Design Hazard Management Register

Project Name: Prince of Wales Cable Stayed Bridge Resurfacing Detail Design

Scheme Number: SBIM-TO824

Client: National Highways

Revision: P01

PIN: 617317

	Name	Signature	Date
Prepared by:	Santosh Pandey	Santosh Pandey Digitally signed by Santosh Pandey	
Checked by:	Tom Bolton	Digitally signed by Tom Bolton Date: 2024.04.12 16:13:17 +01'00'	
Approved by Principal Designer:	Mladen Dragojlovic	Dragojlovic, Mladen1 Digitally signed by Dragojlovic, Mladen1 DN: cn=Dragojlovic, Mladen1 e=Mladen.Dragojlovic1@amey.co.uk Reason: Certification Location: Date: 2024-04-12 13:21+01:00	

Work Stage [1]					Responsibilities and Actions			
Ref	**Element / Activity**	**Hazard**	**Persons at risk [2]**	**Design Team Action taken to eliminate or reduce the hazard [3]**	**By who**	**Target Date**	**Further actions or Information necessary to manage residual risks**	**Status [4]**
HS-01	Services/ Water/ Gas/ Motorway communication	Damage to services, injury, death. Fire, explosions, damage to services, death Death, injury due to excavation near live statutory equipment.	1,3	A full utilities search report will be provided prior to construction. Record shows presence of ducts/trenches ducts under the bridge deck. The PC should locate and verify all services prior to any excavation work.	PD,D,PC	Before works	All statutory to be marked up in advance using C.A.T. GENNY systems and trial holes where required. Refer to Appendix C in the Scheme pre-construction information.	Residual
			Solutions Considered Not Reasonably Practicable		**Presumed Construction Methods**			
			N/A		It is presumed the services will be outside of the area of works, but where required these services should be diverted appropriately before works commence.			

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HS-02	Temporary instability of bridge as a result of carriageway / concrete removal	Uneven loading of the cable stay bridge causing centre span uplift or exceeding load capacity of the stay cables or pier tie-downs. Failure or weakening of the concrete deck supported by the cable stay bridge truss system, potentially resulting in failure causing injury/death.	1,2,3,4	Undertake structural review for temporary loss of superimposed carriageway construction loads. Design of concrete repairs to reduce risk of temporary instability to concrete deck. This may be by limiting size and width of repair areas. Structural review and assessment to be undertaken for temporary stability of concrete removal.	PD,D,PC	Before works and during construction	Agree maximum size of repair areas. Unless otherwise agreed, where a deep concrete repair is undertaken needing to hydrodem behind reinforcement, repair width shall be limited to 3.6m transversely x 3.6m longitudinally, with no additional concrete repairs to be undertaken within 7.3m longitudinally and 2m transversely from the edge of the repair until it has reached the minimum strength required. Alternatively, if larger concrete repair areas are required to be undertaken for programme requirements, a structural review (and potentially assessment) shall be undertaken for temporary stability of the required repair area. Otherwise, the Contractor may design temporary works to support the deck at repair locations. The repair patches shall be remain unloaded by plant and traffic until repair material strength reaches the full required strength. The exposed patch substrate shall remain unloaded and protected during the initial 7 day curing period.	Residual
			Solutions Considered Not Reasonably Practicable		**Presumed Construction Methods**			
			None		Traffic Management for closures, planing of existing pavement, removal of waterproofing membrane and reinstatement of pavement and road markings			

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HS-03	Risk of injury from protruding reinforcement	Protruding reinforcement from construction works may cause injury to personnel on site. The planing undertaken previously have resulted in sharpening of the reinforcement and could cause severe injury	1,3,4	The indicative location of exposed reinforcement is highlighted on the drawings with hazard triangles. Principal Contractor to ensure these are covered/protected during works	PC	During Construction	PC to note residual risk from protruding anchor bolts. PC shall reduce this risk at the site stage through their risk assessment and method statements.	Residual
			Solutions Considered Not Reasonably Practicable		**Presumed Construction Methods**			
			Removal and reinstatement of sharpened reinforcement		Pavement miling, exposure of reinforcement, protection and covering for safety			
HS-04	RA1 procedure limitations may cause injury or workforce fatigue	Inability to undertake RA1 mini-bus drop offs of personnel to Pylons may mean that walking to pylons is required.	1,2,3,4	TM designer shall consider incorporating ability for RA1 mini-bus drop offs on viaducts adjacent to the cable stay bridge. Efforts to reinstate use of Rapid Access Train ongoing.	PC	During Construction	PC shall make temporary amendments to RA1 procedure where required.	Residual
			Solutions Considered Not Reasonably Practicable		**Presumed Construction Methods**			
			No RAT or RA1.		Traffic Management for closures, planing of existing pavement, removal of waterproofing membrane and reinstatement of pavement and road markings			
HS-05	Reduction in deck thickness due to hydro demolition	Instability/failure of bridge deck due to loss in overall depth	1,3,4,5,6	Principal Contractor to ensure hydro demolition of concrete deck is limited to maximum permitted by specification. Refer to HS-02	PC	During Construction	Refer to HS-02	Residual
			Solutions Considered Not Reasonably Practicable		**Presumed Construction Methods**			
			Use alternative method than hydro demolition		Hydro demolition to break existing concrete, water proofing overlapped, reinforcement exposed and lapped and reinstated back with concrete			

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HS-06	Temporary loss in overall thickness of the deck during surface defect repair	Instability/failure of bridge deck due to loss in overall depth	1,3,4,5,6	The as-built record indicates that the overall thickness of the deck is 200mm. It is anticipated that approximately 90mm of the overall thickness will be lost temporarily during the treatment of the surface defects. This could result in failure of the deck in the event of excessive loading. Principal Contractor to ensure that loading is kept off any thin temporary deck regions following hydrodem, and caution should be employed if fixing steel in these areas	PC	During Construction	Principal Contractor to avoid any loading of the deck when the thickness is lost temporarily. Suitable RAMS to be in place to safely carry out the treatments of the deck surface defects without any excessive loading.	Residual
			Solutions Considered Not Reasonably Practicable		**Presumed Construction Methods**			
			Avoid temporary loss of the overall thickness		Removal of asphalt, hydro demolition around the defects, loading of the deck avoided during treatment & reinstated back with concrete			
HS-07	Trafficking of the deck following treatments to the deck surface defects	Failure of the deck due to premature loading	1,3,4,5,6	Principal Contractor to ensure that the concrete has reached the required strength before laying the asphalt layers and opening the carriageway for traffic.	PC	During Construction	Principal Contractor to avoid any loading of the deck when the thickness is lost temporarily. Suitable RAMS to be in place to safely carry out the treatments of the deck surface defects without any excessive loading.	Residual
			Solutions Considered Not Reasonably Practicable		**Presumed Construction Methods**			
			None		Removal of asphalt, hydro demolition around the defects, reinstated back with concrete, overlay with asphalt layers and opened for trafficking			

1. Work Stage: Use a separate row for each Work Stage.
2. Persons at Risk: (1) Construction workers (2) Members of the Public (3) Maintenance workers (4) Demolition workers (5) Client (6) other Amey staff
3. Design Team Action taken to eliminate or reduce the hazard. State where the information on the measures taken to reduce the hazard is contained (i.e. PCI, Specification, etc.). Where no measures have been taken, state "None"
4. Status: Open, Closed or Residual.