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, were 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:	**M4 EB J16 MP132.2 – MP132.8**	**Job No.:**	**570124**
Project Description:	**Drainage Asset CCTV Survey**		
Design Discipline:	**Drainage**		
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 the activities. *Where particular categories do not ordinarily affect the scheme,* ***Part A may 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. **Population 2** – People in a contractual relationship with the client.	**'Workers'**
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	**N/A**			
1.2	Previous/existing land/ structures	**N/A**			
1.3	Roadways			**Yes**	**SRN / Trunk Road**
1.4	Railways	**N/A**			
1.5	Water course	**N/A**			
1.6	Ground conditions:	**N/A**			
	• Contamination	**N/A**			
	• Ground water	**N/A**			
	• Instability	**N/A**			
	• Mineral / mine workings	**N/A**			
1.7	Access restrictions		**Yes**		**Lane closures / On-slip closures as required**
1.8	Adjacent properties	**N/A**			
1.9	Concurrent site activities	**N/A**			
1.10	Interface with the public		**Yes**		**Travelling public**
1.11	Occupied premises	**N/A**			
1.12	Structural instability	**N/A**			
1.13	Fragile materials	**N/A**			
1.14	Hazardous materials	**N/A**			
1.15	Land use	**N/A**			
1.16	Traffic			**Yes**	**SRN / Trunk Road**
1.17	Others (insert as necessary)	**N/A**			
2.	**Existing Services**				
2.1	Underground		**Yes**		
	• Electrical	**N/A**			
	• Gas	**N/A**			
	• Water		**Yes**		**Underground Water**
	• Telecommunications		**Yes**		**British telecom**
	• Foul water sewer	**N/A**			
	• others		**Yes**		**HE underground fuel pipeline**
2.2	Overhead Services				
	• Electrical	**N/A**			
	• Telecommunications		**Yes**		**Overhead British Telecom**
	• Others (insert as necessary)	**N/A**			

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
3.	**Earthworks**				
3.1	Deep excavations	**N/A**			
3.2	Slope / ground stability	**N/A**			
3.3	Ground water / water courses	**N/A**			
3.4	Plant movements	**N/A**			
3.5	Interface with services (refer 2)	**N/A**			
3.6	Contamination (ground / water) (refer 1.6)	**N/A**			
3.7	Adjacent structures (refer 1.8)	**N/A**			
3.8	Others (surface water)	**N/A**			
4.	**Foundations**				
4.1	Adjacent buildings/structures	**N/A**			
4.2	Deep excavations	**N/A**			
4.3	Plant movements	**N/A**			
4.4	Interface with services	**N/A**			
4.5	Contamination (ground / water)	**N/A**			
4.6	Ground water	**N/A**			
4.7	Confined spaces	**N/A**			
4.8	Piling:				
	• Noise	**N/A**			
	• Vibration	**N/A**			
	• Contamination	**N/A**			
	• Plant	**N/A**			
4.9	Grouting:				
	• Drilling work	**N/A**			
	• Dust	**N/A**			
	• Pollution	**N/A**			
4.10	Stability of structure	**N/A**			
4.11	Others (insert as necessary)	**N/A**			
5.	**Services Installation**	**N/A**			
5.1	Excavations	**N/A**			
5.2	Ground water	**N/A**			
5.3	Ground conditions	**N/A**			
5.4	Existing services	**N/A**			
5.5	Testing operations	**N/A**			
5.6	Lifting operations	**N/A**			

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
5.7	Adjacent structures / activities	**N/A**			
5.8	Maintenance	**N/A**			
5.9	Contamination	**N/A**			
5.10	Others (insert as necessary)	**N/A**			
6.	**Drainage Works**				
6.1	Excavations	**N/A**			
6.2	Ground water	**N/A**			
6.3	Ground conditions	**N/A**			
6.4	Confined spaces			**Yes**	Asphyxiation, loss of consciousness, rising water levels, release of toxic or harmful gas, contact with contaminated sediments or sludge, poor lighting and visibility, slips trips and falls, access and egress issues. Temperature variations, hyper/hypothermia
6.5	Leptospirosis / Weils disease			**Yes**	Existing natural and highway surface water drainage pipework likely habitat for rats. Fields may contain livestock excrement. Contact through cuts etc. illness.
6.6	Existing services		**Yes**		**As per points 2 above.**
6.7	Manual handling			**Yes**	Muscular skeletal injuries, cuts / grazes from lifting materials. Slips, trips and falls, falling objects.
6.8	Lifting operations			**Yes**	Falling objects, struck / crushed by machinery or materials, failure of lifting equipment, toppling of lifting equipment
6.9	Maintenance	**N/A**			
6.10	Sewage	**N/A**			
6.11	Traffic			**Yes**	**As per point 1.3**
6.12	Contamination (ground / water)	**N/A**			

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		Not Applicable	Low- NO Action Required	High – Action NEEDED	
6.13	Hepatitis B / Tetanus			**Yes**	**Contact with disease carrying substance, Illness. All staff to have up to date inoculations**
6.14	Surface water		**Yes**		
7.	**Highways**				
7.1	Traffic management			**Yes**	**Lane closures and slip road closure as required**
7.2	Adjacent traffic			**Yes**	**As per point 1.3**
7.3	Construction materials	**N/A**			
7.4	Structural works	**N/A**			
7.5	Adjacent structures	**N/A**			
7.6	Noise			**Yes**	**CCTV and Jetting operation Ear defenders to be worn for noisy operations**
7.7	Vibration			**Yes**	**CCTV and Jetting Operation HAVS recording**
7.8	Dust	**N/A**			
7.9	Moving Plant / concurrent activities			**Yes**	**Control of plant movements with working area**
7.10	Reversing vehicles			**Yes**	**In accordance with PC reversing vehicle policy.**
7.11	Night working			**Yes**	**Poor visibility for workforce.**
7.12	Weather			**Yes**	**Exposure / Drain surcharge**
7.13	Others (insert as necessary)				
8.	**Steelwork Construction**	**N/A**			
8.1	Working at height	**N/A**			
8.2	Lifting operations	**N/A**			
8.3	Temporary stability	**N/A**			
8.4	Connections	**N/A**			
8.5	Unusual sequence	**N/A**			
8.6	Materials, e.g. paints	**N/A**			
8.7	Consideration of future maintenance	**N/A**			
8.8	Others (insert as necessary)	**N/A**			

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

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

Potential Hazards Arising From:		Risk (without designer's elimination / management measures)			Comments
Ref:		**Not Applicable**	**Low- NO Action Required**	**High – Action NEEDED**	
16.4	Working at height	**N/A**			
16.5	Temporary stability	**N/A**			
16.6	Pre/post tensioning	**N/A**			
16.7	Noise	**N/A**			
16.8	Vibration	**N/A**			
16.9	Dust	**N/A**			
16.10	Effect on usage of demolition materials	**N/A**			
16.11	Others (insert as necessary)	**N/A**			
17.	**Future Demolition / decommissioning of new structure/installation**	**N/A**			
17.1	Unusual sequence	**N/A**			
17.2	Pre/post tensioned element	**N/A**			
17.3	Materials	**N/A**			
17.4	Adjacent/adjoining structure	**N/A**			
17.5	Temporary stability	**N/A**			
17.6	Contamination during usage of demolition material.	**N/A**			
17.7	Others (insert as necessary)	**N/A**			
18.	**Maintenance and Operation of Facility / Structure etc.**	**N/A**			
18.1	Access	**N/A**			
18.2	Safety equipment	**N/A**			
18.3	Testing / inspection	**N/A**			
18.4	Procedure	**N/A**			
18.5	Contamination during usage of demolition material.	**N/A**			
18.6	Others (insert as necessary)	**N/A**			
19.	**Use of the structure as a workplace**	**N/A**			
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	**N/A**			
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	**N/A**			

Part B: Hazard Elimination Checklist

Project Title:	**M4 EB J16 MP132.2 – MP132.8**			**HE Job number:**	**570124**
Project Description:	**Drainage asset CCTV Survey**				
Design Discipline:	**Drainage**	**Prepared By:**	[redacted]	**Checked By:**	[redacted]

Reviewed and approved by: [redacted]

* **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 1.16 6.11 7.1 7.2	Working in live lanes	Live traffic in work area	1/2	Full road closure or lane closures to be in place, full PPE to be used, vehicles to full chapter 8 compliance.	Greatly reduced risk due to these measures		Contractor
1.7	Access restrictions	Exposed work area	1/2	Highway lanes closed to public, access for work vehicles only	Prevent unauthorised or accidental entry		Contractor
1.10 1.16	Traffic	Live traffic near to works	1/2	Full road closure or lane closures, full PPE to be used, vehicles to full chapter 8 compliance.	Will greatly reduce risk		Contractor
2.1 2.2	Services	Coming into contact with services	1/2	Obtain C2 plans/check verge for markers/look overhead. Competent and trained person to carry a full CAT and visual survey, mark out services before any work commences.	Buried 11kv cables within works extents. Overhead 11kv cables within works extents. Buried BT cables within works extents.		Contractor

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: **
					Overhead BT cables within works extents. Buried LV cables beyond highway boundary. Overheads within the works area, cable heights to be determined by a competent person prior to works start		
6.4, 6.5, 6.6, 6.11, 6.13, 6.14	Drainage Works	Contact with potentially contaminated highway sediments, runoff and organic materials in existing system. Blood Bourne Viruses (BBV's) and leptospirosis. Crushing hazards, slips trips and falls, third party tampering with equipment and plant left on site. Confined spaces. Contamination / pollution. Culverts. Confined spaces and ground conditions and stability – deep excavations. Existing services - buried. Ground water levels. . Construction materials.	1/2	Contractor to make all site personnel aware of the risks and the symptoms of Blood Bourne Diseases such as leptospirosis and ensure suitable PPE and welfare facilities are present for site personnel. Confined spaces to only be entered by competent personnel using safe systems of work. Chambers to be dewatered prior to entry. Water treated in accordance with CEMP procedures prior to discharge. No plant to be left on site. Over pumping the surface water upstream prior to excavation or not carry out works in extreme weather. CAT & Genny to be used to localise services prior to excavation.	Unable to avoid complete contact with construction materials & potentially contaminated highway sediments or organic materials. Contractor to ensure that all site personnel have appropriate PPE including suitable eye protection and waterproof gloves. Appropriate over pumping/dewatering kit for chambers to be kept available.		Contractor

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: **
		Surface water flow into open excavation / chambers					
6.7, 6.8	Manual handling & lifting operations	• Slips, trips and falls • Muscular skeletal injuries • Reversing vehicles • Falling objects or materials • Overhead collision hazards • Crushing under load and impact hazards	1	• Design proposals aim to reduce the weight of materials and therefore risk posed due to manual handling or lifting operations. Specifications are appropriate for the scope of the design and not oversized or over-engineered. • Preliminary site surveys undertaken to identify overhead and trip hazards. • To protect operatives mechanical or shared lifting to be adopted. • All lifting operations to have an appointed lift supervisor to coordinate lifts. • Lifting plans to be submitted for approval. • Lifting Operations and Lifting Equipment Regulations 1996 apply. • Good 'housekeeping' and site cleanliness to be controlled by the contractor to reduce the risks of manual handling injuries, slips, trips and falls.	• Manual handling and lifting operations remain unavoidable. Contractor to ensure that all site personnel have suitable PPE, lifting equipment and training. • Appointed person to approve lift plans. • Residual risk acceptable.		Contractor

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: **
7.1 7.2	Traffic management	Live traffic near to works	1/2	Full road closure or lane closures, full PPE to be used, vehicles to full chapter 8.	Appropriate TM safety zones should protect work force and travelling public.		Contractor
7.6	General working	Noise	1/2	Turn off machinery if not being used, use correct hearing protection if necessary	Noisy operation, keep record of exposure. Ensure PPE is worn.		Contractor
7.7	General working	Vibration	1/2	Obtain tools the lowest possible vibration ratings, check HAVS limits and make sure operatives stay within them.	Monitor & keep HAVS records		Contractor
7.9	Moving Plant	Plant moving around site	1/2	Site access and egress to be clearly signed. Banksmen to be used where appropriate to direct site traffic within work area.	Works need to be planned so that risk to workers is reduced.		Contractor
7.10	Reversing vehicles	Vehicles reversing within site	1/2	All reversing vehicles to follow Principal Contractors reversing vehicle policy. Task lighting to assist with visibility at night.	Site movements should be planned to reduce the need for reversing vehicles		Contractor
7.11	Night Working	Reduced Visibility	1/2	Task lighting to be installed	Visibility may still be reduced but risk is lower		Contractor
7.12	Weather	Poor visibility from rain	1/2/3	Only carry out works in suitable weather conditions. Forecast to be checked	Monitor weather forecast		Contractor