	30-31	B	Midspan	990		820	740	550	Central Void	
Coal Pier Stem	30-31	B	Seaside	980				540	Central Void	120
Coal Pier Stem	31-32	R	Landside	0		160	220	410	40mm hard drilling, rest of soft drilling	
Coal Pier Stem	31-32	R	Midspan	0		140	260	410	middle void, boat drill	
Coal Pier Stem	31-32	R	Seaside	0		150	290	410	middle void, boat drill	140
Coal Pier Stem	31-32	Q	Landside	0		150	0	400	top void, boat drill	
Coal Pier Stem	31-32	Q	Midspan	0		140	0	400	top void, boat drill	
Coal Pier Stem	31-32	Q	Seaside	0		170	270	400	middle void, top 100 soft drilling	260
Coal Pier Stem	31-32	P	Landside	940			510	530	full depth	
Coal Pier Stem	31-32	P	Midspan	950		880	660	530	Central Void	
Coal Pier Stem	31-32	P	Seaside	940				520	large crack at the start	430
Coal Pier Stem	31-32	K	Landside	660	0			310	Big void/crack all the way to the bottom	
Coal Pier Stem	31-32	K	Midspan	670	0			310	Big void/crack all the way to the bottom	
Coal Pier Stem	31-32	K	Seaside	720	0	690	400	310	Big void at top, solid after	290
Coal Pier Stem	31-32	J	Landside	950				540	solid drill	
Coal Pier Stem	31-32	J	Midspan	950			800	520	top void	
Coal Pier Stem	31-32	J	Seaside	930		810	730	530	Small Central Void	150
Coal Pier Stem	31-32	I	Landside	690	0		540	320	Big void at top, solid for rest	
Coal Pier Stem	31-32	I	Midspan	690	0	540	510	300	20-30mm jump at 250, solid for rest	
Coal Pier Stem	31-32	I	Seaside	690	0		590	320	Big void at top, solid for rest	150
Coal Pier Stem	31-32	H	Landside	930				540	Solid	
Coal Pier Stem	31-32	H	Midspan	970				530	drill went through large crack.	
Coal Pier Stem	31-32	H	Seaside	960				540	Solid	0
Coal Pier Stem	31-32	D	Landside	1090				600	Solid	
Coal Pier Stem	31-32	D	Midspan	1060			930	590	Top Void	
Coal Pier Stem	31-32	D	Seaside	1070				570	large cracks visually present	130
Coal Pier Stem	32-33	R	Landside	0		110	0	410	Large top void	
Coal Pier Stem	32-33	R	Midspan	0		70	0	410	top void, boat drill	
Coal Pier Stem	32-33	R	Seaside	0		200	0	410	top void, 20mm capping layer, boat drill	340
Coal Pier Stem	32-33	Q	Landside	0		300	0	420	top void, boat drill	
Coal Pier Stem	32-33	Q	Midspan	0		170	0	420	top void, boat drill	
Coal Pier Stem	32-33	Q	Seaside	0		90	250	420	middle void, boat drill	250
Coal Pier Stem	32-33	P	Landside	540				100	solid	
Coal Pier Stem	32-33	P	Midspan	560				120	Solid	
Coal Pier Stem	32-33	P	Seaside	540				150	possibly a small bottom void	0
Coal Pier Stem	32-33	O	Landside	690	0		620	320	Big void down to 70, then solid	
Coal Pier Stem	32-33	O	Midspan	690	0			320	Soft at top, drill tracking into crack	
Coal Pier Stem	32-33	O	Seaside	680	0			320	Soft at top, drill tracking into crack. Final drill for day.	70
Coal Pier Stem	32-33	K	Landside	940				500	Solid	
Coal Pier Stem	32-33	K	Midspan	940				520	Solid	
Coal Pier Stem	32-33	K	Seaside	930				510	Solid	0
Coal Pier Stem	32-33	J	Landside	920				510	Solid	
Coal Pier Stem	32-33	J	Midspan	960			740	530	Top Void	
Coal Pier Stem	32-33	J	Seaside	950		920	800	520	Central Void	220
Coal Pier Stem	32-33	I	Landside	690	0	640	620	300	~20mm jump around 50, solid after	
Coal Pier Stem	32-33	I	Midspan	690	0		670	320	Some jumps at 80, solid after	
Coal Pier Stem	32-33	I	Seaside	690	0		590	340	Big void down to 100, then solid	100
Coal Pier Stem	32-33	H	Landside	960				490	Solid	
Coal Pier Stem	32-33	H	Midspan	950				500	Solid	
Coal Pier Stem	32-33	H	Seaside	940				490	Solid	0
Coal Pier Stem	32-33	G	Landside	930			810	540	Top Void	
Coal Pier Stem	32-33	G	Midspan	930				540	Solid	
Coal Pier Stem	32-33	G	Seaside	940			800	530	Top Void	140
Coal Pier Stem	33-34	R	Landside	0		0	0	410	Solid	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	33-34	R	Midspan	0		0	0	410	solid drill, boat drill.	
Coal Pier Stem	33-34	R	Seaside	0		0	0	410	solid drill, boat drill.	0
Coal Pier Stem	33-34	Q	Landside	0		140	340	410	middle void, boat drill	
Coal Pier Stem	33-34	Q	Midspan	0		140	0	410	top void, boat drill	
Coal Pier Stem	33-34	Q	Seaside	0		140	0	410	top void, boat drill	270
Coal Pier Stem	33-34	P	Landside	560				140	drill taking through crack from 400 onwards	
Coal Pier Stem	33-34	P	Midspan	560			220	160	large void	
Coal Pier Stem	33-34	P	Seaside	560			210	170	large void	350
Coal Pier Stem	33-34	O	Landside	710	0		550	340	Large void at top, solid for rest. Black swath noted	
Coal Pier Stem	33-34	O	Midspan	710	0			340	Drill bit tracking through crack. Drill bit broken in this hole	
Coal Pier Stem	33-34	O	Seaside	710	0	650	610	340	Small drop at 60, then solid after	160
Coal Pier Stem	33-34	K	Landside	760	0		520	330	Void at top, felt soft	
Coal Pier Stem	33-34	K	Midspan	760	0			340	Black swath at top, solid for rest	
Coal Pier Stem	33-34	K	Seaside	760	0		560	330	Large void at top, solid for rest	240
Coal Pier Stem	33-34	J	Landside	780	0	390	350	310	Small drop at 390, solid for rest. Start of Day 10	
Coal Pier Stem	33-34	J	Midspan	720	0		610	310	Void from top down to 120, solid for rest. Black swath noted	
Coal Pier Stem	33-34	J	Seaside	710	0	650	300	310	Void from 60 down through girder to bottom, swath black	350
Coal Pier Stem	33-34	I	Landside	560		360	290	140	Central Void	
Coal Pier Stem	33-34	I	Midspan	930			730	530	Large Top Void	
Coal Pier Stem	33-34	I	Seaside	560		500	410	150	Central Void	200
Coal Pier Stem	33-34	H	Landside	940				510	Solid	
Coal Pier Stem	33-34	H	Midspan	940				500	Solid	
Coal Pier Stem	33-34	H	Seaside	930				520	drill got struck in crack.	0
Coal Pier Stem	33-34	G	Landside	550		500	250	130	Central Void	
Coal Pier Stem	33-34	G	Midspan	550			320	130	Large top void	
Coal Pier Stem	33-34	G	Seaside	540			200	140	Large top void	340
Coal Pier Stem	34-35	R	Landside	0		50	330	410	middle void, boat drilling	
Coal Pier Stem	34-35	R	Midspan	0		90	350	410	middle void, boat drilling	
Coal Pier Stem	34-35	R	Seaside	0		80	0	410	full depth void, boat drilling	330
Coal Pier Stem	34-35	Q	Landside	0		160	0	410	top void, boat drill	
Coal Pier Stem	34-35	Q	Midspan	0		150	0	410	top void, 20mm cap, boat drill.	
Coal Pier Stem	34-35	Q	Seaside	0		130	0	410	top void, boat drill	280
Coal Pier Stem	34-35	P	Landside	930				540	FULL DEPTH VOID	
Coal Pier Stem	34-35	P	Midspan	920			560	540	FULL DEPTH VOID	
Coal Pier Stem	34-35	P	Seaside	550				130	FULL DEPTH VOID	360
Coal Pier Stem	34-35	O	Landside	940		730	640	520	small void in the middle.	
Coal Pier Stem	34-35	O	Midspan	940				550	Solid	
Coal Pier Stem	34-35	O	Seaside	940		870	700	550	Central void	170
Coal Pier Stem	34-35	M	Landside	710	0	600	300	330	Void from 110-410 through to bottom of girder	
Coal Pier Stem	34-35	M	Midspan	710	0		530	330	Void at top, solid for rest	
Coal Pier Stem	34-35	M	Seaside	710	0			330	Big crack/void throughout entire girder	300
Coal Pier Stem	34-35	K	Landside	550				140	solid girder	
Coal Pier Stem	34-35	K	Midspan	560				140	solid girder	
Coal Pier Stem	34-35	K	Seaside	550		500	400	150	central void	100
Coal Pier Stem	34-35	J	Landside	710	0		610	310	Void at top, then solid after	
Coal Pier Stem	34-35	J	Midspan	710	0			300	Solid throughout	
Coal Pier Stem	34-35	J	Seaside	720	0	700	610	320	Void at top, then solid after	
Coal Pier Stem	34-35	I	Landside	900		800	510	510	first 100 was soft drilling	100
Coal Pier Stem	34-35	I	Midspan	950		900	510	540	Large internal void	
Coal Pier Stem	34-35	I	Seaside	950		650	510	520	from 850 - 650 was a crack then void.	390
Coal Pier Stem	34-35	H	Landside	940			700	510	large cracks and voids present at top of girder visually.	
Coal Pier Stem	34-35	H	Midspan	950			690	520	large cracks and voids present at top of girder visually.	
Coal Pier Stem	34-35	H	Seaside	900				500	full depth void, girder is visually crack and can see the voids.	260
Coal Pier Stem	35-36	R	Landside		0	270	0	420	top void, boat drill	
Coal Pier Stem	35-36	R	Midspan		0			420	solid, boat drill	
Coal Pier Stem	35-36	R	Seaside		0			420	soft drilling, boat drill	150
Coal Pier Stem	35-36	Q	Landside		0			400	solid, 20mm middle void	
Coal Pier Stem	35-36	Q	Midspan		0			400	solid, boat drill	
Coal Pier Stem	35-36	Q	Seaside		0	230		400	top void, boat drill	170
Coal Pier Stem	35-36	P	Landside	560		440	210	150	Large central void	
Coal Pier Stem	35-36	P	Midspan	560				150	solid drill	
Coal Pier Stem	35-36	P	Seaside	550				140	solid drill	230
Coal Pier Stem	35-36	O	Landside	930		710	600	520	Central Void	
Coal Pier Stem	35-36	O	Midspan	930		810	690	540	Central Void	
Coal Pier Stem	35-36	O	Seaside	930				540	Solid	120
Coal Pier Stem	35-36	M	Landside	710	0	600	400	330	Void at 110-310, then solid	
Coal Pier Stem	35-36	M	Midspan	710	0		410	320	Big void down to 300, then solid	
Coal Pier Stem	35-36	M	Seaside	710	0		320	320	Void all the way through	390
Coal Pier Stem	35-36	K	Landside	550				100	Solid	
Coal Pier Stem	35-36	K	Midspan	560			340	140	Large top void	
Coal Pier Stem	35-36	K	Seaside	550			290	130	Large top void	260
Coal Pier Stem	35-36	J	Landside	760	0		620	380	Big void at top, jump/crack at 340, then solid	
Coal Pier Stem	35-36	J	Midspan	760	0		540	370	Big void at top to 220, second void from 270-340	
Coal Pier Stem	35-36	J	Seaside	730	0	600	510	360	Void at 130-220, then solid	220
Coal Pier Stem	35-36	I	Landside	550		320	250	130	majority of drilling felt soft.	
Coal Pier Stem	35-36	I	Midspan	550			240	130	Large top void	
Coal Pier Stem	35-36	I	Seaside	550		400	240	130	Large central void	310
Coal Pier Stem	35-36	H	Landside	0		140	0	400	boat drill, top void	
Coal Pier Stem	35-36	H	Midspan	0		210	350	400	boat drill, middle void	
Coal Pier Stem	35-36	H	Seaside	0		110	0	400	top void, boat drill	290
Coal Pier Stem	36-37	R	Landside	500		430	220	120	Large central void	
Coal Pier Stem	36-37	R	Midspan	530		410	180	120	Large central void	
Coal Pier Stem	36-37	R	Seaside	520			250	110	crack through girder, crack void to 250	270
Coal Pier Stem	36-37	Q	Landside	0	0	80		410	full depth void	
Coal Pier Stem	36-37	Q	Midspan	0	0	350		410	Top void	
Coal Pier Stem	36-37	Q	Seaside	0	0	350		410	Top void	330
Coal Pier Stem	36-37	P	Landside	530		380	300	130	Central void	
Coal Pier Stem	36-37	P	Midspan	530		390	250	130	crack within girder	

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	36-37	P	Seaside	530				120	Central void	140
Coal Pier Stem	36-37	O	Landside	590				130	Solid	
Coal Pier Stem	36-37	O	Midspan	580		480	320	150	Central void	
Coal Pier Stem	36-37	O	Seaside	530		400	270	120	Central void	160
Coal Pier Stem	36-37	N	Landside	0		280		420	top void	
Coal Pier Stem	36-37	N	Midspan	0				420	solid	
Coal Pier Stem	36-37	N	Seaside	0				420	solid	140
Coal Pier Stem	36-37	L	Landside	690	0		540	380	Big void at top, then solid after	
Coal Pier Stem	36-37	L	Midspan	690	0		500	340	Big void at top, then solid after	
Coal Pier Stem	36-37	L	Seaside	690	0			340	Solid throughout	190
Coal Pier Stem	36-37	K	Landside	630	0		410	300	Black swath visible, felt soft all the way through	
Coal Pier Stem	36-37	K	Midspan	630	0	610	400	300	Felt soft, void at top	
Coal Pier Stem	36-37	K	Seaside	630	0		320	280	Big void at top	310
Coal Pier Stem	36-37	J	Landside	720	0			290	Solid throughout	
Coal Pier Stem	36-37	J	Midspan	610	0			310	Timber damp, soft and black swath noted	
Coal Pier Stem	36-37	J	Seaside	610	0			310	Felt soft throughout	0
Coal Pier Stem	36-37	I	Landside	540				140	SOLID	
Coal Pier Stem	36-37	I	Midspan	540				140	Solid	
Coal Pier Stem	36-37	I	Seaside	520				170	maybe cut into the chamfer	0
Coal Pier Stem	36-37	H	Landside	0				400	solid	
Coal Pier Stem	36-37	H	Midspan	0				400	solid	
Coal Pier Stem	36-37	H	Seaside	0		160		400	top void	240
Coal Pier Stem	37-38	R	Landside	540				140	Solid	
Coal Pier Stem	37-38	R	Midspan	530		460		140	full depth void from 460 through	
Coal Pier Stem	37-38	R	Seaside	530				140	Solid	310
Coal Pier Stem	37-38	Q	Landside	0	0	160		410	top void	
Coal Pier Stem	37-38	Q	Midspan	0	0	170	270	410	central void	
Coal Pier Stem	37-38	Q	Seaside	0	0	180		410	top void	250
Coal Pier Stem	37-38	P	Landside	530			200	130	top void	
Coal Pier Stem	37-38	P	Midspan	530		440	200	140	soft drilling, dry rot.	
Coal Pier Stem	37-38	P	Seaside	530		440	240	140	central void	330
Coal Pier Stem	37-38	O	Landside	540		380	220	140	central void	
Coal Pier Stem	37-38	O	Midspan	550				140	Solid	
Coal Pier Stem	37-38	O	Seaside	530		410	300	150	central void	160
Coal Pier Stem	37-38	N	Landside	0	0	230	280	420	solid with a small piping void	
Coal Pier Stem	37-38	N	Midspan	0	0			420	solid, drilled from boat	
Coal Pier Stem	37-38	N	Seaside	0	0	230	290	420	piping void, drilled from boat	60
Coal Pier Stem	37-38	L	Landside	690	0		520	300	Big void at top, felt soft drilling	
Coal Pier Stem	37-38	L	Midspan	690	0			290	Black swath visible, damp also mainly at top. Then solid after	
Coal Pier Stem	37-38	L	Seaside	710	0			290	Solid throughout. Shoja started drilling here	170
Coal Pier Stem	37-38	K	Landside	680	0		420	280	Felt soft, big void at top	
Coal Pier Stem	37-38	K	Midspan	680	0		490	290	Felt soft, big void at top. Damp, black swath visible	
Coal Pier Stem	37-38	K	Seaside	680	0			300	No voids found, but felt soft drilling	260
Coal Pier Stem	37-38	J	Landside	0	0	160		440	top void, drilled from boat	
Coal Pier Stem	37-38	J	Midspan	0	0	190		440	top void, drilled from boat	
Coal Pier Stem	37-38	J	Seaside	0	0	230	320	440	central void	280
Coal Pier Stem	37-38	I	Landside	540				130	Solid drilling	
Coal Pier Stem	37-38	I	Midspan	530				110	Solid Drilling	
Coal Pier Stem	37-38	I	Seaside	540		350	270	110	Central void	80
Coal Pier Stem	37-38	H	Landside	0	0			420	solid, drilled from boat	
Coal Pier Stem	37-38	H	Midspan	0	0			420	solid, drilled from boat	
Coal Pier Stem	37-38	H	Seaside	0	0			420	solid, drilled from boat	0
Coal Pier Stem	38-39	R	Landside	0	0			400	solid, drilled from boat	
Coal Pier Stem	38-39	R	Midspan	0	0			400	solid, drilled from boat	
Coal Pier Stem	38-39	R	Seaside	0	0	150		400	top void, drilled from boat	250
Coal Pier Stem	38-39	Q	Landside	0	0	200		410	top void, drilled from boat	
Coal Pier Stem	38-39	Q	Midspan	0	0	220		410	top void, drilled from boat	
Coal Pier Stem	38-39	Q	Seaside	0	0	160		410	top void, drilled from boat	250
Coal Pier Stem	38-39	P	Landside	530				-	drilled until 170 voids and cracks all present. Consider full depth.	
Coal Pier Stem	38-39	P	Midspan	530			230	130	void/cracks until 230.	
Coal Pier Stem	38-39	P	Seaside	-					SDRLL WENT RGHT THROUGH, Cracks and large void observed from end of the girder.	300
Coal Pier Stem	38-39	O	Landside	540				120	solid	
Coal Pier Stem	38-39	O	Midspan	540			380	120	top void	
Coal Pier Stem	38-39	O	Seaside	540				-	cracked, drill tracking into a crack. Hard to drill.	160
Coal Pier Stem	38-39	N	Landside	720	0	550	500	320	~50mm void then solid	
Coal Pier Stem	38-39	N	Midspan	660	0	560	530	300	Small drop at 100, then solid	
Coal Pier Stem	38-39	N	Seaside	870	690			310	Solid throughout. Start of 5 holes that were not pre-drilled	50
Coal Pier Stem	38-39	L	Landside	0	0			410	solid, drilled from bat	
Coal Pier Stem	38-39	L	Midspan	0	0			410	solid, drilled from bat	
Coal Pier Stem	38-39	L	Seaside	0	0			410	solid, drilled from bat	
Coal Pier Stem	38-39	K	Landside	710	0	650	610	330	Small drop from 60-100. Solid after	0
Coal Pier Stem	38-39	K	Midspan	660	0			350	Estimated 50mm crack/void at top	
Coal Pier Stem	38-39	K	Seaside	670	0			290	Solid throughout	
Coal Pier Stem	38-39	J	Landside	0	0	120		410	top void, drilled from boat	40
Coal Pier Stem	38-39	J	Midspan	0	0	270		410	top void, drilled from boat	
Coal Pier Stem	38-39	J	Seaside	0	0	290		410	top void, drilled from boat	290
Coal Pier Stem	38-39	I	Landside	530					drilled into a crack at 480. multiple cracks drill is binding. Cracked through	
Coal Pier Stem	38-39	I	Midspan	530			270	160	top void present, exit observed	
Coal Pier Stem	38-39	I	Seaside	530			190	170	large void, with cracks through the girder	340
Coal Pier Stem	38-39	H	Landside	0	0	110		400	full depth void, drilled from boat	
Coal Pier Stem	38-39	H	Midspan	0	0	110		400	full depth void, drilled from boat	
Coal Pier Stem	38-39	H	Seaside	0	0	60		400	full depth void, drilled from boat	340
Coal Pier Stem	39-40	O	Landside	0	0	220	270	400	central void	
Coal Pier Stem	39-40	O	Midspan	0	0			400	solid but soft drilling	
Coal Pier Stem	39-40	O	Seaside	0	0	330		400	top void, drilled from boat	70

Bowen Wharf Structure	Span	Stringer	Position	Start Height	Dim A	Dim B	Dim C	Dim D	Comments	Max void in girder
Coal Pier Stem	39-40	N	Landside	690	0			350	Solid throughout	
Coal Pier Stem	39-40	N	Midspan	740	0			350	Solid throughout	
Coal Pier Stem	39-40	N	Seaside	740	0			350	Solid throughout	0
Coal Pier Stem	39-40	L	Landside	900	800			390	Solid, felt soft with some black swath visible	
Coal Pier Stem	39-40	L	Midspan	710	0			390	Solid throughout	
Coal Pier Stem	39-40	L	Seaside	720	0			370	Solid, but felt soft. Black swath visible	0
Coal Pier Stem	39-40	K	Landside	890	710	550	500	320	Soft, drill tracking through cracks	
Coal Pier Stem	39-40	K	Midspan	900	820		570	420	150mm void into top of girder, went through bottom early Big crack visible to left of drill hole. Not drilled. Measured using stick, with at least 200mm void depth from top of girder	330
Coal Pier Stem	39-40	K	Seaside	790	0				central void	
Coal Pier Stem	39-40	J	Landside	0	0	150	340	410	top void, external dry rot noted	290
Coal Pier Stem	39-40	J	Midspan	0	0	150		410	top void, external dry rot noted	
Coal Pier Stem	39-40	J	Seaside	0	0	120		410	top void, external dry rot noted	
Coal Pier Stem	40-41	O	Landside	0	0			430	Solid, drilled from boat	
Coal Pier Stem	40-41	O	Midspan	0	0			430	Solid, drilled from boat	
Coal Pier Stem	40-41	O	Seaside	0	0			430	drill suck	0
Coal Pier Stem	40-41	N	Landside	710	0			300	Solid throughout	
Coal Pier Stem	40-41	N	Midspan	690	0			300	Solid throughout	
Coal Pier Stem	40-41	N	Seaside	690	0			300	Solid throughout	0
Coal Pier Stem	40-41	L	Landside	680	0			420	Went through slightly early, solid.	
Coal Pier Stem	40-41	L	Midspan	710	0			350	Solid throughout	
Coal Pier Stem	40-41	L	Seaside	730	0			400	50mm jump at start, then solid	0
Coal Pier Stem	40-41	K	Landside	0	0			440	Solid drill, drilled from boat	
Coal Pier Stem	40-41	K	Midspan	0	0	200		440	soft drilling with wet swath and water for the top	
Coal Pier Stem	40-41	K	Seaside	0	0			440	Solid.	240
Coal Pier Stem	40-41	J	Landside	0	0	90		400	full top void, drilled from boat	
Coal Pier Stem	40-41	J	Midspan	0	0	100		400	full top void, drilled from boat	
Coal Pier Stem	40-41	J	Seaside	0	0	50		400	full top void, drilled from boat	350
Coal Pier Stem	41-42	O	Landside	0	0	180		410	top void, drilled from boat	
Coal Pier Stem	41-42	O	Midspan	0	0	200		410	top void, drilled from boat	
Coal Pier Stem	41-42	O	Seaside	0	0	270		410	top void drilled from boat	230
Coal Pier Stem	41-42	N	Landside	680	0	670	420	300	250mm void	
Coal Pier Stem	41-42	N	Midspan	680	0		490	300	Void at top, then solid after	
Coal Pier Stem	41-42	N	Seaside	610	0	520	410	300	100mm void found, then solid	250
Coal Pier Stem	41-42	L	Landside	720	0			300	Void/crack throughout entire girder	
Coal Pier Stem	41-42	L	Midspan	610	0	580	530	300	50mm void, then solid	
Coal Pier Stem	41-42	L	Seaside	680	0			300	Void throughout girder	50
Coal Pier Stem	41-42	K	Landside	0	0			440	solid for 400mm drill, drilled from boat	
Coal Pier Stem	41-42	K	Midspan	0	0			440	solid for 400mm drill, drilled from boat	
Coal Pier Stem	41-42	K	Seaside	0	0			440	solid for 400mm drill, drilled from boat	0
Coal Pier Stem	41-42	J	Landside	0	0	140		400	top void, drilled from boat	
Coal Pier Stem	41-42	J	Midspan	0	0	200		400	top void, drilled from boat	
Coal Pier Stem	41-42	J	Seaside	0	0	210		400	top void, drilled from boat	260
Coal Pier Stem	42-43	O	Midspan	0	0	250	390	450	central piping	
Coal Pier Stem	42-43	O	Seaside	0	0			450	soft drilling for the top 100mm	
Coal Pier Stem	42-43	O	Landside	0	0			450	soft drilling for the top 100mm	140
Coal Pier Stem	42-43	N	Midspan	690	0			320	Solid throughout	
Coal Pier Stem	42-43	N	Seaside	680	0			300	Black swath visible at top, then solid	
Coal Pier Stem	42-43	N	Landside	600	0			300	Black swath visible at bottom, solid	0
Coal Pier Stem	42-43	L	Midspan	720	0		500	300	Drill bit cracked	
Coal Pier Stem	42-43	L	Seaside	700	0			300	Top 200mm soft, then solid	
Coal Pier Stem	42-43	L	Landside	700	0	680	520	300	Void from 20-180	220
Coal Pier Stem	42-43	K	Midspan	0	0	280		440	top void, drill from boat	
Coal Pier Stem	42-43	K	Seaside	0	0			440	solid, drill from boat	
Coal Pier Stem	42-43	K	Landside	0	0	220		440	top void, drill from boat	220
Coal Pier Stem	42-43	J	Midspan	0	0			440	Solid, drilled from boat	
Coal Pier Stem	42-43	J	Seaside	0	0			440	solid, drilled from boat	
Coal Pier Stem	42-43	J	Landside	0	0			440	solid, drilled from boat	0
Coal Pier Stem	43-44	O	Landside	0	0	200		380	top void, drilled from boat	
Coal Pier Stem	43-44	O	Midspan	0	0	270		380	top void, drilled from boat	
Coal Pier Stem	43-44	O	Seaside	0	0			380	Solid, Drilled from boat	180
Coal Pier Stem	43-44	N	Landside	0	0	0	270	340	large visible crack and bottom void, 270mm	
Coal Pier Stem	43-44	N	Midspan	0	0	160		340	top void, drilled from boat	
Coal Pier Stem	43-44	N	Seaside	0	0	160		340	top void, drilled from boat	180
Coal Pier Stem	43-44	L	Landside	0	0			360	Solid, Drilled from boat	
Coal Pier Stem	43-44	L	Midspan	0	0	190		360	top void, drilled from boat	
Coal Pier Stem	43-44	L	Seaside	0	0	190		360	top void, drilled from boat	170
Coal Pier Stem	43-44	K	Landside	0	0	190	370	410		
Coal Pier Stem	43-44	K	Midspan	0	0	190		410	central void with 60mm of top drilled with black, dry rot swath	
Coal Pier Stem	43-44	K	Seaside	0	0	180		410	central void with 60mm of top drilled with black, dry rot swath	230

Appendix B

Public Wharf Headstock & Deck Testing



Date of Issue: 13 August, 2019

Draft Issued: 22 July, 2019

Site Visit(s): 2nd, 3rd, and 4th July, 2019

Report #: 2019-742 ARUP-Bowen Wharf

Client: ARUP

Your reference: Purchase Order 264408-00

Contact: Peter Kastrup <Peter.Kastrup@arup.com> 0431 674 734

Job Description: Ground Penetrating Radar (GPR) and testing of the public section of the Bowen Wharf, Bowen, QLD.

Equipment: Ridgid Seek Tech SR20 Line Locator Serial # 213-12959
Passive Trace 50Hz, 50Hz^s and 50Hz⁹
GSSI Ground Penetrating Radar (GPR) with 2600 MHz antenna (Polarised only) Serial # 00452
Cover meter, Proceq Profoscope+ (Serial # PS02-002-0879 BO).
Water cooled diamond coring rig capable of bolting to the surface.
Water management system for slurry capture.

Procedure(s): In accordance with the manufacturers instructions.
AS1012.14-(6.2) Methods of testing concrete - Method for securing and testing cores from hardened concrete for compressive strength.
AS1012.12.1 Methods of testing concrete - Determination of mass per unit volume of hardened concrete - Rapid measuring method
AS1012.9 Methods of testing concrete - Determination of the compressive strength of concrete specimens
CD-CL002-Chloride Content --Chloride Content in Hardened Concrete Acid digestion and potentiometric titration (based on BS1881-124).



Report Prepared by: Matthew Lamb-Johnson – Managing Director



Disclaimer and Important Notes.

No site structural drawings were received. Headstock #01 is the second headstock (Headstock #02 is the next headstock towards land) from the water end of the wharf.

For the convenience of this report north (report north) will be the land side and south (report south) will be seaside, see image below for clarification. This is not true or magnetic north.

GPR cannot determine the diameter of reinforcement. Bar size measurements ± 2 mm were performed by concrete breakout where directed.

Slab depth $\pm 10\%$ determined by core or drilling.

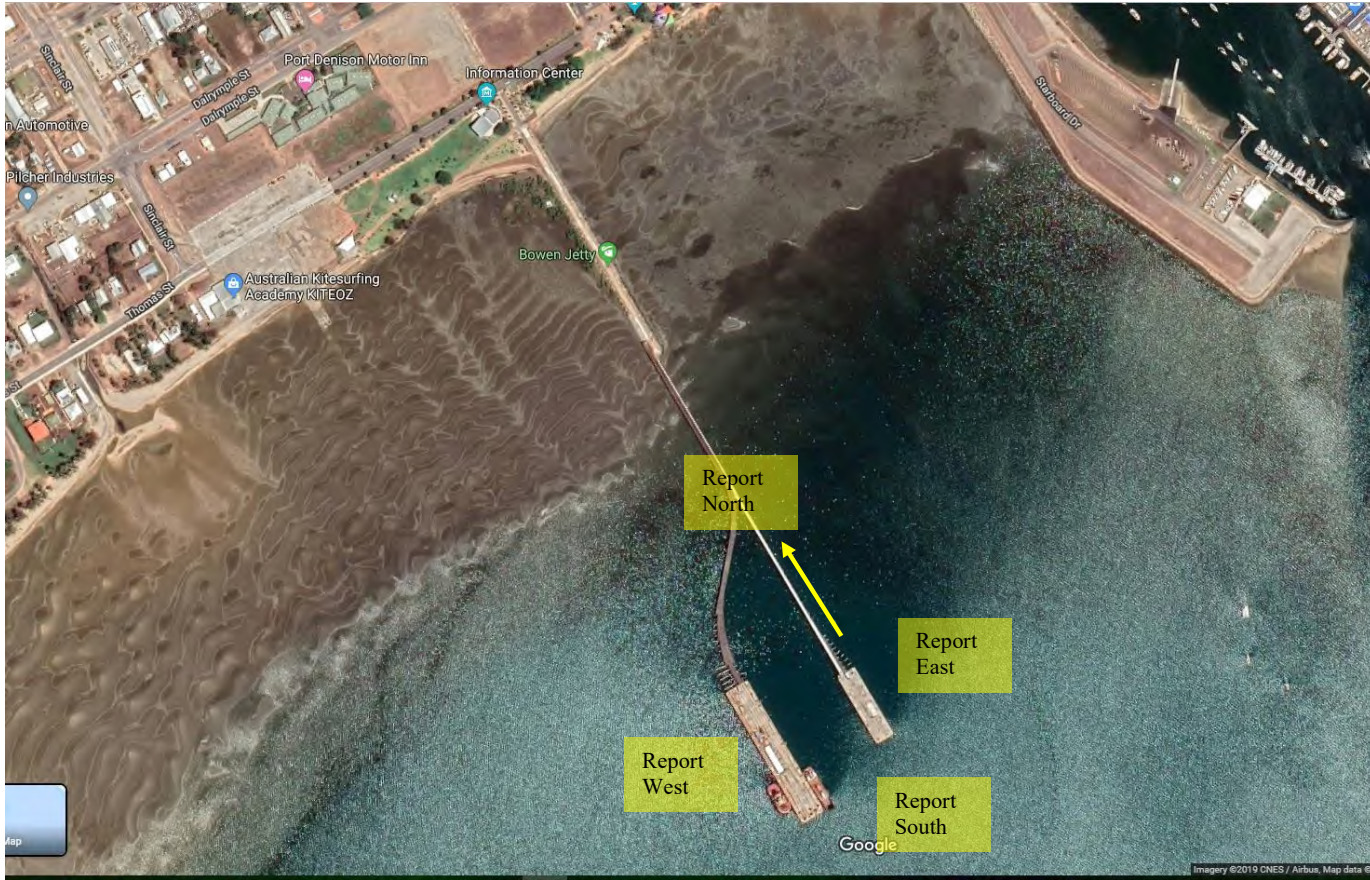
Reinforcement spacing ± 20 mm was averaged in the test location over a distance of at least 1 m.

Whilst all care is taken, no warranties expressed or implied that the information contained within this report is free of errors or omissions and no liability is taken over non-detection of targets or GPR reflections interpreted incorrectly.

Reinforcement will be detected perpendicular to the line scan direction. E.g. a scan running south to north will only detect reinforcement running east/west.



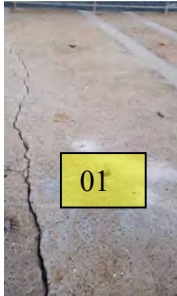
Site image from Google Maps





Topside – Deck Scanning, Coring and Testing

Topside core #1 location, land side (north) of headstock #01, western side of longitudinal wharf crack



Slab consisted of three (3) layers, A, B and C

Layer A – 90 mm thick with no reinforcement detected.
There was a 10 mm void between layers A and B

Layer B – 120 mm thick. A bar was clipped during the coring and showed significant corrosion, size is not clear, possibly 12 mm.
There was a 20 mm void between layers B and C
Bar spacing NS bars 230 mm
Bar spacing EW bars 215 mm

Layer C – Core split at 55 mm, the remaining core had a total height of 175 mm. A pilot hole suggested layer C was 200 mm thick. The reinforcement was too deep to detect by radar. A 12 mm round smooth bar running EW was discovered with about 175 mm of cover in layer C.

Total deck thickness 410 mm



Layer C split with visible white deposits (left image). Smooth round 12 mm bar running EW towards the soffit of layer C (right image).



Topside core #2 location, land side (north) of headstock #02, western side of longitudinal wharf crack



Slab consisted of three (3) layers, A, B and C

Layer A – 90 mm thick with no reinforcement detected.
Layers A and B were still bonded

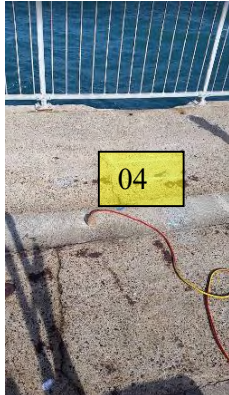
Layer B – 120 mm thick.
There was a 15 mm void between layers B and C
Bar spacing NS bars 250 mm
Bar spacing EW bars 130 mm

Layer C – Core split at 55 mm, the remaining core had a total height of 180 mm. A pilot hole suggested layer C was 200 mm thick. The reinforcement was too deep to detect by radar. A 12 mm round smooth bar running NS was discovered with about 35 mm of cover in layer C.

Total deck thickness 410 mm



An additional core hole was extracted 1.2 m from the western edge of the wharf, just over headstock #02 / Core location labelled as Topside #4



Slab consisted of three (3) layers, A, B and C and headstock

Layer A – 85 mm thick with no reinforcement detected.
Layers A and B were not bonded

Layer B – 120 mm thick.
There was a 10 mm void between layers B and C
Bar spacing NS bars 230 mm
Bar spacing EW bars 190 mm

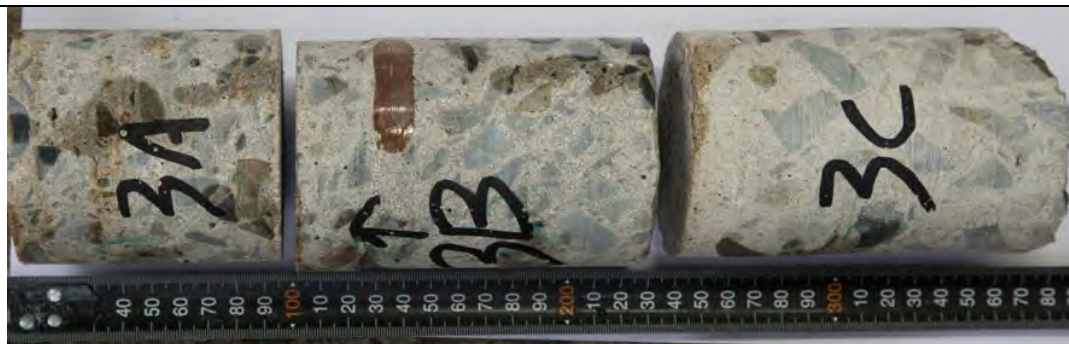
Layer C (structural slab and headstock)– Core split at 25, 110 and 220 mm.

The reinforcement was too deep to detect by radar.
A 12 mm round smooth bar running EW was discovered with about 45 mm of cover in layer C.
A 32 mm round smooth bar running NS was discovered with about 70 mm of cover in layer C.
A large diameter bar was discovered at the bottom of section C (220 mm), section of bar was given to the client, an image of the bar is shown below.





Topside core #3 location, land side of headstock #03, eastern side of longitudinal wharf crack



Slab consisted of three (3) layers, A, B and C

Layer A – 90 mm thick with no reinforcement detected.

Layers A and B were not bonded, there was no void between A and B.

Layer B – 120 mm thick.

There was a 15 mm void between layers B and C.

A 12 mm NS round smooth bar was in layer B at a depth of 25 mm.

Bar spacing NS bars 225 mm

Bar spacing EW bars 140 mm

Layer C – 130 mm core. A pilot hole suggested layer C was 180 mm thick. The reinforcement was too deep to detect by radar.

Total deck thickness 390 mm



Underside – Headstock Scanning, Coring and Testing



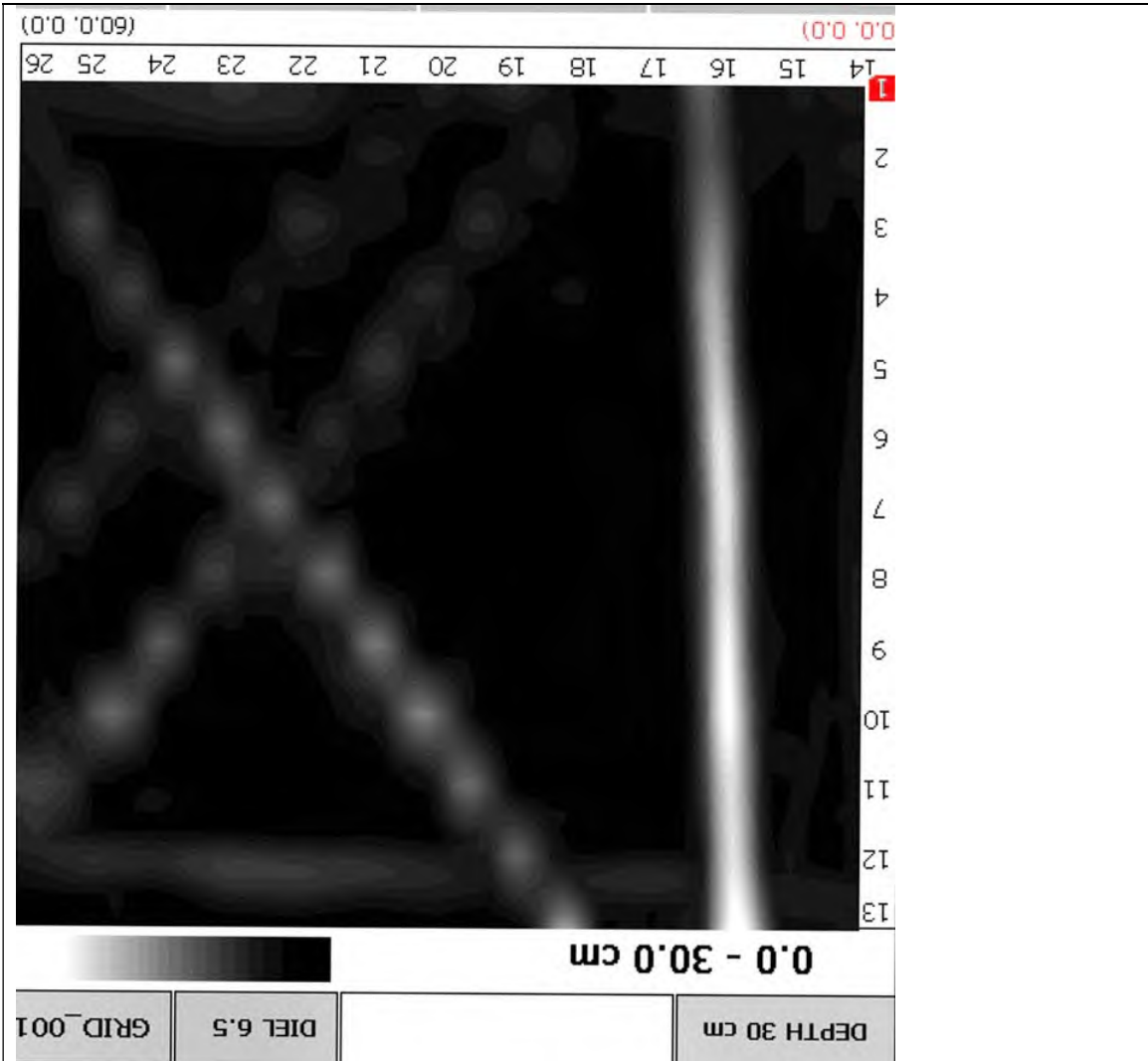
Headstock 01 – North face

3D scan – grid 01 – Note origin is up the top right corner of the grid paper.

Approximate bar locations marked up above for **illustration** only, see below for radar image and bar positioning.

Blue bars horizontal and vertical, **orange** bars diagonal downwards away from the cross brace, **red** bars diagonal upwards away from cross brace.

Circle indicates bar that was broken out for sizing.



Headstock 3D scan – grid 01 – Observe the numbers on the axis, the vertical axis has 1-13 and the top horizontal axis has numbers 14 – 26. These are the individual line scan files that are processed with more detail below.



File	Scan distance m	Depth mm	Velocity mm/ns	Time ns	Target
3D G01 FILE_003	0.104	69	108	1.281	Rebar
3D G01 FILE_003	0.278	83*	108	1.539	Rebar*
3D G01 FILE_003	0.387	77	108	1.422	Rebar
3D G01 FILE_003	0.565	60	108	1.117	Rebar

Line scan **03** horizontal scan from 3D grid 01 – Note data moves from **right to left** as the origin was inverted. * Breakout diagonal bar

File	Scan distance m	Depth mm	Velocity mm/ns	Time ns	Target
3D G01 FILE_017	0.03	106	108	1.961	Rebar
3D G01 FILE_017	0.575	102	108	1.891	Rebar

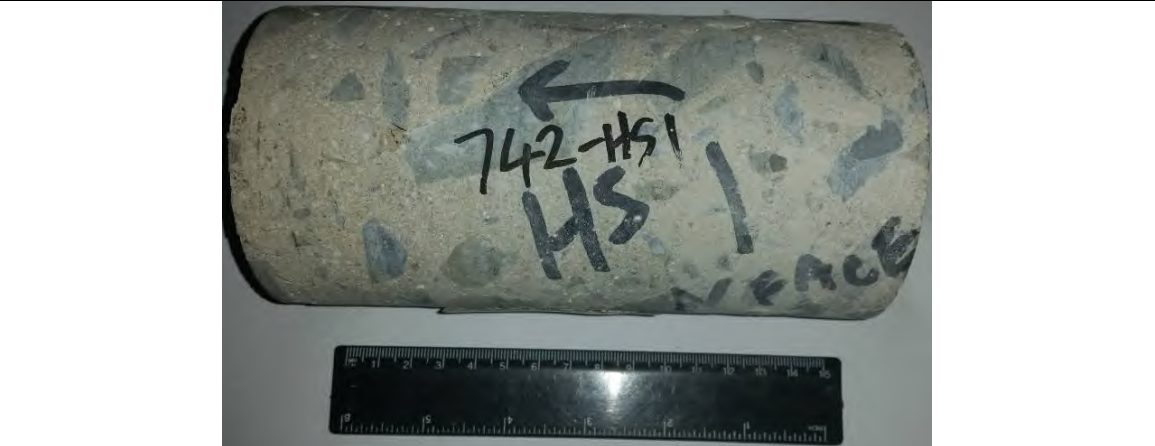
Line scan **17** vertical scan from 3D grid 01 – Note data moves from **right to left** as the origin was inverted.



Radars could not detect any reinforcement on the northern (land) side running adjacent to the crack in the head stock (as shown above). This could be due to there being no steel present, heavily chloride contaminated concrete or the steel has been severely corroded.



Breakout of upwards diagonal bar – 12 mm round (not deformed/ribbed)



Core and breakout **Headstock #01** North face location. Core removed for strength, image taken after crushing.

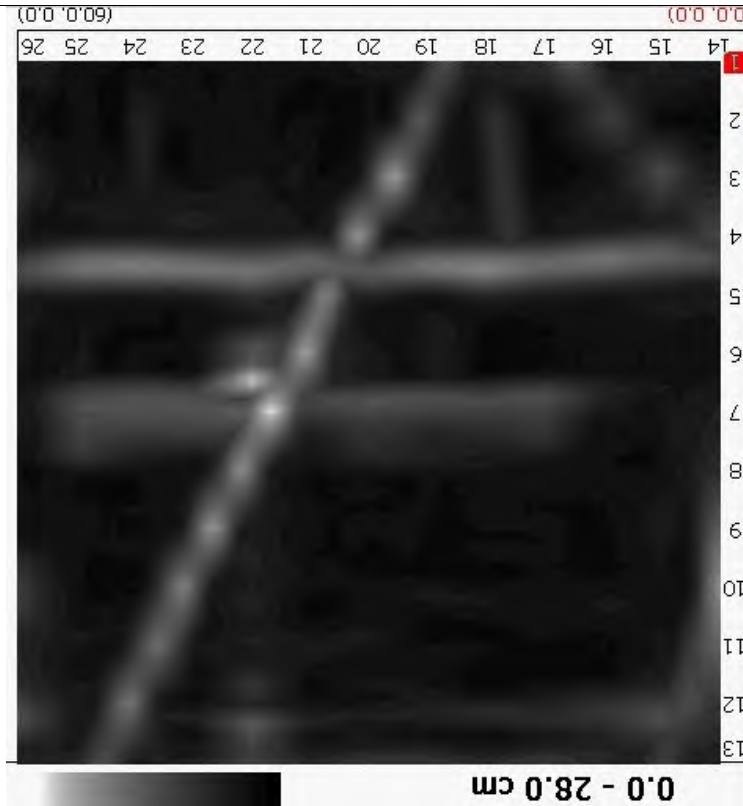


Headstock 02 South face, east of cross brace

3D scan – grid 02 – Note origin is up the top right corner of the grid paper.

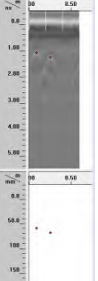
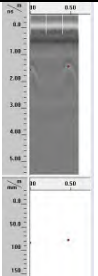
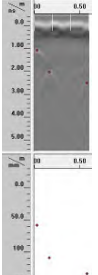
Approximate bar locations marked up above for **illustration** only, see below for radar image and bar positioning.

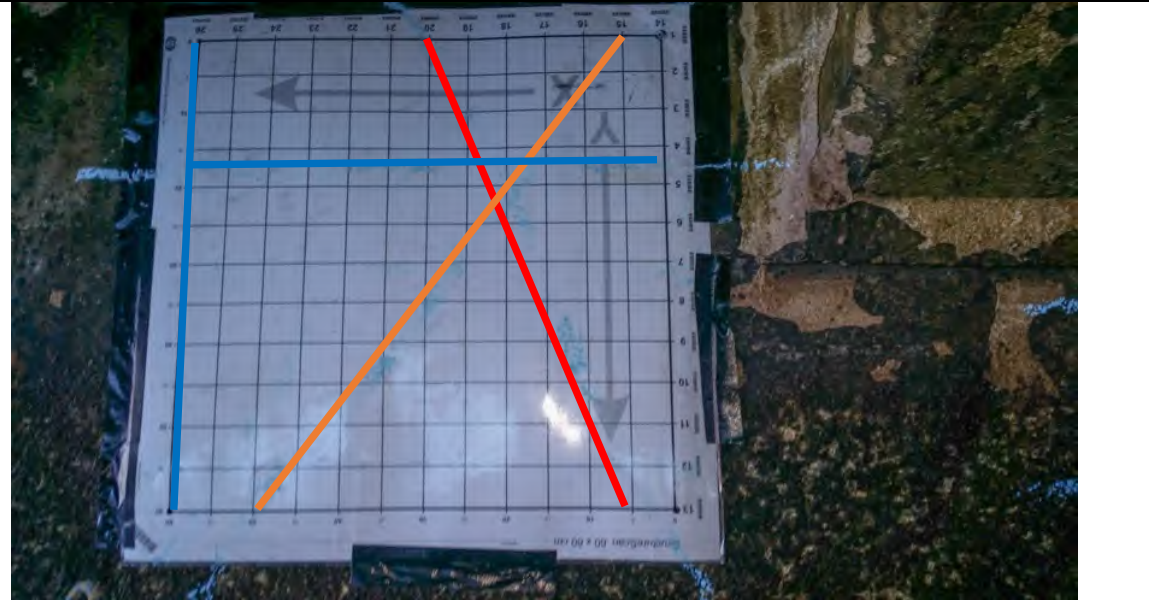
Blue bars horizontal and vertical, **orange** bars diagonal downwards away from the cross brace, **red** bars diagonal upwards away from cross brace.



Headstock 3D scan – grid 02 – Observe the numbers on the axis, the vertical axis has 1-13 and the top horizontal axis has numbers 14 – 26. These are the individual line scan files that are processed with more detail below. A few possible artifacts appear from the hyperbola of the diagonal bars, these are the horizontal line at line 7 and the vertical line at 18.



	File	Scan distance m	Depth mm	Velocity mm/ns	Time ns	Target
	FILE__002	0.089	59	108	1.094	Rebar
	FILE__002	0.253	68	108	1.258	Rebar
Line scan 02 from 3D grid 02 – Note data moves from right to left as the origin was inverted.						
	File	Scan distance m	Depth mm	Velocity mm/ns	Time ns	Target
	FILE__011	0	84	108	1.563	Rebar
	FILE__011	0.471	78	108	1.445	Rebar
Line scan 11 from 3D grid 02 – Note data moves from right to left as the origin was inverted.						
	File	Scan distance m	Depth mm	Velocity mm/ns	Time ns	Target
	FILE__016	0.03	59	108	1.094	Rebar
	FILE__016	0.164	110	108	2.031	Rebar
	FILE__016	0.575	135	108	2.5	Rebar
Line scan 16 from 3D grid 02 – Note data moves from right to left as the origin was inverted.						

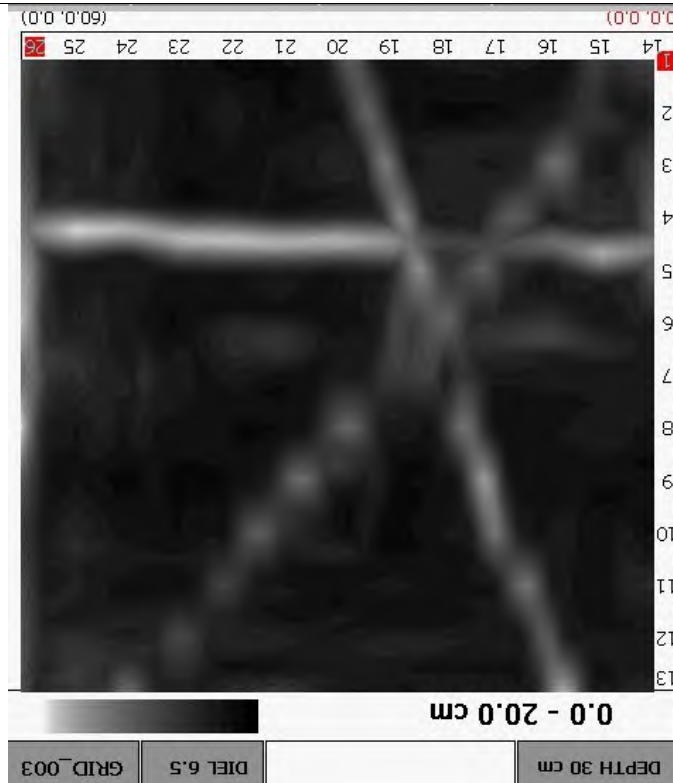


Headstock 02 South face west of cross brace.

3D scan – grid 03 – Note origin is up the top right corner of the grid paper.

Approximate bar locations marked up above for **illustration** only, see below for radar image and bar positioning.

Blue bars horizontal and vertical, orange bars diagonal downwards away from the cross brace, red bars diagonal upwards away from cross brace.



Headstock 3D scan – grid 03 – Observe the numbers on the axis, the vertical axis has 1-13 and the top horizontal axis has numbers 14 – 26. These are the individual line scan files that are processed with more detail below.

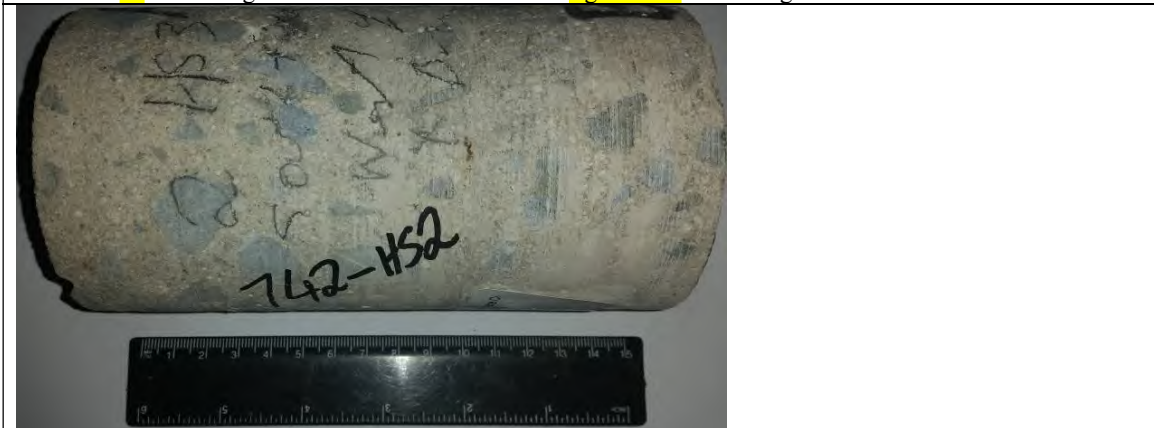


File	Scan distance m	Depth mm	Velocity mm/ns	Time ns	Target	3D
3D3 FILE__010	0.154	77	108	1.422	Rebar	3D
3D3 FILE__010	0.367	68	108	1.258	Rebar	3D
3D3 FILE__010	0.595	65	108	1.211	Rebar	3D

Line scan 10 from 3D grid 03 – Note data moves from right to left as the origin was inverted.

File	Scan distance m	Depth mm	Velocity mm/ns	Time ns	Target	3D
3D3 FILE__022	0.179	102	108	1.891	Rebar	3D
3D3 FILE__022	0.486	70	108	1.305	Rebar	3D

Line scan 22 from 3D grid 03 – Note data moves from right to left as the origin was inverted.



Headstock #2 core for compressive strength. Image after crushing.



Compressive Strength

Date of testing: 12/7/19
Preconditioning: Standard three day wet cure
Grinding or capping: Grinding (G)/Plaster (P)
Sampling: Performed by Concrete Diagnostics

Specimen ID			Headstock 1 HS 1 N-face	Headstock 2 H.S 2 S-face	Top #1C	Top #2c 2c 743	Top #3c	Top #4c
Sampling	Core direction		Horizontal	Horizontal	Vertical	Vertical	Vertical	Vertical
Before Trimming	Reinforcement	Size mm				8		
		Direction				Horizontal		
		Position in Core				Top		
	Core Defects							
After Trimming	Reinforcement	Size						
		Direction						
		Position in Core						
	Core Defects				Circumferential break on end B (11x18mm)	Circumferential break on end A (12 X 39mm) and end B (15x31mm)		
General	Notes							
Core Dimensions	Diameter	mm	80.9	81.3	81.4	81.3	80.9	80.1
	Height	mm	161	153	97	76	109	84
	Density	Kg/m ³	2360	2280	2340	2280	2400	2280
Cap	Type		G	G	P	P	G	G
Uncorrected	Strength	MPa	44.9	34.0	43.4	54.2	51.6	52.2
Corrected*	Strength	MPa	45.0	33.5	39.5	46.5	48.5	46.0

*Corrected for diameter : length ratio



Chloride Content

Digestion: Acidic
 Detection: Potentiometric Titration
 Reported as: Mass percent of concrete unless otherwise noted.
 Sampling: Performed by client
 Profiling: Performed by client

Lab ID	Client ID	Profile mm	% Chloride by mass of Concrete
742-01	TP01 P109 A pile	0 -20 (10)	0.43
742-02	TP01 P109 A pile	20 -40 (30)	0.25
742-03	TP01 P109 A pile	40 -60 (50)	0.15
742-04	TP01 P109 A pile	60 -80 (70)	0.10
742-05	TP02 Pile P25 - A	0 -20 (10)	0.54
742-06	TP02 Pile P25 - A	20 -40 (30)	0.45
742-07	TP02 Pile P25 - A	40 -60 (50)	0.43
742-08	TP02 Pile P25 - A	60 -80 (70)	0.35
742-09	TP03	0 -20 (10)	1.09
742-10	TP03	20 -40 (30)	0.70
742-11	TP03	40 -60 (50)	0.38
742-12	TP03	60 -80 (70)	0.18
742-13	TP04	0 -20 (10)	1.19
742-14	TP04	20 -40 (30)	0.95
742-15	TP04	40 -60 (50)	0.54
742-16	TP04	60 -80 (70)	0.32
742-17	TP05	0 -20 (10)	0.22
742-18	TP05	20 -40 (30)	0.19
742-19	TP05	40 -60 (50)	0.06
742-20	TP05	60 -80 (70)	0.02



Lab ID	Client ID	Profile mm	% Chloride by mass of Concrete
742-21	TP06	0 -20 (10)	0.43
742-22	TP06	20 -40 (30)	0.32
742-23	TP06	40 -60 (50)	0.17
742-24	TP06	60 -80 (70)	0.11
742-25	TP07	0 -20 (10)	0.55
742-26	TP07	20 -40 (30)	0.39
742-27	TP07	40 -60 (50)	0.22
742-28	TP07	60 -80 (70)	0.12
742-29	TP08	0 -20 (10)	1.04
742-30	TP08	20 -40 (30)	0.75
742-31	TP08	40 -60 (50)	0.49
742-32	TP08	60 -80 (70)	0.25
742-33	TP09	0 -20 (10)	0.59
742-34	TP09	20 -40 (30)	0.68
742-35	TP09	40 -60 (50)	0.56
742-36	TP09	60 -80 (70)	0.38
742-37	TP10	0 -20 (10)	0.35
742-38	TP10	20 -40 (30)	0.47
742-39	TP10	40 -60 (50)	0.27
742-40	TP10	60 -80 (70)	0.12
742-41	TP11	0 -20 (10)	0.18
742-42	TP11	20 -40 (30)	0.05
742-43	TP11	40 -60 (50)	0.07
742-44	TP12	0 -20 (10)	0.54
742-45	TP12	20 -40 (30)	0.39
742-46	TP12	40 -60 (50)	0.30
742-47	TP12	60 -80 (70)	0.20



Lab ID	Client ID	Profile mm	% Chloride by mass of Concrete
742-48	TP13	0 -20 (10)	0.50
742-49	TP13	20 -40 (30)	0.28
742-50	TP13	40 -60 (50)	0.18
742-51	TP14	0 -20 (10)	0.48
742-52	TP14	20 -40 (30)	0.22
742-53	TP14	40 -60 (50)	0.11
742-54	TP14	60 -80 (70)	0.06
742-55	TP15	0 -20 (10)	0.28
742-56	TP15	20 -40 (30)	0.51
742-57	TP15	40 -60 (50)	0.52
742-58	TP15	60 -80 (70)	0.27
742-59	TP16	0 -20 (10)	0.27
742-60	TP16	20 -40 (30)	0.15
742-61	TP16	40 -60 (50)	0.20
742-62	TP17	0 -20 (10)	0.85
742-63	TP17	20 -40 (30)	0.64
742-64	TP17	40 -60 (50)	0.61
742-65	TP17	60 -80 (70)	0.52
742-66	TP18	0 -20 (10)	0.48
742-67	TP18	20 -40 (30)	0.37
742-68	TP18	40 -60 (50)	0.18
742-69	TP18	60 -80 (70)	0.05
742-70	TP19	0 -20 (10)	1.05
742-71	TP19	20 -40 (30)	0.72
742-72	TP19	40 -60 (50)	0.53
742-73	TP19	60 -80 (70)	0.40



Lab ID	Client ID	Profile mm	% Chloride by mass of Concrete
742-74	TP20	0 -20 (10)	0.25
742-75	TP20	20 -40 (30)	0.16
742-76	TP20	40 -60 (50)	0.14



Terms and Conditions

- | | | |
|--|---|---|
| <p>1 Definitions</p> <p>1.1 "Service Provider" means Concrete Diagnostics A.B.N. 71 153 930 422</p> <p>1.2 "Client" means the person(s) who has requested the goods and/or services from the Service Provider.</p> <p>1.3 "Clients Representative" means any person the client has given authority (written or verbal) to act on behalf of the client.</p> <p>1.4 "Services" means any services or goods provided by the service provider to the client.</p> <p>1.5 "Force Majeure Event" means any event or circumstance beyond the service provider's reasonable control, including but not limited to the following:
Act of God, weather such as rain, storm, flood, lightning, earthquake or fire,
act of declared or undeclared war, riot, civil disturbance or release of nuclear or radioactive material, act of government or council authority restricting services.</p> <p>2 Acceptance</p> <p>2.1 Any instruction received by the service provider from the client for the supply of services this may be written or verbal.</p> <p>2.2 Acceptance of works is also deemed to be acceptance of all our terms and conditions and any test restrictions that may apply.</p> <p>3 Clients Responsibilities</p> <p>3.1 The client is responsible for supplying adequate information on the site and location of reinforcement, stressing cables, services and amenities within concrete, ground or building.</p> <p>3.2 The client shall insure the work site is free of tools, materials debris, and any other obstacles that may hinder the service provider.</p> <p>3.3 The client is responsible to reduce any delays outside of the Service Providers control so as to avoid additional charges.</p> <p>3.4 The client shall insure a smooth working surface free of adhesives, concrete, grout and dust.</p> <p>3.5 The client is responsible for directing scanning locations or determining the degree of scanning or testing. The service provider does not offer advice on the degree of scanning or testing that may be required.</p> <p>3.6 On completion of the services the client or clients representative shall be in attendance and the services duly measured. Should neither the client nor the clients representative be present the service provider shall assess the situation and take relevant measurements. This assessment and measurement shall be deemed conclusive evidence the services have been provided.</p> <p>3.7 Any samples submitted by the client must be correctly labeled in a legible fashion with the surface clearly identified. The service provider shall not be liable for any loss or damage caused due to incorrectly labeled samples.</p> <p>3.8 If working at heights the client shall supply all lifting equipment and associated safety equipment including harnesses unless otherwise arranged in writing for the service provider to supply lifting equipment.</p> <p>3.9 The client is responsible for supplying or additional charges will apply for PPE outside of our standard issue. Our standard issue PPE include, cotton long sleeve shirts, hardhat, steel cap boots, safety glasses, dust masks, ear plugs and gloves.</p> | <p>4 Concrete and Ground Scanning</p> <p>4.1 When offering a concrete or ground scanning service it should be noted this is a risk reduction service and will reduce the likelihood of cutting unwanted objects. However there are limitations with all equipment and hidden targets within concrete may still remain undetected. The Service Provider shall not be liable for any loss or damage including consequential loss caused due to undetected or misinterpretation of amenities or structural infrastructure such as, but not limited to, reinforcement, stressing cables, water, gas, electricity, optical cables, telephone, internet, cables or other amenities</p> <p>4.2 Scanning should be used in conjunction with structural drawings and information of immersed or buried services. If these are not available, investigative drilling, high pressure water blasting or vacuum extraction should be used prior to coring, drilling or digging.</p> <p>4.3 The service provider shall not be liable for any loss or damage caused in accessing the work site.</p> <p>5 Reports</p> <p>5.1 The report issued is for the clients use only. If the client releases or discloses the report to a third parties the client does so at their own risk and indemnify the service provider against responsibility and/or liability.</p> <p>5.2 The service provider prepares the report on the basis of client instruction, equipment results and sample material(s) received from the client and therefore makes no representation or gives any opinion in relation to materials that have not been tested by the service provider.</p> <p>5.3 Reports only apply to samples as submitted by the client.</p> <p>5.4 Whilst all care is taken, the service provider does not make any warranties, expressed or implied, that the information contained within reports is free of errors or omissions. The service provider does not offer professional advice and interpretation of any and all results is the responsibility of the client.</p> <p>5.5 Reports are issued on good faith that the material supplied has not been interfered with, or the client has misrepresented or mislabeled the samples. The service provider will not be liable for any samples that have been interfered with or have been misrepresented or mislabeled.</p> <p>5.6 No part or parts of the report shall be reproduced expect in full.</p> <p>6 Cancellation</p> <p>6.1 The service provider may cancel these terms and conditions or cancel delivery of services at any time before the services have been delivered. The client will be notified of services being cancelled with written notice. The service provider shall not be liable for any loss or damage caused by the cancellation.</p> <p>7 Consequential Loss</p> <p>7.1 The service provider or its sub-contractors, employees and/or agents are not liable for consequential loss and/or indirect financial loss or damage.</p> <p>8 Limitation of Liability</p> <p>8.1 The service providers limit of liability to the Client whether in contract or in tort and whether for negligence or otherwise is hereby limited to the total aggregate amount of \$10,000 or re-performance of the services whichever is the lesser. The service provider shall in no event be liable to the Client in respect of matters not notified within 12 months from completion of the Services. The client hereby irrevocably agrees to indemnify the service provider safe from any loss or damage incurred in excess of the said aggregate amount.</p> <p>8.2 If the service provider is prevented in whole or in part from completing the services by Force Majeure Event, the services are to be suspended or cancelled. This will not be considered a breach of contract and the service provider shall not be liable for any loss or damage caused by the cancellation.</p> | <p>9 Service Provider Entitlements</p> <p>9.1 The service provider is entitled to sub-contract any or all of the services to be supplied to the client, but in doing so the service provider is not relieved of its obligations to the client under the contract.</p> <p>9.2 Due to the technical nature of our equipment delays or cancellation may occur due to equipment malfunction. The service provider will notify the client of any such malfunction and organize an alternate time for testing. This does not constitute a breach of contract.</p> <p>9.3 Any materials submitted by the client or collected by the service provider will be retained for 30 days after the provision of the report. After the 30 days the service provider reserves the right to dispose of all materials or charge a rental fee at cost + 15%</p> <p>9.4 Any materials submitted by the client or collected by the service provider where there is no provision of a report will be retained for 30 days after submission or collection. After the 30 days the service provider reserves the right to dispose of all materials or charge a rental fee at cost + 15%</p> <p>9.5 If equipment hire is required the service provider can charge the hire or rental fee plus 15%.</p> <p>9.6 Any quote or proposal is valid only for 30 days from the date of issue. Any samples associated with a quote or proposal will be disposed of after 30 days from the date of issue, if the client has not notified their acceptance of the quote or proposal.</p> <p>10 Hours of operation</p> <p>10.1 Normal hours of operations are Monday to Friday excluding public holidays between 06:00-18:00. Works performed outside of these hours may incur additional charges, with a minimum four hour callout.</p> <p>10.2 Day rates are based on up to 8 hours in the same day including travel.</p> <p>11 Credit</p> <p>11.1 The client is not entitled to any credit facilities unless approved by the service provider in writing</p> <p>11.2 Until the client receives written notification that credit has been approved the client shall pay a deposit of the estimated fee before commencement of services.</p> <p>11.3 The remainder of the fee will be payable on the supply of the services on a "cash on delivery". The service provider retains the right to withhold any services including any report until payment.</p> <p>11.4 If credit has been granted to the client payment must be made no later than fourteen (14) days after the date of invoice. Payment is to be made as instructed on the invoice.</p> <p>11.5 Where invoices become overdue, you will be contacted to arrange payment. Every effort will be made by the service provider to collect payment from you, however, the service provider may, at its sole discretion, engage a collection agency to collect any overdue payments on our behalf. In some jurisdictions, the costs of engaging a 3rd party to collect outstanding payments can be passed to the customer. It is your responsibility to pay us for services we provide to you and by the due date.</p> <p>11.6 Any amounts not paid by the due date shall accrue interest at the rate of 0.069 percent per day, calculated from the day after the due by date stated on the invoice. Each notice sent to the client shall incur a \$30+GST administration fee. Third party collection fee approximately 15% of the total outstanding amount.</p> |
|--|---|---|

Appendix C

Concrete Condition Testing

Test Point 1
Element - Concrete Pile
Location - P-25-A

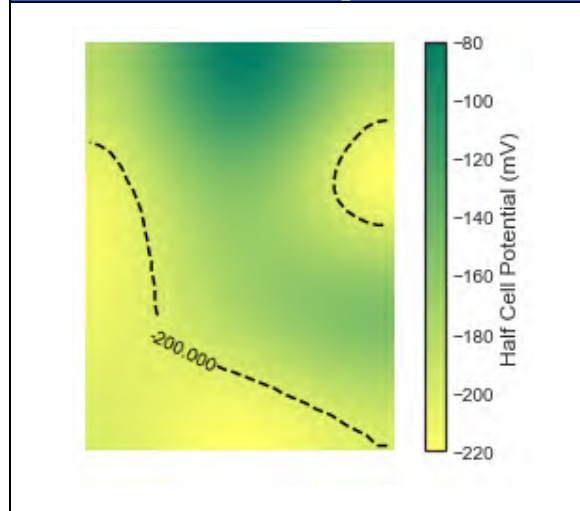
Above Water Photo



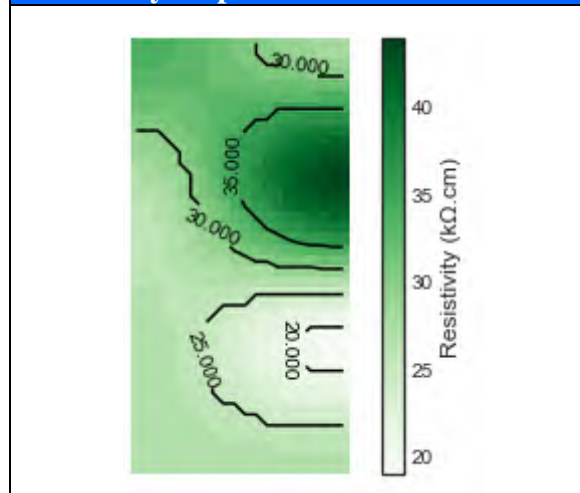
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	44 mm	46 mm	45 mm
Longitudinal	44 mm	46 mm	45 mm

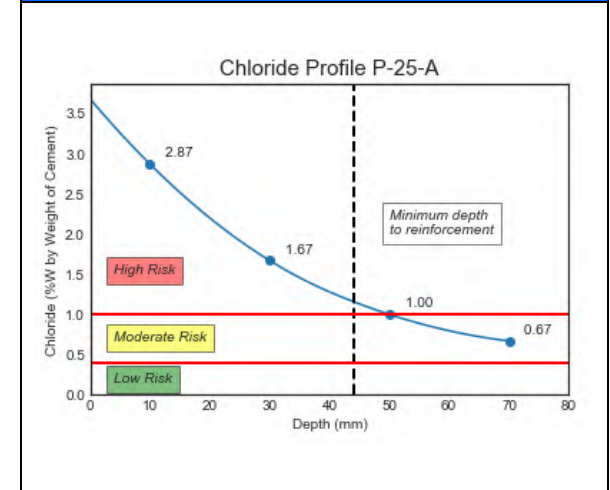
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
44 mm	1.20 %	-220 mV	20 kΩ.cm	Moderate

Test Point 2
Element -Concrete Pile
Location – P-109-A

Above Water Photo

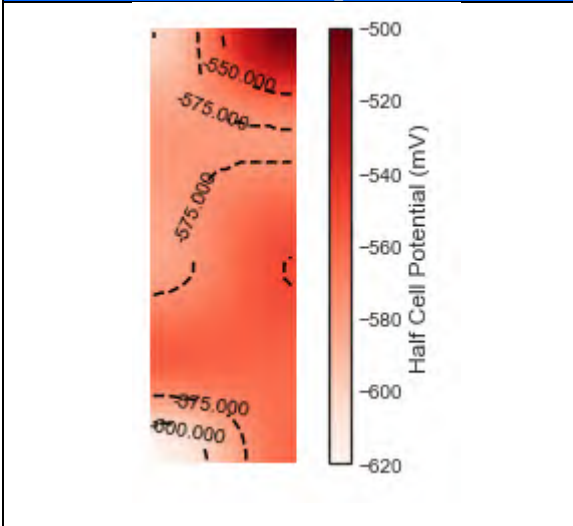


Cover to Reinforcement

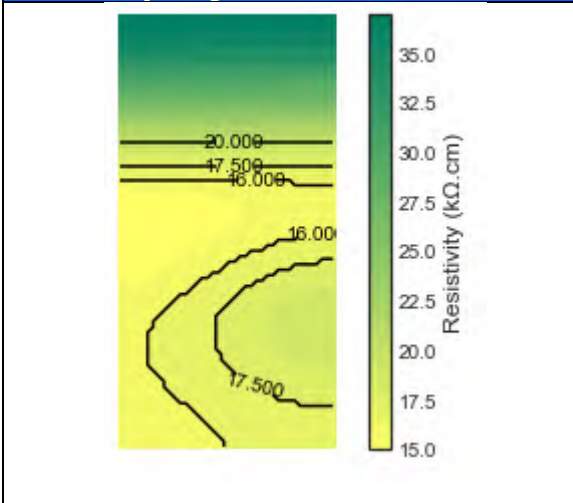
	Minimum	Maximum	Average
Transverse	60 mm*	-	-
Longitudinal	72 mm	100 mm	76 mm

*Physical measure only due to the density of transverse steel

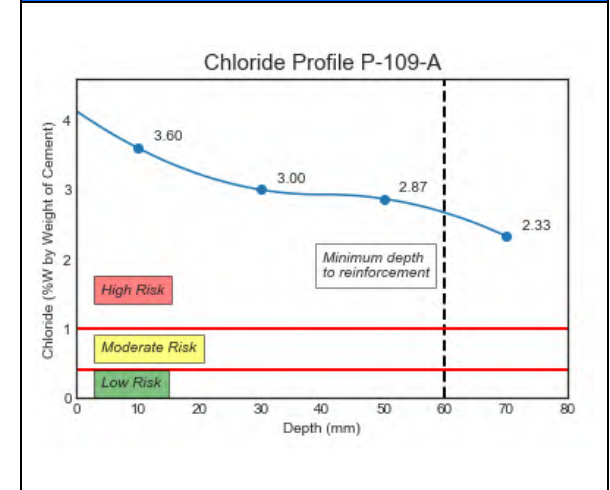
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
60 mm	2.4 %	-600 mV	16 kΩ.cm	High

Test Point 3

Element -Concrete Headstock

Location – HS-109

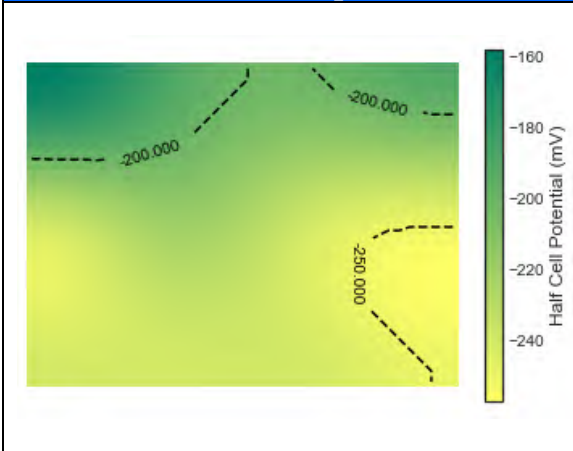
Above Water Photo



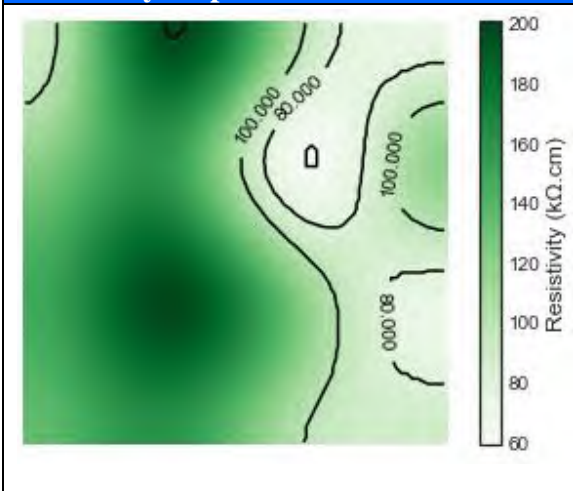
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	58 mm	80 mm	63.5 mm
Longitudinal	47 mm	76 mm	63.25 mm
Physical	50 mm		

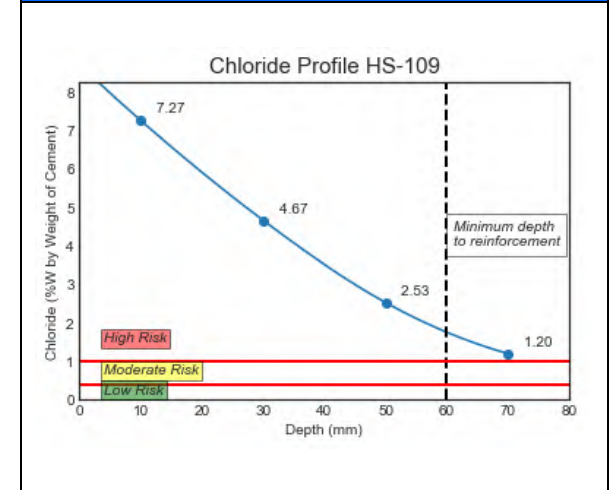
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
47 mm	2 %	-250 mV	60 kΩ.cm	Moderate

Test Point 4
Element -Concrete Headstock
Location – HS-90

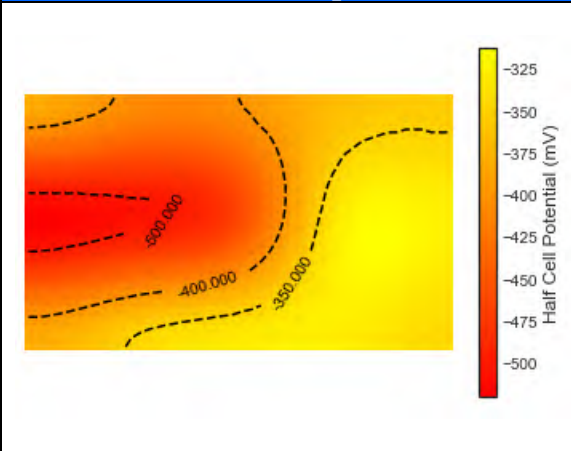
Above Water Photo



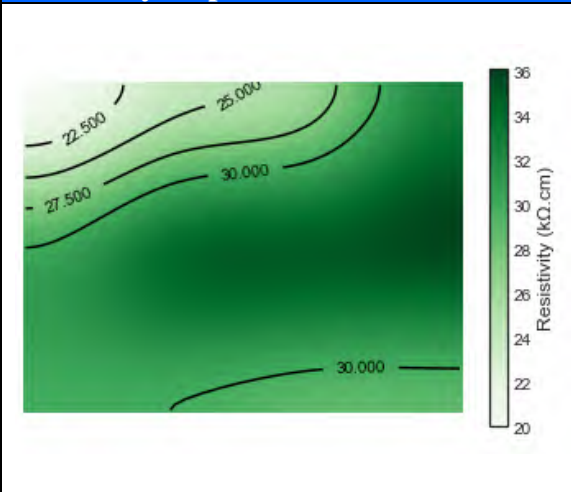
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	52 mm	76 mm	61 mm
Longitudinal	53 mm	83 mm	69 mm

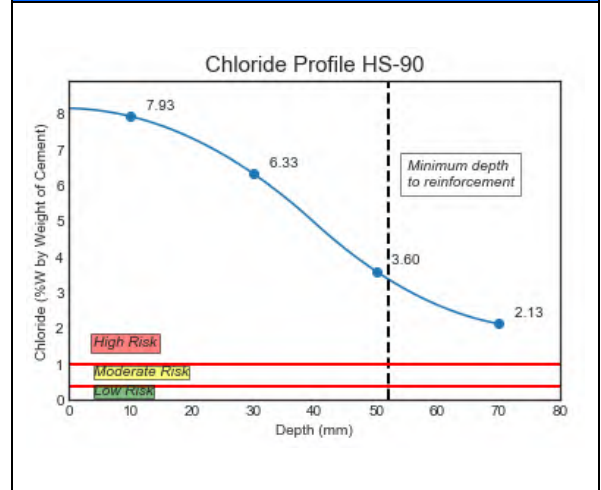
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
52 mm	3.5 %	-500 mV	20 kΩ.cm	High

Test Point 5

Element - Concrete Headstock

Location - HS-39

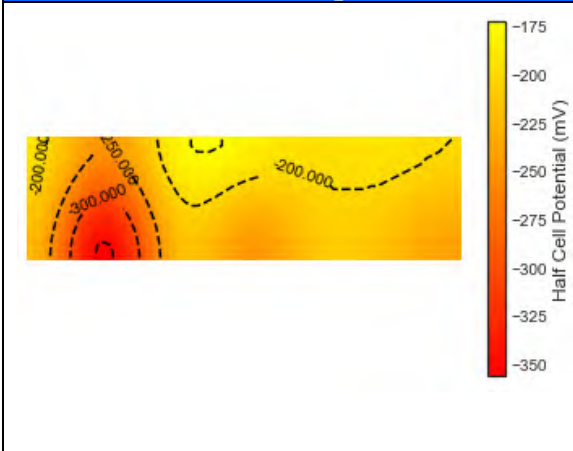
Above Water Photo



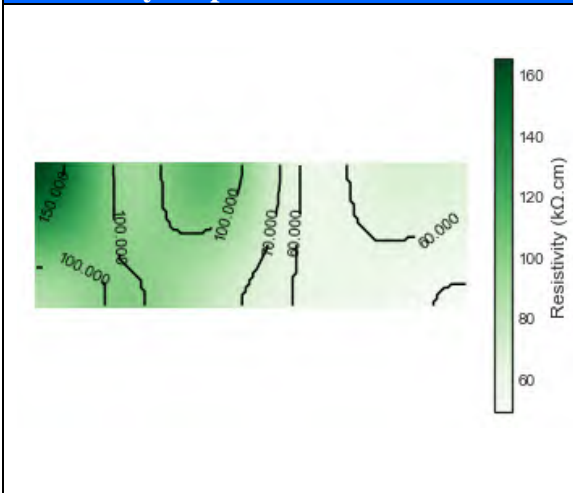
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	56 mm	79 mm	73 mm
Longitudinal	73 mm	75 mm	74 mm

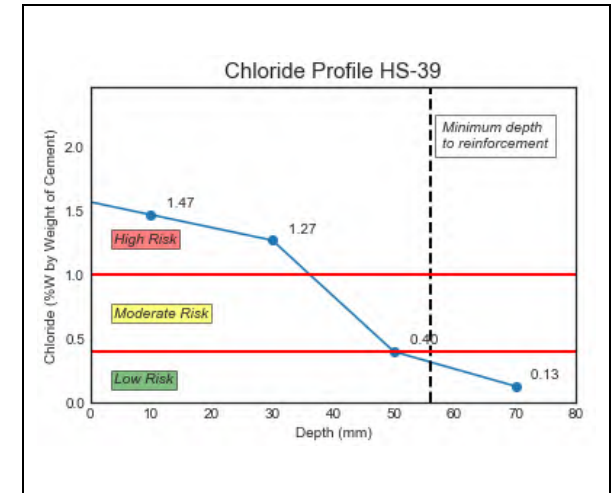
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
44 mm	0.36 %	-355 mV	55 kΩ.cm	Moderate

Test Point 6
Element -Concrete Pile
Location – P-332-A

Above Water Photo

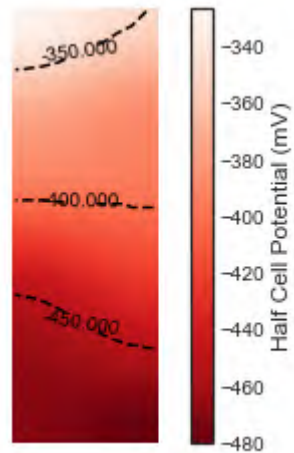


Cover to Reinforcement

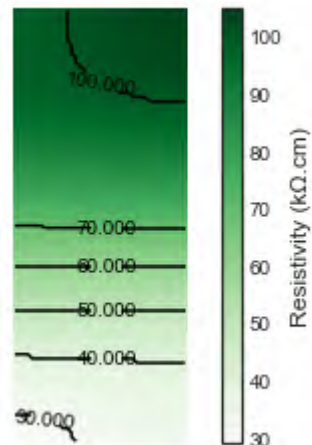
	Minimum	Maximum	Average
Transverse*	-	-	-
Longitudinal	48 mm	53 mm	51 mm
Physical	55 mm		

*No transverse defined due to close placement

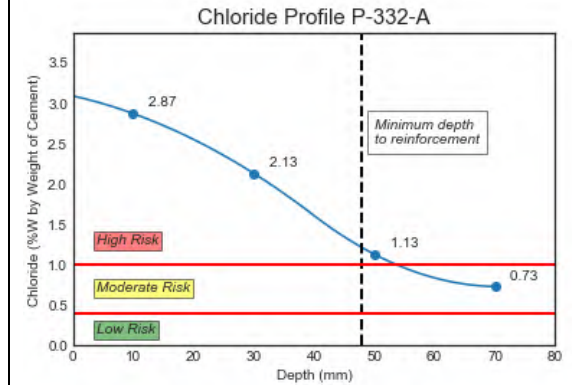
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
48 mm	1.20 %	-450 mV	30 kΩ.cm	High

Test Point 7
Element -Concrete Pile
Location – P-301-E

Above Water Photo

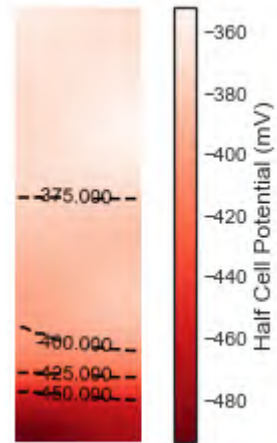


Cover to Reinforcement

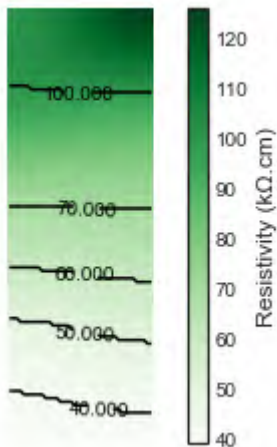
	Minimum	Maximum	Average
Transverse*			
Longitudinal	52	56	54

*No transverse defined due to close placement

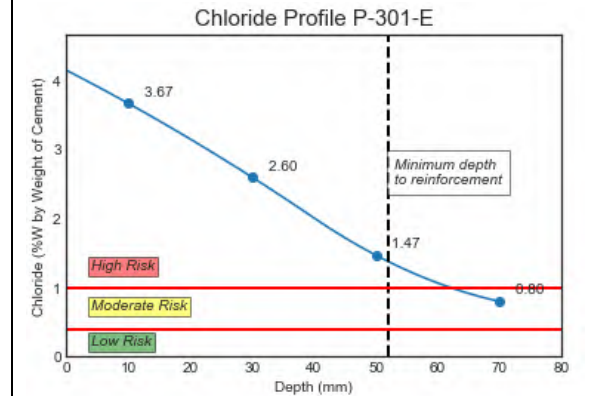
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
52 mm	1.47 %	-450 mV	39 kΩ.cm	High

Test Point 8
Element - Concrete Pile
Location – HS-65

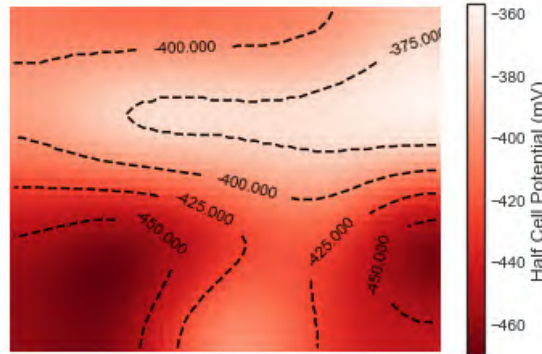
Above Water Photo



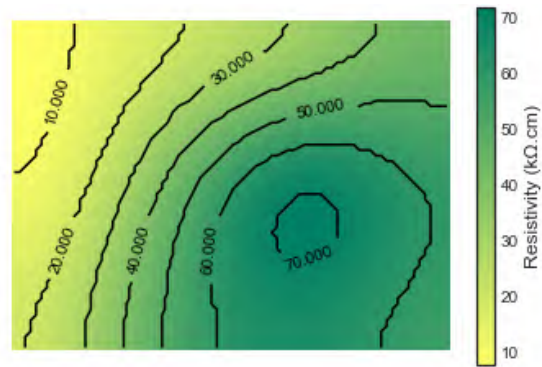
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	50	63	53
Longitudinal	60	100	73

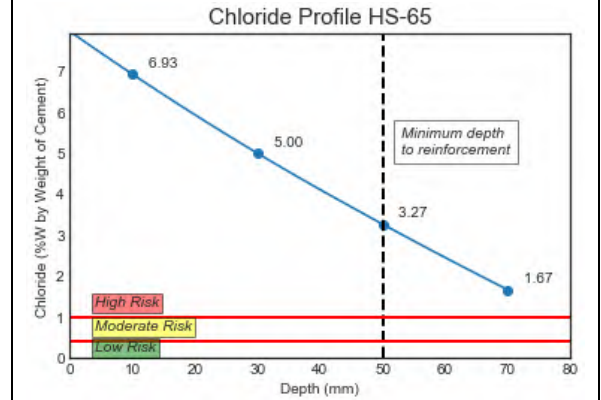
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
50 mm	3.27 %	--480 mV	20 kΩ.cm	High

Test Point 9

Element - Concrete Headstock
Location - HS-19

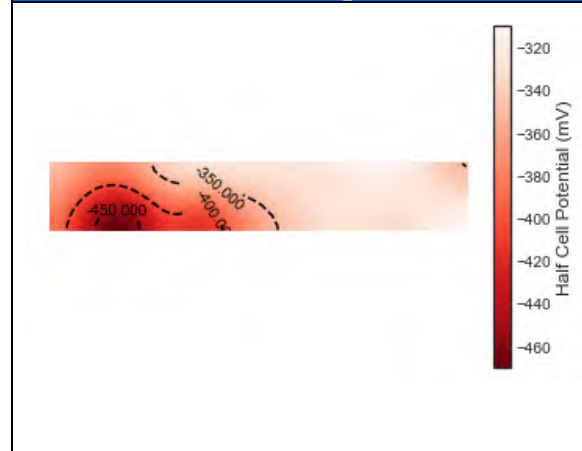
Above Water Photo



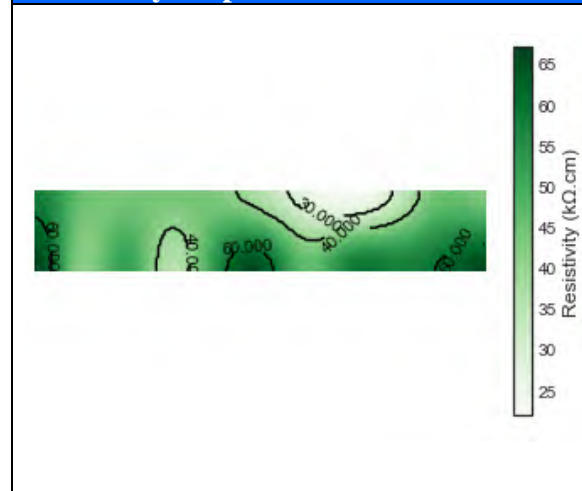
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	58 mm	87 mm	77 mm
Longitudinal	67 mm	96 mm	86 mm

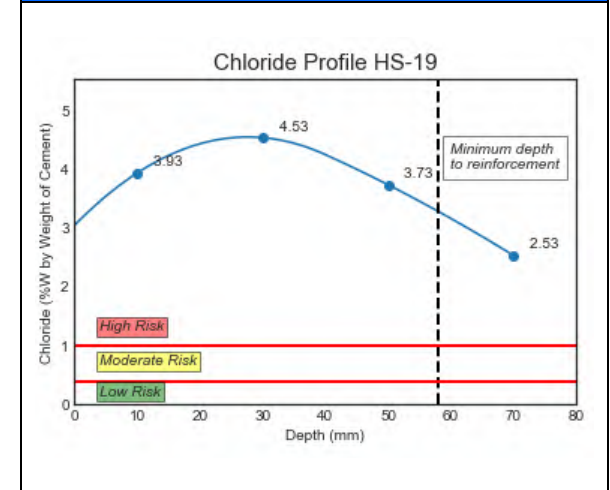
Electrode Potential Map



Resistivity Map



Chloride Profiles



Summary of Results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
58 mm	3 %	-450 mV	22 kΩ.cm	High

Test Point 10

Element -Concrete Headstock

Location – HS-312

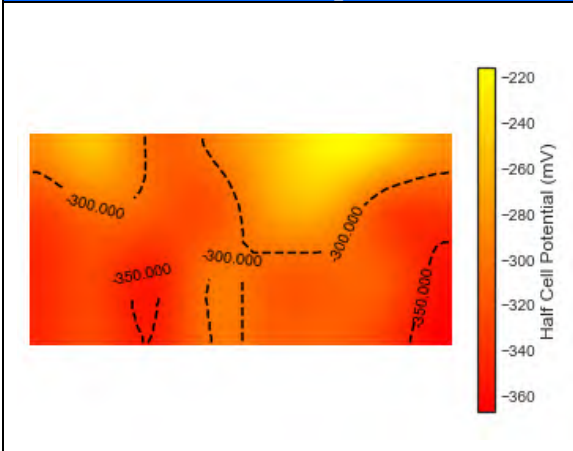
Above Water Photo



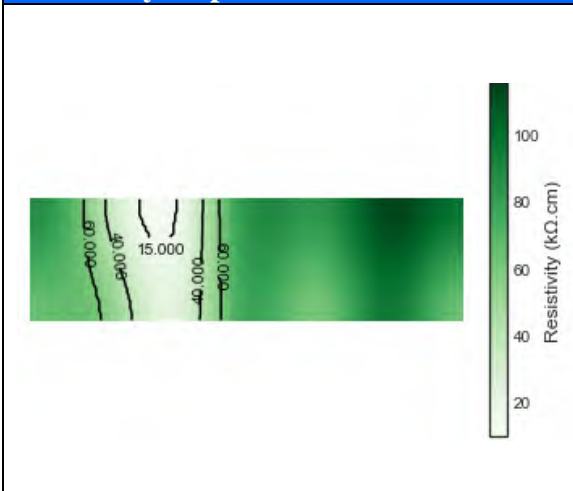
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	80	101	95
Longitudinal	94	108	103

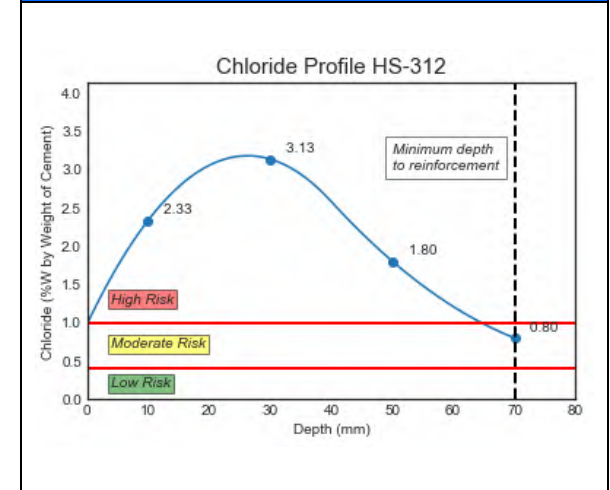
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
80 mm	0.8 %	-360 mV	15 kΩ.cm	High

Test Point 11

Element - Concrete Deck Soffit

Location – Soffit 312-313

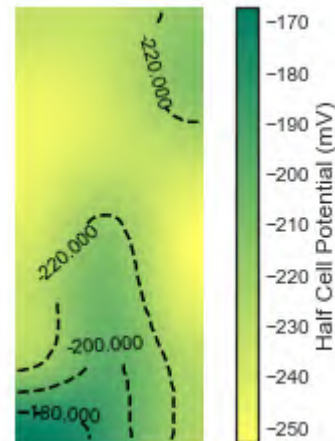
Above Water Photo



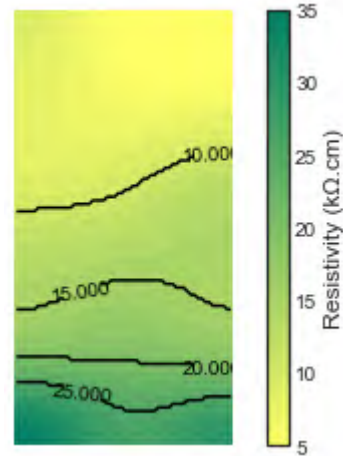
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	40 mm	64 mm	48 mm
Longitudinal	48 mm	70 mm	60 mm
Physical	50 mm		

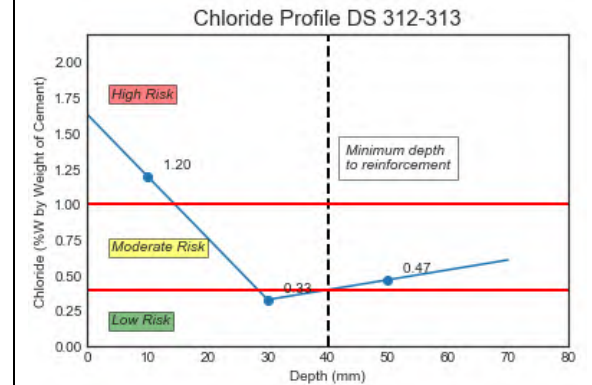
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
40 mm	0.4 %	-248 mV	5 kΩ.cm	Moderate

Test Point 12
Element -Concrete Pile
Location – P-211-A

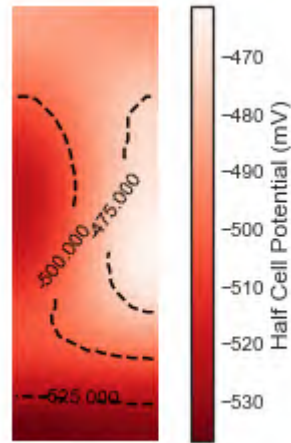
Above Water Photo



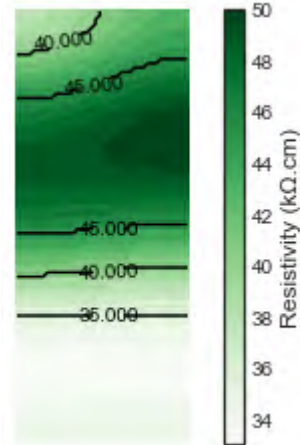
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	-	-	-
Longitudinal	48	62	54.2

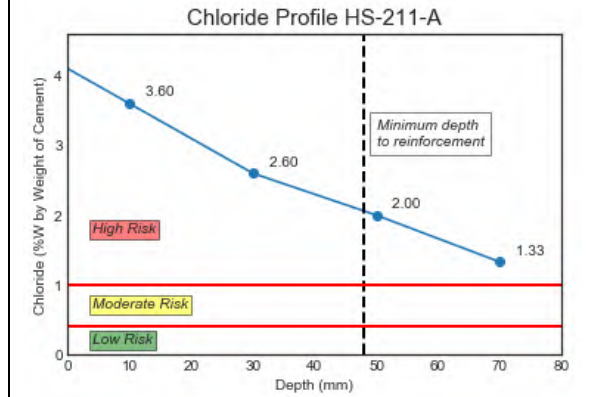
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
48 mm	2 %	-530 mV	34 kΩ.cm	High

Test Point 13
Element -Concrete Pile
Location – P-201-G

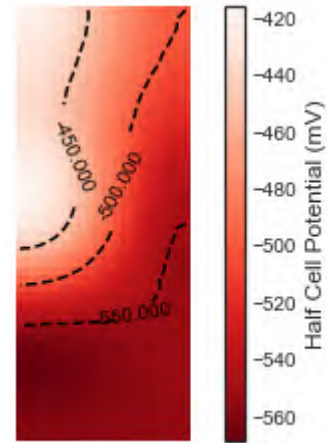
Above Water Photo



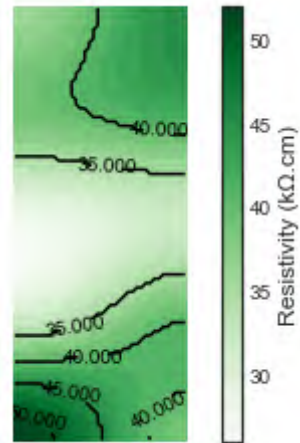
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	-	-	-
Longitudinal	36 mm	45 mm	40 mm

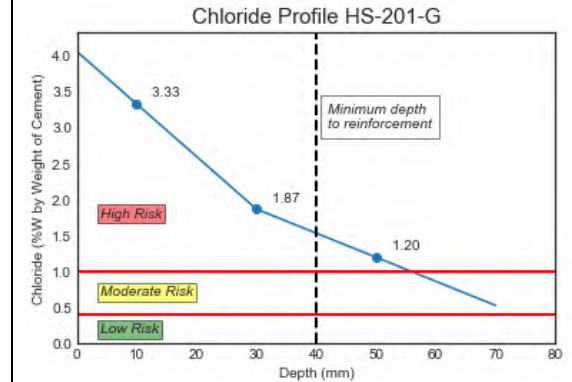
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
40 mm	1.30 %	-550 mV	27 kΩ.cm	High

Test Point 14

Element -Concrete Headstock

Location – HS-217

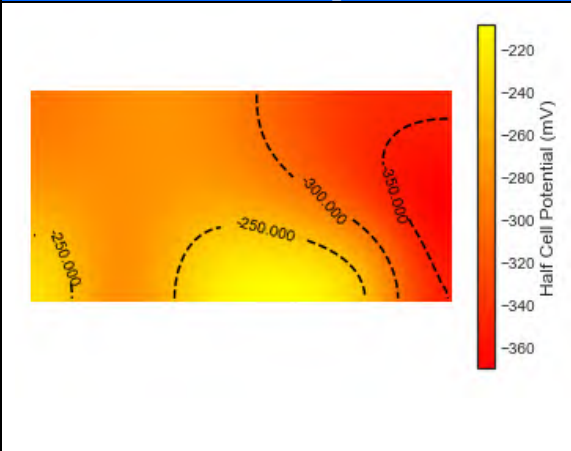
Above Water Photo



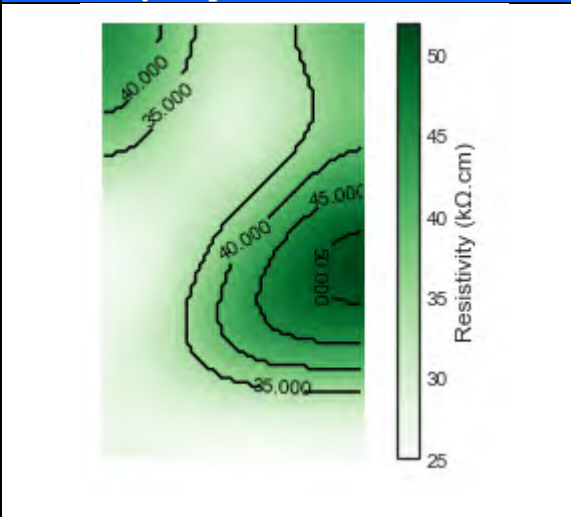
Cover to Reinforcement

	Minimum	Maximum	Average
Vertical	69	92	87
Longitudinal	76	117	92

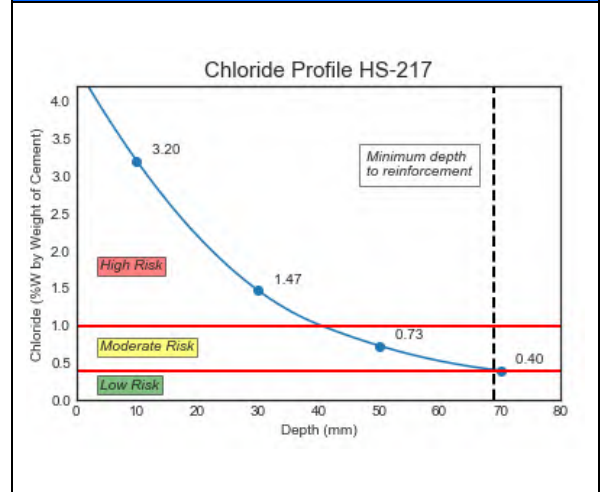
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
69 mm	0.42 %	-360 mV	25 kΩ.cm	Moderate

Test Point 15

Element -Concrete Headstock

Location – HS-338

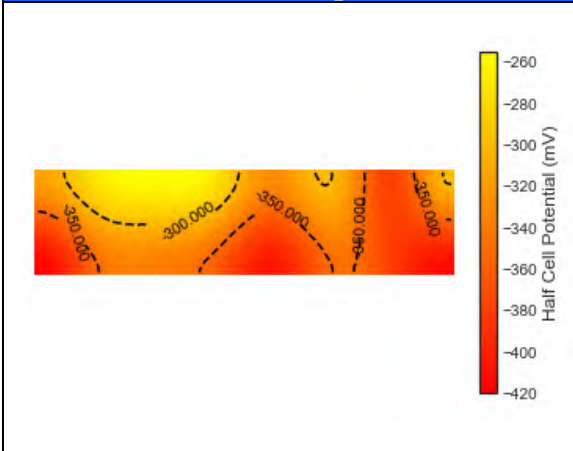
Above Water Photo



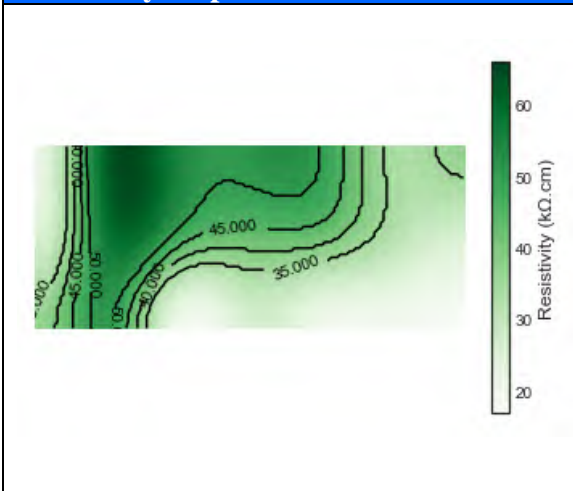
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse	92 mm	119 mm	101 mm
Longitudinal	84 mm	118 mm	98 mm

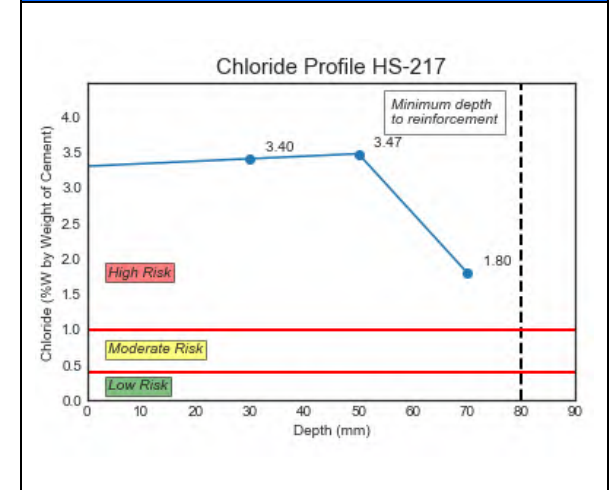
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

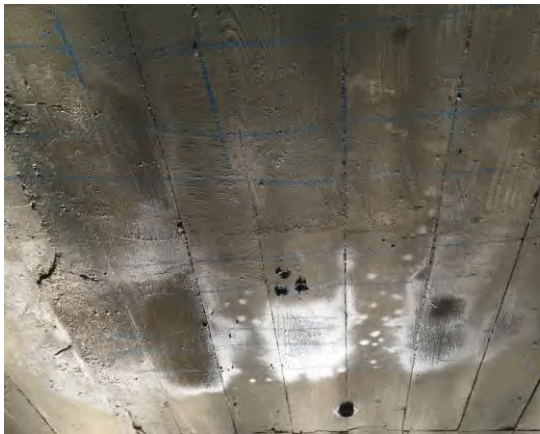
Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
84 mm	1.8 %	-420 mV	17 kΩ.cm	High

Test Point 16

Element - Concrete Deck Soffit

Location - DS-338-339

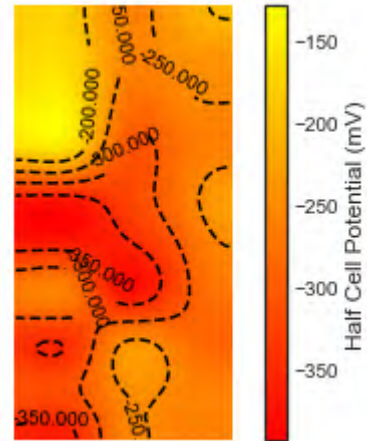
Above Water Photo



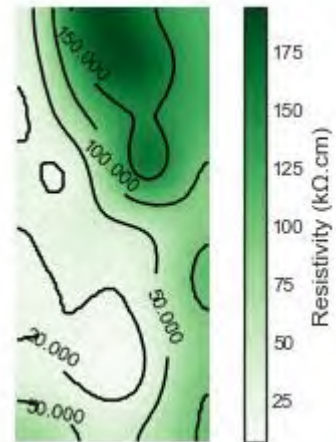
Cover to Reinforcement

	Minimum	Maximum	Average
General	43 mm	69 mm	49 mm

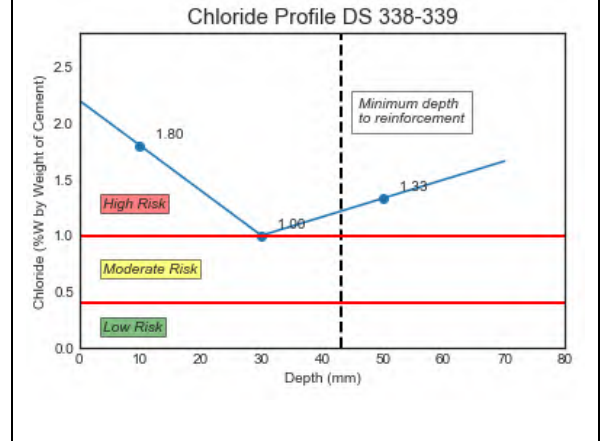
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
43 mm	1.20 %	-350 mV	24 kΩ.cm	High

Test Point 17

Element - Concrete Headstock
Location – HS-203

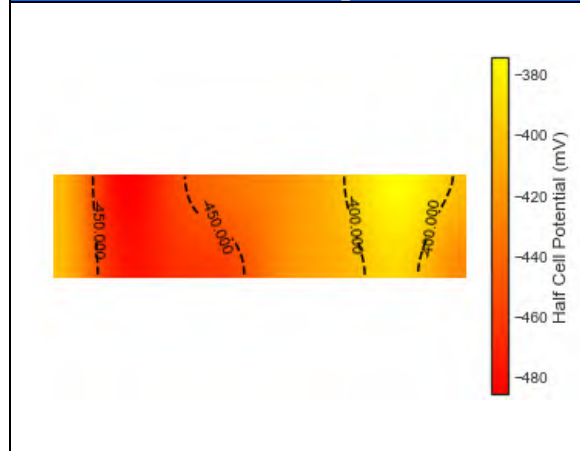
Above Water Photo



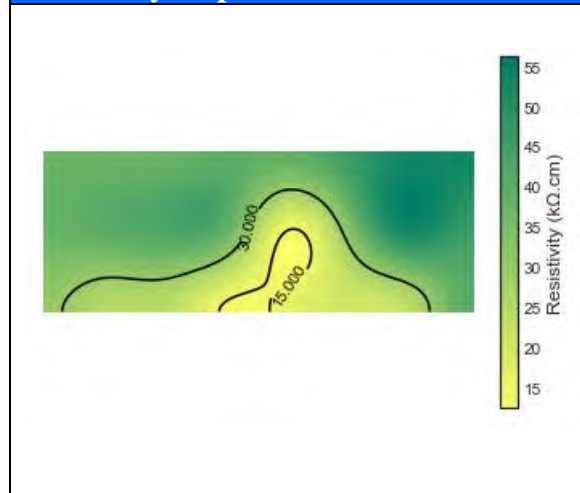
Cover to Reinforcement

	Minimum	Maximum	Average
Transverse/vertical	55 mm	176 mm	106 mm
Longitudinal	57 mm	160 mm	124 mm

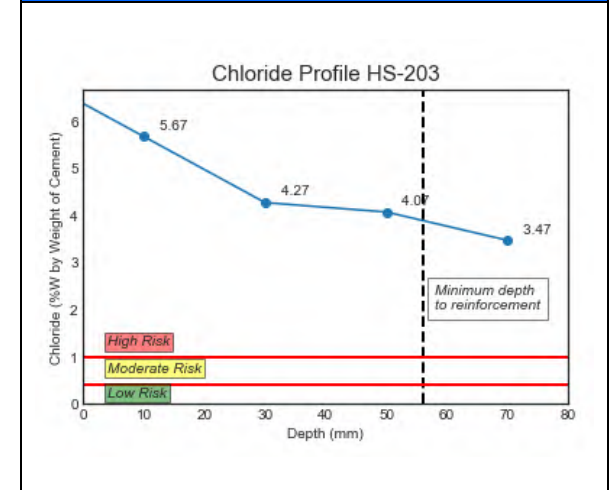
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
55 mm	3.5 %	-450 mV	15 kΩ.cm	High

Test Point 18
Element -Concrete Pile
Location – P-219-D

Above Water Photo

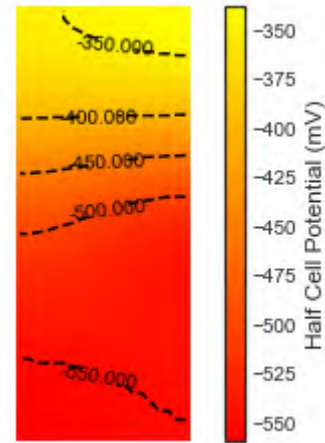


Cover to Reinforcement

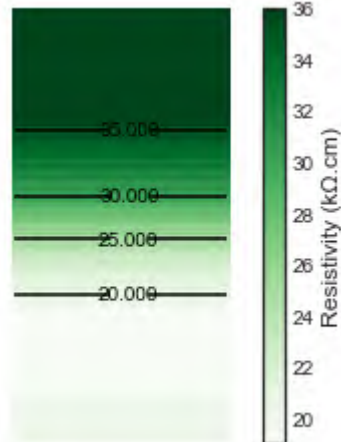
	Minimum	Maximum	Average
Transverse*			
Longitudinal	43 mm	47 mm	45 mm

*No transverse defined due to close placement

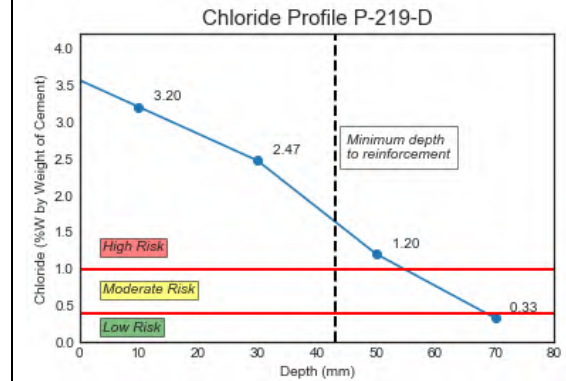
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
43 mm	1.7 %	-560 mV	20 kΩ.cm	High

Test Point 19
Element -Concrete Pile
Location – P-210-H

Above Water Photo

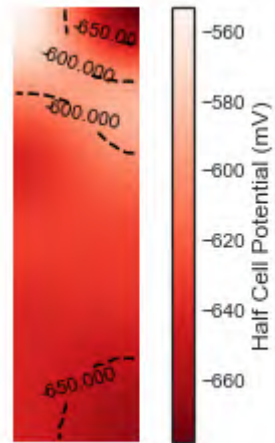


Cover to Reinforcement

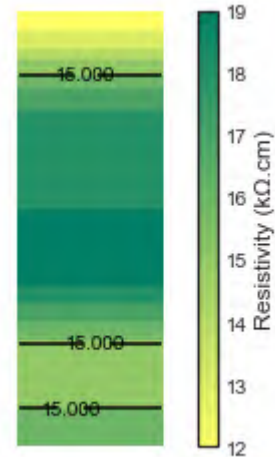
	Minimum	Maximum	Average
Transverse	-	-	-
Longitudinal	46 mm	51 mm	49 mm

*No transverse defined due to close placement

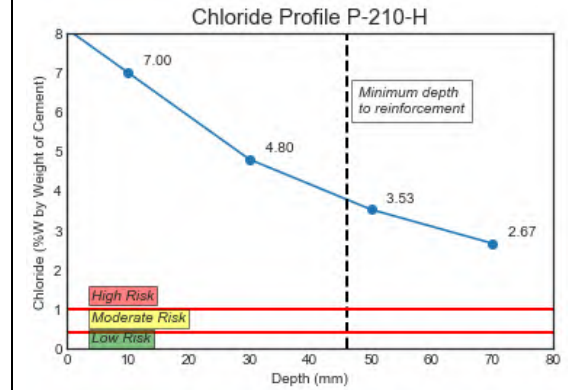
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
46 mm	3.53 %	-665 mV	12 kΩ.cm	High

Test Point 20
Element - Concrete Pile
Location –

Above Water Photo

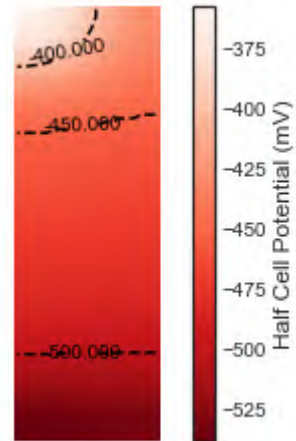


Cover to Reinforcement

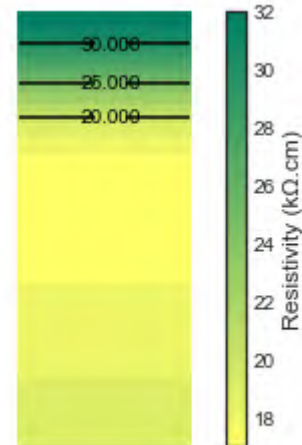
	Minimum	Maximum	Average
Transverse	-	-	-
Longitudinal	40	54	47

*No transverse defined due to close placement

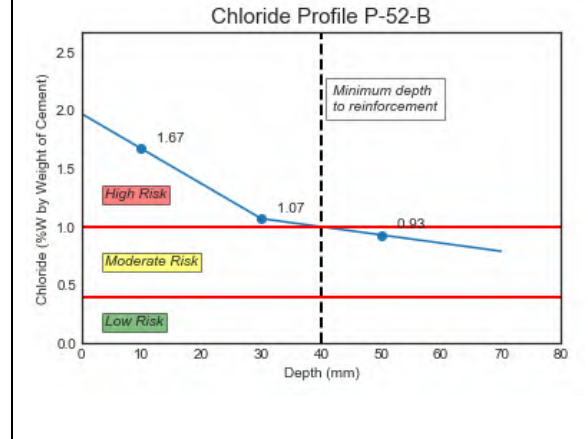
Electrode Potential Map



Resistivity map



Chloride Profiles



Summary of results

Minimum Cover	Chloride content at Reinforcement	Minimum Half Cell	Minimum Resistivity	Overall Risk
40 mm	1.0 %	-538 mV	18 kΩ.cm	High

Appendix D

Diving Survey



PACIFIC MARINE GROUP PTY LTD
AUSTRALIA



**ARUP GROUP PTY LTD
BOWEN WHARF UNDERWATER PILE INSPECTIONS**

Final Report

DOCUMENT NUMBER

1243-ARUP-FR-R1

DATE

15/07/2019

PMG JOB NUMBER

1243

CLIENT JOB NUMBER

Contract #: Underwater Pile Inspections

CLIENT

ARUP Group Pty Ltd
Level 4, 108 Wickham Street
Fortitude Valley
Brisbane
QLD 4006

RECIPIENT/POSITION

Peter Kastrup / QLD Maritime Leader
Transport and Resources
Telephone: (07) 3023 6078
Mobile: 0431 674 734
Email: peter.kastrup@arup.com.au

DOCUMENT CONTROL

REVISION	DATE	DESCRIPTION OF CHANGES	AUTHOR	CHECKED	APPROVED
R0	17/07/19	Draft For Review	Steven Gouws	Ashley Bean	
R1	26/07/19	For Issue	Steven Gouws	Ashley Bean	Enrique Mosquera



CLIENT: ARUP Group PTY Ltd

JOB NO: 1243

DESCRIPTION: Underwater Pile inspections at Bowen Wharf, Bowen

CALL OUT DATES: 1st - 5th July 2019

DIVE PERSONNEL: All diving personnel used were qualified and certified in accordance with Australian Standard for the Training and Certification of Occupational Divers AS 2815

Dive Supervisor: Steven Gouws

Diver: Nathan Marsh

Diver: Neil Ritchie

Diver/Coxswain: Narai Cousins



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1. INTRODUCTION

- 1.1 General
- 1.2 Safety and Compliance

2. SCOPE OF WORKS

- 2.1 Clean 2 x 300mm bands per pile with water blaster unit
- 2.2 Inspection of 48 nominated piles noting defects including: Cracking, Spalling, Delamination and evidence of Reinforcement Corrosion

3. RESULTS

- 3.1 Middle Wharf Stem
- 3.2 Outer Wharf Stem
- 3.3 Coal Pier Stem
- 3.4 Berths 1 & 2 Public Access Wharf
- 3.5 Berths 3 & 4 Tug Operations Wharf

4. CONCLUSION

APPENDIX A – DAILY SUMMARY REPORTS

APPENDIX B – RECORD OF DIVE LOGS

APPENDIX C – PROJECT PHOTOGRAPHS & VIDEO LOGS

INCLUDED – USB MEMORY (PILE DATA SHEET. PHOTOS AND VIDEOS)



1. INTRODUCTION

1.1 General

This document summarises the results of the Bowen Wharf Underwater Pile Inspections, as requested by Mr Peter Kastrop on behalf of ARUP Group PTY Ltd.

The works were completed between 1st and 5th of July 2019.

1.2 Safety & Compliance

All work was performed in accordance with the following:

- Queensland Work Health and Safety Act 2011
- Queensland Work Health and Safety Regulation 2011 – Part 4.8 Diving Work
- Pacific Marine Group's Quality Assurance System
- AS/NZS 2299.1:2015 Occupational dive operations

A pre-start meeting / safety briefing, hazard assessment and equipment function / safety checklists were conducted daily prior to commencement of work.

The diver was briefed on his task prior to entering the water.

2. SCOPE OF WORKS

To carry out underwater visual inspections of the Wharf Piles at Bowen Wharf according to the specific requirements on the ARUP Group provided Scope of Works as described below.

2.1 Water-blaster Cleaning:

Cleaning 2 x 300mm wide inspection bands per pile below the Lowest Astronomical Tide level as per the clients' instructions.

2.2 Pile Inspections:

Inspections of 48 nominated piles noting defects including: Cracking, Spalling, Delamination and evidence of Reinforcement Corrosion.



3. RESULTS

3.1 MIDDLE WHARF STEM

All three piles inspected at the middle wharf stem have vertical cracking as a result of, what appears to be, reinforcement corrosion within the piles.

As these three piles are exposed at low tide, only one RL was cleaned and inspected as per clients' instruction.

A comprehensive defect summary can be referenced in the Pile data sheet provided.

Video footage can be referenced in the video USB provided.



3.2 OUTER WHARF STEM

Five out of the eight piles inspected at the outer wharf stem have vertical cracking as a result of, what appears to be, reinforcement corrosion within the piles.

As well as cracking, there appeared to be evidence of 'corrosion bleeding' at pile number P115-C as can be seen in the adjacent photo.

A comprehensive defect summary can be referenced in the Pile data sheet provided.

Video footage can be referenced in the video USB provided.





3.3 COAL PIER STEM

All of the piles inspected at the coal pier stem have vertical cracking as a result of, what appears to be, reinforcement corrosion within the piles.

A fair amount of chipping was seen along the chamfered edges of the piles.

Cracking was also noted between the horizontal brace members and the vertical piles.

A comprehensive defect summary can be referenced in the Pile data sheet provided.

Video footage can be referenced in the video USB provided.



3.4 PUBLIC ACCESS WHARF

Most of the inspected piles at the public access wharf have vertical cracking.

A fair amount of chipping was seen along the chamfered edges of the piles.

A comprehensive defect summary can be referenced in the Pile data sheet provided.

Video footage can be referenced in the video USB provided.





3.5 TUG OPERATIONS WHARF

All of the piles inspected at the tug operations wharf have vertical cracking as a result of, what appears to be, reinforcement corrosion within the piles.

Horizontal cracking was also seen at piles P330-M-R and P350-M-R

A fair amount of chipping was seen along the chamfered edges of the piles.

Cracking was also noted between the horizontal brace members and the vertical piles.

A comprehensive defect summary can be referenced in the Pile data sheet provided.

Video footage can be referenced in the video USB provided.





4. CONCLUSION

Pacific Marine Group successfully completed the Underwater Pile inspections at Bowen Wharf, as requested by Mr Peter Kastrop, on behalf of ARUP Group PTY Ltd.

The diving services provided by Pacific Marine Group were carried out in compliance with AS/NZS 2299.1:2015 as required by the Queensland Work Health and Safety Act 2011. All work was carried out under our internationally certified Quality Assurance Program based on ISO 9001:2015.

Report compiled by Steven Gouws

Date: 15th July 2019

Signature _____

A handwritten signature in black ink, written over a horizontal line. The signature is stylized and appears to be 'S. Gouws'.



PACIFIC MARINE GROUP PTY LTD
AUSTRALIA

FINAL REPORT BOWEN WHARF UNDERWATER PILE INSPECTIONS

APPENDIX A – DAILY SUMMARY REPORTS




DAILY SUMMARY REPORT

JOB NUMBER: 1243
LOCATION: Bowen
VESSEL: PMG Workboat
SUPERVISOR: S. Gouws

CLIENT / COMPANY: ARUP
DATE: 02/07/19
SHEET OF

TIME	DESCRIPTION
0530	Travel to Bowen Marina
0600	On site - pre-start and JSA sign-on
0610	Load work boat – perform equipment function tests
0700	Depart Marina
0800	Secure at Wharf for diving operations -
0900	Diver in the water – N Marsh - 1243-01-19
1320	Diver out the water – completed inspection of piles at Outer & Middle Wharf
1410	Diver in the water – N Ritchie - 1243-02-19
1630	Diver out the water – 6 piles completed at Public Access Wharf
1640	Depart Wharf for Marina
1700	Remove boat from water
1730	Off duty

PERSONNEL

1. N Cousins	2. N Marsh
3. N Ritchie	4. S Gouws
5.	6.
SUPERVISOR SIGNATURE: 	CLIENT SIGNATURE:




DAILY SUMMARY REPORT

JOB NUMBER: 1243
LOCATION: Bowen
VESSEL: PMG Workboat
SUPERVISOR: S. Gouws

CLIENT / COMPANY: ARUP
DATE: 03/07/19
SHEET OF

TIME	DESCRIPTION
0630	On site - pre-start and launch punt
0700	Travel to wharf
0715	Secure at wharf
0730	Diver in the water – N Marsh - 1243-03-19
1230	Diver out the water – completed inspection of 9 piles at Public Access Wharf & Coal Pier
1300	Diver in the water – N Cousins - 1243-04-19
1730	Diver out the water – 8 piles completed at Coal Pier & Tug operations wharf
1740	Depart Wharf for Marina
1800	Remove boat from water
1830	Off duty

PERSONNEL

1. N Cousins	2. N Marsh
3. N Ritchie	4. S Gouws
5.	6.
SUPERVISOR SIGNATURE: 	CLIENT SIGNATURE:




DAILY SUMMARY REPORT

JOB NUMBER: 1243
LOCATION: Bowen
VESSEL: PMG Workboat
SUPERVISOR: S. Gouws

CLIENT / COMPANY: ARUP
DATE: 04/07/19
SHEET OF

TIME	DESCRIPTION
0630	On site - pre-start and launch punt
0700	Travel to wharf
0715	Secure at wharf
0730	Diver in the water – N Ritchie - 1243-05-19
0930	Diver out the water – completed inspections at Tug Wharf
1020	Diver in the water – N Marsh - 1243-06-19
1300	Diver out the water – Inspections at Tug operations wharf
1330	Diver in the water- N Cousins - 1243-07-19
1530	Diver out- inspection of piles at Tug operations wharf
1600	Unable to tie up for last piles – severe weather – client informed
1640	Back at marina- removed boat from the water
1700	Off duty

PERSONNEL

1. N Cousins	2. N Marsh
3. N Ritchie	4. S Gouws
5.	6.
SUPERVISOR SIGNATURE: 	CLIENT SIGNATURE:



APPENDIX B – RECORD OF DIVE LOGS



Customer: ARUP Group _____ Vessel: PMG Workboat _____ Date: 02-07-19 _____

Location: Bowen Wharf _____ Dive Number: 1243-01-19 _____

Diver: N Marsh _____ Standby Diver: N Ritchie _____ Supervisor: S Gouws _____

System (s) Locked Out Required _____ Yes/No

Equivalent Air Depth: NA _____ Dive Table: DCIEM – 6M – 300MIN - H _____

Left Surface: 0900	Left Bottom: 1320	Bottom Time: 260min	Reach Surface: 1320	Total Water Time: 260min	
Actual Depth: 3M	Breathing Mixture: Air	O ₂ Partial Pressure:	Maximum O ₂ Exposure:	Maximum Operating Depth:	
OTU / min:	OTU Total:	CNS% / min:	CNS % Total:		
	Water Stops				
Depth	feet (metres)				
	50(15)	40(12)	30(9)	20(6)	10(3)
Interval					
Arrive Stop					
Depart Stop					

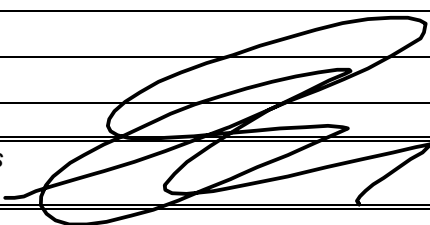
Decompression Completed: 1320 _____ Total Time Under Pressure: 260min _____

Diver OK: **Yes** / No Reports well _____ Divers Signature 

Breathing Supply	Pre Dive	Regulated To	Post Dive	Gas Used
LP compressor		9B		LP
HP Bank 1	200B	9B	200B	
HP Bank 2	200B	9B	200B	
Bailout Cylinder 1	150B	Reg	150B	
Bailout Cylinder 2	150B	Reg	150B	
Medical O ₂	Full			

Dive Hat: KM 17B _____ Standby Hat: KMB 28 _____

Notes and Work Carried Out: Wharf pile inspections _____

Supervisor's Signature: 	Client's Signature: _____
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Customer: ARUP Group _____ Vessel: PMG Workboat _____ Date: 02-07-19 _____

Location: Bowen Wharf _____ Dive Number: 1243-02-19 _____

Diver: N Ritchie _____ Standby Diver: N Cousins _____ Supervisor: S Gouws _____

System (s) Locked Out Required _____ Yes/No

Equivalent Air Depth: NA _____ Dive Table: DCIEM – 6M – 300MIN - H _____

Left Surface: 1410	Left Bottom: 1630	Bottom Time: 140min	Reach Surface: 1630	Total Water Time: 140min			
Actual Depth: 4M	Breathing Mixture: Air	O ₂ Partial Pressure:	Maximum O ₂ Exposure:	Maximum Operating Depth:			
OTU / min:	OTU Total:	CNS% / min:	CNS % Total:				
	Water Stops				Chamber Stop	Notes	
Depth	feet (metres)					feet (metres)	
	50(15)	40(12)	30(9)	20(6)	10(3)	40(12)	
Interval							
Arrive Stop							
Depart Stop							

Decompression Completed: 1630 _____ Total Time Under Pressure: 140 min _____

Diver OK: Yes / No Reports well _____ Divers Signature

Breathing Supply	Pre Dive	Regulated To	Post Dive	Gas Used
LP compressor		9B		LP
HP Bank 1	200B	9B	200B	
HP Bank 2	200B	9B	200B	
Bailout Cylinder 1	150B	Reg	150B	
Bailout Cylinder 2	150B	Reg	150B	
Medical O ₂	Full			

Dive Hat: KM 17B _____ Standby Hat: KMB 28 _____

Notes and Work Carried Out: Wharf pile inspections _____

Supervisor's Signature:	Client's Signature: _____
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Customer: ARUP Group _____ Vessel: PMG Workboat _____ Date: 03-07-19 _____

Location: Bowen Wharf _____ Dive Number: 1243-03-19 _____

Diver: N Marsh _____ Standby Diver: N Cousins _____ Supervisor: S Gouws _____

System (s) Locked Out Required _____ Yes/No

Equivalent Air Depth: NA _____ Dive Table: DCIEM – 6M – 300MIN - H _____

Left Surface: 0730	Left Bottom: 1230	Bottom Time: 300min	Reach Surface: 1230	Total Water Time: 300min	
Actual Depth: 5M	Breathing Mixture: Air	O ₂ Partial Pressure:	Maximum O ₂ Exposure:	Maximum Operating Depth:	
OTU / min:	OTU Total:	CNS% / min:	CNS % Total:		
	Water Stops				
Depth	feet (metres)				
	50(15)	40(12)	30(9)	20(6)	10(3)
Interval					
Arrive Stop					
Depart Stop					

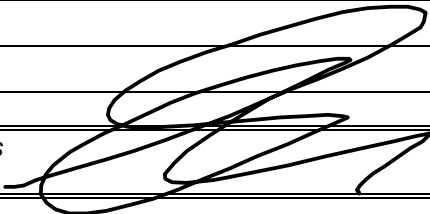
Decompression Completed: 1230 _____ Total Time Under Pressure: 300min _____

Diver OK: Yes / No Reports well _____ Divers Signature 

Breathing Supply	Pre Dive	Regulated To	Post Dive	Gas Used
LP compressor		9B		LP
HP Bank 1	200B	9B	200B	
HP Bank 2	200B	9B	200B	
Bailout Cylinder 1	150B	Reg	150B	
Bailout Cylinder 2	150B	Reg	150B	
Medical O ₂	Full			

Dive Hat: KM 17B _____ Standby Hat: KMB 28 _____

Notes and Work Carried Out: Wharf pile inspections _____

Supervisor's Signature: 	Client's Signature: _____
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Customer: ARUP Group _____ Vessel: PMG Workboat _____ Date: 03-07-19 _____

Location: Bowen Wharf _____ Dive Number: 1243-04-19 _____

Diver: N Cousins _____ Standby Diver: N Ritchie _____ Supervisor: S Gouws _____

System (s) Locked Out Required _____ Yes/No

Equivalent Air Depth: NA _____ Dive Table: DCIEM – 6M – 300MIN - H _____

Left Surface: 1300	Left Bottom:	Bottom Time: 140min	Reach Surface: 1630	Total Water Time: 140min			
Actual Depth: 4M	Breathing Mixture: Air	O ₂ Partial Pressure:	Maximum O ₂ Exposure:	Maximum Operating Depth:			
OTU / min:	OTU Total:	CNS% / min:	CNS % Total:				
	Water Stops				Chamber Stop	Notes	
Depth	feet (metres)					feet (metres)	
	50(15)	40(12)	30(9)	20(6)	10(3)	40(12)	
Interval							
Arrive Stop							
Depart Stop							

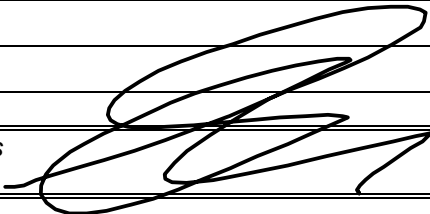
Decompression Completed: _____ Total Time Under Pressure: min _____

Diver OK: Yes / No Reports well _____ Divers Signature 

Breathing Supply	Pre Dive	Regulated To	Post Dive	Gas Used
LP compressor		9B		LP
HP Bank 1	200B	9B	200B	
HP Bank 2	200B	9B	200B	
Bailout Cylinder 1	150B	Reg	150B	
Bailout Cylinder 2	150B	Reg	150B	
Medical O ₂	Full			

Dive Hat: KM 17B _____ Standby Hat: KMB 28 _____

Notes and Work Carried Out: Wharf pile inspections _____

Supervisor's Signature: 	Client's Signature: _____
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Customer: ARUP Group _____ Vessel: PMG Workboat _____ Date: 04-07-19 _____

Location: Bowen Wharf _____ Dive Number: 1243-05-19 _____

Diver: N Ritchie _____ Standby Diver: N Cousins _____ Supervisor: S Gouws _____

System (s) Locked Out Required _____ Yes/No

Equivalent Air Depth: NA _____ Dive Table: DCIEM – 12M – 120MIN - H _____

Left Surface: 0730	Left Bottom: 0930	Bottom Time: 120min	Reach Surface: 0930	Total Water Time: 120min	
Actual Depth: 1	Breathing Mixture: Air	O ₂ Partial Pressure:	Maximum O ₂ Exposure:	Maximum Operating Depth:	
OTU / min:	OTU Total:	CNS% / min:	CNS % Total:		
	Water Stops				
Depth	feet (metres)				
	50(15)	40(12)	30(9)	20(6)	10(3)
Interval					
Arrive Stop					
Depart Stop					

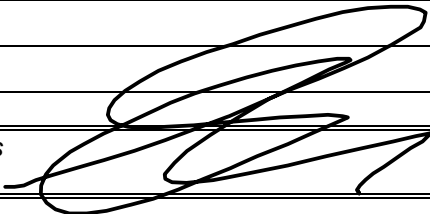
Decompression Completed: 0930 _____ Total Time Under Pressure: 120min _____

Diver OK: Yes / No Reports well _____ Divers Signature 

Breathing Supply	Pre Dive	Regulated To	Post Dive	Gas Used
LP compressor		9B		LP
HP Bank 1	200B	9B	200B	
HP Bank 2	200B	9B	200B	
Bailout Cylinder 1	150B	Reg	150B	
Bailout Cylinder 2	150B	Reg	150B	
Medical O ₂	Full			

Dive Hat: KM 17B _____ Standby Hat: KMB 28 _____

Notes and Work Carried Out: Wharf pile inspections _____

Supervisor's Signature: 	Client's Signature: _____
---	---------------------------



Customer: ARUP Group _____ Vessel: PMG Workboat _____ Date: 04-07-19 _____

Location: Bowen Wharf _____ Dive Number: 1243-07-19 _____

Diver: N Cousins _____ Standby Diver: N Ritchie _____ Supervisor: S Gouws _____

System (s) Locked Out Required _____ Yes/No

Equivalent Air Depth: NA _____ Dive Table: DCIEM – 9M – MIN - _____

Left Surface: 1330	Left Bottom: 1530	Bottom Time: 120min	Reach Surface: 1530	Total Water Time: 120min
Actual Depth: 7M	Breathing Mixture: Air	O ₂ Partial Pressure:	Maximum O ₂ Exposure:	Maximum Operating Depth:
OTU / min:	OTU Total:	CNS% / min:	CNS % Total:	
	Water Stops			
Depth	feet (metres)			
	50(15)	40(12)	30(9)	20(6)
Interval				
Arrive Stop				
Depart Stop				

Decompression Completed: 1530 _____ Total Time Under Pressure: 120min _____

Diver OK: Yes / No Reports well _____ Divers Signature _____

Breathing Supply	Pre Dive	Regulated To	Post Dive	Gas Used
LP compressor		9B		LP
HP Bank 1	200B	9B	200B	
HP Bank 2	200B	9B	200B	
Bailout Cylinder 1	150B	Reg	150B	
Bailout Cylinder 2	150B	Reg	150B	
Medical O ₂	Full			

Dive Hat: KM 17B _____ Standby Hat: KMB 28 _____

Notes and Work Carried Out: Wharf pile inspections _____

Supervisor's Signature: _____	Client's Signature: _____
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APPENDIX C - PROJECT PHOTOGRAPHS & VIDEO LOGS



Middle Wharf
Stem



P69-D



P72-J



P75-J



Outer Wharf
Stem



P6-B



P6-G



P100-B



P100-J



P115-C



P115-I



Coal Pier Stem



P10-B



P10-H



P10-K



P25-C



P25-E



P36-I



P36-P



P38-I



P38-P



Public Access
Wharf



P201-H



P201-H-R



P205-H-R



P205-I



P210-D



P210-E



P219-B



P219-B-R



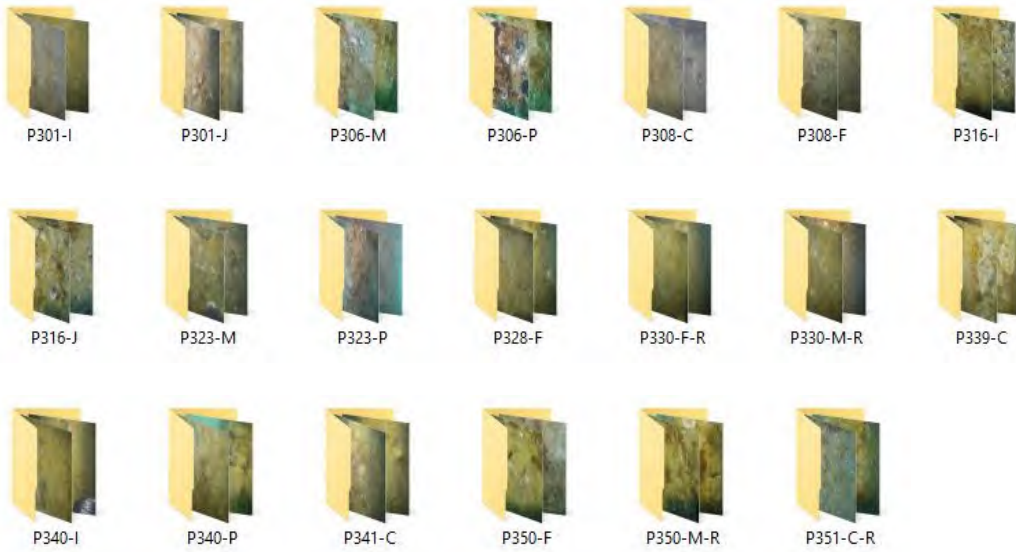
P219-H



P219-I



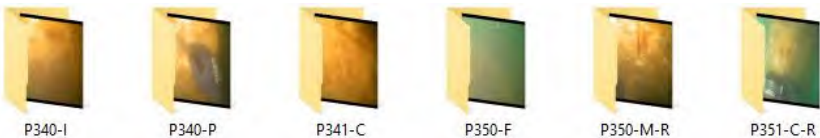
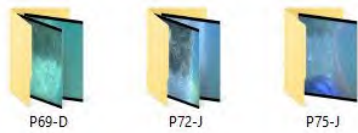
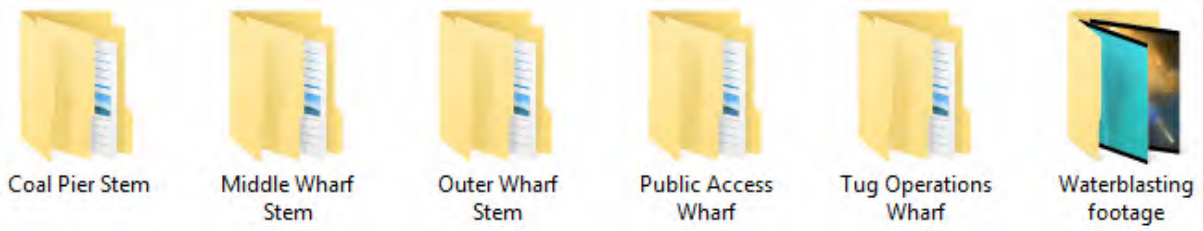
Tug Operations
Wharf



Note – All project photographs are included on the accompanying USB stick and organised in folders as shown in the next page



PROJECT VIDEOS



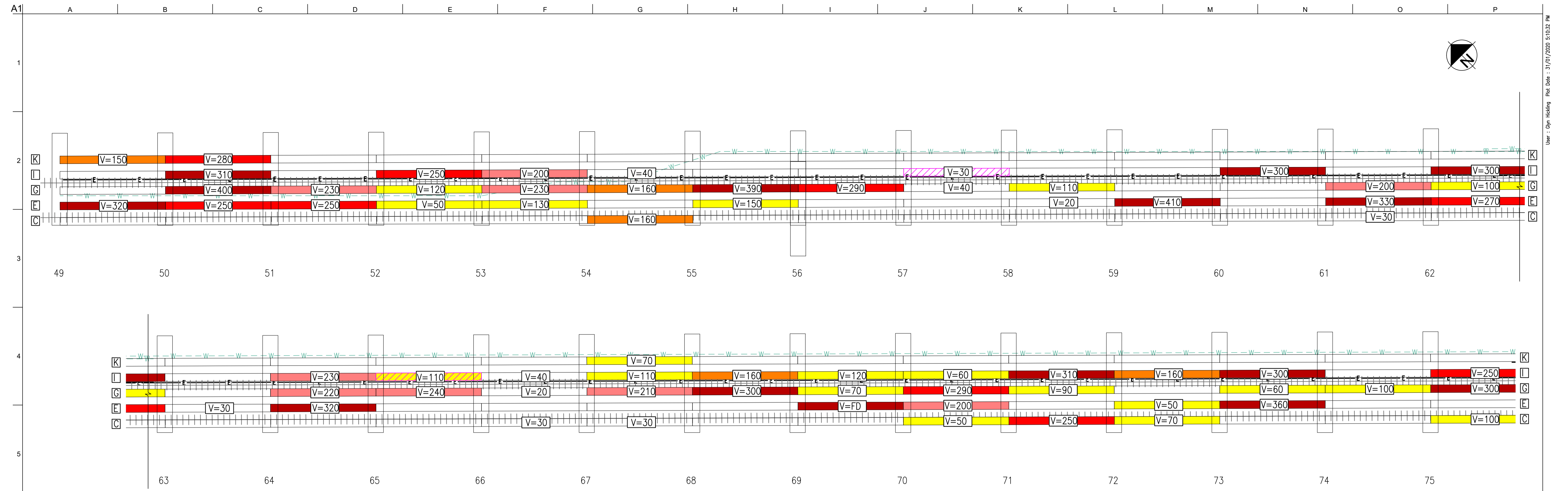


(Note – All project videos are included on the accompanying USB stick and are contained into each individual pile file per wharf)

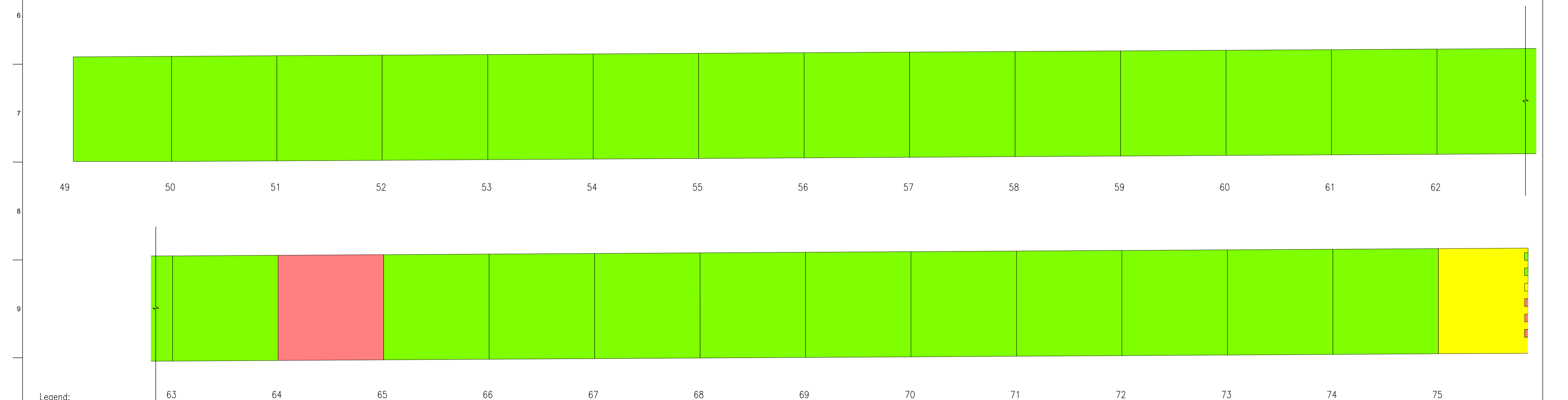
Location				South West					West					North West					DEBRIS / NOTES	
Date	Wharf Number	Pile Number	RL Above Sealed	Cracking	Spalling	Dalamination	Reinforcement Corrosion	Other Defects/Damage	Cracking	Spalling	Dalamination	Reinforcement Corrosion	Other Defects/Damage	Cracking	Spalling	Dalamination	Reinforcement Corrosion	Other Defects/Damage		
2/07/19	Middle Wharf	P69D	RL 500mm																Shallow Pile - Exposed at Low Tide	
2/07/19		P72J	RL 500mm						yes										Shallow Pile - Exposed at Low Tide	
2/07/19		P75J	RL 500mm							yes										Shallow Pile - Exposed at Low Tide
2/07/19	Outer Wharf	P6-B	RL 500mm																Shallow Pile - Exposed at Low Tide	
2/07/19		P6-G	RL 500mm																Shallow Pile - Exposed at Low Tide	
2/07/19		P100-B	RL 500mm																Shallow Pile - Exposed at Low Tide	
2/07/19		P100-J	RL 500mm							large crack										Shallow Pile - Exposed at Low Tide
2/07/19		P115-I	RL 1.0							large crack										Shallow Pile - Exposed at Low Tide
2/07/19		P115-C	RL 2.5							large crack										Shallow Pile - Exposed at Low Tide
2/07/19		P115-C	RL 1.0							large crack										Shallow Pile - Exposed at Low Tide
2/07/19	Public Access Wharf	P201-H	RL 1.0						yes				chipping							
2/07/19		P201-H-R	RL 2.5										chipping							
2/07/19		P205-I	RL 1.0																	
2/07/19		P205-I	RL 2.5																	
2/07/19		P205-H-R	RL 1.0											chipping						
2/07/19		P205-H-R	RL 2.5																	
2/07/19		P210-D	RL 1.0																	
2/07/19		P210-D	RL 2.5																	
2/07/19		P210-E	RL 1.0																	
2/07/19		P210-E	RL 2.5																	
3/07/19		P219-I	RL 1.5																	
3/07/19		P219-I	RL 3.0						10% chipping 30x30x10mm									10% chipping 10x10x5mm		
3/07/19		P219-H	RL 1.5																	
3/07/19		P219-H	RL 3.0						10% chipping 20x20x5mm										10% chipping 20x20x5mm	
3/07/19	P219-B	RL 1.5							centre continuing x2mm											
3/07/19	P219-B	RL 3.0							centre continuing x1mm					100mm long x 0.5mm						
3/07/19	P219-B-R	RL 1.5																		
3/07/19	P219-B-R	RL 3.0							centre continuing x3mm											
3/07/19	Coal Pier	P10-B	RL 500mm										5% chipping 40x40x10mm					5% chipping 25x25x5mm	Shallow Pile - Exposed at Low Tide	
3/07/19		P10-H	RL 500mm						left continuing x2mm										continuing between horizontal brace member and vertical pile	Shallow Pile - Exposed at Low Tide
3/07/19		P10-K	RL 500mm		cracking between horizontal and vertical brace and pile	20% between horizontal and vertical brace and pile			10% chipping 20x20x5mm											Shallow Pile - Exposed at Low Tide
3/07/19		P25-C	RL 500mm											5% chipping 10x10x5mm						Shallow Pile - Exposed at Low Tide
3/07/19		P25-C	RL 2.0																	
3/07/19		P25-E	RL 500mm						20x20x3mm10% chipping 20x20x3mm										centre continuing + spider cracks x3mm wide	
3/07/19		P25-E	RL 2.0							left side continuing x2mm										
3/07/19		P36-I	RL 500mm		right side continuing x2mm					right side 100mm long x 2mm										
3/07/19		P36-I	RL 2.0							right continuing x2mm										
3/07/19		P36-P	RL 500mm		right continuing x4mm															
3/07/19		P36-P	RL 2.0		right continuing x5mm															
3/07/19		P36-P	RL 500mm																100% chipping	
3/07/19		P38-I	RL 2.0																	
3/07/19		P38-I	RL 500mm																	
3/07/19	P38-P	RL 2.0																	chipping 30x10x5mm	

Appendix E

Heat Maps



MIDDLE WHARF - STRINGERS
N.T.S.



MIDDLE WHARF - DECK
N.T.S.

Legend:
 — E — HV cable location (indicative only)
 - - - w - Water pipe location (indicative only)
 + + + + + Vehicle path (indicative only)
 V=250 Tested stringer void (mm), FD= Full depth void

Void Colour Coding

0-40	50-140	150-190	200-240	250-290	300-FD Replacement
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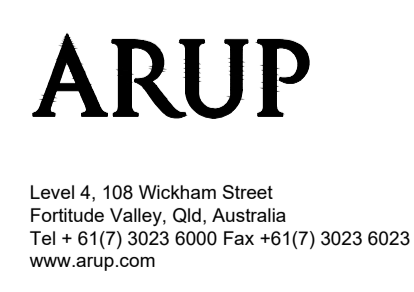
WSCAM Condition Rating

1	2	3	4	5	6	7
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Approved by: _____
Name

RPEQ No. # _____

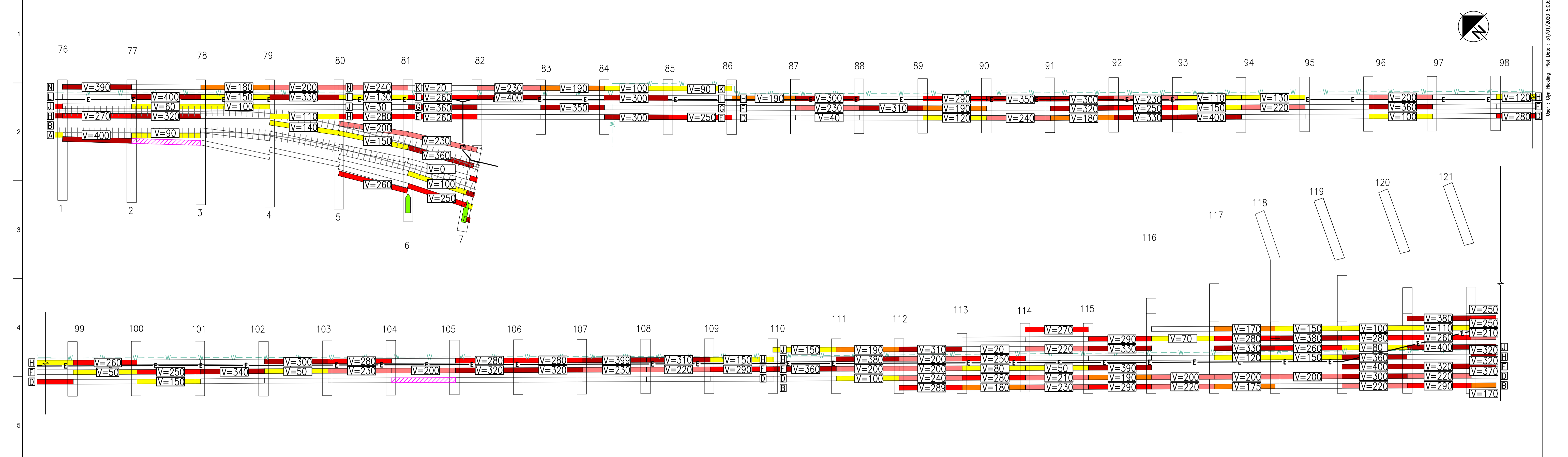
Issue	Description	Date	By	Chkd	Appd



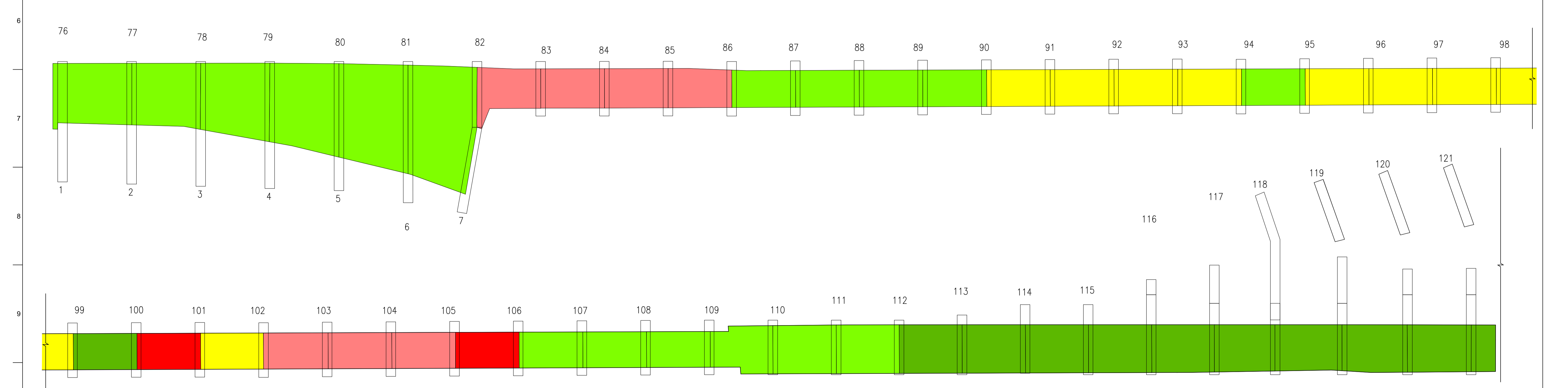
Client
 BOWEN WHARF
 STEM REHABILITATION

Scale at A1 NTS
 Discipline Civil Structures
 Job No 272940-00 Drawing Status Draft
 Drawing No 272940-CS-011 Issue

NOT FOR CONSTRUCTION



OUTER WHARF – STRINGERS
N.T.S.



OUTER WHARF – DECK
N.T.S.

NOT FOR CONSTRUCTION

Legend:
 - - - HV cable location (indicative only)
 - - - w - Water pipe location (indicative only)
 + + + + + Vehicle path (indicative only)
 [V=250] Tested stringer void (mm). FD= Full depth void

Void Colour Coding

0-40	50-140	150-190	200-240	250-290	300-FD Replacement
------	--------	---------	---------	---------	--------------------

WSCAM Condition Rating

1	2	3	4	5	6	7
---	---	---	---	---	---	---

Approved by: _____
Name: _____

RPEQ No. # _____

Issue	Description	Date	By	Chkd	Appd

ARUP

Level 4, 108 Wickham Street
 Fortitude Valley, Qld, Australia
 Tel +61(7) 3022 6000 Fax +61(7) 3023 6023
 www.arup.com

CONSULT AUSTRALIA

Member Firm
 Arup Pty Ltd
 ABN 18 000 966 165

Client: **NORTH QUEENSLAND BULK PORTS CORPORATION**

Job Title: **BOWEN WHARF STEM REHABILITATION**

Scale at A1: **NTS**

Discipline: **Civil Structures**

Job No: **272940-00** Drawing Status: **Draft**

Drawing No: **272940-CS-012**

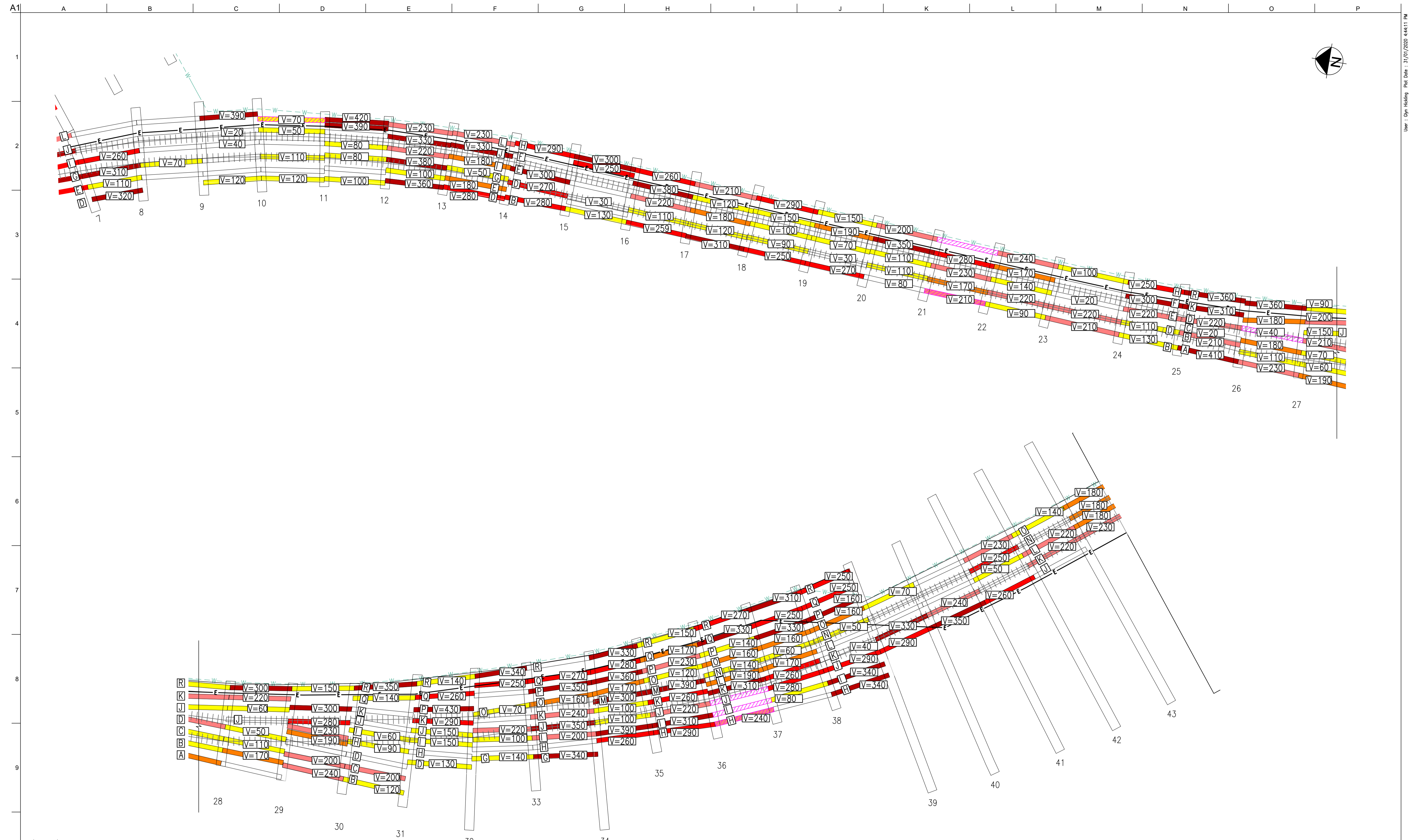
**CONDITION ASSESSMENT
HEAT MAP - OUTER WHARF**

Scale at A1: **NTS**

Discipline: **Civil Structures**

Job No: **272940-00** Drawing Status: **Draft**

Drawing No: **272940-CS-012**



User: Dgn_Helding Plot Date: 31/07/2020 4:44:11 PM

Legend:
 - - - - - HV cable location (indicative only)
 - - - - - Water pipe location (indicative only)
 + + + + + Vehicle path (indicative only)
 [V=250] Tested stringer void (mm). FD= Full depth void

COAL PIER – STRINGERS
N.T.S.

NOT FOR CONSTRUCTION

Void Colour Coding

0-40	50-140	150-190	200-240	250-290	300-FD Replacement
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WSCAM Condition Rating

1	2	3	4	5	6	7
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Approved by: _____
Name: _____

RPEQ No. # _____

Issue	Description	Date	By	Chkd	Appd

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ABN 18 000 966 165

Client

BULK PORTS
CORPORATION

Job Title
**BOWEN WHARF
STEM REHABILITATION**

Scale at A1 NTS

Discipline **Civil Structures**

Job No **272940-00** Drawing Status **Draft**

Drawing No **272940-CS-042** Issue _____

Scale at A1 NTS

Discipline **Civil Structures**

Job No **272940-00** Drawing Status **Draft**

Drawing No **272940-CS-042** Issue _____