

General Note:

During the design stages of a project, designers are required to maintain a **"Hazard Elimination Checklist"** (part B of this document). The 'checklist' records the various significant (high risk) hazards identified by the designer(s) and, where they have been able, details of how they have been eliminated.

It is recognised that not every hazard can be 'designed out' and therefore the checklist will also be used to record the residual risks of which the designer(s) are aware.

The checklist provides an audit trail of the design process and may also be used as evidence in the event that a designer is required to defend his or her actions in any HSE investigation.

Copies of parts A and B should be passed to all members of the project team, especially the Principal Designer. Reference must also be made to GG104 Requirements for safety risk assessment.

Part A: Designer's Hazard Checklist

Project Title:	M5 J24-25 River Tone Deck Refurbishment Scheme MP 206/0	Kier Highways Job No.:	603427
Project Description:	This Designer's Hazard Checklist covers a number of surveys being carried out on M5 J24-25 River Tone Underbridge. The survey works are to include: <ul style="list-style-type: none"> - Asbestos Testing - Trial holes including PAK testing for Tar Bound Material - Topographical Survey 		
Design Discipline:	Structures/Highways		
Project Type as determined by GG104 (if applicable)	A	Prepared By:	[REDACTED]

Notes:

1. This section of the document includes a list of potential hazards pertaining to a wide range of situations which may occur across Kier Highways' activities. *Where particular categories do not ordinarily affect the scheme, **Part A should be edited/sections deleted to more accurately reflect the work carried out.***
2. An individual item or a whole section (by ticking the heading) can be noted as not applicable showing you have considered the hazard area and judged it to be not applicable.
3. The list of potential hazards is not exhaustive, and all sections can be added to, or additional sections added, as required. Reference to the Approved Code of Practice may be helpful.
4. All items considered by the designer as having a potential high risk must be addressed on the 'Hazard Elimination Management Schedule'. Low risk activities can also be included if considered appropriate.
5. Consideration must be given to all populations that may be affected as follows -

Population 1 – People directly employed by the Client and who work on the site e.g. Traffic Officers.	'Workers'
Population 2 – People in a contractual relationship with the client.	
Population 3 – Other parties, including road users, the police and emergency services and non-motorised 'Users' such as equestrians, cyclists and pedestrians, as well as those others not in a contractual relationship with the client, such as privately contracted vehicle recovery and vehicle repair providers.	'Users'
Population 4 – Third parties includes any person or persons who could be affected by the works, but who are neither using it, nor working on it, i.e. living or working adjacent to the site.	'Other Parties'

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
1.	Existing Environment				
1.1	Existing buildings	✓			
1.2	Previous/existing land/ structures			✓	Works to be undertaken on River Tone which is a multicellular post-tensioned structure and therefore care should be taken during excavations to prevent damages. A number of overhead structures have been identified across the 5km worksite which should not be impacted by the proposed works
1.3	Roadways			✓	Survey works being carried out on the M5. TM will be required to carry out the works
1.4	Railways		✓		The M5 crosses a railway line at MP 205/5. However, this should not be affected by the proposed survey works.
1.5	Water course			✓	M5 River Tone is situated over a water course. The M5 crosses a number of other watercourses across the 5km worksite, but these should not be impacted by the proposed survey works.
1.6	Ground conditions:				
	<ul style="list-style-type: none"> Contamination 		✓		PAK testing previously completed but further PAK testing to be completed on excavated material as part of this package of works

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
	<ul style="list-style-type: none"> Ground water 		✓		There are a number of watercourses present along the 5km worksite which may result in the groundwater table being higher than expected. However, it should not impact on the proposed survey works
	<ul style="list-style-type: none"> Instability 	✓			No areas that show evidence of being unstable have been identified.
	<ul style="list-style-type: none"> Mineral / mine workings 	✓			No previous mineral/mine workings have been identified
1.7	Access restrictions			✓	<p>Working area to be accessed directly from the M5 with TM in place.</p> <p>There is a gate to access bearing shelf gallery at the north abutment to inspect air gap between deck and abutment.</p> <p>Contractor to liaise with HE for gate to be unlocked. The north abutment and bearing shelf gallery areas are to be inspected for presence of sharp and needles in advance of the works and shall be safely cleared if required.</p> <p>Junction 25 off and on slips are located within the 5km worksite and will need to be considered when planning the TM for the works.</p>
1.8	Adjacent properties		✓		There are a number of businesses located around Junction 25 that should be

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
					notified of any full closures or works that could disrupt business.
1.9	Concurrent site activities			✓	Survey works are planned on a number of other structures in the area including Blackbrook Interchange, Bathpool Canal and Bathpool Railway. M5 Queue Detection scheme also on site until January 2021. West Somerset and Taunton Council also have a scheme on the J25 roundabout.
1.10	Interface with the public			✓	TM to be in place to protect workforce from members of the travelling public and vice versa during the proposed works. The area under River Tone Bridge is known for being a hot spot for anti-social behaviour and drug paraphernalia.
1.11	Occupied premises		✓		A number of businesses are located within the area of Junction 25
1.12	Structural instability	✓			No unstable structures have been identified
1.13	Fragile materials	✓			
1.14	Hazardous materials			✓	No existing hazardous materials have currently been identified. Works to include asbestos testing.
1.15	Land use			✓	The works are to be completed on Highways England land, but traffic management will be required.
1.16	Traffic			✓	The M5 has 3 lanes of running traffic, a

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
					hard shoulder and a central reservation
1.17	Others (insert as necessary)				
2.	Existing Services				
2.1	Underground				
	<ul style="list-style-type: none"> Electrical 		✓		11kV underground cable located at 206/3+50 but will not affect the works
	<ul style="list-style-type: none"> Gas 		✓		Abandoned LP Gas Main located at MP 205/0 but will not be affected by the proposed works
	<ul style="list-style-type: none"> Water (Asbestos pipes?) 		✓		A number of Wessex Water pipes are shown to cross the carriageway across the 5km worksite but will not be affected by the works.
	<ul style="list-style-type: none"> Telecommunications 		✓		
	<ul style="list-style-type: none"> Motorway Communications 			✓	Motorway communications cable and a number of traffic loops are located across the length of the worksite. There are buried motorway communication in the southbound verge of the M5 over River Tone.
2.2	Overhead Services				
	<ul style="list-style-type: none"> Electrical 			✓	Electrical Overheads including 11kV (MP205/4 – 40m) and 33kV (MP 204/9 + 20m) cables are along the length of the worksite. Heights are currently unknown. To be measured as part of the topographical survey.

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
					Cable locations are shown on scheme drawings.
	• Telecommunications	✓			
3.	Earthworks				
3.1	Deep excavations		✓		No excavations planned past a depth of 1.0m
3.2	Slope / ground stability		✓		There are no known ground stability problems at this location.
3.3	Ground water / water courses		✓		Whilst there is a river located below the structure, it is not anticipated that the proposed survey works will impact the ground water table or any watercourses
3.4	Plant movements			✓	Although it is anticipated that excavation works will be carried out with hand-held breaker, the Contractor need to be aware that heavy plants/breakers shall not be used on this post-tension structure.
3.5	Interface with services (refer 2)			✓	See section 2
3.6	Contamination (ground / water) (refer 1.6)		✓		No known ground contamination.
3.7	Adjacent structures (refer 1.8)			✓	Some of the planned survey works are being complete on structures which is post-tensioned, therefore care should be taken when excavations carried out to ensure the bridge decks are not damaged. Businesses located around Junction 25 should be notified of any full closures or

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
					works that could disrupt business.
3.8	Others (insert as necessary)				
4.	Foundations	✓			
4.1	Adjacent buildings/structures				
4.2	Deep excavations				
4.3	Plant movements				
4.4	Interface with services				
4.5	Contamination (ground / water)				
4.6	Ground water				
4.7	Confined spaces				
4.8	Piling:				
	• Noise				
	• Vibration				
	• Contamination				
	• Plant				
4.9	Grouting:				
	• Drilling work				
	• Dust				
	• Pollution				
4.10	Stability of structure				
4.11	Others (insert as necessary)				
5.	Services Installation	✓			
5.1	Excavations				
5.2	Ground water				
5.3	Ground conditions				
5.4	Existing services				
5.5	Testing operations				
5.6	Lifting operations				
5.7	Adjacent structures / activities				
5.8	Maintenance				
5.9	Contamination				
5.10	Others (insert as necessary)				
6.	Drainage Works	✓			
6.1	Excavations				

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
6.2	Ground water				
6.3	Ground conditions				
6.4	Confined spaces			✓	Drainage chambers to be inspected for Asbestos may be considered as confined space. Contractor to undertake assessment to confirm.
6.5	Leptospirosis / Weils disease				
6.6	Existing services (asbestos pipes?)				
6.7	Manual handling				
6.8	Lifting operations				
6.9	Maintenance				
6.10	Sewage				
6.11	Traffic				
6.12	Contamination (ground / water)				
6.13	Hepatitis B / Tetanus				
6.14	Others (insert as necessary)				
7.	Highways				
7.1	Traffic management			✓	TM will be required to complete the works. It is proposed to complete the works using a series of lane closures. Highways England to confirm TM requirements following discussions with the surveying contractors.
7.2	Adjacent traffic			✓	A running lane may need to be maintained whilst the works are carried out so adequate measures should be in place to protect the workforce.
7.3	Construction materials		✓		Hot bitumen materials are required to reinstate excavations. Typical construction

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
					materials that is familiar to the contractor will be used.
7.4	Structural works			✓	Some of the survey works are being completed on River Tone Bridge. Care should be taken when excavating on the bridge decks. please note the presence of post-tension cables in the deck.
7.5	Adjacent structures		✓		A number of structures are located across the extent of the worksite.
7.6	Noise			✓	Noise restrictions may need to be put in place depending on the time of day the works are completed.
7.7	Vibration			✓	Contractor must monitor HAVS exposure from mechanical hand tools/breakers used for the works.
7.8	Coal TAR in pavement			✓	Scope of works includes testing for tar bound material. Suitable PPE to be provided to protect workforce. Previous samples have been taken in the area and tested negative.
8.	Steelwork Construction	✓			
8.1	Working at height				
8.2	Lifting operations				
8.3	Temporary stability				
8.4	Connections				
8.5	Unusual sequence				
8.6	Materials, e.g. paints				

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
8.7	Consideration of future maintenance				
8.8	Others (insert as necessary)				
9.	Concrete Construction	✓			
9.1	Working at height				
9.2	Plant restrictions				
9.3	Lifting operations				
9.4	Noise				
9.5	Vibration				
9.6	Temporary instability				
9.7	Pre/post tensioning				
9.8	Materials				
9.9	Maintenance				
9.10	Joints (scabbling should not be undertaken)				
9.11	Others (insert as necessary)				
10.	Masonry Construction	✓			
10.1	Manual handling				
10.2	Lifting operations				
10.3	Materials				
10.4	Temporary stability				
10.5	Working at height				
10.6	Dust				
10.7	Durability				
10.8	Catastrophic collapse				
10.9	Others (insert as necessary)				
11.	Timber Construction	✓			
11.1	Materials				
11.2	Working at height				
11.3	Temporary stability				
11.4	Lifting operations				
11.5	Manual handling				
11.6	Fire				
11.7	Dust				
11.8	Others (insert as necessary)				

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
12.	Cladding	✓			
12.1	Lifting operations				
12.2	Manual handling				
12.3	Maintenance / cleaning				
12.4	Others (insert as necessary)				
13.	Glazing	✓			
13.1	Manual handling				
13.2	Lifting operations				
13.3	Cleaning / maintenance				
13.4	Others (insert as necessary)				
14.	Mechanical/Electrical Systems	✓			
14.1	Access				
14.2	Existing services (asbestos?)				
14.3	Manual handling				
14.4	Materials / substances				
14.5	Confined spaces				
14.6	Pressure systems				
14.7	Testing operations				
14.8	Fixings				
14.9	Working at height				
14.10	Maintenance				
14.11	Others (insert as necessary)				
15.	Railway Activities	✓			
15.1	Train movements				
15.2	Overhead lines				
15.3	Electrified track				
15.4	Underground services				
15.5	Adjacent structures				
15.6	Ground stability				
15.7	Contamination				
15.8	Others (insert as necessary)				

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
16.	Demolition of Existing Structures				
16.1	Services			✓	See section 2
16.2	Adjacent / adjoining structures		✓		Works being completed on River Tone structure.
16.3	Materials:				
	<ul style="list-style-type: none"> Hazardous i.e. asbestos in permanent shuttering, waterproofing to bridge decks, joints etc. 			✓	Works includes Asbestos, trial holes and PAK testing
	<ul style="list-style-type: none"> fragile 	✓			
16.4	Working at height		✓		
16.5	Temporary stability	✓			
16.6	Pre/post tensioning			✓	There are post tension cables in the deck
16.7	Noise			✓	Highways England to communicate the works with businesses situated around the area that might be impacted by the proposed works.
16.8	Vibration			✓	Works will include the use of mechanical tools. Operatives should monitor HAVS in line with their employer's policies and procedures
16.9	Dust		✓		Some works will require the existing carriageway to be cut prior to excavations
16.10	Effect on usage of demolition materials	✓			
17.	Future Demolition / decommissioning of new structure/installation				
17.1	Unusual sequence	✓			
17.2	Pre/post tensioned element		✓		The scope of works is not to affect the existing post-tension system in the bridge deck
17.3	Materials		✓		No unusual or contaminated materials will be used during the reinstatement that will

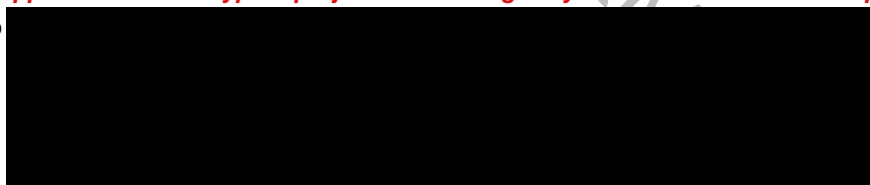
Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
					impact future maintenance.
17.4	Adjacent/adjoining structure		✓		Some surveys are being carried out on River Tone bridge including excavation works.
17.5	Temporary stability	✓			
17.6	Contamination during usage of demolition material.		✓		
18.	Maintenance and Operation of Facility / Structure etc.				
18.1	Access		✓		
18.2	Safety equipment		✓		
18.3	Testing / inspection		✓		
18.4	Procedure		✓		
18.5	Contamination during usage of demolition material.		✓		
19.	Use of the structure as a workplace	✓			
19.1	Does the proposed use of the structure / premises include the intention for it to be made available to any person as a place of work				
19.2	If yes; the design and materials used must take in to account the provisions of the Workplace (Health, Safety and Welfare) Regulations 1992				

Part B: Hazard Elimination Checklist

Project Title:	M5 J24-25 River Tone Deck Refurbishment Scheme MP 206/0		Kier Highways Job No.:	603427
Project Description:	<p>This Designer's Hazard Checklist covers a number of surveys being carried out on M5 J24-25 River Tone Underbridge</p> <p>The survey works are to include:</p> <ul style="list-style-type: none"> - Asbestos Testing - Trial holes including PAK testing for Tar Bound Material - Topographical Survey 			
Design Discipline:	Structures/Highways	Prepared By:	██████████	Checked By: ██████████

Note: If GG104 applies to your contract, the checklist must be approved by an appropriate person: For a Type A project the Scheme PD must approve, for a Type B projects the Senior Manager must approve and for a Type C project the Kier Highways Service Director must approve.

Reviewed and approved by



- * **Persons at Risk:** (1) Workers (2) Users (3) Other parties
- ** **Action by:**
- | | |
|----------------------|--|
| Principal Designer | - Include within the H&S file |
| Designer | - include in the pre-construction information |
| Principal Contractor | - manage risk during the construction phase |
| Other designer | - take into consideration when preparing their designs |
| Client | - pass information to designers / Principal designer |

Ref.	Activity	Hazard	Persons at Risk *	Design Measures taken, or being taken to eliminate or reduce the hazard	Information on the Residual Risk	Principal Designer Review	Action Req'd by: **
1.3 1.7 1.10 1.15 1.16 7.1 7.2	Installation of traffic management	Operatives getting struck by vehicles Additional control measures required on 3 rd party networks	1, 2, 3	TM contractor to ensure suitable measures are in place to protect workforce when installing TM. Contractor to consider the need to close the M5 Southbound on-slip just South of the bridge.	Risk will be reduced but will remain.	No further comment.	PC, TM contractor
1.10 1.15	Interface with the public from local authority network	Unauthorised access to site Injuries to members of the public Injuries to workforce	1,2,3	Works may require TM to be installed on the local authority network which has footpaths and pedestrian access. Works to be communicated with the local authority. TM Contractors are to be made aware and have suitable control measures in place to protect operatives and pedestrians	Risk will be reduced but will remain	No further comment.	PC TM Contractor
1.10	Interface with the public	Anti-social behaviour under the bridge Presence of drug paraphernalia and Hyperdermics	1	Area around north abutment to be inspected in advance of the works with sharps and needles to be safely disposed of if necessary. Area not to be accessed if not considered safe. Site operatives should be briefed on the associated risks with dealing with anti-social behaviour as part of the site induction. Contractor to put control measures in place to protect workforce	Risk will be reduced but will remain	No further comment.	PC

Ref.	Activity	Hazard	Persons at Risk *	Design Measures taken, or being taken to eliminate or reduce the hazard	Information on the Residual Risk	Principal Designer Review	Action Req'd by: **
1.16 7.2	Works being completed adjacent to live traffic	Vehicles trying to enter TM from joining slip roads	1,2	Highways England survey TM are to discuss TM requirements with Contractor and TM Contractor. If a running lane needs to be maintained during the works then the PC and TM contractor should ensure enough measures are in place to protect the workforce and road users.	Vehicles may try to access TM	No further comment.	PC/ Client
2.1 3.5 16.1	Excavation works around existing services	Damage to existing services Injury to workforce	1	STATS locations highlighted on drawings provided within survey pack. Known information from previous trial holes has also been provided. Contractor responsible for scanning the area prior to excavating and operate a permit to dig system in line with their company policy.	Risk of Service Strike	No further comment.	PC
1.9 2.1 3.5 16.1	Excavation works around existing services	Unknown location of services Changes since C2 returns obtained	1	Ongoing works at J25 as part of the M5 queue detection scheme means that the location of cables/services may have changed since the works located. Highways England to provide updates to contractors before survey works commence on site.	Risk or service strike	No further comment.	PC
1.9	Concurrent site activities from M5 queue detection scheme works and survey works being completed on other structures	Clash of operations Injury to operatives	1	Contractor to liaise with PC for the M5 Queue detection scheme to ensure all parties are aware of concurrent site activities and they are managed / co-ordinated in a safe manner	Clash of works remains	No further comment.	PC

Ref.	Activity	Hazard	Persons at Risk *	Design Measures taken, or being taken to eliminate or reduce the hazard	Information on the Residual Risk	Principal Designer Review	Action Req'd by: **
2.2	Working in close proximity of overhead cables	Injury to workforce Damage to STATS	1	Heights of overhead cables unknown survey works include measuring the heights of cables for the deck refurbishment schemes. Overhead cables have been shown on scheme drawings. Survey operatives to be briefed on their location. The TM and Survey Contractors are to determine if goal posts are required	Risk of service strike	No further comment.	PC
1.2 3.4 3.7 7.4 16.6	Works on bridge deck of post-tension structure	Damage to structure could significantly weaken the structure. Risk of excessive damage to the waterproofing system.	1, 2, 3	Works will involve excavations being completed on structures to gather information. The Contractor is to develop a method of works that eliminates the risk of damaging the structure. heavy plant/breaker are not to be used for excavations. Structural concrete is not to be removed as part of these surveys Previous trial holes information has been provided so depths are known. This information has also been added to the existing general Arrangement drawings.	Risk is reduced with estimated construction depths but still remains	No further comment.	PC
1.6 1.14 7.8 16.3	Excavation and inspection works	Exposure of Hazardous Materials including Asbestos and Coal Tar that could affect an operative	1	All known information about the structure has been provided as part of the survey pack. Survey works to be completed by suitably trained and licenced contractors to cover the associated risks	Risk of hazardous materials being identified.	No further comment.	PC

Ref.	Activity	Hazard	Persons at Risk *	Design Measures taken, or being taken to eliminate or reduce the hazard	Information on the Residual Risk	Principal Designer Review	Action Req'd by: **
7.6 16.7	Excavation and cutting of carriageway Reinstatement of excavations	Excessive Noise Disturbances to businesses/hotels in the area.	1, 3	Noise restrictions to be put into place where required. Highways England to communicate planned works with local businesses that may be impacted by the works.		No further comment.	PC, Client
7.7 16.8	Excavation in hard material	HAVS Exposure	1	HAVS exposure to be monitored and limited in line with company policy and guidance provided by the HSE. Contractor to programme works accordingly to mitigate prolonged exposure to vibrating/mechanical tools.		No further comment.	PC
6.4	Inspection in confined space environment	Drainage chambers to be inspected for asbestos may be assessed by Contractor as confined space. Risk of serious/fatal injury	1	Inspection/sampling shall be carried out from road level and by lifting kerb drainage unit prior to considering entering the chamber. Contractor to be confined space trained and qualified to undertake an assessment of the chambers. Contractor should follow the approved code of practice to enter confined spaces.	Risk is reduced but hazard remains.	No further comment.	
1.5	Working above a water course	Pollution Event Rubbish/waste accessing the water course	1,3	No planned survey works to be carried out below the structure. All proposed surveys are to be completed on the bridge deck. Operatives to be briefed on the canal below the structure. Plant Nappies and spill kits to be used on site.		No further comment.	PC

Ref.	Activity	Hazard	Persons at Risk *	Design Measures taken, or being taken to eliminate or reduce the hazard	Information on the Residual Risk	Principal Designer Review	Action Req'd by: **
				All waste produced during the survey works should be removed from site.			

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