SP MANWEB

Reinforcement to the North Shropshire Electricity Distribution Network

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Environmental Statement Appendix 3.2
Draft Construction Environmental Management Plan

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November 2018

SP MANWEB

Reinforcement to the North Shropshire Electricity Distribution Network

APPENDIX 3.2
DRAFT CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

Environmental Statement

DCO Document 6.3.2
November 2018
PINS Reference EN020021

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The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Regulation 5(2)(a)

Reinforcement to the North Shropshire Electricity Distribution Network

Environmental Statement Appendix 3.2

Draft Construction Environmental Management Plan

Document Reference No.	**6.3.2**
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APPENDIX 3.2: DRAFT CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

1.1 INTRODUCTION

Objective of this Document

1.1.1 As set out in Chapter 3 of the Environmental Statement, this draft Construction Environmental Management Plan (CEMP) has been produced to outline the means by which the effects on the environment of the Reinforcement to the North Shropshire Electricity Distribution Network (hereafter referred to as 'the Proposed Development') would be minimised. It has been prepared with the objective of securing environmental management measures in one cohesive document for the construction works associated with the Proposed Development.

1.1.2 It will help to control and guide the working practices used during the construction of the development. It aims to establish a framework through which SP Manweb and their contractors ensure a robust and effective approach to environmental management and implementation of measures in constructing electricity distribution infrastructure.

1.1.3 The draft CEMP incorporates Natural England and Environment Agency guidelines, as appropriate, reflecting current best practice in protecting the environment during the works.

1.1.4 It will be reviewed and amended as necessary throughout construction.

Structure of this Document

1.1.5 Table A2.1.1 provides a brief overview of the content of this document.

Table A2.1.1 Structure of this Document

No.	Title	Description of Content
1.1	Introduction	Provides background information about this document its objectives and content.

Table A2.1.1 Structure of this Document		
No.	**Title**	**Description of Content**
1.2	The Proposed Development	Provides details of the Proposed Development including a description of construction methods and facilities.
1.3	Roles and Responsibilities	Sets out the roles and responsibilities of the parties involved in the construction of the Proposed Development.
1.4	Communications, Reporting and Training	Sets out the measures for regular communications and reporting as well as staff training.
1.5	General Environmental Management Measures	Sets out the general measures with respect to environmental management during construction.
1.6	Subject Specific Management Plans	Provides an overview of the subject specific management plans to be implemented.
1.7	Species Protection Plans	Sets out the general measures with regard to protected species.
1.8	[redacted] - Species Protection Plan	Sets out the measures with regard to protection of [redacted].
1.9	Bats - Species Protection Plan	Sets out the measures with regard to protection of bats.
1.10	Great Crested Newts - Species Protection Plan	Sets out the measures with regard to protection of great crested newts.
1.11	Reptiles - Species Protection Plan	Sets out the measures with regard to protection of reptiles.
1.12	Birds - Species Protection Plan	Sets out the measures with regard to protection of birds.
1.13	Hedgerow Management Plan	Sets out the measures with regard to protection and reinstatement of hedgerows.
1.14	Pollution Prevention Plan	Sets out the measures with regard to pollution prevention and protection of the water environment.
1.15	Watercourse Crossing Register	Sets out a watercourse crossing strategy and structure of a detailed crossing register.

Table A2.1.1 Structure of this Document		
No.	**Title**	**Description of Content**
1.16	Drainage Management Plan	Sets out the measures with regards to drainage management
1.17	Traffic Management Plan	Sets out the measures with regard to the routeing and management of construction-related traffic.

1.2 THE PROPOSED DEVELOPMENT

1.2.1 The Proposed Development is described in detail in Chapter 3 of the ES (**DCO Document 6.3**). Article 3, Schedule 1 to the draft DCO and the Works Plans set out the detail of the Proposed Development authorised.

Construction Programme

1.2.2 It is currently anticipated that (subject to consent being granted) work on site would commence in mid-2020. The construction phase is anticipated to be completed within twelve months following starting on site. The target is for the Proposed Development to be operational in 2021.

<table>
<tr><td colspan="7">2020</td><td colspan="5">2021</td></tr>
<tr><td>June</td><td>July</td><td>Aug</td><td>Sept</td><td>Oct</td><td>Nov</td><td>Dec</td><td>Jan</td><td>Feb</td><td>Mar</td><td>April</td><td>May</td></tr>
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1.3 ROLES AND RESPONSIBILITIES

SP Manweb

1.3.1 This section identifies the key roles and responsibilities under the draft CEMP.

SP Manweb will oversee and manage the planning and environmental aspects of the Proposed Development through the appointment of an Environmental/Ecological Clerk of Works (ECoW).

1.3.2 SP Manweb will be responsible for ensuring that all relevant DCO requirements are satisfactorily discharged,

1.3.3 SP Manweb will be responsible for reviewing risk assessments and method statements and will submit the required documents and information to the relevant authority to discharge DCO requirements.

The Contractor

1.3.4 SP Manweb will appoint Contractor(s) to undertake the construction of the Proposed Development. The Contractor (as well as all Sub-Contractors) is required to comply with the measures and provisions of the ES, the draft CEMP, and any requirement imposed by the DCO and/or licences associated with the Proposed Development. The Contractor will have or will engage a suitably qualified environmental advisor to assist with meeting their (and the Sub-Contractors) obligations.

1.3.5 The draft CEMP will form part of the legal contract between SP Manweb and the Contractor. The Contractor will be responsible for ensuring all works are undertaken strictly in accordance with their legal and contractual obligations, terms and conditions. The Contractor will be responsible for ensuring the general management measures and species management plans identified in this draft CEMP are incorporated into the risk assessments and construction method statements to be produced for the Proposed Development.

1.3.6 The Contractor will also be responsible for ensuring the construction works are supervised on a day to day basis and for carrying out regular site

inspections to ensure all works personnel are aware of the general environmental management measures and subject specific management plans, including species protection plans, detailed in this document.

1.3.7 The Contractor will take all reasonable precautions and undertake all reasonable measures under their control to ensure that all legal requirements are complied with and that no unnecessary damage, disturbance or pollution results from undertaking the works.

Environmental/Ecological Clerk of Works

1.3.8 SP Manweb will appoint an Environmental / Ecological Clerk of Works (ECoW) for the duration of the construction of the Proposed Development. The purpose of this appointment is to ensure that the environmental interests of areas that may be affected by the works are safeguarded. The ECoW will have the appropriate authority to review method statements, oversee works and recommend action as appropriate, including temporarily stopping works if required, for example to safeguard protected species and their habitats, or where any other breaches of environmental legislation are likely to occur.

1.3.9 The ECoW will work with the Contractor to ensure the implementation of, and compliance with, the provisions of the draft CEMP, licensing or other requirements imposed on the Proposed Development. The ECoW will report to SP Manweb.

1.3.10 The ECoW may be a company who provide a general Clerk of Works who can liaise with a team of internal specialists on specific environmental subjects, for example, ecology, archaeology, noise, air quality, or pollution where required throughout the Proposed Development, or a suitably qualified individual.

1.3.11 The ECoW shall be responsible for:

- Inspections of the Contractor's work site, on a daily basis;
- Weekly routine audits of the Contractor's compliance with the draft CEMP – site activities and record keeping;

- Monitoring or inspection of site activities in response to incidents, breaches of the draft CEMP or complaints received from a third party;
- Inspections of works to ensure that environmental measures incorporated into the design have been implemented

Contacts Register

1.3.12 A detailed Contacts Register will be prepared with contact details of all key internal and external parties involved with the Proposed Development. This will be prepared prior to commencement of construction and updated as appropriate where staff changes occur. The Contact Register structure is contained in Appendix A.

1.4 COMMUNICATIONS, REPORTING AND TRAINING

Communications and Liaison

1.4.1 The Contractor will adopt an appropriate system for the logging and recording of any complaints with copies made available to the ECoW and the relevant consultees. Any complaints received will be acknowledged within 24 hours during all hours when works, including deliveries, are taking place.

1.4.2 The Contractor will provide a telephone number for any complaints and further details (postal and email address) to which all written complaints should be addressed. The Contractor shall ensure that all complaints receive a written response, to include details of any action undertaken if such action is deemed appropriate. The Contractor shall provide SP Manweb with a monthly report that details all complaints, who they were filed by and the actions taken.

1.4.3 Where required, in addition to ensuring that the public is fully informed of the proposed programme of works (including working hours), the Contractor will ensure that procedures are established for notifying the public in advance of planned works. It should also be noted that advanced notification will similarly apply to any alterations in the construction programme or working hours that have been agreed with the Contractor and the relevant departments of Shropshire Council.

1.4.4 The ECoW will be responsible for liaison with Shropshire Council via SP Manweb and all consultees such as Natural England, Environment Agency and Historic England.

Inductions and Training in Environmental Issues

1.4.5 The Contractor will ensure all employees, sub-contractors, suppliers, and other visitors to the site undertake site specific induction training. The induction will include a summary of environmental risks associated with the Proposed Development, specifically those relevant to the inductee. Topics that will be addressed will include any areas of environmental sensitivity, such as ecological or archaeological, sensitive areas, in addition to pollution

prevention and protection of the water environment, ground stability, and waste management.

1.4.6 The Contractor will ensure all personnel are suitably trained on general site good practice emergency procedures including the use of spill kits and silt mitigation for example. To ensure all staff are suitably trained on such procedures, training will be provided by a suitably qualified person on a regular basis. Details of the proposed training will be provided to SP Manweb prior to commencement of construction works.

1.4.7 Toolbox talks, information updates to onsite construction personnel on specific issues such as environmental awareness or a specific issue that has arisen on site, will be provided by the ECoW (or other relevant specialist such as archaeological clerk of works). These shall continue throughout construction of the Proposed Development to provide on-going reinforcement and address any new issues that arise. Prior to works starting on site the programme of talks to be undertaken will be agreed by the appointed Contractor. Additional toolbox talks may be required outwith this based on circumstances such as unforeseen risks, observation of bad practices, perceived lack of awareness, pollution event, etc. A record of all toolbox talks and attendees will be maintained and recorded by the Contractor.

Environmental Management Reporting

General Reporting

1.4.8 Regular reporting of environmental management will be undertaken for the duration of construction of the Proposed Development. Table A2.4.1 outlines the reporting which is expected to be undertaken. Prior to the commencement of Development the Contractor in consultation with the ECoW shall agree exact reporting requirements.

Table A2.4.1 Environmental Management Reporting		
Task	**Summary of Requirements**	**Responsibility**
Daily Reporting	e.g daily report following set proforma for highlighting sensitive environmental receptors and impacts	e.g Contractor
Weekly Reporting	e.g weekly report summarising key incidents (positive and negative) over the previous week. Including actions taken and lessons learnt.	e.g Site manager
Monthly Reporting	e.g monthly report summarising key incidents (positive and negative) over the previous week. Including actions taken and lessons learnt. e.g. Complaints received	e.g ECoW / Site manager

Environmental Incident Reporting

1.4.9 The Contractor will produce an Environmental Incident Response Plan. This document will set out and categorise potential environmental incidents as Category 1 (Major Pollution Incident) or Category 2 (Limited Pollution Incident) and set out the procedure to follow in each case. For example Category 2 incident reporting would involve cleaning up on site, logging the incident internally and recording lessons learnt. For Category 1 incidents, the Category 2 incident response would be undertaken in addition to reporting the incident to the relevant statutory body e.g. Environment Agency or Natural England.

1.5 DESIGN CHANGE REVIEW PROCESS

1.5.1 In order to ensure that the Proposed Development is constructed in compliance with the consent awarded, including approved Order Limits, a design review process must be followed.

1.5.2 The Construction Report (**DCO document 7.2**) describes in detail the Order Limits for the Proposed Development. These Order Limits are in effect a construction and operation corridor, where all the proposed work shall be undertaken. The width of the Order Limits is 25m wide for the overhead line section and approximately 20m wide for the underground cable. The Order Limits also include construction access from public roads and are between 3m and 5m wide. Laydown areas are included within the Order Limits and are located adjacent to construction accesses.

1.5.3 Within the Order Limits the poles would, wherever possible, be located where indicated along the Final Route Alignment. The Final Route Alignment provides an indication of the likely pole positions and forms the centreline of the Order Limits. The indicative pole locations are shown on the Works Plans (**DCO Document 2.3.0 to 2.3.16**). It is anticipated however that post consent it may be necessary and desirable to refine the final vertical and horizontal profile of the conductors and pole positions (known as micro-siting) to reflect the following:

- The outcome of pre-construction surveys which identify new localised environmental constraints and ground investigations surveys; and
- Agreements on minor alterations suggested by landowners.

1.5.4 In carrying out the proposed development, the Order Limits allow for the following:

- To move any pole structure by no more than 5m from its indicative position (as shown on the Works Plans (**DCO Documents 2.3.0 – 2.3.16**)), and not within 1m of the outside edge of any hedgerows; and

- To increase vertically in height any pole structure (not exceeding 2 metres) from the heights shown in the Proposed Pole Schedule (Appendix 3.1 to the ES (**DCO Document 6.3.1**)).

1.5.5 The indicative location of the 132kV underground cable is shown on the Works Plans (**DCO Document 2.3.1**).

1.5.6 The Contractor shall be responsible for the final pole positions and will produce a final design of the Proposed Development. This shall include details of all final pole positions and will consider landowner wishes wherever possible along with any relevant issues arising from pre-construction environmental surveys.

1.5.7 The ECoW will be responsible for reviewing and, where appropriate, approving micro-siting which is within the Order Limits in writing prior to the commencement of revised works. A record of design changes approved by the ECoW will be kept for the duration of construction.

1.5.8 Where the ECoW identifies an issue with a suggested change to a pole location, SP Manweb shall be responsible for approving the final design and relevant pole locations.

1.6 GENERAL ENVIRONMENTAL MANAGEMENT MEASURES

Introduction

1.6.1 This section provides a description of the general environmental management measures to be implemented during the construction of the Proposed Development. As the draft CEMP forms part of the contract between SP Manweb and the Contractor, these measures shall form part of the Contractors contractual obligations and shall also be part of any arrangements with Sub-Contractors.

General Measures

1.6.2 Overhead lines must conform to the specifications contained in the Electrical Safety, Quality and Continuity Regulations 2002 (as amended). Overhead lines are also constructed to conform to the Electricity Supply Industry's own engineering standards (Energy Networks Association Technical Specification 43-8) which govern the minimum clearances to be provided between the conductors, roads, trees and other features.

Fencing

1.6.3 During construction, fencing may be required in proximity to the Proposed Development at the request of landowners or in the vicinity of public rights of way. Fencing may be provided along temporary access tracks, surrounding excavations for pole positions or around winching and pulling positions. Fencing will be temporary for the duration of the construction works.

1.6.4 If fencing is to be provided during construction and there is a risk of local flood water, identified through flood risk mapping by the ECoW, the construction will be post and wire to ensure the free passage of local flood water.

Water Supplies

1.6.5 Discussion will be undertaken with affected landowners to identify water supplies used for livestock. During construction, if livestock are unable to be relocated away from the actual work areas and grazed elsewhere, the Contractor will provide replacement water sources through the provision of

additional water piping or water troughs.

1.6.6 If landowners have a right to use a water supply on neighbouring land, the Contractor will source an alternative water supply or relocate the existing water supply if there is deemed to be an interference with this specific right as a result of the construction or operation of the Proposed Development.

Noise

1.6.7 SP Manweb recognises that construction has the potential to cause noise in a quiet rural area. A number of embedded measures are proposed below to minimise the potential for disturbance. Where necessary, suitable plant and working methods that have the potential to cause noise will be discussed and agreed in consultation with Shropshire Council.

1.6.8 To ensure noise does not become an issue during construction activities the following principles will be applied when relevant:

- limiting site work to daylight hours;
- appropriate choice of plant and equipment such as low noise generators and quieter plant and equipment as far as reasonably practicable;
- Regular plant maintenance to keep plant in good working condition;
- Reduce noise from all vehicles, plant and equipment using effective exhaust silencers;
- Careful phasing of the proposed operations; and
- In locations where there is the potential for noise disturbance, the provision of temporary barriers around static plant (pumps, generators) and equipment liable to create noise whilst in operation as suggested in Section 8 of British Standard 5228-1:2009 *Code of Practice for noise and vibration*.

Air Quality

1.6.9 The emissions of pollutants and creation of dust from on-site vehicles, plant

and construction activities will be minimised as far as is practicable. These measures will include:

- Ensuring all vehicle movements are kept to the absolute minimum;
- Rigorously enforcing appropriate speed limits for all construction vehicles on site to minimise dust generation through the use of signage and tool box talks;
- The ECoW will carry out check of the Contractors vehicles to ensure low emission vehicles and plant fitted with catalysts, diesel particulate filters or similar devices are utilised where practicable;
- The ECoW will carry out checks to ensure plant is well maintained, with routine servicing of plant and vehicles to be carried out in accordance with manufacturer's recommendations by the Contractor;
- Requiring that all construction vehicles hold current MOT certificates;
- Requiring all vehicles to switch off engines when not in use;
- Minimising the use of diesel or petrol powered generators and using mains electricity or battery powered equipment where practicable;
- No burning of waste materials to be permitted on site;
- Vehicle loads to be sheeted during the transportation of loose or potentially dusty material or spoil; and
- Regular cleaning of site work areas and wheel washing facilities if necessary.

Vegetation Management

1.6.10 Where the overhead line passes over, or is in close proximity, to vegetation that could infringe the safety clearance from live conductors then these will be either felled or trimmed prior to construction of the line. SP Manweb carries out vegetation clearance to the Engineering Networks Association (ENA) Technical Specification 43-8 which represents best current practice in the UK for clearances for overhead lines and includes the statutory ground

clearance requirements of the Electricity Safety, Quality and Continuity Regulations (ESQCR). SP Manweb has a duty under the ESQCR regulations to keep sufficient distance between vegetation and overhead lines both to safeguard public safety and to ensure continuity of supply.

1.6.11 Guidance on how SP Manweb should ensure that sufficient clearance distances between vegetation and the overhead lines can be achieved is contained in ENA Engineering Technical Report 132, Issue 2 Improving resilience of overhead networks under abnormal weather conditions using a risk based methodology 2016. This is a risk based assessment which makes an allowance for the tree species and expected growth rates, and the frequency of return visits by the tree cutting contractors.

1.6.12 Generally it will be necessary to ensure that the clearance from trees and vegetation under the overhead line and trees adjacent remain in accordance with ENA Technical Specification 43-8. For the wooded areas through which the overhead line passes it is expected that it will be necessary to cut and trim trees immediately under the line. In the SP Manweb licenced area tree trimming for overhead lines would not normally be expected within 5 years of the last visit.

1.6.13 Tree protection in and around construction working areas will be in accordance with British Standard 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations*. Construction activities in proximity to trees and woodlands will adhere to the National Joint Utilities Group (NJUG) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (2007). This guidance sets out the principles for protecting trees (including shrubs and hedges) during utility works and ensuring that tree protection zones are maintained.

1.6.14 The following precautions will be adhered to *outside of* tree protection zones:

- Planning of construction activities in proximity to trees should take sufficient account of wide loads, tall loads and plant with booms, jibs and counterweight;

- no burning of waste on site; and
- Material whose spillage could cause damage to a tree should be stored and handled away from the outer edge of the Root Protection Area (RPA), downhill and at least 10m away.

1.6.15 The following precautions will be adhered to *within* tree protection zones:

- No mechanical excavation;
- No excavation without arboricultural site supervision;
- No hand digging without a written method statement approved by the arboriculturists;
- No lowering or raising of levels;
- No storage of plant or materials;
- No storage of handling of any chemicals including waste from cement mixing; and
- No vehicular access.

1.6.16 Whenever trees have been identified within close proximity to the works and require protective measures, there shall be an auditable system of arboricultural site monitoring.

1.6.17 Pre-construction surveys shall be undertaken to confirm the location of invasive species in proximity to the Proposed Development. Any such species shall be identified on a plan and on site.

Soil Handling and Storage

1.6.18 Indiscriminate vehicle movements across soil will be avoided, with the location of stored soils in an area away from construction traffic and clearly demarcated to ensure construction traffic does not track over them.

Waste Management

1.6.19 SP Manweb promotes and practices waste minimisation, encouraging beneficial re use or recycling of materials where feasible. The Contractor will

be required to ensure construction is legally compliant with waste management standards and legislation. SP Manweb prefers recycling and recovery and only uses landfill as a final option. It will encourage this approach with the Contractor.

1.6.20 As far as reasonably practicable the following embedded measures will be applied by the Contractor:

- Waste will be removed at frequent intervals;
- All waste will be identified, quantified and where practicable appropriately segregated and recycled;
- Site waste susceptible to spreading by wind or liable to cause litter will be stored in secure containers;
- Only registered carriers will be used to take waste off-site;
- No burning of material will be permitted on site;
- In the event of a spillage, all contaminated material will be removed from the sites to a licensed waste facility;
- Only soil that is to be re-used will be stored on site; and
- Any soil moved, handled or stored on site will be treated in accordance with Defra's Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.

1.6.21 The Contractor will be required to develop a Site Waste Management Plan (SWMP). The SWMP will set the framework for the management of wastes generated during the construction process. It will document the decisions taken during the planning and design stages to minimise waste and set objectives and targets for the main waste types. It will also identify the following:

- responsibilities within the construction team for waste management;
- the types of waste and the quantities likely to be generated;

- measures to be adopted during construction to minimise waste generated.
- opportunities for recycling and/or reuse;
- proposed treatment and disposal sites together with details of their Environmental Permit; and
- provisions for staff training and use of the SWMP.

Management of Accesses and Public Rights of Way During Construction

1.6.22 The Access and Rights of Way Plans (ARoW plans, **DCO document 2.4**) show affected accesses and public rights of way. The Construction Report (**DCO document 7.2**), details the Public Rights of Way (PRoW) affected by the Proposed Development, identifies the length of PRoW affected and sets out the management of PRoW during construction. The Construction Report also sets out the utilisation of existing farm accesses to construction the Proposed Development.

General Management of Accesses and PRoWs

1.6.23 There are a number of PRoW running through the Order Limits, however, none of these PRoW are directly affected by the Proposed Development and do not need to be permanently stopped up or diverted. Farm accesses will also be utilised for construction traffic but also will not require diversions and will not prevent the landowner from using the access.

1.6.24 All points where Public Rights of Way (PRoW) follow access tracks or alternatively enter the Proposed Development Order Limits, as shown on the Access and Rights of Way Plans (**DCO Documents 2.4.0 – 2.4.16**), would have appropriate signage advising of dates and hours of work. Management would involve the use of construction staff at those points where and when construction works affect a PRoW. In these instances PRoW users may have to wait for a short period of time whilst the PRoW is in use by the construction team. Use would include the movement of vehicles and plant along the access or the oversailing of the conductors during stringing.

1.6.25 Any restrictions are likely to be for tens of minutes rather than hours. Users would be advised when works are completed and when it is safe to cross or use the PRoW by staff at an appropriate location. There is no requirement to erect scaffolding or netting to complete the conductor stringing across any PRoW.

Bio Security

1.6.26 Good biosecurity practice helps to minimise the risk of disease occurring or spreading, safeguarding the health and welfare of animals and protecting the viability of businesses. Good biosecurity reduces the spread of disease, improves farm efficiency and keeps new diseases out.

Biosecurity - Animal Disease

1.6.27 SP Manweb is committed to observing precautions recommended by Government agencies. Defra hold primary regulatory responsibility for management of biosecurity and implementation of controls to prevent, restrict, control and eradicate outbreaks of animal disease. During outbreaks it may refer to other government agencies to bring these controls to bear by issue of restriction, prohibitions and compulsory actions on those directly affected including any indirect third parties. Breach of the requirements and license restrictions may be an offence.

1.6.28 Defra has produced guidance relevant to livestock owners, landowners and third parties entitled ‘Biosecurity Guidance to Prevent the Spread of Animal Diseases’. A number of the biosecurity measures are relevant for SP Manweb and the Proposed Development, which will be adopted where the potential for spread of animal disease has been identified through discussions with landowners and the relevant authorities:

- Where appropriate any visit to site should be made with the agreement of the owner or premises manager and any reasonable requests for additional biosecurity measures should be observed, especially if contractors have visited other premises with farm animals in the previous 3 days.

- Livestock vehicles or trailers must be cleansed and disinfected in accordance with current legislation.
- If other vehicles are taken on to the premises they should, wherever possible, be parked on hard standing away from farm animals and must be visibly free of for example animal excreta and slurry. Vehicles or trailers should not normally be taken into areas where farm animals have access – these arrangements should be confirmed, where appropriate, with the owner or premises manager in advance of the visit. Before leaving the premises all visible contamination with manure, slurry or similar material must be removed (including where appropriate, cleaning of the inside of vehicles, especially foot wells and pedals). If this is not possible, vehicles and trailers must be cleaned before they are taken onto other premises with farm animals, either at the end of the day or before the next visit.
- Owners or farm managers are recommended to have facilities available for disinfecting vehicles, footwear and clothing. If facilities are NOT available on farm, cleansing and disinfection should be arranged as soon as possible and before the next visit to premises with farm animals.
- Suitable protective clothing and footwear must be worn on all premises where visits include entering areas where farm animals are present or to which they normally have access. The type of protective clothing and footwear required depends on the nature of the visit (e.g. the protection required for a visit to a dairy herd would differ from that required for a visit to extensive premises on moorland). Contractors should ensure clothing is changed and washed between visits to different premises.
- The purpose of the protective clothing and footwear is to prevent any contamination being carried from premises to premises. Protective clothing and footwear may be disposable or re-usable. The following

are examples of types of protective clothing:

- Disposable boiler type suits. These can be used once and should be discarded at the end of the visit to the premises. They can be left on the premises with the owner's agreement or bagged and suitably disposed of later, as can disposable overshoes for footwear.
- Non-disposable protective clothing (for example cotton boiler suits or cotton coats). These may be used once and should be laundered before being re-used on any other livestock premises.
- Waterproof protective clothing and waterproof boots. These should be cleansed and disinfected before entering the premises and again at the end of the visit just before leaving the premises.

- All equipment used must be clean on arrival and on departure. Great care must be taken when cleaning electrical apparatus or tools. Where possible equipment should be protected from contamination, for example by using plastic bags. Health and Safety rules must be observed. Where equipment can be cleansed and disinfected this must be done before entry to the premises and again on departure.

1.6.29 Landowners may adopt preventative controls and expect staff and visitors to comply with best practice guidance for the prevention of the spread of disease. During the construction phase of works consideration will be made for discussion with grantors regarding particular measures during the works.

1.6.30 If a disease outbreak occurred during the construction of the Proposed Development SP Manweb and the Contractor would discuss the measures for work with the affected landowners and the relevant regulatory authority. Primary risk controls are based upon avoidance of the need to undertake work, minimising staff numbers on site and restricting staff and equipment for the duration of the works. A licence may be required if the works are to

continue during such an outbreak.

Biosecurity - Other Pests and Diseases

1.6.31 Chytrid fungus is a disease that affects amphibians including great crested newts and specific biosecurity measures shall be put in place if works are undertaken that require working close to or entering of ponds. These biosecurity measures shall include the use of dedicated survey equipment (bottle traps, canes and pond nets) for each separate site/pond and the disinfection of boots and equipment following each survey.

Watercourses

1.6.32 There are a number of watercourses within the Order Limits. The Development oversails the Rivers Perry and Roden and the Montgomery Canal.

1.6.33 In addition, the Proposed Development oversails a number of smaller watercourses, ditches, streams and ponds. A number of the watercourses also have associated floodplains which extend wider than the watercourse as marked.

1.6.34 SP Manweb has developed a number of good practice measures for construction work in proximity to watercourses and floodplains:

- Wherever possible, machinery and equipment will be kept a minimum of 10m from the edge of the watercourse. If the watercourse has an associated floodplain, machinery and equipment shall be located 10m from the edge of the floodplain. Soil shall only be stockpiled in locations sited at least 10m away from any watercourse. If the watercourse has an associated floodplain, stockpiled soil shall be located 10m from the edge of the floodplain. Silt fences shall be used around stockpiled soil where considered appropriate.
- Water containing silt will not be pumped or allowed to flow into watercourses.
- Where possible, water will be prevented from entering excavations.

- The amount of exposed ground will be minimised in the working area to reduce the risk of silty surface water runoff.
- Fuel, oil and chemical storage will only be permitted at the construction compound and not on site.
- Suitable spill kits or absorbent materials will be held in the vicinity of the watercourses during works. In the event of a spill, the spilt material shall be contained and the incident management procedures followed.
- Herbicides will not be used on or near any watercourses or ponds within the working area without written approval from the Environment Agency.

1.6.35 Further specific management and details on protective provisions in relation to the Rivers Perry and Roden and the Montgomery Canal are provided in the Water Crossings Register, section 1.16 of this draft CEMP.

Other Utilities

1.6.36 SP Manweb has confirmed that other utilities such as water supplies, gas pipelines and high voltage overhead lines are crossed by the Proposed Development. The Contractor will be required to carry out further detailed utilities searches and onsite surveys to confirm the exact location of water and sewage pipes, telecommunications and electricity cables and overhead lines prior to construction. Severn Trent (water and sewage), Wales and West Utilities (gas pipeline) have provided specifications for working. These specifications can be found in Appendix B – Companies Specifications. A set of Protective Provisions has been drafted by SP Manweb relating to water supply and sewage and are included in the draft DCO (**DCO Document 3.1**).

1.6.37 Openreach, which replaced BT Telecommunications, have undertaken an initial assessment of the Proposed Development and have indicated that diversions of Openreach infrastructure will be required at Rednal, Hordley and Wackley Lodge. SP Manweb will agree terms with Openreach regarding the required diversion of Openreach infrastructure to enable Openreach to undertake the necessary diversion works. A set of Protective Provisions has been drafted by SP Manweb relating to Openreach and are

included in the draft DCO (**DCO Document 3.1**).

1.6.38 SP Manweb is in discussion with National Grid regarding agreements to cross the high voltage 400kV overhead line in Rednal. Appropriate Protective Provisions are included in the draft DCO **(DCO Document 3.1)**.

1.6.39 It will be the Contractors responsibility to adhere to the working specifications set out in Appendix B.

Road and Rail Crossings

1.6.40 Scaffolding and nets will be erected over major roads (A and B Classified) and noticeably busy minor roads to enable the conductors to be pulled out unhindered.

1.6.41 On minor roads (C Classified and Non-classified) temporary traffic management (manned signalling), is sufficient to control traffic during stringing activities.

1.6.42 All requirements of the appropriate authority would be adhered to such as relevant codes of practice, specification and procedures and where necessary temporary traffic management will be agreed with Shropshire Council.

1.6.43 There is one railway crossing located at Babbinswood. At this location, the conductors would be installed in a manner agreed with Network Rail. SP Manweb is in discussions with Network Rail regarding Protective Provisions and these are included in the draft DCO (**DCO Document 3.1**).

Working Hours

1.6.44 Construction activities would in general be undertaken during daylight hours only. For weekdays, this includes between the hours of 0700 to 1900 March to October and 0730 to 1730 or during daylight hours, whichever is the shorter, November to February. At weekends, the working hours would be 0700 to 1300 on Saturdays with no works on Sundays or bank/public holidays. Some works may be required outside of the working hours such as scaffolding/netting, highways crossings and completion of operations that

cannot be safely stopped.

Site Management and Housekeeping

1.6.45 The construction compound is located within an existing SP Manweb depot and will be the main store for all materials, including paints, sealants or other chemicals. Any temporary laydown areas to be used for temporary storage of materials will be located at least 25 metres away from surface water bodies in a secure container within impermeable areas within the temporary laydown area. All construction materials will be stored in accordance with the appropriate regulatory requirements, including the Control of Substances Hazardous to Health Regulations 2002.

Staff Facilities

1.6.46 Appropriate welfare facilities will be provided. These will be located at Maesbury Road and at the Wem laydown area (laydown area 7). Prior to construction, the Contractor will prepare the arrangements for welfare provision and will be responsible for the maintenance of the facilities throughout the life of the project. The nature and scale of facilities required will be in proportion to the size and location of the Proposed Development.

Secondary Consents, Permits and Licences

1.6.47 The Contractor and ECoW will be responsible for obtaining other necessary consents, licences and permissions for activities as required by current legislation governing the protection of the environment. It is anticipated that other consents and licences such as European protected species licences will be required for the Proposed Development. The DCO application is supported by a document entitled Other Consents and Licences (**DCO document 5.5**) which sets out the requirements in full.

Monitoring, Audits and Inspections

1.6.48 The ECoW will be responsible for weekly routine audits of the Contractor's compliance with the draft CEMP including site activities and record keeping. SP Manweb will be responsible for monitoring the contract and ensuring the Contractor is working within the contract.

1.7 SUBJECT SPECIFIC MANAGEMENT PLANS

Introduction

1.7.1 Additional management plans, referred to as subject specific management plans (listed in Table A2.6.1), are required to control the potential effects and address the measures identified in the ES.

Table A2.6.1Subject Specific Management Plans	
Species Protection Plans: • [redacted] Protection Plan • Bat Protection Plan • Great Crested Newt Protection Plan • Reptiles Protection Plan • Bird Protection Plan	Hedgerow Management Plan Pollution Prevention Plan Watercourse Crossing Register Archaeological Management Plan Traffic Management Plan

Structure of the Subject Specific Management Plans

1.7.2 The subject specific management plans establish the principles that will be adopted and adhered to in order to mitigate potential environmental impacts. The principles of the subject specific management plans draw on relevant good practice, however, project specific measures has also been included where relevant. The subject specific management plans largely follow a common structure:

- Introduction: sets out the purpose of the plan and a summary of its contents;
- Project Specific Considerations: identifies project specific constraints or impacts;
- General Measures: sets out the principles of environmental management to be followed;
- Project Specific Measures: sets out project-specific environmental measures; and
- Summary of Responsibilities: provides a summary of all responsibilities.

1.8 SPECIES PROTECTION PLANS

Overview

1.8.1 A number of protected species have been identified through EIA surveys. Some have the potential to be affected by the Proposed Development and as such required specific measures to avoid any adverse significant effects. These species protection plans will assist with the application for protected species licences.

1.8.2 The Species Protection Plans that have been developed for this project are:

- [redacted]
- Bat;
- GCN; and
- Reptiles.

1.8.3 A Species Protection Plan has also been developed for birds as a precautionary measure.

1.9 [redacted] – SPECIES PROTECTION PLAN

Introduction

1.9.1 This Species Protection Plan has been produced for the Proposed Development in relation to protected species, [redacted] (*Meles meles*).

1.9.2 Full details on the [redacted] survey findings recorded during the pre-application stage are contained within ES Chapter 7 (**DCO document 6.7**) and the confidential Appendix 7.9 (**DCO document 6.7.9**) which should be referred to in conjunction with this document.

Legislation

1.9.3 [redacted] are legally protected from intentional or reckless cruelty and they and their setts are protected from the results of otherwise lawful human activities such as building developments and forestry operations. The main legislation protecting [redacted] is the Protection of [redacted] Act 1992.

Site and Project Description

1.9.4 The habitats along the survey corridor for the Proposed Development are dominated by agricultural land supporting a mixture of arable and (largely improved) grassland fields with scattered ponds. Field boundaries contain mature hedgerows (both species rich and species poor) and trees and there are scattered individual mature trees within the fields which are often associated with ponds. Tree lines, scattered mature trees and a number of broadleaved woodland copses are found along the route of the Proposed Development. Although predominantly within a rural landscape, the proposed route passes a range of built features including roads, a railway line, farm complexes, and residential and commercial buildings.

Background

1.9.5 [redacted] are known to be present within 100m of the Proposed Development with surveys undertaken for the ES confirming 29 active and inactive setts. Several setts lie in close proximity to the Proposed Development As such, [redacted] are required to be considered at an early stage within the Proposed Development to ensure no significant impact on this species with all

appropriate measures in place, including any licences where required.

1.9.6 This Species Protection Plan sets out the approach to ensure the protection of [redacted] during the construction of the Proposed Development.

Review of Existing Data

1.9.7 The ES concluded that specific measures will be required to safeguard individuals and ensure compliance with the legislation. However, [redacted] are common and widespread in Shropshire and the Proposed Development will have no discernible effects on local population levels arising from the limited [redacted] measures likely to be required during construction.

Sources of Potential Impacts

1.9.8 As addressed within the ES the Proposed Development has the potential to impact upon [redacted]. Impacts are related to the following:

- Direct land take leading to permanent or temporary habitats loss;
- Indirect habitats damage or alteration to habitats (and the species they may support) through:
    - Changes to surface or ground waters (hydrological alteration): alterations to the physical regime, typically water levels/availability to wetland species or habitats;
    - Pollution: release of pollutants (for example silt-laden runoff from working areas and fuel spills) into habitats inside or outside the Order Limits including watercourses or ditches which provide pathways to affect downstream habitats and species; and
    - Introduction or spread of invasive non-native species.
- Direct or indirect harm or disturbance to or displacement of protected or notable species from machinery, equipment and human activities during construction works along the Proposed Development, including noise and visual disruption.

Environmental / Ecological Clerk of Works

1.9.9 As set out in section 1.3 an Environmental/Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction. The ECoW will be responsible for ensuring the implementation of the measures described within this Species Protection Plan and the application for licences if required.

Site Surveys and Monitoring

1.9.10 Due to the potential for impacts on [redacted], additional pre-construction surveys will be undertaken to identify any new sett construction and/or [redacted] presence within 50m of potential working areas.

Update of Data and Impact Assessment

1.9.11 The results of the additional surveys will be reviewed by the ECoW in conjunction with the previous information and assessments. Licences to authorise works affecting [redacted] or interfering with [redacted] setts will be obtained if required.

1.9.12 Measures proposed will be reviewed and updated where appropriate. The Contractor will be advised of existing/new constraints, together with measures developed by the ECoW. This will include undertaking toolbox talks with relevant construction teams. In addition, the following general good practice measures will be adhered to throughout the construction period by the Contractor.

General Measures

1.9.13 General good practice measures will be adhered to at all times during the construction of the Proposed Development. This includes:

- Construction will be confined as far as possible to those habitats less favoured by [redacted];
- No work will be undertaken within 30m at an active [redacted] sett without a relevant licence;
- Disturbance in the vicinity of any sett where breeding is confirmed or

expected will be avoided during the period 1st December to 30th June inclusive;

- Topsoil rich in earthworms (good [redacted] foraging habitat) should be retained on site and reused in amenity/grassland habitats;
- Any [redacted] fencing used to prevent [redacted] gaining access to roads, or to guide [redacted] to tunnel entrances or passes, must conform to a specification of 2.5mm gauge wire and a 25mm x 50mm welded mesh size;
- Within development areas, depending on expected traffic volumes, provision should be made for the incorporation of traffic calming measures in order to reduce the likelihood of [redacted] road mortality;
- The use of noisy plant and machinery in the vicinity of the protection zone should cease at least two hours before sunset;
- Chemicals should be stored as far away from the setts and [redacted] paths as possible;
- Trenches must be covered at the end of each working day, or include a means of escape for any animal falling in;
- Any temporarily exposed open pipe system should be capped in such a way as to prevent [redacted] gaining access overnight;.
- Water sources (for [redacted]) should always be safeguarded; and
- Trees should be felled away from setts and must not block [redacted]r paths.

Project Specific Measures

1.9.14 No additional project specific measures has been identified in the ES. [redacted] licences will be applied for once the DCO is made. This section shall be updated following issue of those licences to include any additional details included within those licences. Any associated conditions imposed on a licence and details on how all of the work in relation to [redacted] will be included. A species specific mitigation plan/management plan will likely be

required in accordance with any licence.

Summary of Responsibilities

1.9.15 Table A2.9.1 provides a summary of the responsibilities of the parties involved in the Proposed Development.

Table A2.9.1 [redacted] Protection Plan – Summary of Responsibilities	
Party	**Responsibilities**
SP Manweb	Appointment of independent ECoW Provision of relevant survey reports and other material prepared during pre-application stages of the Proposed Development.
ECoW	Undertaking appropriate pre-construction surveys and reporting results. Undertaking appropriate monitoring during construction. Undertaking consultation with Natural England as required. Obtaining protected species licence if required. Establishing exclusion zones as required. Briefing contractor on specific requirements.
Contractor	Assisting the ECoW with implementation of measures. Adhering to measures in of Species Protection Plan. Adhering to conditions of protected species licence (if one is required).

1.10 BATS – SPECIES PROTECTION PLAN

Introduction

1.10.1 This Species Protection Plan has been produced for the Proposed Development in relation to European protected species of bat.

1.10.2 Full details on the bat survey findings recorded during the pre-application stage are contained within ES Chapter 7 Ecology (**DCO document 6.7**) which should be referred to in conjunction with this document.

Legislation

1.10.3 Bats are a Schedule 2 European Protected Species (EPS) under the Conservation (Natural Habitats and Species .) Regulations 2017. Under this legislation a person is guilty of an offence if he acts intentionally or recklessly, or knowingly causes or permits an act, to kill, injure, capture or keep bats, or disturb bats.

Site and Project Description

1.10.4 The habitats along the survey corridor for the Proposed Development are dominated by agricultural land supporting a mixture of arable and (largely improved) grassland fields with scattered ponds. Field boundaries contain mature hedgerows (both species rich and species poor) and trees and there are scattered individual mature trees within the fields which are often associated with ponds. Tree lines, scattered mature trees and a number of broadleaved woodland copses are found along the route of the Proposed Development. Although predominantly within a rural landscape, the proposed route passes a range of built features including roads, a railway line, farm complexes, and residential and commercial buildings.

Background

1.10.5 Bats are known to be present within the survey corridor with surveys previously undertaken confirming no trees identified as having high bat roost potential but some with moderate bat roost potential within 25m of the Proposed Development. As such, bats are required to be considered at an early stage within the Proposed Development to ensure no significant impact

on this species with all appropriate measures in place, including any European Protected Species (EPS) licences where required.

1.10.6 This Species Protection Plan sets out the approach to ensure the protection of bats during the construction of the Proposed Development.

Review of Existing Data

1.10.7 Of the trees considered to have moderate roost potential, none are currently considered likely to be directly affected by the Proposed Development construction works.

1.10.8 Bat activity transects were undertaken at representative locations along the Proposed Development but did not suggest the presence of any roosts in close proximity to the line. Activity levels overall were not high and reflected the open, largely arable/improved grassland habitats crossed by the Proposed Development. As would be expected, bat activity was higher in the vicinity of woodlands, along watercourses and where the hedgerow network provided commuting routes and connected suitable foraging and roosting habitats.

1.10.9 Overall much of the surveyed areas were considered to be of low value for foraging or roosting, comprising exposed open fields often lacking trees suitable for roosting, with more valuable habitat confined to the hedgerow margins. Areas of higher value to bats were considered to be along the watercourse corridors of the River Perry, where tree and hedgerows linked to woodlands in the wider landscape and where clusters of ponds, trees and woodland were well connected and associated with potential roost locations such as farm complexes containing barns and other potentially suitable roost structures.

Sources of Potential Impacts

1.10.10 As addressed within the ES the Proposed Development has the potential to impact upon bats. Impacts are related to the following:

- Direct land take leading to permanent or temporary habitats loss;

- Indirect habitats damage or alteration to habitats (and the species they may support) through:
    - Changes to surface or ground waters (hydrological alteration): alterations to the physical regime, typically water levels/availability to wetland species or habitats;
    - pollution: release of pollutants (for example silt-laden runoff from working areas and fuel spills) into habitats inside or outside the Order Limits including watercourses or ditches which provide pathways to affect downstream habitats and species; and
    - introduction or spread of invasive non-native species.
- Direct or indirect harm or disturbance to or displacement of protected or notable species from machinery, equipment and human activities during construction works along the Proposed Development, including noise and visual disruption.

Environmental / Ecological Clerk of Works

1.10.11 As set out in section 1.3 an Environmental/Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction. The ECoW will be responsible for ensuring the implementation of the measures described within this Species Protection Plan.

Site Surveys and Monitoring

1.10.12 Bat species soprano and common pipistrelle, noctule, myotis species, and nyctalus species were identified during ES surveys. The most commonly recorded species was soprano pipistrelle. Additional pre-construction surveys of the trees with bat potential will be undertaken.

1.10.13 Should moderate roost potential trees require pruning back or removal, this will be subject to further survey (climbing inspection) to confirm whether or not they support bat roosts. Trees with low roost potential requiring removal will be subject to ‘soft felling’ techniques under supervision.

Update of Data and Impact Assessment

1.10.14 The results of the additional surveys will be reviewed by the ECoW in conjunction with the previous information and assessments. Where appropriate Protected Species Licences will be obtained.

1.10.15 Measures proposed will be reviewed and updated where appropriate. The Contractor will be advised of existing/new constraints, together with measures developed by the ECoW. This will include undertaking toolbox talks with relevant construction teams. In addition, the following general good practice will be adhered to throughout the construction period by the Contractor.

General Measures

1.10.16 General good practice measures will be adhered to at all times during the construction of the Proposed Development. This includes:

- Prior to removal of any trees they will be surveyed to assess their potential for roosting bats as per the latest BCT Guidelines;

Project Specific Measures

1.10.17 The Proposed Development has avoided affecting trees as far as possible through a process of iterative design and alignment. The route passes through a relatively open landscape with scattered trees, treelines and small woodland copses identified along the surveyed corridor within areas dominated by arable and improved grassland fields under agricultural management.

1.10.18 No large section of hedgerow removal is proposed for construction. The short sections of hedgerow that will be temporarily removed to construct the Proposed Development are only 4m in length. The small lengths involved are easily crossed by bats and would not represent a barrier to flight lines or connectivity.

1.10.19 Pre-construction checks on trees with identified moderate bat roost potential affected by the proposed works and the application for licences if required to ensure no disturbance occurs during the construction phase.

Summary of Responsibilities

1.10.20 Table A2.10.1 provides a summary of the responsibilities of the parties involved in the Proposed Development.

Table A2.10.1 Bats Protection Plan – Summary of Responsibilities

Party	Responsibilities
Employer (SP Manweb/IEC)	Appointment of independent ECoW Provision of relevant survey reports and other material prepared during pre-application stages of the Proposed Development.
ECoW	Undertaking appropriate pre-construction surveys and reporting results. Undertaking appropriate monitoring during construction. Undertaking consultation with Natural England as required. Obtaining protected species licence if required. Briefing contractor on specific measures and measures.
Contractor	Assisting the ECoW with implementation of measures. Adhering to requirements of Species Protection Plan. Adhering to conditions of protected species licence (if one is required).

1.11 GREAT CRESTED NEWTS – SPECIES PROTECTION PLAN

Introduction

1.11.1 This Species Protection Plan has been produced for the Proposed Development in relation to European protected species of great crested newts *Triturus cristatus* (GCN).

1.11.2 Full details on GCN findings recorded during the ES are contained within Chapter 7 Ecology (**DCO document 6.7**) and Appendix 6.7.6 Amphibians (**DCO document 6.7.6**) which should be referred to in conjunction with this document.

Legislation

1.11.3 GCN are a Schedule 2 European Protected Species (EPS) under the Conservation (Natural Habitats and Species) Regulations 2017. Under this legislation a person is guilty of an offence if he acts intentionally or recklessly, or knowingly causes or permits an act, to kill, injure, capture or keep GCNs, or disturb GCN.

1.11.4 It is anticipated that an EPS Low impact class licence will be required for construction works. Some works may be carried out under Reasonable Avoidance Measures Method Statement (RAMs) and this Protection Plan will be used as the basis for those RAMs.

Site and Project Description

1.11.5 The majority of ponds within the survey area are field ponds in managed agricultural land, generally arable or improved grassland. A number of these ponds are isolated within open fields, lacking good habitat connectivity or extensive areas of high quality foraging or refuge habitat nearby apart from a narrow border of trees and scrub around their banks. Field ponds lying at the boundaries of fields adjacent to hedgerows or woodland copses have better habitat connectivity and higher quality terrestrial habitat nearby for great crested newts and other amphibians.

1.11.6 It is considered that the dominant habitats (arable and grazed improved grassland farmland) provide low value amphibian terrestrial habitat, with

higher value habitats provided by woodland copses, hedgerows and associated ditches, unmanaged scrub and ruderal vegetation present in limited areas, mainly along watercourse banksides.

Background

1.11.7 Ponds identified within 50m of the Proposed Development were subject to a Habitat Suitability Index (HSI) assessment with 21 ponds potentially suitable for GCN identified for follow-up presence-absence survey. Water sampling for amphibian environmental DNA (eDNA) was undertaken to confirm presence-absence.

1.11.8 Of the 21 ponds that were surveyed, nine tested positive for the presence of GCN. There was generally good correlation between HSI and eDNA results with positive eDNA results from ponds whose HSI score ranged from Good-Excellent.

1.11.9 As such, GCN are required to be considered at an early stage within the Proposed Development to ensure no significant impact on this species with all appropriate measures in place, including any European Protected Species (EPS) licences.

1.11.10 This Species Protection Plan sets out the approach to ensure the protection of GCN during the construction of the Proposed Development.

Review of Existing Data

1.11.11 The ES concludes that there will be no loss of any ponds as a result of the Proposed Development. Poles are mainly located well away from pond banks, thereby reducing the potential for indirect effects on aquatic habitats. The underground sections of the Proposed Development do not lie within 50m of any pond.

Sources of Potential Impacts

1.11.12 As addressed within the ES the Proposed Development has the potential to impact upon GCN. Impacts are related to the following:

- Direct land take leading to permanent or temporary habitats loss;

- Indirect habitats damage or alteration to habitats (and the species they may support) through:
    - Changes to surface or ground waters (hydrological alteration): alterations to the physical regime, typically water levels/availability to wetland species or habitats;
    - pollution: release of pollutants (for example silt-laden runoff from working areas and fuel spills) into habitats inside or outside the Order Limits including watercourses or ditches which provide pathways to affect downstream habitats and species; and
    - introduction or spread of invasive non-native species.
- Direct or indirect harm or disturbance to or displacement of protected or notable species from machinery, equipment and human activities during construction works along the Proposed Development, including noise and visual disruption.

Environmental / Ecological Clerk of Works

1.11.13 As set out in section 1.3 an Environmental/Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction. The ECoW will be responsible for ensuring the implementation of the measures described within this Species Protection Plan. The EC0W will develop the RAMs or apply for the EPS licence.

Site Surveys and Monitoring

1.11.14 Due to the potential for impacts on GCN, additional pre-construction surveys will be undertaken.

Update of Data and Impact Assessment

1.11.15 The results of the additional surveys will be reviewed by the ECoW in conjunction with the previous information and assessments. Where appropriate EPS licences will be obtained.

1.11.16 Measures proposed will be reviewed and updated where appropriate. The Contractor will be advised of existing/new constraints, together with

measures developed by the ECoW. This will include undertaking toolbox talks with relevant construction teams. In addition, the following general good practice will be adhered to throughout the construction period by the Contractor.

General Measures

1.11.17 General good practice measures will be adhered to at all times during the construction of the Proposed Development. These measures will be the basis for the RAMs. This includes:

- All works, including access tracks and laydown areas will take place within a clearly demarcated works area, as defined on a plan.
- Terrestrial habitat around a pond provides feeding and sheltering for GCN when they are out of water and as such the area up to around 500m surrounding a pond should be considered as potential /GCN habitat;
- Vegetation removal will not occur if the habitat has potential for overwintering GCN. Any potential overwintering refuges, fallen timber (for example) will be left in situ wherever possible. In the event that they must be moved they will be relocated closer to an identified newt pond in suitable habitat.
- Material shall not be stored in areas which may be used by GCN.
- Excavations in proximity to GCN habitat should be filled in or covered over at night. Alternatively, escape routes can be incorporated into the excavation. Any excavations left open overnight shall be checked each morning prior to the commencement of works.

Project Specific Measures

1.11.18 No project specific measures has been identified in the ES. GCN EPS licences will be applied for once the DCO is made. This section shall be updated following issue of those licences to include any additional details included within those licences. Any associated conditions imposed on a

licence application and details on how all of the work in relation to GCN will be included. A species specific mitigation plan/management plan will likely be required in accordance with any licence.

Summary of Responsibilities

1.11.19 Table A2.11.1 provides a summary of the responsibilities of the parties involved in the Proposed Development.

Table A2.11.1 Great Crested Newts Protection Plan – Summary of Responsibilities

Party	Responsibilities
Employer (SP Manweb/IEC)	Appointment of independent ECoW Provision of relevant survey reports and other material prepared during pre-application stages of the Proposed Development.
ECoW	Undertaking appropriate pre-construction surveys and reporting results. Undertaking appropriate monitoring during construction. Undertaking consultation with Natural England as required. Obtaining protected species licence if required. Establishing protection zone as required. Briefing contractor on specific requirements.
Contractor	Assisting the ECoW with implementation of measures. Adhering to measures in Species Protection Plan. Adhering to conditions of EPS licence

1.12 REPTILES – SPECIES PROTECTION PLAN

Introduction

1.12.1 This Species Protection Plan has been produced for reptiles.

1.12.2 Details on reptile survey findings recorded during the pre-application stage are contained within ES Chapter 7 Ecology (**DCO document 6.7**) and Appendix 7.3 Phase 1 Habitat Survey (**DCO document 6.7.3**) which should be referred to in conjunction with this document.

Legislation

1.12.3 Reptiles, including snakes (adders, grass and smooth), lizards (sand and common) and slow worm are protected under the Wildlife and Countryside Act 1981 (as amended) against intentional or reckless killing and injuring and against trade.

Site and Project Description

1.12.4 Arable habitats and improved grassland along the Proposed Development are intensively farmed and would not hold substantial viable reptile populations. Small extents of potentially more suitable habitat comprising narrow field margins along the bases of hedgerows, scrub and dense marginal vegetation along watercourses and ditches and woodland edges was recorded at a limited number of locations, along with refuge habitat such as log piles. However, there were no extensive areas of high habitat suitability or with good connectivity to high suitability habitat in the wider area suitable to support more than small populations of or individual reptiles within the surveyed area or nearby.

1.12.5 On a precautionary basis it is considered that individuals of common species of reptile may potentially be occasionally present along the survey corridor, for example grass snake around damp habitats especially along watercourse riparian corridors.

Background

1.12.6 Reptiles are considered to be present in low numbers in proximity to the Proposed Development. As such, common reptiles are required to be

considered at an early stage within the Proposed Development to ensure no significant impact on this species with all appropriate measures in place.

1.12.7 This Species Protection Plan sets out the approach to ensure the protection of reptiles during the construction of the Proposed Development.

Review of Existing Data

1.12.8 The ES concludes that the nature of the Proposed Development entails a restricted construction footprint and construction proceeds in a largely linear way, meaning that habitat disturbance will be temporary and short term at any given location along the route. There will be inconsequential loss of suitable reptile habitat and hence negligible fragmentation effects on reptiles (if present near the construction area).

Sources of Potential Impacts

1.12.9 As addressed within the ES the Proposed Development has the potential to impact upon reptiles. Impacts are related to the following:

- Direct land take leading to permanent or temporary habitats loss
- Indirect habitats damage or alteration to habitats (and the species they may support) through:
    - Changes to surface or ground waters (hydrological alteration): alterations to the physical regime, typically water levels/availability to wetland species or habitats;
    - pollution: release of pollutants (for example silt-laden runoff from working areas and fuel spills) into habitats inside or outside the Order Limits including watercourses or ditches which provide pathways to affect downstream habitats and species; and,
    - introduction or spread of invasive non-native species; and

1.12.10 Direct or indirect harm or disturbance to or displacement of protected or notable species from machinery, equipment and human activities during construction works along the Proposed Development, including noise and visual disruption.

Environmental / Ecological Clerk of Works

1.12.11 As set out in section 1.3 an Environmental/Ecological Clerk of Works (ECoW) will be appointed prior to the commencement of construction. The ECoW will be responsible for ensuring the implementation of the measures described within this Species Protection Plan.

Site Surveys and Monitoring

1.12.12 Due to the low potential for impacts on common reptiles, further pre-construction surveys are unlikely to identify populations of reptiles.

Update of Data and Impact Assessment

1.12.13 Previous information and assessments will be reviewed by the ECoW.

1.12.14 Measures proposed will be reviewed and updated where appropriate. The Contractor will be advised of existing constraints, together with measures developed by the ECoW. This will include undertaking toolbox talks with relevant construction teams. In addition, the following general good practice will be adhered to throughout the construction period by the Contractor.

General Measures

1.12.15 General good practice measures will be adhered to at all times during the construction of the Proposed Development. This includes:

- Where possible, micro-siting will be undertaken so that areas used by reptiles are not developed/used as temporary laydown areas.
- All works, including access tracks, laydown areas will take place within a clearly demarcated works area illustrated on a plan.
- Measures will be designed by appropriately experienced ecologists and be installed under expert ecological supervision if necessary using specialist contractors.

Project Specific Measures

1.12.16 No additional project specific measures are proposed.

Summary of Responsibilities

1.12.17 Table A2.12.1 provides a summary of the responsibilities of the parties involved in the Proposed Development.

Table A2.12.1 Common Reptiles Protection Plan – Summary of Responsibilities

Party	Responsibilities
SP Manweb	Appointment of independent ECoW Provision of relevant survey reports and other material prepared during pre-application stages of the Proposed Development.
ECoW	Undertaking appropriate monitoring during construction. Undertaking consultation with Natural England as required.
Contractor	Assisting the ECoW with implementation of measures. Adhering to measures in Species Protection Plan.

1.13 BIRDS – SPECIES PROTECTION PLAN

Introduction

1.13.1 This Species Protection Plan has been produced for the Proposed Development in relation to wild birds.

1.13.2 Full details on the bird survey findings recorded during the pre-application stage are contained within ES Chapter 7 (**DCO document 6.7**) which should be referred to in conjunction with this document.

Legislation

1.13.3 All wild birds are protected by law under the Wildlife & Countryside Act 1981 and by the Conservation (Natural Habitats and Species) Regulations 2017 and Countryside and Rights of Way Act 2000, making it an offence to:

- kill or injure any wild bird;
- capture or keep (alive or dead) any wild bird;
- destroy or take the egg of any wild bird;
- sell or advertise for sale any wild bird or its eggs; and
- destroy, damage, interfere with, take or obstruct the use of the nest of any wild bird while it is in use or being built.

1.13.4 Additional protection is given to rare breeding birds listed under Schedule 1 of the Wildlife and Countryside Act 1981. It is an offence to intentionally or recklessly disturb any Schedule 1 species while they are nest building, or at a nest containing eggs or young, or disturb the dependent young of such birds.

Site and Project Description

1.13.5 The survey area is largely dominated by open arable/pastoral farmland with woodland copses, networks of hedgerows and watercourses including the Rivers Roden and Perry, and the Montgomery Canal.

Background

1.13.6 Target bird species (such as Schedule 1 species, species considered vulnerable to collision, bird species present during the breeding season) are known to be present in proximity to the Proposed Development. As such

they require to be considered at an early stage within the Proposed Development to ensure no significant impact on this species with all appropriate measures in place.

1.13.7 This Species Protection Plan sets out the approach to ensure the protection of birds during the construction of the Proposed Development.

Review of Existing Data

1.13.8 Surveys undertaken for the ES confirmed the Proposed Development does not constitute a particularly sensitive area for target species of birds and does not support large numbers of vulnerable species such as geese or other waterfowl. Small numbers (1-2 pairs) of lapwing were observed attempting to breed in a small number of the numerous large open fields present across the survey area, however agricultural management and ploughing of fields meant that little or no successful breeding was noted. Numerous heron flights were recorded in winter passing north-south and intersecting the Proposed Development. Flights were however all above the height of the proposed overhead line. Few intersecting flights were recorded in the spring/early summer, suggesting that heron movements changes seasonally in the area.

Sources of Potential Impacts

1.13.9 As addressed within the ES the Proposed Development has the potential to impact upon birds. Impacts are related to the following:

- Disturbance/displacement of target bird species
- Breeding birds may be affected if works are carried out during the breeding season
- Collision risk with the overhead line
- Increased predation through the use of the new poles as hunting perches by raptors

ECoW

1.13.10 As set out in section 1.3 an ECoW will be appointed prior to the

commencement of construction. The ECoW will be responsible for ensuring the implementation of the measures described within this Species Protection Plan.

Site Surveys and Monitoring

1.13.11 Due to the potential for impacts on target birds species, additional pre-construction surveys will be undertaken. Nest checks by a suitably qualified ecologist will be undertaken.

Update of Data and Impact Assessment

1.13.12 The results of the additional surveys will be reviewed by the ECoW in conjunction with the previous information and assessments. Where appropriate Protected Species Licences will be obtained.

1.13.13 Measures proposed will be reviewed and updated where appropriate. The Contractor will be advised of existing/new constraints, together with measures developed by the ECoW. This will include undertaking toolbox talks with relevant construction teams. In addition, the following general good practice will be adhered to throughout the construction period by the Contractor.

General Measures

1.13.14 General good practice measures will be adhered to at all times during the construction of the Proposed Development. This includes:

- In advance of construction, appropriate bird surveys will be undertaken to ensure no impacts on Schedule 1 or 1A birds, which breed all year round;
- In open areas suitable for ground nesting birds, measures including placement of Hawkeye bird scarers, ticker tape or scarecrows (e.g from old PPE) and strimming may be used to discourage birds nesting (providing no Schedule 1 or 1A species are present);
- All works, including access tracks and laydown areas will take place within a clearly demarcated works area as defined on a plan; and

- Should birds be found breeding during construction, a protection zone will be erected around the nesting site and left until the young have fledged. It is an offence to remove any birds nest while it is being built or in use. If a bird nest is to be removed then it must be shown to be disused.

Project Specific Measures

1.13.15 No project specific measures are identified for birds.

Summary of Responsibilities

1.13.16 Table A2.13.1 provides a summary of the responsibilities of the parties involved in the Proposed Development.

Table A2.13.1 Bird Protection Plan – Summary of Responsibilities

Party	Responsibilities
SP Manweb	Appointment of independent ECoW Provision of relevant survey reports and other material prepared during pre-application stages of the Proposed Development.
ECoW	Undertaking appropriate surveys during construction. Undertaking consultation with Natural England as required.
Contractor	Assisting the ECoW with implementation of good practice measures. Adhering to measures in this Species Protection Plan.

1.14 HEDGEROW MANAGEMENT PLAN

Introduction

1.14.1 This Hedgerow Management Plan (HMP) has been produced for the Proposed Development and sets out the measures required to ensure protected features on site and existing hedgerows are adequately protected.

1.14.2 Full details on the hedgerow survey findings recorded during the environmental impact assessment are contained within Chapter 7 Ecology of the ES (**DCO document 6.7**) which should be referred to in conjunction with this document.

1.14.3 The purpose of the HMP is to identify potentially affected hedgerows and set out proposed measures. The HMP shall provide a link between the design phase of the project, the consenting process and construction. The HMP is provided in support of the DCO application and is secured through a requirement in the DCO.

1.14.4 Hedgerows are distinctive features of the countryside in England and Wales. As the most traditional type of field boundary in many areas, hedgerows and the field banks on which they often run are often of considerable historic interest.

1.14.5 Many hedgerows contain a great diversity of species both plant and wildlife. Their role in conserving and enhancing biodiversity is recognised in the section 41 list of Habitats of Principal Importance for Conservation of Biological Diversity in England. The section 41 list is used to guide decision-makers such as public bodies in implementing their duty under section 40 of the Natural Environment and Rural Communities Act 2006 to have regard to the conservation of biodiversity in England, when carrying out their normal functions.

1.14.6 Plan of Important Hedgerows (**DCO document 2.5**) identifies those hedgerows listed as “Important” affected by the Proposed Development.

Project Specific Considerations

1.14.7 All hedgerows within 50m of the Proposed Development were identified and

assessed in the ES. The survey corridor identified field boundaries containing mature hedgerows (both species rich and species poor). Important hedgerows were also identified.

1.14.8 Protection of these hedgerows through avoidance and minimisation of damage and loss is necessary for the following reasons:

- Priority habitat; and
- Considered to meet the relevant ecological criteria to be considered important under the Hedgerow Regulation 1997.

1.14.9 Works shall require the removal of hedgerows for construction of the Proposed Development to facilitate the location of wood poles and in a few instances to increase the size of some existing field accesses.

General Measures

1.14.10 There are no additional general measures in relation to this Hedgerow Management Plan.

Project Specific Measures

Proposed Construction Works

Accesses

1.14.11 The construction accesses routes have been identified to make use of the most suitable local roads from the main construction compound at Maesbury road. Existing farm accesses and field gates used by farmers will also be utilised to access the working areas along the route of the Proposed Development.

1.14.12 The construction accesses into and between fields have been chosen to intentionally avoid breaching the many field boundary hedgerows that the Proposed Development crosses. These construction accesses allow access to every pole position along the route of the Proposed Development.

1.14.13 Construction activities near hedgerows will be undertaken in line with British Standard 5837: 2012 *Trees in Relation to Design, Demolition and Construction - Recommendations.*

Pole Locations

1.14.14 Where the proposed overhead line crosses field boundary hedgerows, these hedgerows have been assessed in terms of their historic and/or ecological value and therefore their importance in terms of the relevant statutory hedgerow regulations. Where poles are proposed, a limit of deviation will be applied to ensure that the hedgerow is not affected and is oversailed.

1.14.15 Where section poles are shown indicatively close to a hedge on the Works Plans (**DCO Document 2.3.0 – 2.3.16**) then these hedgerows shall be uplifted and temporarily stored to one side whilst the area is excavated and the pole installed. The length of hedgerow removed will be a maximum of 2.5m in length. (the width of the excavation required for a double H-pole, the largest structure proposed).

1.14.16 On completion of the development, all hedgerows between pole structures shall be reinstated following the proposed method detailed in section 1.14.28 - 1.14.34.

Identification of Hedgerows

1.14.17 Prior to construction works commencing the contractor shall prepare a schedule detailing all hedgerows affected by the Proposed Development and the works proposed. This shall be agreed with the ECoW.

Pre-Construction Surveys

1.14.18 Following identification of required hedgerow removal, pre-construction surveys for protected and invasive species shall be carried out. Some flexibility in micrositing of poles will allow some more sensitive hedgerow species to be avoided. If hedgerow removal is required during the bird breeding season (March – September) additional checks shall be required to ensure no nests are affected. During this period these checks shall be no longer than 48hrs in advance of removal works.

Removal

1.14.19 The Contractor and ECoW shall agree the method for hedgerow removal for accesses and pole locations. This method may vary for each location and shall ensure potential adverse environmental effects are minimised.

1.14.20 Work shall be planned to limit disturbance to those sections of the hedgerow that are not proposed for removal, including roots of hedge plants. The optimal time for hedgerow removal is in the winter months whilst the plants are in a dormant growth phase.

1.14.21 Hedgerows shall be hard-pruned in the autumn prior to construction after the bird breeding season to render the hedgerow unsuitable for various overwintering species and nesting birds the following season.

1.14.22 The section of hedgerow for removal will be clearly marked on site to ensure minimum take.

1.14.23 In respect of hedgerow removal for the erection of poles, the shortest length of hedgerow necessary will be removed with the maximum length being no greater than 2.5m. This will be achieved through clear and accurate marking prior to works commencing.

Temporary Removals

1.14.24 Where excavations and reinstatements for pole installations occur over a short period of time, the intention is to temporarily remove the hedgerow. The section of hedgerow will be lifted, including root growth and associated soil, using an excavator. Roots shall be cut during the lifting operations to prevent excessive damage to the adjoining sections of the hedgerow.

1.14.25 This section of intact hedgerow will be set aside as the pole is constructed and installed, and the excavations refilled. The section of hedgerow will then be replaced back in its original position. The hedgerow will be replaced within 48hrs.

Other Removals

1.14.26 One short sections of hedgerow will be required to be cut back to increase

the size of an existing field access. Once the hedgerow is removed a gated access and required fencing shall be installed to maintain continuity along the boundary.

1.14.27 All operations shall be undertaken by suitably qualified persons. Machinery including chainsaws and excavators shall be used to remove the required section of hedgerow. Hedgerows removed will either be mulched on site and used in reinstatement or shall be disposed of at a licensed waste facility. Burning of cut hedgerow material on site shall not be permitted under any circumstances.

Reinstatement

1.14.28 All reinstatements of hedgerows shall ensure compatible species are used during the reinstatement. If the hedgerow is in a poor condition, a species rich but still reflective mix will be planted.

1.14.29 Reinstatement and planting shall be undertaken in suitable weather conditions so as not to stress the plants. No planting shall be undertaken if the ground is frozen or waterlogged. Hedgerows shall be watered when out and when replaced as necessary.

1.14.30 Hedgerow species shall be two year old root trained grown stock of native origin, obtained from reputable suppliers and delivered to site ready for planting. The replanting shall be in an appropriate pattern to ensure integration with the structure of the undisturbed section.

1.14.31 Planting shall be at a density of six plants per linear metre in a double staggered row in accordance with the proposed species mix. All newly planted hedgerows shall be protected to prevent damage to the young plants from livestock. Rabbitproof fencing shall be installed where necessary. Species replanted shall include hawthorn, blackthorn, Hazel, elder, Rose sp., Oak sp., Field Maple and Holly. A standard detail for hedgerow planting can be found at the end of the Plan.

Maintenance

1.14.32 A programme of maintenance shall be devised to ensure weed control and replacement of non-surviving stock. Monitoring of reinstated hedgerows shall be undertaken 12 months after construction is completed to ensure recovery has been successful. Where plants have failed, new appropriate native species will be planted into the hedgerow.

1.14.33 The first cut to newly planted hedgerows shall take place within years 2 to 3 (dependant on growth), and shall consist of 'facing up' either side of the hedge. Additional hedge cutting may be required from a health and safety perspective should there be a good growing season although this is unlikely within the first few years of establishment, but shall be monitored.

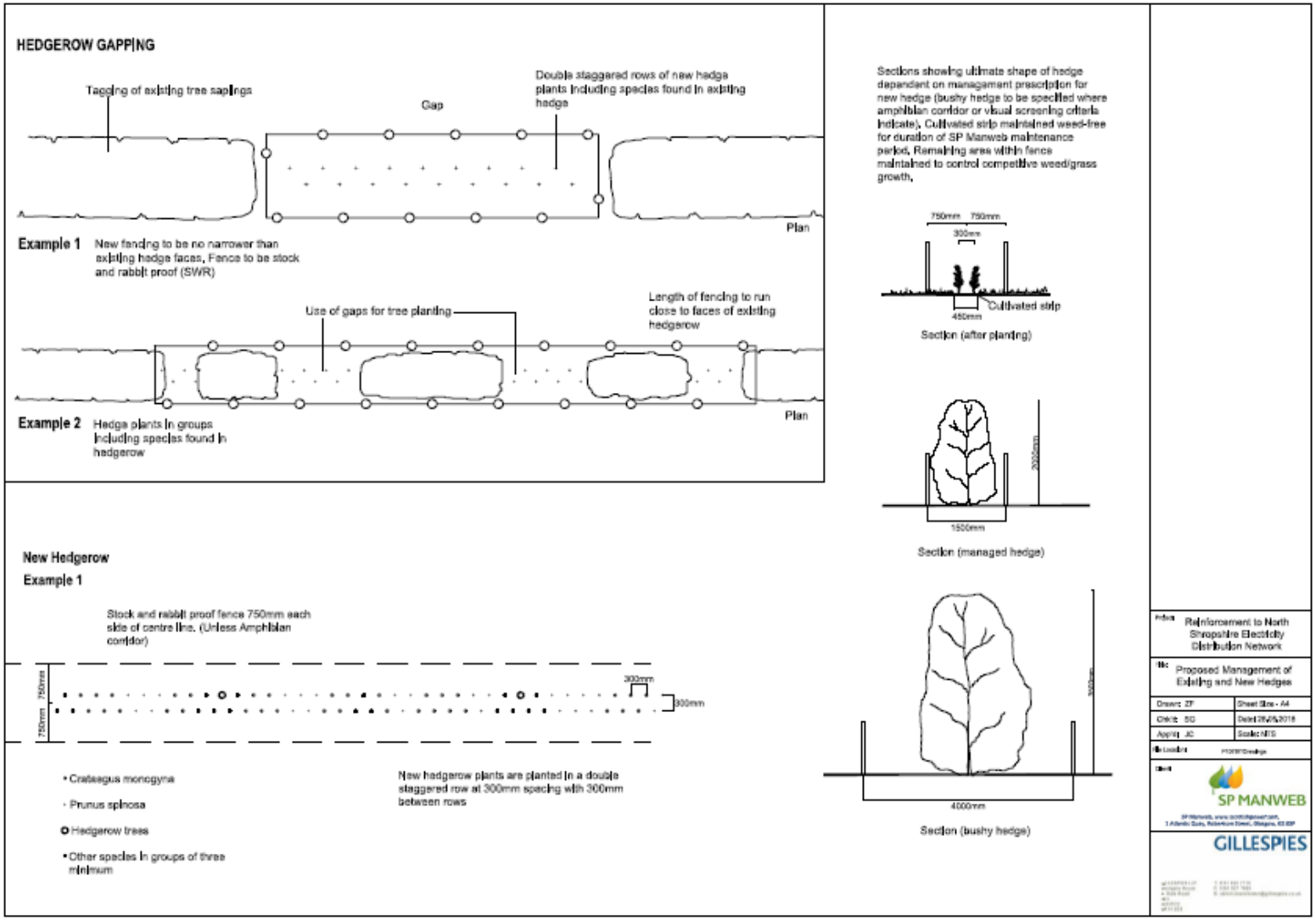
1.14.34 Newly planted hedgerows shall be cut in an 'A' shape to maintain a wide base for bird nesting and roosting and only one side shall be cut annually unless health and safety issues necessitates that both sides are cut. All such hedge cuts must be undertaken using appropriate hand or power tools or mechanical methods of management.

Summary of Responsibilities

1.14.35 Table A2.14.1 provides a summary of the responsibilities of the parties involved in the Proposed Development.

Table A2.14.1 Hedgerow Management Plan – Summary of Responsibilities

Party	Responsibilities
SP Manweb	Review risk assessments and method statements prepared by contractor
ECoW	Undertaking appropriate surveys during construction. Undertaking consultation with Natural England as required.
Contractor	Assisting the ECoW with implementation of good practice measures. Adhering to measures in this Management Plan.


HEDGEROW GAPPING
Tagging of existing tree saplings
Gap
Double staggered rows of new hedge plants including species found in existing hedge
Plan
Example 1
New fencing to be no narrower than existing hedge faces. Fence to be stock and rabbit proof (SWR)
Use of gaps for tree planting
Length of fencing to run close to faces of existing hedgerow
Plan
Example 2
Hedge plants in groups including species found in hedgerow
New Hedgerow
Example 1
Stock and rabbit proof fence 750mm each side of centre line. (Unless Amphibian corridor)
750mm
750mm
300mm
300mm
• Crataegus monogyna
· Prunus spinosa
O Hedgerow trees
• Other species in groups of three minimum
New hedgerow plants are planted in a double staggered row at 300mm spacing with 300mm between rows
Sections showing ultimate shape of hedge dependant on management prescription for new hedge (bushy hedge to be specified where amphibian corridor or visual screening criteria indicate). Cultivated strip maintained weed-free for duration of SP Manweb maintenance period. Remaining area within fence maintained to control competitive weed/grass growth.
750mm 750mm
300mm
Cultivated strip
450mm
Section (after planting)
3000mm
1500mm
Section (managed hedge)
3000mm
4000mm
Section (bushy hedge)
Project
Reinforcement to North Shropshire Electricity Distribution Network
Title
Proposed Management of Existing and New Hedges
Drawn: ZF
Sheet Size - A4
Chkd: SG
Dated:28/05/2018
Appvd: JC
Scale: NTS
File Location
Client
SP MANWEB
GILLESPIES

1.15 POLLUTION PREVENTION PLAN

Introduction

1.15.1 This Pollution Prevention Plan sets out the measures to be implemented to protect the water environment and ensure that the Proposed Development does not result in significant impacts on surface and ground water resources.

Project Specific Considerations

1.15.2 Relevant constraints or impacts which are addressed within this plan are identified in the ES and include watercourses, canals and other sensitive habitats.

General Measures

Relevant Guidance

1.15.3 Construction of the Proposed Development will be carried out in accordance with all current good practice guidance including:

- WAT-SG-25 Engineering in the Water Environment: Good Practice Guide, River Crossings;
- WAT-SG-26 Engineering in the Water Environment: Good Practice Guide, Sediment Management;
- WAT-SG-29 Engineering in the Water Environment: Good Practice Guide, Temporary Construction Methods;
- CIRIA Report C532 Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors;
- CIRIA Handbook C650 Environmental Good Practice on Site;
- The Forests and Water Guidelines (Forestry Commission); and
- British Standard 6031: 2009 *Code of practice for Earthworks*.

Scheduling of works

1.15.4 Works shall be scheduled to:

- Reduce the periods for which soils are exposed and stockpiled thereby reducing the risk of generating silt laden runoff;
- Avoid where possible undertaking specific activities such as earthworks

during prolonged and heavy rainfall thereby reducing the risk of sediment or pollutants becoming entrained in excess runoff; and

- Avoid where possible undertaking particular works in closer proximity to watercourses when water levels are higher and adjacent land is at risk of flooding.

Storage of Chemicals, Fuels and Oil

1.15.5 Fuel shall be stored:

- In areas where potential for contamination of water bodies is low i.e. outwith 50 metres of a spring, well or borehole and 10 meters of an open watercourse;
- In areas that are low risk of flooding;
- In tanks that meet the manufacturing standards appropriate for the type of oil stored and comply with BS EN ISO 9001;
- With contents clearly marked on their storage containers;
- With secondary containment (a bund or drip tray) where required;
- With secure and appropriately sized bunds being suitable to contain 110% of the contents (single tank). If more than one storage container is involved, the bund must be capable of containing 110% of the largest tank, or 25% of the total aggregate capacity, whichever is the greatest; and
- Tanks/ storage containers shall be protected against vehicle collision.

Additional Measures:

- Storage will be minimalised;
- Any tanks or drums of non-oil based chemicals must be recorded and additional records kept as required by the Control of Substances Hazardous to Health Regulations 2002 (COSHH Regulations);
- All storage containers will be checked daily for oil and fuel leaks and record of such checks kept by the contractor; and
- Leaking or empty drums must be removed from the site immediately and appropriately disposed of.

Movement, Parking and Re-fuelling of Vehicles and Plant

1.15.6 Vehicles and plant will comply with the following:

- Movement of construction plant and vehicles will be limited to clearly defined access tracks and construction areas only in order to prevent compaction and erosion of undeveloped ground;
- All construction plant and vehicles will be parked/stored at least 10m away from surface waterbodies and springs;
- All construction plant and vehicles will be checked daily for oil and fuel leaks and record of such checks kept by the construction contractor;
- Mobile plant will be in good working order, kept clean and fitted with drip trays where appropriate;
- Refuelling of construction plant and vehicles will be undertaken on an impermeable surface at a temporary construction compound only; and
- All refuelling activities will be supervised by site personal with emergency response training.

Silt Control

1.15.7 The following measures will be implemented in order to reduce the potential generation of silt laden runoff:

- Bare ground exposure shall be minimised by only removing vegetation from areas that require to be exposed in the near future and completing reinstatement as soon as practicably possible;
- Stockpiles of excavated soils will be located away from surface watercourses and away from known surface drainage pathways as much as possible;
- Pumped water from excavations and de-watering activities will be drained to a suitably sized settlement pond to remove silt before discharge;
- Site roads will be regularly maintained and kept free from sediment deposits in order to reduce the volume of silt becoming entrained in surface runoff and entering any watercourse or drain;
- Watercourses will be monitored regularly with additional monitoring during periods of high rainfall and construction activities with potential for

significant run-off; and

- Additional measures will be implemented as required (silt fencing, placement of straw bales into ditches, sediment traps) to intercept and collect silt, reduce runoff velocity and encourage deposition of suspended sediment.

Emergency Spill Response

1.15.8 Any spillage shall be dealt with in accordance with the Environmental Incident Response Plan (see section 1.4.9). which shall be developed prior to the commencement of Development. This will comply with the following:

- Site personal shall be provided with emergency spill response training;
- Spill kits shall be made available at fuel storage and refuelling locations; and in individual plant and vehicles; and
- Specific emergency response actions shall be detailed in the Environmental Incident Response Plan.

Monitoring and Record Keeping

1.15.9 The COSHH record for any chemicals stored on site will be kept and updated by the Contractor.

1.15.10 Records will be kept of all visual fuel and oil checks of construction plant, vehicles and fuel and oil storage containers by the Contractor.

1.15.11 Monitoring of sensitive watercourses will be required during construction of the Proposed Development. The frequency and nature of monitoring will be proportionate to the sensitivity of the water environment and the risks posed by construction. This could include regular visual inspections of watercourses.

Project Specific Measures

1.15.12 No additional project specific measures are required.

Summary of Responsibilities

1.15.13 The content of this table has been prepared to clearly illustrate who is responsible for the different activities during construction.

Table A2.15.1 Pollution Prevention Plan – Summary of Responsibilities	
Party	**Responsibilities**
SP Manweb	Review risk assessments and method statements prepared by Contractor
ECoW	Inspect and monitor construction activities. Assist with any training required
Contractor	Ensure construction activities follow the general measures set out above. Responsible for the implementation of the Environmental Incident Response Plan and recording of information relating to chemicals and spills

1.16 WATERCOURSE CROSSING REGISTER

Introduction

1.16.1 The main aim of the Watercourse Crossing Register is to manage the construction activities in proximity to the watercourses and canal crossed by the Proposed Development. No works are proposed within the rivers or canal but construction activities will take place adjacent to, and over, the watercourses. To ensure construction activities are controlled in this sensitive environment the following measures are set out for each river and canal. There are also a large number of drainage ditches in the Proposed Development area. Most of these were found to be dry for the majority of the year but The Environment Agency (EA) state that these could support populations of water voles and otters.

Project Specific Considerations

1.16.2 Where the proposed overhead line crosses the Montgomery Canal, Rivers Perry and Roden, the conductors will be strung across without the need to access the water or banks. To enable conductor stringing, a pilot wire will be fired across from one bank to the other, with conductors subsequently pulled over under tension. The conductors will not touch the water during this operation. There is no requirement to erect scaffolding or netting to complete the conductor stringing across the Montgomery Canal.

1.16.3 SP Manweb has discussed the crossing of the Montgomery Canal with the Canal & River Trust. A Code of Practice for Works in proximity to the Canal and a set of protective provisions has been provided by the Trust and SP Manweb's proposed provisions are included in the draft DCO **(DCO Document 3.1)**.

1.16.4 SP Manweb have discussed the crossing of the Rivers Perry and Roden with the Environment Agency (EA) and have agreed a set of working methods for construction activities in proximity to the watercourse. These methods are set out below. The EA have confirmed that the River Perry crossings are exempt from requiring an Environmental Permit (formerly known as a Flood Defence Consent) but, as the overhead line crosses close to their Common

Wood flood defence on the River Roden, a bespoke Flood Risk Environmental Permit is required.

General Measures

1.16.5 Design and construction of all temporary and permanent watercourse crossings will comply with the following:

- Watercourse crossings will be designed and constructed taking into account the guidance contained within WAT-SG-25 *Engineering in the Water Environment: Good Practice Guide, River Crossings*;
- Watercourse crossings will be designed such that they do not restrict water flow or hinder the passage of mammals along the banks; and
- Where works require temporary working within close proximity to surface waters all activities shall be undertaken in accordance with the guidance contained within PPG 5: *Works and Maintenance Near Water*. Measures shall be put in place in order to minimise disturbance of substrate material and silt pollution.

Project Specific Measures

1.16.6 Table A2.16.1 below sets out each watercourse crossed by the Proposed Development, give a brief description of the watercourse, explains the type of crossing proposed and whether any additional licences or permits are required.

Table A2.16.1 Watercourse Crossing Register						
Crossing ID	**Location**	**Watercourse Name**	**Approx. Channel Width**	**Type of Crossing**	**Description & Rationale**	**Environmental Permit required?**
WC01	SJ358295	Montgomery Canal	8.3m	Overhead Line	Important canal for nature, much is designated for plants and wildlife, although not the section crossed by the overhead line.	Protective Provisions for crossing the canal are include in the draft DCO (**DCO document 3.1**)
WC02 WC03 WC04	SJ372294 SJ375293 SJ385292	River Perry	4.7m 6.6m 7.4m	Overhead Line Overhead Line Overhead Line	Classified in 2016 as ecologically Moderate but Good chemically. Licensed abstractions of surface and groundwater in catchment for agricultural purposes, principally for spray irrigation	Construction works > 8m from bank of River. Therefore works exempt from requiring an Environmental Permit.
WC05	SJ492283	River Roden	9.2m	Overhead Line	Classified in 2016 as ecologically Poor but Good	Construction works > 8m from bank of River but close to

Table A2.16.1 Watercourse Crossing Register						
Crossing ID	**Location**	**Watercourse Name**	**Approx. Channel Width**	**Type of Crossing**	**Description & Rationale**	**Environmental Permit required?**
					chemically. Licensed abstractions of surface and groundwater in catchment for agricultural purposes, principally for spray irrigation	the EA Common Wood Flood Defence therefore a bespoke Flood Risk Environmental Permit is required.

Agreed Working Methods for River Perry crossings

1.16.7 The EA sets out conditions that must be met to register a crossing as an exempt activity:

- the service crossing is within 10° of perpendicular to the direction of flow of the main river;
- you erect permanent hazard markers on both banks of the main river;
- your works do not disturb the bed and banks of the main river;
- you remove from the floodplain all excavated material not re-used on the site of the works; and
- the vertical and horizontal clearances of the service crossing comply with the distances below:

Voltage (kV)	Vertical clearance above bank or flood bank crest level (metres)	Horizontal clearance of any tower or support landward from the top of the bank of the main river (metres)
132	12	15

1.16.8 Pre-construction surveys shall also be carried out along drainage ditches to confirm presence/absence of water voles and otters. If water voles or otters are identified the following good practice measures will be followed:

- Site staff will be briefed by means of a Toolbox Talk;
- ECoW will determine if necessary licences are required;
- Ensure the riparian vegetation is maintained; and
- Any excavations left open overnight in proximity to water vole/otter habitat are fenced or fitted with escape planks.

Agreed Working Methods for the Canal Crossing

1.16.9 The Canal & River Trust have requested the following:

- signage shall be located at the Canal crossing to warn anglers of the

danger of fishing in proximity to overhead lines; and

- bird diverters are placed along the overhead line where it crosses the Canal.

1.16.10 The Canal & River Trust have provided a Code of Practice for Works in proximity to the Canal (see Appendix B) and the draft DCO (**DCO Document 3.1**) contains protective provisions.

1.16.11 The towpath/footpath alongside the Canal shall be kept open at all times during the construction works. As per the PRoW management described in sections 1.6.23 - 1.6.25, management will use construction staff at those crossing points where and when construction works affect the towpath/footpath. Towpath/footpath users may have to wait for a short period of time whilst the towpath/footpath is in use by the construction team. Users will be advised when works are completed and it is safe to cross the towpath/footpath by staff at the crossing point.

Summary of Responsibilities

1.16.12 The content of this table has been prepared to clearly illustrate who is responsible for the different activities during construction.

Table A2.16.2 Watercourse Crossing Register – Summary of Responsibilities

Party	Responsibilities
SP Manweb	Review risk assessments and method statements prepared by Contractor
ECoW	Inspect and monitor construction activities
Contractor	Prepare risk assessments and detailed method statements for watercourse crossings. Confirm exact location of Poles in proximity to river crossing

1.17 DRAINAGE MANAGEMENT PLAN

Introduction

1.17.1 This Drainage Management Plan (DMP) sets out the measures to be implemented to protect the water environment and ensure that the Proposed Development does not result in significant impacts on surface and ground water resources.

Project Specific Considerations

1.17.2 Relevant constraints or impacts which are addressed within this plan include:

- Increased flood risk due to location of laydown areas, access tracks and temporary construction activities within the floodplain;
- Release of sediment into surface water during construction activities;
- Accidental release of oils, fuels and construction materials, including accidental release of contaminants into the groundwater, particularly from temporary laydown areas;
- Trenching activities for the underground sections; and
- Drainage of site offices and welfare unit.

General Measures

Drainage System Design Principles

1.17.3 Site Drainage System will comply with the following principles:

- The drainage system will not discharge directly to any waterbody, but will discharge to appropriately sited buffer strips or trenches, preferably on flat ground. The buffer strips will act as filters, minimising sediment transport, attenuating higher velocity flows and maximising infiltration;
- During construction a range of temporary measures will be put in place to manage surface and groundwater flows and prevent pollution. These will be developed in detail prior to construction but shall include silt traps, settlement ponds and buffer strips as required;
- Temporary interception bunds including silt fences and/or matts and straw bales will be installed upslope and downslope of excavations and stockpiles in order to intercept surface water runoff, trap

entrained/suspended sediment and reduce ingress of water to excavations; and

- Artificial drainage will only be installed where necessary. The individual lengths, depths and gradients of these drains will be minimised to avoid intercepting large volumes of diffuse overland flow and generating high velocity flows during storm events.

Project Specific Measures

1.17.4 The main construction compound will be located at an Existing SP Manweb depot at Maesbury Road in Oswestry. New office cabins, welfare unit and storage containers will be all be located in the site. The drainage from these units will be connected into the existing drainage systems at Maesbury road. The welfare unit at the Wem laydown area will be self-contained.

Summary of Responsibilities

1.17.5 The content of this table has been prepared to clearly illustrate who is responsible for the different activities during construction.

Table A2.17.1Drainage Management Plan – Summary of Responsibilities

Party	Responsibilities
SP Manweb	Review risk assessments and method statements prepared by Contractor
ECoW	Inspect and monitor construction activities
Contractor	Prepare risk assessments and detailed method statements for construction activities Ensure construction activities follow the general measures set out above

1.18 TRAFFIC MANGEMENT PLAN

Introduction

1.18.1 This Traffic Management Plan (TMP) sets out measures to be implemented to ensure the appropriate routeing of all traffic generated by the construction of the Proposed Development including abnormal loads.

1.18.2 Access and Rights of Way Plans (ARoW Plans, **DCO document 2.4**) identifies the proposed areas for access required for the Proposed Development. The Construction Report (**DCO document 7.2**) describes how existing farm accesses will be used to access the Proposed Development rather than the need to create new accesses.

1.18.3 Operational traffic will largely comprise of ad-hoc maintenance and scheduled inspections, with the potential for larger scale works in the event of a major failure or natural disaster. The level of traffic generated during the operational phase is expected to be extremely low and thus formal management is not covered within this TMP.

1.18.4 The objectives of the TMP are as follows:

- Ensure that movements of people and materials are achieved in a safe, efficient, timely and sustainable manner;
- Keep construction traffic to a minimum during network peaks to reduce the impact on the highway network during busy periods;
- Ensure that the impact and disruption to the local communities is minimised;
- Minimise construction trips where possible;
- Ensure the continued monitoring, review and subsequent improvement of the CTMP and measures;
- Minimise impacts on the Strategic Road Network (SRN) and Local Road Network (LRN); and
- Minimise impacts on the natural and built environment.

1.18.5 This TMP shall be agreed with Highways England (HE) and Shropshire Council before construction works commence. It is a live document that will be updated and modified as agree with HE and Shropshire Council, as highways authorities, as the Proposed Development progresses and as detailed construction activities are clarified by the Contractor.

Project Specific Considerations

1.18.6 Relevant constraints or impacts which are addressed within this plan are contained with ES Appendix 1.1 Transport and Highway Technical Note (**DCO document 6.1.1**) This includes:

- Construction traffic numbers and movement on local roads to the existing SP Manweb depot at Maesbury Road, Oswestry;
- Construction traffic travelling to the overhead line route.

General Measures

1.18.7 Traffic management measures shall be put in place to protect the condition and safety of the local highways used. These will include:

- making safe vehicular accesses;
- use of wheel washing facilities, dust control, road sweeping;
- noise/ vibration control;
- use of banksmen to ensure safe access/ egress of vehicles;
- convoy support vehicles for wide loads;
- wide load notifications; and
- compliance with width and weight restrictions.

Project Specific Measures

Primary Routes to Site

1.18.8 In order to construct the Proposed Development, access will be required onto and from the public highway network both for construction purposes and on a permanent basis to allow routine maintenance and inspection of the completed infrastructure.

1.18.9 For the majority of the Proposed Development existing gates and field access will be used. A small number of existing accesses will be widened.

1.18.10 Construction traffic will utilise the Strategic Road Network (SRN, A roads and Motorways managed by HE) and the Local Road Network (LRN).

Crossing the Road Network

1.18.11 Scaffolding and nets would normally be erected over major roads to enable the conductors to be pulled out unhindered. On minor roads temporary traffic lights are sufficient to control traffic during stringing activities. Prior to construction the contractor will agree the relevant codes of practice, specifications and procedures with HE and Shropshire Council.

Traffic Management Measures

Traffic Signage

1.18.12 Temporary signage will be erected along construction traffic routes on the LRN to provide directional routeing information for construction vehicles, to ease navigation between the SRN and the construction sites. In addition, temporary signage will be erected along the proposed construction access roads where necessary. The signage will provide construction vehicle drivers with information on the distances to construction sites (destinations) and warning (hazard) information related to potential vehicle conflict or pedestrian conflict areas.

Temporary Traffic Management

1.18.13 Temporary traffic management will be deployed throughout the construction programme. Construction activities that may require temporary traffic management include but are not limited to:

- Improvements to construction access points;
- The construction/dismantling of overhead lines within the vicinity of the highway;
- Erection/netting of scaffolding;
- Haul road crossing points; and

- Delivery of materials to the work areas.

1.18.14 The type of temporary traffic management deployed will vary and could include temporary traffic signals, manned stop/go boards, road narrowing and speed restrictions.

1.18.15 All temporary traffic management implementation plans will need to be approved by HE and Shropshire Council.

1.18.16 Temporary traffic management arrangements will be included as part of the detailed design submission by the Contractor, which will also be subject to approval by the relevant highway authority.

Working Hours

1.18.17 Working hours will be restricted to those defined in the draft DCO (**DCO document 3.1**) and are as follows:

- Construction activities would in general be undertaken during daylight hours only;
- For weekdays, this includes between the hours of 0700 to 1900 March to October and 0730 to 1730 or during daylight hours, whichever is the shorter, November to February;
- At weekends, the working hours would be 0700 to 1300 on Saturdays with no works on Sundays or bank/public holidays, and;
- Some works may be required outside of the working hours such as scaffolding/netting, highways crossings and completion of operations that cannot be safely stopped.

1.18.18 Heavy good vehicle (HGV) movements associated with the Proposed Development shall take place during working hours.

Construction Contractor

1.18.19 Prior to construction the Contractor will be required to provide details on the following:

- HGV restrictions;

- Construction routes;
- Non-compliance guidance;
- Complaints procedure;
- Standard communication procedures between contractors and site; and
- Emergency and non-emergency contacts.

1.18.20 These shall be included in the TMP for approval by HE and Shropshire Council.

Identification of Hazards

1.18.21 Table A2.18.1 below identifies key constraints and proposed management measures.

Table A2.18.1 Traffic Management

Constraint	Management Measures
Deliveries to site	Deliveries to site will follow defined haulage routes. One abnormal load delivery is required to the existing SP Manweb substation at Wem. The route and timing of this delivery shall be agreed with HE and Shropshire Council. General traffic management measures relating to the timing, escort provisions and advertisement shall be included in a detailed plan submitted by the appointed haulier along with confirmation of the vehicle configuration (axle loads/spacings and dimensions).
Debris on roads	All vehicles exiting from a bellmouth will be checked and cleaned manually if required (or if it is deemed necessary, will pass through a wheel cleaning facility) prior to using the public highway to prevent the debris from being transferred off the site onto the road. A road sweeper will be utilised to further ensure that the LRN remains safe and clear of debris.
Construction traffic exiting farm access or near PRoW	Qualified personnel (banksmen) shall be placed at key locations when necessary during the construction of the Proposed Development. Key locations are likely to include access at key parts of the Proposed Development works or at the PRoW crossing points during construction at that location.

Table A2.18.1 Traffic Management	
Constraint	**Management Measures**
Damage to highways and accesses	Each access point to any public highway by any access road or track used by the Proposed Development will be inspected. These inspections shall take place before first use, at intervals during the construction programme and following final use, to ensure that the surface of the highway remains in good repair and highway safety is maintained. The inspections will also enable any repairs to be made in a timely manner throughout the construction period. At the end of the construction period, the accesses and crossing points shall be inspected and a programme of works to restore them to the condition they were in before the construction period began will be agreed with SC and HE.

Summary of Responsibilities

1.18.22 The content of this table has been prepared to clearly illustrate who is responsible for the different activities during construction.

Table A2.18.2 Traffic Management Plan – Summary of Responsibilities	
Party	**Responsibilities**
SP Manweb	Provision of relevant survey reports and other material prepared during pre-application stages of the Proposed Development. Review risk assessments and method statements prepared by Contractor
ECoW	Inspect and monitor construction activities. Assist with any training required
Contractor	Ensure construction activities follow the general measures set out above. Provide detailed information to update TMP Consultation with HE and Shropshire Council Develop the TMP to include any additional measures identified through consultation with HE or Shropshire Council

Appendix A – Contacts Register

<Project-specific Register to be finalised prior to the start of construction>

Contacts Register				
Name	**Company**	**Position**	**Tel. No.**	**Email address**
	SP Manweb	**Planning/Consents Lead**		
	SP Manweb	**Wayleaves Lead**		
	SP Manweb	**Project Manager**		
	SP Manweb	**Project Coordinator**		
	SP Manweb	**Environmental Manager**		
		Environmental Clerk of Works		
	Contractor	**Site Manager**		
	Contractor	**Foreman**		
	Contractor	**Environmental Manager**		

Appendix B – Companies Specifications

Severn Trent Water

Guidance for working near our assets

Please ensure that a copy of these conditions is passed to your representative and/or your Contractor on site. If any damage is caused to STW (Severn Trent Water) apparatus, the person, Contractor or Subcontractor responsible must inform us immediately on 0800 783 4444 (24 hours).

These general conditions and precautions apply to the public sewerage, water distribution and telemetry systems. The conditions include sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991 and mains installed in accordance with the Agreement for the self construction of water mains. Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.

On request, we will issue a copy of the plan showing the approximate locations of STW apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan is furnished as a general guide only and no warranty as to its accuracy is given or implied. The plan must not be relied upon in the event of excavations or other works in the vicinity of STW apparatus. No person or Company shall be relieved from liability for damage caused by reason of the actual position and/or depths of STW apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any apparatus the following should be observed:

1. All STW apparatus should be located by hand digging prior to the use of mechanical excavators.

2. All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to our apparatus. You or your contractor must ensure the safety of our equipment and will be responsible for the cost of repairing any damage caused.

3. Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm; but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.

4. During construction work, where heavy plant will cross the line of STW apparatus, specific crossing points must be agreed with the Company and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of STW apparatus at other locations must be prevented.

5. Where it is proposed to carry out piling or boring within 20 metres of any STW apparatus, STW should be consulted to enable any affected STW apparatus to be surveyed prior to the works commencing.

6. Where excavation of trenches adjacent to any STW apparatus affects its support, the STW apparatus must be supported to the satisfaction of STW. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.

7. Where a trench is excavated crossing or parallel to the line of any STW apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the STW apparatus. In special cases, it may be necessary to provide permanent support to STW apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the STW apparatus.

8. No apparatus should be laid along the line of STW apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of STW apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any STW apparatus.

9. A minimum radial clearance of 300 millimetres should be allowed between any plant being installed and existing STW apparatus. - We reserve the right to increase this distance where strategic assets are affected.

10. Where any STW apparatus coated with a special wrapping is damaged, even to a minor extent, STW must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any STW apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged.

11. It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable.
Minor reduction in existing levels may result in conflict with apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such apparatus in order to determine any necessary alterations in advance of the works.

12. With regard to any proposed resurfacing works, you are required to contact STW on the number given above to arrange a site inspection to establish the condition of any STW apparatus in the nature of surface boxes or manhole covers and frames affected by the works. STW will then advise on any measures to be taken, in the event of this a proportionate charge will be made.

13. You are advised that Severn Trent Water Limited will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants,

14. No explosives are to be used in the vicinity of any STW apparatus without prior consultation with STW.

Tree planting restrictions

There are many problems with the location of trees adjacent to sewers, water mains and other STW apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other STW apparatus.

15. Please ensure that, in relation to STW apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.

16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other STW apparatus.

17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other STW apparatus. E.g. Ash, Beech, Birch, most Conifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear.

18. STW personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metres of the centre line of a sewer, water main or other STW apparatus.

19. In certain circumstances, both the Company and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main of other STW apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose: Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Privet, Quickthorn, Snowberry, and most ornamental flowering shrubs.

Wales and West Utilities

WW/SP/SSW/22

SPECIFICATION FOR

SAFE WORKING IN THE VICINITY OF PIPELINES AND ASSOCIATED INSTALLATIONS OPERATING ABOVE 2 BARG - REQUIREMENTS FOR THIRD PARTIES

JUNE 2013

CONTENTS

This Document is Uncontrolled When Printed – See Intranet for Current Copy

FOREWORD

This Specification was approved, by Chris Clarke, Director of Asset Management and HS&E Dept on 21st June 2013 for use by managers, engineers and supervisors throughout Wales & West Utilities Limited.

Documents are revised, when necessary, by the issue of new editions. Users should ensure that they are in possession of the latest edition by referring to the document library available on the company intranet.

Compliance with this document does not confer immunity from prosecution for breach of statutory or other legal obligations.

BRIEF HISTORY

First published as T/SP/SSW22	October 2001	EPSG/L01/283
Editorial update to reflect merger October 2002	November 2002	
Revised and reissued.	November 2003	EPSG/A03/10125
Revised and Reissued as T/SP/SSW/22	June 2004	EPSG/T04/1209
Editorial update to comply with GRM	August 2004	
Document revised to remove reference to Transco and replace with WWU Ltd.	May 2006	
Document revised to reflect WWU management structure, include IP pipelines and update letters	April 2013	

KEY CHANGES (Identify the changes from the previous version of this document)

Section	Amendments
1	Scope extended from any pipe operating above 7bar to above 2bar gauge
5 & 6	References added to T/PR/P/18
8	References added to wind turbine development near pipelines

USE

This document is provided by Wales & West Utilities Limited for information and reference.

MANDATORY AND NON-MANDATORY REQUIREMENTS

In this document:

must: indicates a mandatory requirement.

should: indicates best practice and is the preferred option. If an alternative method is used then a suitable and sufficient risk assessment must be completed to show that the alternative method delivers the same, or better, level of protection.

SPECIFICATION FOR

SAFE WORKING AND DEVELOPMENT IN THE VICINITY OF PIPELINES AND ASSOCIATED INSTALLATIONS OPERATING ABOVE 2 BARG - REQUIREMENTS FOR THIRD PARTIES

INTRODUCTION

This specification is for issue to third parties carrying out work in the vicinity of high pressure gas pipelines (above 2 bar gauge) and associated installations and is provided to ensure that individuals planning and undertaking work take appropriate measures to prevent damage.

Any damage to a high-pressure gas pipeline or its coating can affect its integrity and can result in failure of the pipeline with potential serious hazardous consequences for individuals located in the vicinity of the pipeline if it were to fail. It is therefore essential that the procedures outlined in this document are complied with when working near to a high pressure, above 2 bar gauge, pipeline. If any work is considered by Wales & West Utilities to be in breach of the requirements stipulated in this document then the Wales & West Utilities responsible person will suspend the work until the non-compliances have been rectified.

The Pipelines Safety Regulations state that "No person shall cause such damage to a pipeline as may give rise to a danger to persons" (Regulation 15). Failing to comply with these requirements could therefore also result in prosecution by the Health and Safety Executive (HSE).

The requirements in this document are in line with the requirements of the IGE (Institution of Gas Engineers) recommendations IGE/SR/18 Edition 2 - Safe Working Practices To Ensure The Integrity Of Gas Pipelines And Associated Installations and the HSE's guidance document HS(G)47 Avoiding Danger from Underground Services.

It is the responsibility of the third party to ensure that any work carried out also conforms with the requirements of the Construction and Design Management Regulations and all other relevant health and safety legislation.

WHEN CARRYING OUT WORK IN THE VICINITY OF A HIGH PRESSURE PIPELINE FOLLOW THE FOLLOWING PROCESS

CONTACT WALES & WEST UTILITIES

Contact Wales & West Utilities to obtain formal consent - Section 2 of this document.

Note: at least 7 days' notice prior to commencement of the work is normally required

↓

CONSIDER SAFETY

Consider the safety requirements - Section 3 of this document.

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INFORM Wales & West Utilities **AND REQUEST PIPELINE LOCATION**

Inform Wales & West Utilities prior to carrying out work and arrange for Wales & West Utilities to locate the pipeline - Section 4 of this document

Note: at least 7 days' notice is normally required

↓

OBSERVE RESTRICTIONS

Observe Wales & West Utilities restrictions on the allowed proximity of mechanical excavators and other power tools and the measures to protect the pipeline from construction vehicles when carrying out the work – Sections 5, 6 and 7 of this document.

Note: Wales & West Utilities may wish to supervise the work, consult Wales & West Utilities to confirm whether or not this is the case.

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SPECIFIC ACTIVITIES

If work involves any of the following activities:

- No-Dig Techniques
- Increase in Cover
- Piling
- Demolition
- Hot Work
- Blasting
- Surface Mineral Extraction
- Deep Mining
- Landfilling
- Pressure Testing
- Seismic Surveys
- Wind Turbines

Comply with the requirements in Section 8 of this document

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CONSULT WALES & WEST UTILITIES

Consult Wales & West Utilities prior to any backfilling over, alongside or under the pipeline and obtain Wales & West Utilities agreement to proceed. Normally Wales & West Utilities require 48 hours notice prior to backfilling - Section 9 of this document.

IMPORTANT: This flowchart should be used in conjunction with the entire SSW22 document and not in isolation, AND if at any time during the works the pipeline is damaged even slightly then observe the precautions in Section 10 of this document.

IF IN DOUBT CONTACT Wales & West Utilities

1. SCOPE

This specification sets out the safety precautions and other conditions affecting the design, construction and maintenance of services, structures and other works in the vicinity of Wales & West Utilities pipelines and associated installations operating at pressures greater than 2 bar gauge, located in both negotiated easements (see Section 12), in public highways and within the wider area of interest around a pipeline.

2. FORMAL CONSENT

High pressure pipelines are generally laid across country within an easement agreed with the landowner or within the highway.

As the required arrangements for working within an easement and working within the highway differ, this document has been structured to highlight the specific requirements for these two types of area where work may be carried out.

Generally, normal agricultural activities are not considered to affect the integrity of the pipeline, however consult Wales & West Utilities prior to undertaking deep cultivation in excess of 0.5m.

In all other cases no work shall be undertaken in the vicinity of the pipeline without the formal written consent of Wales & West Utilities.

Any documents, handed to contractors on site by Wales & West Utilities must be signed for by the site manager. Wales & West Utilities will record a list of these documents using the form in Appendix A, and the contractor should maintain a duplicate list.

2.1 Within an Easement

The promoter of any works (see Section 12) within an easement must provide Wales & West Utilities with details of the proposed works including a method statement of how the work is intended to be carried out.

Work must not go ahead until formal written consent has been given by Wales & West Utilities. This will include details of Wales & West Utilities protection requirements, contact telephone numbers and the emergency telephone number.

On acceptance of Wales & West Utilities requirements the promoter of the works must give Wales & West Utilities 7 working days' notice, or shorter only if agreed with Wales & West Utilities, before commencing work on site.

2.2 Within the Highway

Work must be notified to Wales & West Utilities in accordance with the requirements of The New Roads and Street Works Act (NRSWA) and HS(G)47.

The promoter of any works within the highway should provide Wales & West Utilities with details of the proposed works including a method statement of how the work is intended to be carried out. This should be submitted 7 working days before the planned work is to be carried out or shorter, only if agreed with Wales & West Utilities. If similar works are being carried out at a number of locations in close proximity a single method statement should be adequate.

Work should not go ahead until formal written consent has been given by Wales & West Utilities. This will include details of Wales & West Utilities' protection requirements, contact telephone numbers and the emergency telephone number.

2.3 Within the Area of Interest

Certain other activities , such as the development of adjacent land with buildings, or other constructions which may have an impact on the safe operation of above 2 bar gauge pipelines, must also be notified to Wales & West Utilities, for example the construction of wind turbines, masts or aerials.

Developers should ensure early consultation with Wales & West Utilities in respect of such development, rather than relying on local authority planning consultation, which may lead to substantial late changes to design or constraints on the planned development.

3. HS&E CONSIDERATIONS

3.1 Safe Control of Operations

All working practices must be agreed by Wales & West Utilities prior to work commencing. All personnel working on site must be made aware of the potential hazard of the pipeline and the actions they should follow in case of an emergency. The Site Document Control Form (Appendix A) should be used to record the list of relevant documents that have been provided by Wales & West Utilities to the contractor.

3.2 Deep Excavations

Special consideration should be given to the hazards associated with deep excavations. The HSE document CIS08 'Safety in Excavations' provides further guidance and is available on the HSE web site www.hse.gov.uk

3.3 Positioning of Plant

Mechanical excavators must not be sited or moved above the pipeline unless written authority has been given by the Wales & West Utilities responsible person.

Mechanical excavators must not dig on one side of the pipeline with the cab of the excavator positioned on the other side.

Mechanical excavators and other traffic must be positioned far enough away from the pipeline trench to prevent trench wall collapse.

3.4 General

Activities associated with working in the vicinity of pipelines operating above 2 bar gauge may have impact on the safety of the general public, Wales & West Utilities staff and contractors, and may affect the local environment. Contractors must carry out suitable and adequate risk assessments prior to the commencement of work to ensure that all such issues are properly considered and risks mitigated.

4. PIPELINE LOCATING

The third party should give 7 working days' notice (or shorter as agreed with Wales & West Utilities) to ensure that the pipeline is suitably located and marked out by Wales & West Utilities prior to the work commencing.

Prior to work commencing on site the pipeline must be located and pegged or suitably marked out by Wales & West Utilities personnel. In exceptional circumstances with the prior agreement of Wales & West Utilities the locating and marking out of the pipeline could be carried out by competent third parties on behalf of the contractor as long as Wales & West Utilities is assured of their competence and the procedures to be followed.

Safe digging practices, in accordance with HSE publication HS(G)47 should be followed as both direct and consequential damage to gas plant can be dangerous both to employees and to the general public.

Previously agreed working practices should be reviewed and revised based on current site conditions. Any changes must be agreed by the Wales & West Utilities responsible person.

The requirements for trial holes to locate the pipeline or determine levels at crossing points must be determined on site by the Wales & West Utilities responsible person.

The excavation of all trial holes must be supervised by the Wales & West Utilities responsible person.

5. SLABBING AND OTHER PROTECTIVE MEASURES

No protective measures including the installation of concrete slab protection should be installed over or near to the Wales & West Utilities pipeline without the prior permission of Wales & West Utilities. Wales & West Utilities will need to agree the material, the dimensions and method of installation of the proposed protective measure. The method of installation must be confirmed through the submission of a formal written method statement from the contractor to Wales & West Utilities.

Where permanent slab protection is to be applied over the pipeline Wales & West Utilities should carry out a survey (Pearson or DCVG Survey) of the pipeline to check that there is no existing damage to the coating of the pipeline prior to the slab protection being put in place. In addition the pipeline records should be consulted to determine whether any other investigations or remedial works would be needed in advance of the slab construction, e.g. reference to T/PR/P/18. Wales & West Utilities must therefore be contacted prior to the laying of any slab protection to arrange this survey. The Safety precautions detailed in Sections 3 and 6 of this document should also be observed during the installation of the pipeline protection.

6. EXCAVATION

6.1 In Proximity to a Pipeline in an Easement

Third parties must not excavate unsupervised, with a powered mechanical excavator closer than 3 metres to the Wales & West Utilities located pipeline or with hand held power tools closer than 1.5 metres. Any fitting, attachment or connecting pipework on the pipeline must be exposed by hand. All other excavation must be by hand.

Consideration may be given to a relaxation of these limits by agreement with the Wales & West Utilities responsible person on site and only whilst he remains on site. In this case a powered mechanical excavator must not be allowed to excavate closer than 0.6 metres to the nearest part of the pipeline.

Where sufficient depth of cover exists, following evidence from hand dug trial holes, light tracked vehicles may be permitted to strip topsoil to a depth of 0.25 metres, using a toothless bucket.

No topsoil or other materials should be stored within the easement without the written permission of Wales & West Utilities.

No topsoil or materials should be stored over the pipeline.

No fires should be allowed in the easement strip or close to above ground gas installations.

After the completion of the work the level of cover over the pipeline should be the same as that prior to work commencing unless agreed otherwise with the Wales & West Utilities responsible person.

No new service shall be laid parallel to the pipeline within the easement. In special circumstances, and only with formal written agreement from Wales & West Utilities, this may be relaxed for short excursions where the service shall be laid no closer than 600 mm to the side of the pipeline.

Where work is being carried out parallel to the pipeline within or just alongside the easement a post and wire fence must be erected as a protective barrier between the works and the pipeline.

6.2 In Proximity to a Pipeline in the Highway

Removal of the bituminous or concrete highway surface layer by mechanical means is permitted to depth of 300 mm, although the use of chain trenchers to do this shall not be permitted within 3 metres of the pipeline. The Wales & West Utilities responsible person may want to monitor this work.

Where the bituminous or concrete highway surface layer extends below 0.3 metres deep it should only be removed by handheld power assisted tools under the supervision of the Wales & West Utilities responsible person. In exceptional circumstances, and following a risk assessment, these conditions may be relaxed by the Wales & West Utilities responsible person.

Third parties should not excavate, unsupervised, with a powered mechanical excavator closer than 3 metres to the located Wales & West Utilities pipeline or with hand held power tools closer than 1.5 metres. Any fitting or attachment must be exposed by hand.

In special circumstances consideration may be given to a relaxation of these rules by agreement with the Wales & West Utilities responsible person on site and only whilst he remains on site only whilst he remains on site and only whilst he remains on site to supervise this work..

The use of 'No dig' techniques is covered in Section 8.1.

Any new service running parallel to the pipeline should be laid no closer than 600 mm to the pipeline (see Section 6.4).

6.3 Crossing Over a Pipeline

Where a new service is to cross over the pipeline a clearance distance of 600 mm between the crown of the pipeline and underside of the service must be maintained. If this cannot be achieved the service must cross below the pipeline with a clearance distance of 600 mm.

In special circumstances this distance may be reduced at the discretion of the Wales & West Utilities responsible person on site.

6.4 Crossing Below a Pipeline

Where a service is to cross below the pipeline a clearance distance of 600 mm between the crown of the service and underside of the pipeline should be maintained.

The exposed pipeline must be suitably supported. The Wales & West Utilities responsible person must be consulted and a stress analysis may be required in order to establish support requirements. The stress analysis should be carried out by individuals with demonstrated expertise in this area, Wales & West Utilities can be consulted for advice on suitable specialists. Wales & West Utilities may request a copy of the stress analysis to confirm its adequacy.

Specific additional constraints apply to Wales & West Utilities pipelines that fall under the requirements of T/PR/P/18.

All supports must be removed prior to backfilling.

The exposed pipelines must be protected by matting and suitable timber cladding.

6.5 Cathodic Protection

Cathodic Protection is applied to all of Wales & West Utilities above 2 bar gauge buried steel pipelines and is a method of protecting pipelines with damaged coatings from corrosion by maintaining an electrical potential difference between the pipeline and anodes placed at strategic points along the pipeline.

Where a new service is to be laid and similarly protected, Wales & West Utilities will undertake interference tests to determine whether the new service is interfering with the cathodic protection of the Wales & West Utilities pipeline.

Should any cathodic protection posts or associated apparatus need moving to facilitate third party works reasonable notice, typically 7 days, should be given to Wales & West Utilities. Wales & West Utilities will undertake this work and any associated costs will be borne by the third party.

7. CONSTRUCTION TRAFFIC

Where existing roads cannot be used construction traffic should ONLY cross the pipeline at previously agreed locations. All crossing points will be fenced on both sides with a post and wire fence and with the fence returned along the easement for a distance of 6 metres. The pipeline shall be protected at the crossing points by temporary rafts of either sleeper or reinforced concrete construction, constructed at ground level. The Wales & West Utilities responsible person will review ground conditions, vehicle types and crossing frequencies to determine the type and construction of the raft required.
Notices directing traffic to the crossing points should be erected.

8. SPECIFIC ACTIVITIES

This section details the precautions that need to be taken when carrying out certain prescribed activities in the vicinity of the pipeline. Consult Wales & West Utilities if you are intending to undertake one of the listed prescribed activities and/or you require further advice on whether the work that you are intending to undertake has the potential to affect the pipeline.

8.1 No-Dig Techniques

Where the contactor intends using no dig techniques then a formal method statement must be produced for all work that would encroach (either above or below ground) within the pipeline easement. This method statement must be formally agreed with Wales & West Utilities prior to the commencement of the work. Wales & West Utilities may wish to be present when the work is being carried out and must therefore be given adequate advance notice before the commencement of the work.

8.2 Increase in Cover

A pipeline integrity assessment must be provided for situations involving a final cover depth exceeding 2.5 metres. This assessment should take due account of both soil ‘dead’ loading and ground settlement due to earthworks. Embankment design and construction over pipelines must give consideration to prevention of any instability. Expert advice may need to be sought which can be arranged through Wales & West Utilities.

8.3 Piling

No piling will be allowed within 15 metres of a pipeline without an assessment of the vibration levels at the pipeline. The peak particle velocity at the pipeline should be limited to a maximum level of 75 mm/sec. In any event the ground vibration shall be monitored by the contractor and the results available to the Wales & West Utilities Responsible person at their request. A typical monitoring device would be the Vibrock V801 seismograph and tri-axial geophone sensor.

Where ground conditions are of submerged granular deposits of silt and sand, an assessment of the effect of vibration on settlement and liquefaction at the pipeline shall be made.

Expert advice may need to be sought which can be arranged through Wales & West Utilities.

8.4 Demolition

No demolition should be allowed within 150 metres of a pipeline without an assessment of the vibration levels at the pipeline. The peak particle velocity at the pipeline must be limited to a maximum level of 75 mm/sec. In any event the ground vibration shall be monitored by the contractor and the results available to the Wales & West Utilities Responsible person at their request.

Where ground conditions are submerged granular deposits of silt or sand, an assessment of the effect of vibration on settlement and liquefaction at the pipeline shall be made.

Expert advice may need to be sought which can be arranged through Wales & West Utilities.

8.5 Blasting

No blasting should be allowed within 250 metres of a pipeline without an assessment of the vibration levels at the pipeline. The peak particle velocity at the pipeline must be limited to a maximum level of 75 mm/sec. In any event the ground vibration must be monitored by the contractor and the results available to the Wales & West Utilities Responsible person at their request.

Where ground conditions are of submerged granular deposits of silt or sand, an assessment of the effect of vibration on settlement and liquefaction at the pipeline shall be made.

Expert advice may need to be sought which can be arranged through Wales & West Utilities.

8.6 Surface Mineral Extraction

An assessment must be carried out on the effect of surface mineral extraction activity within 100 metres of a pipeline. Consideration should also be given to extraction around groundbeds and other pipeline associated plant and equipment.

Where the mineral extraction extends up to the pipeline easement, a stable slope angle and stand-off distance between the pipeline and slope crest must be determined by Wales & West Utilities. The easement strip should be clearly marked by a suitable permanent boundary such as a post and wire fence, and where appropriate, slope indicator markers shall be erected to facilitate the verification of the recommended slope angle as the slope is formed, by the contractor. The pipeline easement and slope needs to be inspected periodically to identify any signs of developing instability. This may include any change of slope profile including bulging, the development of tension cracks on the slope or easement, or any changes in drainage around the slope. The results of each inspection should be recorded.

Where surface mineral extraction activities are planned within 100 metres of the pipeline but do not extend up to the pipeline easement boundary, an assessment, by Wales & West Utilities must be made on whether the planned activity could promote instability in the vicinity of the pipeline. This may occur where the pipeline is routed across a natural slope or the excavation is deep. A significant cause of this problem is where the groundwater profile is affected by changes in drainage or the development of lagoons.

Where the extraction technique involves explosives the provisions of section 8.5 apply.

8.7 Deep Mining

Pipelines routed within 1 km of active deep mining may be affected by subsidence resulting from mineral extraction. The determination of protective or remedial measures will normally require expert assistance, which can be arranged through Wales & West Utilities.

8.8 Landfilling

The creation of slopes outside of the pipeline easements may promote instability within the vicinity of the pipeline. An assessment should therefore be carried out, by Wales & West Utilities, on the effect of any landfilling activity within 100 metres of a pipeline. The assessment is particularly important if landfilling operations are taking place on a slope in which the pipeline is routed.

8.9 Pressure Testing

Hydraulic pressure testing will not be permitted within 8 metres of the pipeline unless suitable precautions have been taken against the effects of a burst. These precautions should include limiting of the design factor to 0.3 for the third party pipeline for a distance of 6 metres either side of the Wales & West Utilities pipeline, and the use of mill tested pipe or sleeving.

8.10 Seismic Surveys

Wales & West Utilities must be advised of any seismic surveying work in the vicinity of pipeline that will result in Wales & West Utilities' pipeline being subjected to peak particle velocities in excess of 50 mm/sec. In any event the ground vibration near to the pipeline shall also be monitored by the contractor whilst the survey work is being carried out.

Where the peak particle velocity is predicted to exceed 50 mm/sec, the ground vibration should be monitored by the contractor and the results available to the Wales & West Utilities Responsible person at their request.

8.11 Hot Work

The Wales & West Utilities responsible person on site should supervise all welding, burning or other 'hot work' that takes place within the easement.

8.12 Wind Turbines

Wales & West Utilities must be advised of any planned development of wind turbines in the vicinity of an above 2 bar gas pipelines to ensure the development does not impact on the future safe operation of the pipeline. Industry guidance states that any wind turbine must be sited no closer than 1.5 times the proposed height of the turbine mast away from the nearest edge of the pipeline.

9. BACKFILLING

Third parties must provide Wales & West Utilities with 7 days' notice, or shorter notice only if agreed with Wales & West Utilities, of the intent to backfill over, under or alongside the pipeline. This requirement should also apply to any backfilling operations alongside the pipeline within 3 metres of the pipeline. Any damage to the pipeline or coating must be reported to the Wales & West Utilities responsible person in order that damage can be assessed and repairs can be carried out.

Minor damage to pipe coating and damage to test leads will normally be repaired by Wales & West Utilities free of charge.

No backfilling should be undertaken without Wales & West Utilities agreement to proceed. When backfilling, the pipeline should be surrounded by at least 300mm of soft fill (i.e. stone dust) containing no stones, bricks, lumps of concrete, etc. The Wales & West Utilities responsible person will stipulate the necessary consolidation requirements.

If the pipeline has been backfilled without the knowledge of the Wales & West Utilities responsible person then he will require the material to be re-excavated in order to enable the condition of the pipeline coating to be confirmed.

10. ACTION IN THE CASE OF DAMAGE TO THE PIPELINE

If the Wales & West Utilities pipeline is damaged, even slightly, and even if no gas leak has occurred then the following precautions must be taken immediately:-

- Shut down all plant and machinery and extinguish any potential sources of ignition.
- Evacuate all personnel from the vicinity of the pipeline.
- Notify Wales & West Utilities using the free 24 hour emergency telephone number **0800 111 999***[1]
- Notify the Wales & West Utilities responsible person or his office immediately using the contact telephone number provided.
- Ensure no one approaches the pipeline.
- Do not try to stop any leak.

[1] * All calls are recorded and may be monitored

11. REFERENCES

NRSWA	New Roads & Street Works Act
HS(G)47	Avoiding Danger from Underground Services
IGE/SR/18	Safe Working Practices to Ensure the Integrity of Gas Pipelines and Associated Installations
T/PR/P/18	Working on Pipelines Containing Defective Girth Welds or Girth Welds of Unknown Quality
CIS08	Safety in Excavations (HSE document)

12. GLOSSARY OF TERMS

Contractor:	the person, firm or company with whom Wales & West Utilities enters into a contract to which this specification applies, including the Contractor's personal representatives, successors and permitted assigns.
Easement:	Easements are negotiated legal entitlements between Wales & West Utilities and landowner and allow Wales & West Utilities to lay, operate and maintain pipelines within the easement strip. Easement strips may vary in width typically between 6 and 25 metres depending on the diameter and pressure of the pipeline. Consult Wales & West Utilities for details of the extent of the easement strip where work is intended.
Liquefaction:	Liquefaction is a phenomenon in which the strength and stiffness of the soil is reduced by earthquake shaking or other rapid loading. Liquefaction occurs in saturated soils, that is, soils in which the space between individual particles is completely filled with water. When liquefaction occurs, the strength of the soil decreases and the ability of the soil to support pipelines or other components is reduced.
Pearson Survey:	a survey used for locating coating defects on buried pipeline services.
DCVG Survey:	Direct Current Voltage Gradient, a survey for locating and grading coating defects on buried pipeline service
Promoter of new works:	the person or persons, firm, company or authority for whom new services, structures or other works in the vicinity of existing Wales & West Utilities pipelines and associated installations operating above 7 bar gauge are being undertaken.
Wales & West Utilities responsible person:	the person or persons appointed by Wales & West Utilities with the competencies required to act as the Wales & West Utilities representative for the purpose of the managing the particular activity.
Wayleave:	general term which is considered equivalent to 'easement' in this document.

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APPENDIX A

SITE DOCUMENT CONTROL FORM - SAMPLE

Emergency Telephone No. **0800 111 999***

Plant Protection Telephone No. **02920278912**

SITE DOCUMENT CONTROL FORM	
Activity Reference:	
Activity Location:	
Site Manager: *(name & telephone number)*	
Wales & West Utilities Contact: *(name & telephone number)*	

The following documents were issued to *(individual's name)*
…… **of**
(company name and address)
……
by *(Wales & West Utilities representative)*
……**on**
(date)……**:-**

Documents:-

(List of documents)

_____

Signed : *(by the recipient)*

Date of signature :

SITE DOCUMENT CONTROL FORM

Emergency Telephone No. 0800 111 999*

Plant Protection Telephone No. 02920 278912

SITE DOCUMENT CONTROL FORM

Activity Reference:	
Activity Location:	
Site Manager: *(name & telephone number)*	
Wales & West Utilities Contact: *(name & telephone number)*	

The following documents were issued to (Individuals Name)
……**of**
(company name and address)
……

by *(Wales and West Utilities representative)*
…… ……**on**
(date) …….. **:-**

Documents:-

_____

Signed :

Date of signature :

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ENDNOTE

Comments

Comments and queries regarding the technical content of this document should be directed to:

Asset Management & HSE Dept
Wales & West Utilities Ltd
Wales & West House
Spooner Close
Celtic Springs
Coedkernew
Newport
NP10 8FZ.

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Canal & River Trust

CODE OF PRACTICE FOR WORKS AFFECTING THE CANAL & RIVER TRUST

PART 1

GENERAL INFORMATION

April 2018

CONTENTS

Foreword to the 2018 Edition of the Code of Practice for Works Affecting the Canal & River Trust

Thank you for agreeing to work with the Canal & River Trust on your project. The Trust is the guardian of 2,000 miles of historic waterways across England and Wales. We are among the largest charities in the UK, maintaining the nation's third largest collection of listed structures, as well as museums, archives, navigations and hundreds of important wildlife sites. Our canals and rivers are a national treasure and a local haven for people and wildlife. It is our job to care for this wonderful legacy – holding it in Trust for the nation in perpetuity and giving people a greater role in the running of their local waterways.

Within Infrastructure Services, we have a professional team of works engineers, technical administrators and specialists in a variety of disciplines ready to help you to deliver your project goals, while at the same time protecting the very special nature of our historic inland waterway network.

Our waterways are a vibrant, living network; they bring life to communities across England & Wales. Income earned by our teams is reinvested directly into the waterways so we can secure the best future possible.

We are working hard to ensure we offer the best possible service to our customers and are delighted to be able to confirm that we have not increased our hourly charge out rates for our Works Engineers since March 2012.

Peter Walker

Head of Technical Support

1 INTRODUCTION

The Code of Practice for Works Affecting the Canal & River Trust (The Code) gives guidance and details procedures for all those (The Third Party) whose work may or will affect the property of the Canal & River Trust (the Trust)

The purpose of the Code is to facilitate the undertaking of works by the Third Party while at the same time safeguard the interests of the Trust, and it forms the basis of the relationship between the Trust and the Third Party.

All works that 'affect' the Trust must comply with the Code. This includes but is not limited to construction works on the property of the Trust, works undertaken on neighbouring property, works requiring access across the property of the Trust and works that over sail the property of the Trust.

This document comprises three parts;

1. General Information
2. Detailed Information
3. Forms

Approval to carry out works is gained through an application process which is illustrated on the next page. The process is managed by on behalf of the Trust by Works Engineers.

The Third Party determines the speed of progression of the process by ensuring that the required forms and payments are received by the Trust. The Works Engineer will aim to agree methods of working in a timely manner. The Third Party must allow sufficient time for the process to be completed. Without completion of the process, the works cannot proceed.

The Third Party should provide a single point of contact for the Works Engineer to avoid confusion. The Third Party should disseminate the information from this process to his staff - project managers, site managers, accounts managers, designers, CDM coordinator, contractors, H&S officers and others as appropriate.

Access for All

The Trust has a corporate priority to encourage the use of its network of canals and rivers by people with disabilities. The Trust also recognises its responsibilities under the Disability Discrimination Act to take reasonable steps to improve access to its waterways and associated services (including works undertaken by third parties). Where works affect the Trust, the Third Party is required where possible to provide suitable access for all people. The Third Party is required to demonstrate to the Trust that the access needs of all people will be met during and after construction, where the project allows.

Community Consultation

Consultation with various community groups is an important planning issue for any new scheme. With works affecting the Trust's network and infrastructure the Third Party may be required to consult with various groups to gain approval for the proposed scheme and to assure user groups that the development will not adversely affect the waterway environment and associated uses. Community consultation will also be integral to delivering a project

that considers the needs of all people, e.g. consult with people with disabilities to ensure that local needs are taken into account.

Vandalism

A significant social issue is potential damage to works, equipment and the environment due to vandalism. In particular damage to plant and equipment or fuel storage tanks can be costly in both financial and environmental terms. The Third Party is responsible for all fuel, oil and chemicals that are present on the site and for their appropriate containment. The Third Party should be aware of its legal obligations in regards to a pollution incident. Measures should be implemented to reduce the risk of vandalism on-site including risks to the Trust's property and the waterway environment. Where such an incident occurs, the Trust may seek to reclaim any costs incurred in responding.

Economic

The Trust encourages projects which promote local economic growth and employment. As a result the Third Party is encouraged to utilise local labour and materials within the project that affects the Trust, where appropriate.

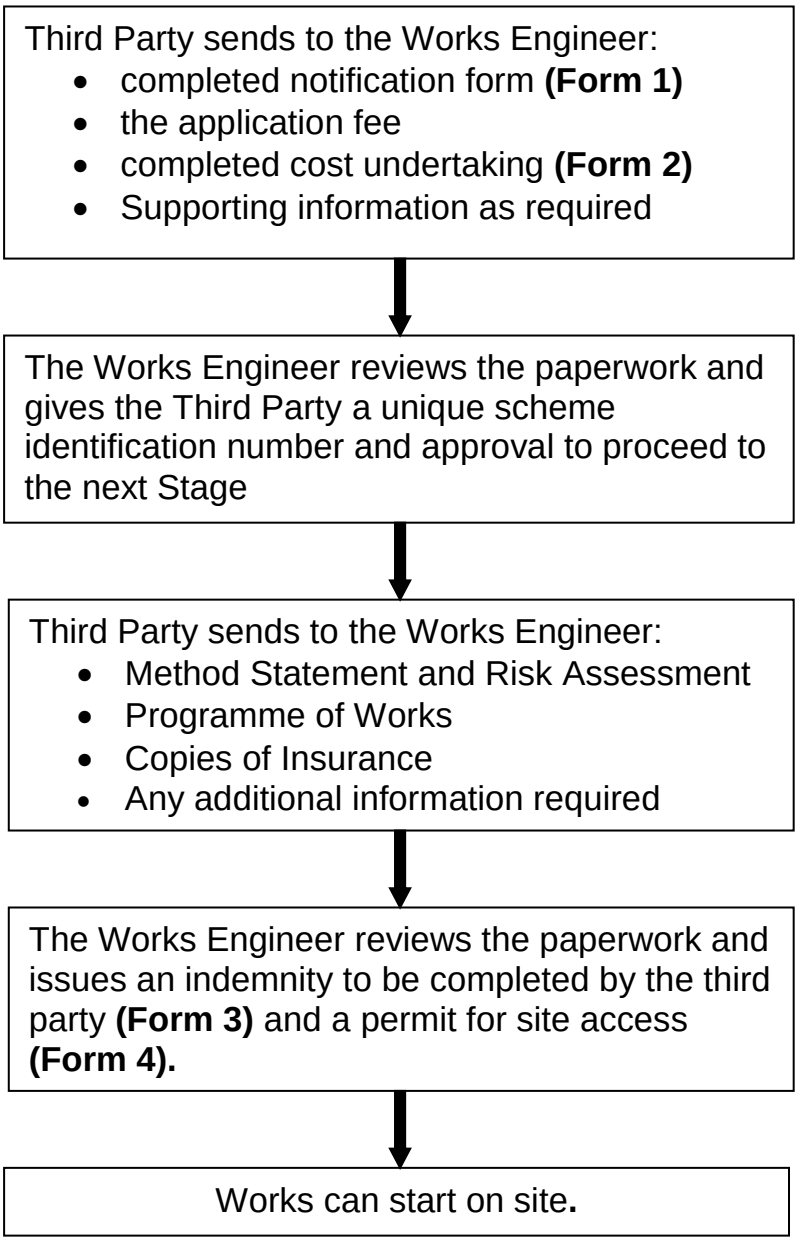
Environment

The Trust has a statutory duty to not only protect, but also to further the conservation of the natural environment. As such, all work within its boundaries is subject to agreement with the Works Engineer who may consult internal environmental experts. Third parties must also apply to the Trust for abstraction and/or discharge of water, effluent etc. in every instance as we are not a land drainage authority. This Code of Practice has been written to provide advice for applicants when designing their projects. This can be found in Part 2, section 14.

Heritage structures

Many elements of the waterway fabric are over 200 years old. The heritage of the waterway is unique and even where no statutory protection is in force the Trust seeks to protect and enhance all structures, surfaces and features with heritage/historic value. Part 2, Section 15 provides detailed information.

2 APPLICATION PROCESS IN BRIEF



3 THE APPLICATION PROCESS

Initial Information

Having familiarised themselves with the requirements of the parts of this document relevant to the work, the Third Party should complete and submit to the Trust a completed Notification Form, the Application Fee and a Cost Undertaking. (the 'Initial information')

As a guideline, notification of the proposed works should be made **3 months** in advance of commencement of the works, or by **1st January** if a closure of the navigation is required within the upcoming winter maintenance period.

As the Trust is subject to the Freedom of Information Act 2000 and the Environmental Information Regulations 2004, we must provide any information requested of us that we hold, unless one of the exemptions applies. This includes information regarding proposed works by a Third Party. There may be some information (such as names and addresses of individuals) that will be automatically exempt and which we will not disclose. There may be other reasons, such as confidentiality or commercial sensitivity, why a Third Party may not wish for the Trust to disclose this information to the public. Whilst we may still have to disclose this information under the Act or the Regulations, we will take your reasons into account in assessing our duties to disclose or withhold the requested information. For this reason on the Notification Form, the Third Party can express a preference that information regarding their proposed works is not disclosed to the public. If you select "yes", we will not disclose any information in response to a request for information without consulting you further.

Scheme Registration

On receipt of the Initial Information, the Works Engineer will undertake initial project administration and will provide a receipt for the payment together with a unique scheme reference number which, should be used on all future correspondence. The Works Engineer will then undertake a preliminary appraisal to assess the impact of the works on the waterway.

Detailed Information

If approval is given by the Works Engineer to proceed to the next stage, the Works Engineer will provide specific site information that affects the works to assist the Third Party in preparing Health and Safety Information. General safety information can be found in section 7 of this document.

The Works Engineer will require from the Third Party a method statement and risk assessment for the works. In addition, depending on the nature of the works, the Works Engineer may require:

- COSHH assessment
- Drawings / Plans / Maps
- Details of proposed diversion route for towpath users
- Copies of consents and approvals already obtained from Regulatory Bodies (e.g. Planning Consent / EA consent)
- Details on the assets of utility companies affected by the works.

- Works Programme
- Copies of Insurance
- EIA or other environmental assessment

The Works Engineer will then review and comment on the proposals. This may require taking advice from other departments within the Trust.

If the works include a request by the Third Party to use the land of the Trust for the works, either in a temporary or permanent fashion, the Works Engineer will arrange for the required licences to be drawn up by an Estates Surveyor of the Trust.

The Third Party should then update documentation taking into account the comments by the Works Engineer; then resubmitting any as required.

Once the Works Engineer is in receipt of the correct documentation, they will return to the Third Party a signed Indemnity Form and a Permit for Site Access Form.

Receipt, countersigning and returning the signed Indemnity Form constitutes approval to gain access to or across the property of the Trust or adjacent land to undertake the works in accordance with the agreed methods of working. A copy of the Permit must be maintained on site to demonstrate to other agents of the Trust that permission is in place. If a valid Permit cannot be produced on demand the works may be stopped. A Trust representative may without notice present themselves at the works and should be granted access to inspect the works.

4 LICENCES

In addition to a permit / indemnity form, a licence to occupy property owned by the Trust may be required and if so should be in place before works can begin. A licence is entered into between the Trust and the Third Party and this forms a commercial arrangement.

Examples of when licences are needed include;

- The installing, maintaining and removing of structures on the Trust's property.
- Undertaking regular works on the Trust's property for maintenance, vegetation clearance, cleaning and other similar
- Temporary use of the Trust's property, including: scaffolding, hoarding, towpath closure, crane oversail, storage area and site compounds.
- Use of floating plant to extend a site
- Towpath closures
- Installation of utilities

Works of a short duration (up to 48 hours) are not generally licenced.

All licence fees are payable ahead of receipt of the Licence. The Licence fee comprises two parts: the fee to raise the licence and the weekly occupation fee. A further fee is levied for extending the licence and is payable before the date of expiry of the original licence.

5 NAVIGATIONS AND TOWPATHS

Navigation Closures

A major element of the work of the Trust concerns Navigations and Towpaths. The Trust aims to keep all navigations and towpaths open wherever possible. With this in mind, the Third Party is strongly advised to design his works to avoid such closure as permission will only be granted in exceptional circumstances.

To avoid closures, the Third Party is advised to consider utilising restrictions, such as;

- A day time restriction on a towpath could involve closing the towpath for a few minutes at a time using a banks man.
- A day time restriction on a navigation could involve closing the navigation for up to 30 minutes at a time within any 3 hour period (for small scale works this may be negotiable).
- A night time restriction on either a towpath or navigation could be for up to 8 hours.
- Width restrictions as long as one boat can pass.

Our Works Engineers can advise further.

If a restriction is not practical, full closures (or 'stoppages') may be requested by the Third Party but these requests are often rejected as they impact upon one of our primary roles i.e. to make the waterways available to all. Stoppages are subject to consultation by users and this consultation can take several months to complete.

Any request should consider that permission, where granted, is more likely if (a) the request is for a closure between 1st November and the 29th February and (b) is received by 1st January for a closure of the navigation within the upcoming winter maintenance period. Stoppages may only be available if they coincide with pre-planned stoppages (see below for the Trust's proposed winter maintenance dates). A late booking fee will apply for stoppages requested without the required notification period.

Requests for stoppages between March 1st and October 31st are seldom granted. There is also a 2 week window over Christmas where the navigation must remain open.

If granted, a stoppage begins at 08:30 on the first day and ends at 17:00 on the last day unless otherwise specified.

The fees for stoppages are listed in Section 8.

The Third Party may be required to install signs on site to advertise the stoppage.

All stoppages must be of minimised duration. Where feasible the waterway should be re-opened to navigation at weekends during the stoppage.

Transfer of boats around the works by road may be required at the Third Party's expense.

Some boating businesses have agreements with the Trust entitling them to compensation for loss of income due to disruption and these charges will be passed on to the third party.

Proposed winter maintenance dates

	Pre-Christmas		Post-Christmas	
	From	To	From	To
2018/19	05/11/2018	14/12/2018	02/01/2019	15/03/2019
2019/20	04/11/2019	13/12/2019	02/01/2020	13/03/2020
2020/21	02/11/2020	11/12/2020	04/01/2021	19/03/2021

Towpath closures

The Trust require 4 weeks notice for a towpath closure; in addition to any statutory obligations relating to public rights of way (which remain the responsibility of the Third Party). Notices of a suitable size and type are required to be displayed for towpath closures.

Two weeks before the closure, the Third Party should display a notice at both ends of the closure, to advise users with an "**ADVANCE NOTICE OF TEMPORARY TOWPATH CLOSURE"** notice.

On the first day of the closure, each of these should be replaced with a **"TEMPORARY TOWPATH CLOSURE**" notice displayed with a plan of the diversion route.

On completion of the works all notices and diversion route maps should be removed.

Where a towpath is a Public Right of Way (PRoW), the Third party is responsible for obtaining consent for closure from the Local Authority.

The towpath should be closed over its entire width in a manner that prevents people moving past or climbing over the barrier. The barrier should be self-supporting and as required lit at night to make it discernible to towpath users that there is a barrier across the towpath.

Loading on Towpaths

Wherever possible the Third Party should design the works to avoid plant and equipment on towpaths. In the event that plant or equipment is required to be on the towpath, permission for it being on the towpath must be given by the Works Engineer. (See Part 2 / Section 12 for more details)

In all cases, the suitability of the towpath for load bearing must be agreed with the Works Engineer in advance. It is worth noting that nearly 50% of our towpaths are classed as unsuitable for vehicles.

Works adjacent to the Waterway

In the case of works adjacent to the Trust's property, the principles are that no support is offered and no loads are to be imposed on the property. The Party Wall …etc Act 1996 is usually applicable and you may wish to apply in accordance with that Act.

The Trust enjoys a right of support under Common Law. It is important that support is not removed by excavation, dewatering undermining etc. In areas of mining subsidence canals can be of great depth due to bank raising - 10m is not unknown. Factors of safety are often not great and ill-considered actions can be disastrous.

A less obvious consequence of excavating near to canals is that of increasing hydraulic gradients. Not all canals are lined and so seepage rates can be increased. Permanent leakage or piping failure can result.

The Trust offers no support to new works. Loads should not be placed near to cuttings, over tunnels etc. without being independently supported. Should a Trust structure withdraw support from later development, the Trust would accept no liability. When building over tunnels, for example, not only should the new structure span independently but the effect of a collapse of the tunnel should be considered.

River Navigations

River navigations are affected by currents, floods and in some cases tides. There will be a deep navigation channel, not necessarily in the centre of the river. Elsewhere there may be insufficient depth to navigate. It is less easy to control vessels travelling in the same direction as the flow than those travelling against it. The former can move at considerable speed and need sufficient visibility and space to manoeuvre. Temporary and permanent works in the river can produce turbulence affecting navigation. The effects will vary in different river conditions.

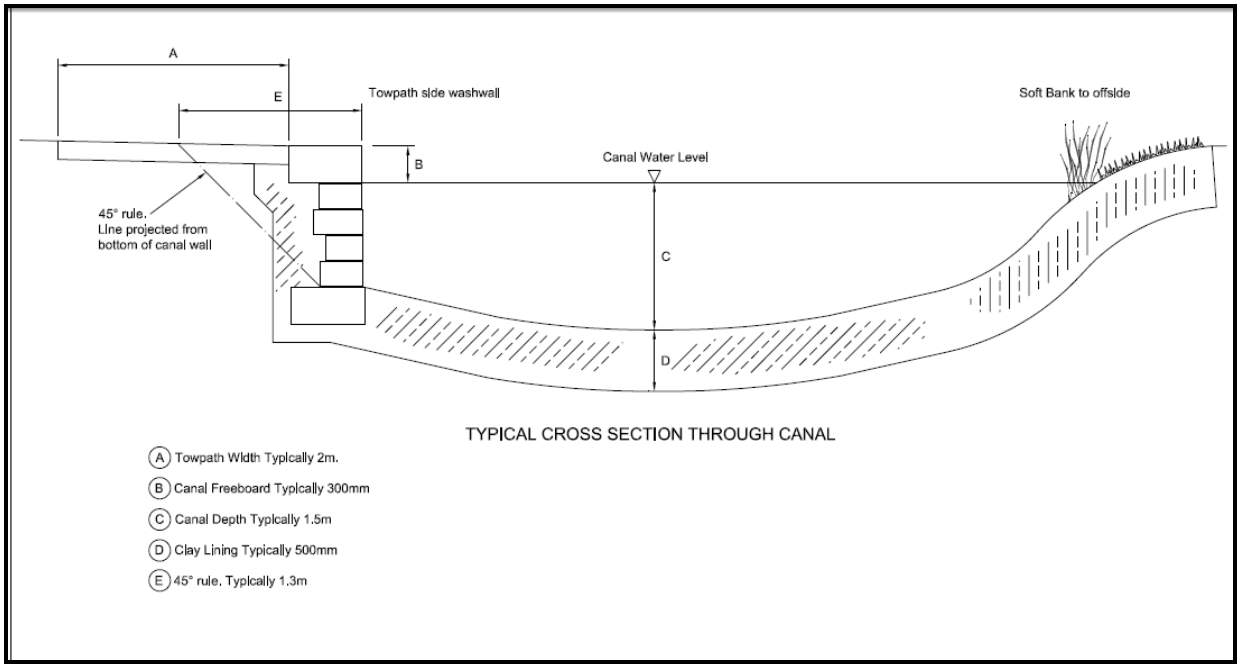
Stability of Structures

Many existing structures were built before slope stability, foundation design etc were understood. Materials and methods now taken for granted were not available. Compaction of embankment fill was not possible. It was not practice to prepare engineering drawings until the 1820's. Calculations were not undertaken until later in the 19th Century.

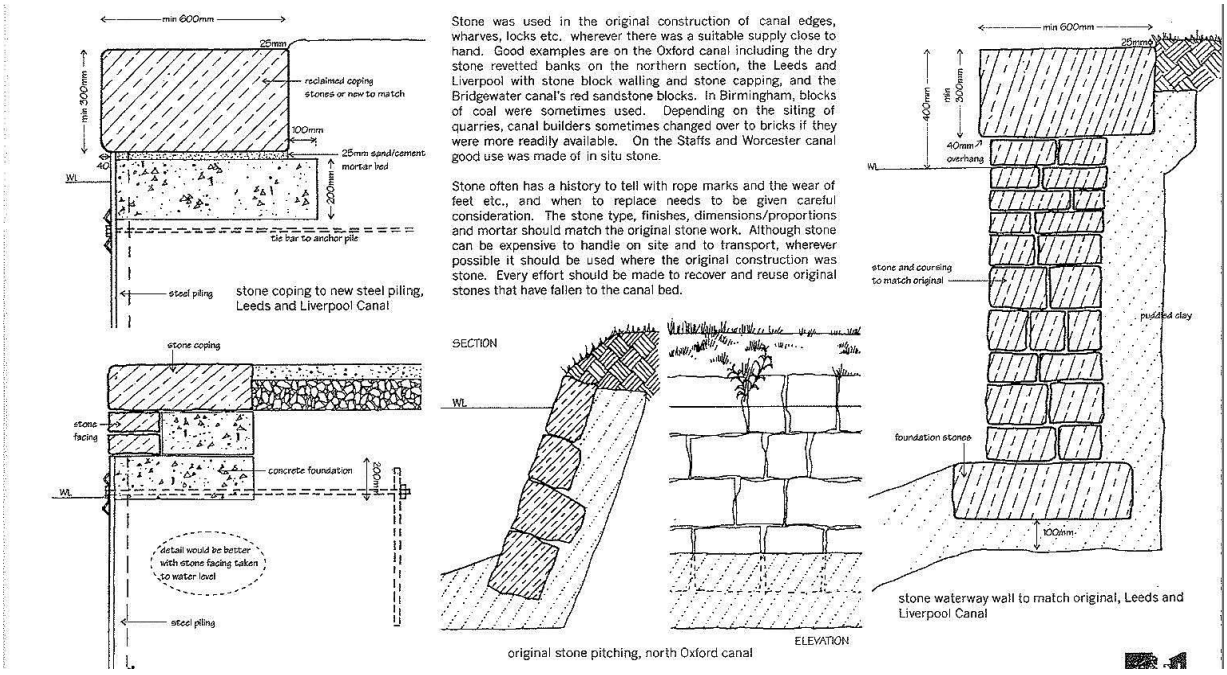
Old structures often have factors of safety close to unity. Factors of safety for embankments and cuttings reduce with time. Old structures are therefore particularly vulnerable to nearby works. Ill-considered excavations at the toe of an embankment, for instance, can have disastrous consequences.

No discernible vibration will be acceptable to Trust property unless the level of vibration has been prescribed in advance by the Works Engineer. Vibration is a particularly significant issue close to embankments of a granular composition.

All work near old structures must be carried out with great care and forethought. It is the Third Party's responsibility to demonstrate that there will be no detrimental impact on existing structures.



Typical cross section through canal



Typical waterway wall details

6 CONDITIONS

6.1 All operations affecting the Trust's property shall be carried out in such a manner so as not to endanger or damage the Trust's property and/or any persons entitled to be present thereon and to avoid (except to the extent agreed in writing) any interference to the free movement of any persons, pedestrians and/or road and waterborne traffic.

6.2 The Third Party shall not commence any Works, particularly excavation piling or dredging work, until adequate provisions to the satisfaction of the Works Engineer been taken to ensure the stability and security of any Waterway or associated supporting structures whether in the ownership of the Trust or not and to prevent the escape of water there from.

6.3 The Third Party shall if required by the Works Engineer provide temporary fencing to the satisfaction of the Works Engineer to provide safety and to prevent trespass or the straying of animal or poultry stock.

6.4 The Works Engineer and other agents of the Trust shall at all times have reasonable access to the Trusts property on the site.

6.5 Unless otherwise agreed uninterrupted passage for craft on the Waterway is to be maintained at all times. All lights provided by the Third Party shall be so placed or screened so as not to interfere with any signal lights, navigation lights and/or beacons of the Trust. Any Temporary Works which obscure signs signals or beacons shall not be erected without the written permission of the Works Engineer.

6.6 In addition to any special marking or lighting requirements of the Works Engineer, warning notices/signs/lights must be displayed throughout the duration of the Works as follows:

- boards with the words "CAUTION - WORKS IN PROGRESS" in red letters 150 mm high on a white background shall be erected on both banks of the navigation at a distance of 100 and 200 metres upstream and downstream of the Works
- where appropriate, metal squares 450 mm by 450 mm of cruciform construction painted red shall be displayed to define the navigation opening upstream and downstream of the Works and also at the extremities of the lead into the navigation opening both upstream and downstream of the Works
- by night, lights shall be displayed to define the navigation opening upstream and downstream of the Works. Two red lights side by side, 300 mm apart should be fixed at each position and in addition an amber light should be displayed upstream and downstream of the Works to mark the centre of the navigation opening.
- Where the completion of the Works involves projections of any kind into the navigable channel and/or anywhere vertically above the line of its edge the Contractor shall conform to the Board's Bye-Laws in respect of signing, marking, lighting and fendering.
- Where work is on a River or Freight Waterway the Third Party should discuss the lighting requirements with the Works Engineer as IALA lighting requirements must be followed.

6.7 No construction equipment for the Works shall be allowed on the Trust's property and, in particular, adjacent to the canal without the acceptance of the Works Engineer which may be subject to the prior submission of stability calculations.

6.8 The Contractor shall NOT without the specific written permission of the Works Engineer (and then ONLY under such conditions and restrictions as the Works Engineer may require) do any of the following:

- Use or place plant and/or heavy vehicles which may cause damage to the Waterway and which shall particularly include but not be limited to damage to Waterway walls.
- 'Crane' or otherwise similarly move plant materials and/or vehicles over any Waterway.
- Use floating plant barges and/or pontoons and the like in any Waterway.
- Excavate, tunnel or carry such other underground operations beneath any waterway.
- Display any advertisement or other material, except as specifically required by this condition, on or above the Trust's property.
- Discharge trade or sewage effluent, or arising's, surface water of any kind in any way into or onto the Trusts property including the waterways.
- Abstract extract and/or draw water from the Trusts property including the waterways.
- Damage or remove flora, fauna, waterway relics, architectural heritage, industrial heritage, landscaping, towing paths or waterway walls.
- Drill into any Trust Asset, including Coping Stones on the bank
- Store fuel or oil re-fuel service vehicles or plant on or in proximity to the waterway where there is a risk of pollutants entering the waterway.
- Access the Trust's property by any unauthorised route.

6.9 The Third Party shall take all necessary measures to prevent:

- Siltation of any Waterways.
- Damage to the Trust's property.
- Construction debris, materials or arising's of any sort which shall include but not be limited to bricks, timber, containers of any kind, reinforcing bars, polythene or plastic sheeting entering any waterway.
- Contamination of any waterway with any toxic, or other polluting matter or liquid of any sort which shall include but not be limited to grout, concrete or silane.
- The creation of any hazard to the visitors to the Trusts property which shall include but not be limited to oxy-acetylene burning, welding, grit blasting, water jetting or cleansing, spraying or pointing. Alternatively all such works shall cease until the craft or persons are past and clear.
- The spread of any invasive species

In the event of any of the above occurring the Third Party shall immediately inform the Works Engineer and then follow his instructions to abate and remedy the situation.

On completion of the Works all surplus material attributable to the Works, including any temporary works, on the Trust's property (including the waterway) shall be removed from it and the property shall be made good to the satisfaction of the Works Engineer.

6.10 Where for the purpose of completing the Works any Temporary Works are required above the waterway the Third Party shall provide and maintain a minimum height clearance above the water surface as specified by the Works Engineer.

6.11 The Third Party should particularly note when planning any work in relation to the waterway that the Trust cannot guarantee any particular water level or depth, nor prevent any fluctuations to such water level depth or speed of flow in any Waterway.

If completion of the Works necessitates the closure and/or the reduction in width of the Waterway or towpath the Third Party shall strictly comply and work within the arrangements and limits defined by the Works Engineer for the closure and/or reduction in width of the Waterway or towpath.

6.12 Any vessel or craft on the waterway for which the Third Party has obtained the permission of the Works Engineer for use in completing the works shall be licensed, used and moored in accordance with the Trusts Bye-Laws.

6.13 If any plant, vessel or craft falls or sinks or is cast adrift the Third Party shall immediately inform the Works Engineer and take immediate steps to make the hazard known to users of the Waterway. The Third Party shall immediately arrange the salvage/re-securing of the plant, vessel or craft from the Waterway and until such salvage/re-securing has been completed the Third Party shall provide buoys and/or markers and erect warning notices indicating the navigation hazard to Waterway users to the satisfaction of the Works Engineer. In the event of resulting oil or fuel spills affecting the water or land, the Trust may seek to recharge any costs incurred through containing and treating the spills.

6.14 The Third Party shall keep the Trusts property free from rubbish. The Third Party shall not leave rubbish or project waste on or in the property of the Trust

6.15 All damage to the Trust's property shall be made good by the Third Party to the satisfaction of the Works Engineer.

6.16 The following actions shall be taken by the Contractor in the event of any damage in the Waterway its containment and/or supporting structure or banking:

- IMMEDIATELY inform the Works Engineer and (if required) the Emergency services.
- Secure the area from the approach of traffic and/or the general public.
- Render every assistance to the Emergency Services and/or the Trust as shall be requested for the purposes of mitigating water loss and/or damage arising from the incident and/or for the purpose of securing public safety and the stability of other property.

6.17 The Third Party will be liable for any damage arising from the activities of his or her Agents, such as Consulting Engineers, Contractors and Sub-Contractors. In the event of a claim, the first course of action by the Trust would be directed towards the Third Party, though others may be joined in. It is in the Third Party's interest to ensure that his agents have adequate insurance to protect him or her from action. However, it is the Third Party's responsibility to ensure the appropriate level of cover is taken. If a Third Party or his or her agents, causes damage to the Trust's property then it will seek reinstatement of such damage, plus any inconvenience costs, loss of profits etc., which the Trust might incur, in full and without monetary limit. Levels of insurance will be specific to the risks attached to the proposal. The design and construction of the Works should minimise risk to a reasonable level such that insurance for **£5,000,000** should suffice. If the potential consequences require it, higher insurance levels may be necessary. The Trust reserves the right to inspect copies of insurance documents to ensure adequate levels of cover.

6.18 Press and publicity activities regarding the intended works must have the approval and prior knowledge of the Trust.

6.19 Site signs of agreed format should be erected indicating the organisation responsible for the Works including a description of the Works and telephone numbers for twenty four hour emergency contact and provide an apology for disruption caused to the Trust's customers.

6.20 All contract work and reinstatements shall have a maintenance and defects correction period, normally for one year.

6.21 If the Works Engineer considers the Waterway, Waterway users, or environmental or heritage features are at risk until his or her reasonable requirements or conditions have been met, the Works Engineer reserves the right to order operations to be suspended and issue a cessation of works notice (Form 5). It should be noted that the Trust cannot accept any liability for any costs or claims which may be incurred by the Third Party as a result.

6.22 The Works Engineer shall be given twenty eight days' notice of the end of the maintenance Defects Correction Period of the Works Contract and/or seven days' notice of any meeting in connection therewith, to enable an inspection to be made to ensure all outstanding works have been completed.

6.23 No works of maintenance, alteration or demolition may be carried out unless further submissions have been agreed.

6.24 In order to demonstrate the public value of the canals and rivers, the Trust is required to capture the value of investments in its canals and rivers, therefore we require the third party to supply financial information in respect of the costs of works which constitute improvements to the waterway as set out in Part 2 / Section 16. Such works may include, improved towpaths, access points, waterway walls, signage and other physical improvements to improve public access to waterways. The final information required by the Trust is a copy of the final certificate from the contractor or the final invoice, both of which need to demonstrate the cumulative value of the works. If the works are completed "in house" then a screen shot/report from the internal financial system demonstrating the value of works carried out on the Trust's infrastructure. This information will be for internal use only and will not be published externally and treated with the strictest confidence.

7 HEALTH AND SAFETY CONSIDERATIONS

General

This section highlights some types of hazard that might be encountered in the canal and waterway environment. Whilst the examples outlined are believed to be comprehensive, they cannot be seen as exhaustive as with 3000km of canals and waterways there can be specific hazards and conditions which maybe unique at a location. You are advised to seek more detailed information. You should present this information to your designer in addition to any site specific information provided by the Works Engineer.

The Trust's canals and rivers in general are not hazardous environments but there are some elements that need to be considered when working, or seeking access along, our property.

The canal and river system does not have an easy reference system for locating yourself when compared to most works where an address is often enough for suppliers and emergency services to locate your works. Site staff and suppliers need to be given accurate information to allow them to locate you from the adjacent road system. This may be a problem in both rural and urban areas. All bridges and locks are numbered to assist with this.

Some areas of the canal network have poor reception for mobile phones and you should test coverage at an early point in the project feasibility stage. Be aware that different networks have different coverage so there may not be universal coverage. Towpath conditions can vary throughout the year with some surfaces becoming wet and slippery particularly during the winter months. Some lengths of canal can be very exposed and changing weather conditions can present new hazards.

The Trust invites the general public onto its property to enjoy both boating as well as towpath access for walking, cycling and fishing…..etc. It must be assumed that these people are unfamiliar with the risks associated with your activity and you may need to take additional precautions to protect them. The towpath, the path adjacent to the waterway, is not usually suitable for vehicular traffic. You may have been given specific permission to use the towpath if it is suitable, otherwise you must gain access by alternative routes.

Where permission has been given then the requirements of the approved method of access must be strictly adhered to. Driving too close to water's edge or with larger plant than specified, can lead to the failure of the towpath edge and vehicles capsizing into the canal. In such instances, there is the risk of occupants being trapped in their vehicle. Particular attention needs to be paid to ensuring that vehicles and plant can be safely turned around. Reversing vehicles down the towpath is not acceptable without a banks man and safe turning areas need to be identified as part of any method statement. In public access areas such as car parks….etc all reversing manoeuvres must be supervised and banks men used where necessary.

Water and its hazards

Canal and river water represents a number of hazards. The obvious risk of drowning is in fact less than that of the shock of falling into the water, particularly in cold conditions which can cause a heart spasm. Despite the majority of canals being relatively shallow, dragging oneself out of the water when cold and wet can be energy sapping particularly if you are some distance away from welfare facilities. The Trust strongly advises that suitable life jackets are used when working near water.

Water levels on rivers in particular can change rapidly as a result of river flows upstream or the operational need to transfer water. Particular areas to avoid are weirs and sluices where water speeds can be higher than expected.

The water and canal sediments can be potential sources of infection, in particular leptospirosis, which is a life threatening disease which most doctors are unfamiliar with. This can lead to delays in treating the disease and long periods of rehabilitation.

Other more obvious health problems are stomach bugs and the possibility of infections entering your body through cuts and abrasions.

In certain areas there is a hazard from discarded syringes and other antisocial activities. Accessing these areas unaccompanied, particularly at night, may not be advisable.

Services and other hidden hazards

Buried within the towpath and also present overhead are large number of services all of which have the potential to cause injury to your staff or disruption to the local community if damaged. Risks from striking underground high voltage electricity cables and gas services are significant. Some of these services maybe unfamiliar to Third Parties as they include strategic oil pipelines, fibre optic cable networks and occasionally private services such as oxygen mains linking parts of adjacent factories together. Increasingly the Trust has its own apparatus within the towpath providing power to locks and other structures.

Structures

Many of our structures are old and were never designed to accommodate the activities of the 21st century. Some modern plant and equipment can gain access to the waterways in a way that was never envisaged when the system was constructed. It is worth remembering that the original canal system was operated by men with horses. Some of the canal side buildings have fallen into disuse and entering them can present particular hazards ranging from weak floors through to abandoned materials which maybe unstable or harmful.

Preserving the heritage of the canal system sometimes means that trip hazards and some unguarded falls may not be safeguarded in the way you may expect. Some of our structures particularly those below ground, such as culverts, can harbour poor air conditions sometimes with fatally low oxygen levels.

Increasingly some of our structures are mechanised and this can lead to entrapment hazards with structures such as lock and bridges moving unexpectedly, giving the potential for people to be crushed between the moving and static elements of the structure. It is essential that agreed lock-off procedures are implemented when it is necessary to work within the confines of such structures. Sometimes the hazard can change as a result of the day-to-day operation, for instance a full lock does not represent such a hazard to falling from a height as does an empty lock.

The Health and Safety File for the works should include reference to this Code or a statement that the Trust's agreement must be obtained before any works of maintenance, alteration or demolition are undertaken.

Please note the above information is general to the canal and river network. There may be site specific information that the works engineer can make available and you should request this information.

8 FEES

In general, the Trust will normally recover all reasonable costs associated with the works.

The Application Fee, to be paid upon notification of the works, is **£380 + VAT**. This covers the initial administration associated with each project. The application fee will be valid for up to 12 months, a new application will be required if no works are undertaken within this period.

The fee and any further costs can be paid by Credit / Debit Card by telephone or in person at any Trust office; by BACS transfer (please contact the Works Engineer for details) or by Cheques made payable to Canal & River Trust.

A receipt will be issued upon receipt of each payment.

The Trust will issue invoices throughout the life of the project at a frequency of not less than 1 month and not greater than 3 months.

In the event of late payment, the Trust may charge a rate of 8% above the Bank of England base rate on overdue amounts. The Trust also reserves the right to claim debt recovery costs.

At the discretion of the Works Engineer, projects of a domestic nature or where there is no commercial benefit, a reduced application fee of £150 + VAT may be applied.

Reasonable costs include time (measured in hours) dedicated to the application of this process. This will include the time of the Works Engineer and other staff of the Trust or Consultants as may be required.

The current rates per hour for Trust staff are as follows (subject to annual increases);

Grade	Rate (£/hr)
Administration / Operational	60
Supervisory	75
Technical	90
Professional / Management	120
Senior Management/Principal	180

The Works Engineer is classed at professional / management unless otherwise indicated.

Consultants and Contractors procured by the Trust as part of the process will be re-charged at actual cost.

The Third Party will be required to sign a cost undertaking to guarantee that the Trust will receive payment. The Works Engineer will not progress a project past the initial application unless the cost undertaking is in place

The Works Engineer will advise upon the amount to be included in the Cost Undertaking. This is usually £5,000. NB: The cost undertaking is for a sum exclusive of VAT

Disbursements - subsistence and other out-of-pocket expenses will be recharged at cost. Car mileage will be at 56p per mile.

Costs incurred for projects which are cancelled by the third party will still be invoiced.

The Works Engineer will be happy to provide an outline quotation in advance of the works. This will clearly be subject to change as the project progresses as the required inputs from the Trust's staff are established. As a guide, the following charges are typical in addition to the application fee, and are quoted ex of VAT:

Notices

For issuing / amending a restriction/advice/ stoppage notice - £500

Stoppages

The term "Stoppage" is used to define the period of time that a waterway is closed to allow works to be undertaken.

The Canal & River Trust (the Trust) customers are very tolerant and understanding with regard to stoppage works. Often these works create a huge disruption to their plans as practical diversion routes are not always available. For Boaters these diversion routes can often take weeks to navigate. It is therefore in all our interests to ensure that the duration of stoppages is reduced as much as possible.

Stoppage works during the summer season (1st March – 31st October) will not be agreed by the Trust, save in exceptional circumstances. It is vital that the waterway network that is open and accessible to all users remains open and there is not a negative impact on the boating tourism industry.

Stoppage Overruns - Penalties

The Trust will not permit stoppages to overrun beyond the agreed period. Should your project overrun beyond the agreed period the Trust will impose a number of sanctions in order to ensure the waterway is reopened as soon as possible. In signing the Code of Practice, you are agreeing to pay the reasonable financial penalty imposed together with reasonable compensation to affected Trust customers and waterway business.

The sanctions include (but are not limited to):-

- Daily Penalty fees to for each day that the stoppage overruns (these fees will be advised by your Works Engineer before your works commence on site)
- Reasonable compensation payment to identified Trust customers and waterway businesses who have suffered loss as a result of the additional stoppage
- The Trust requires the site to be returned free from any plant, equipment, debris used in the course of the works to which the stoppage applies
- Recovery of costs (including legal fees and interest) incurred by the Trust in clearance of machinery and/or debris left on the land following completion of the works

Stoppage Overruns – Working together to prevent these

Should your works require a stoppage the Trust will require your co-operation in working together with its own Works Engineer to ensure that the works are completed without overrunning on the booked stoppage. Typically this will include

- Commenting on your proposed programme of works with respect to the closure of the canal
- Requiring you to confirm that the programmed stoppage period has been validated via some form of Early Contractor Involvement
- Requesting weekly progress reports including confirmation that the stoppage period will not be exceeded
- Weekly site visits by our Works Engineer and / or Works Inspector to check on progress of the works

Winter Stoppages

The Winter period is generally when the Trust undertakes works that require the canals to be restricted or closed, and it is during this period that we will consider requests from outside organisations for closures and/or restrictions.

For a navigation stoppage in "Winter" (1st November to 29th February) a fixed weekly charge in the amount of £2,500 will be applied.

A stoppage application confirming the proposed works and canal closure dates must be received by the Trust no later than the 1st January for the upcoming Winter stoppage season (which will commence on the following 1st November). The application will form part of the Trusts annual public consultation on proposed stoppages. We will confirm to you by 1 April if your request has been successful.

A late booking fee of £2,500 will be applied for stoppages requested after 1 January, as such applications will require a bespoke review and approval process.

Once the stoppage is confirmed, the fees for that stoppage become due immediately. Please note no refunds will be made in the event of any subsequent cancellation by the Applicant or reduction in stoppage time.

Summer Stoppages

The Summer season is when the canals are at their busiest. Requests for stoppages during this period will only be granted in exceptional circumstances. Any works will therefore need to be carefully planned to avoid the summer season.

Summer stoppage applications will be considered on a case by case basis. Permission and fees may vary depending on location.

Please note that for both Winter and Summer stoppages there may be additional costs for the actual implementation of a stoppage or restriction on site depending on the technical details. Please also note that compensation for freight carriers and other businesses may also be required – the Works Engineer will be able to offer guidance on this.

Restrictions

Where the works reduce the width of the canal but still allow for the passage of boats and / or create a delay for boaters not exceeding 30 minutes (once in any 3 hour period) – this is classed as a restriction**.**

Use of Waterspace

Works that require the use of the waterspace may be subject to charges depending on the details. The Works Engineer will be able to advise.

Towpaths

For a towpath closure - £600 per week

Miscellaneous

Issuing a cessation of works notice - £500

Wharfage – this includes mooring operational craft, their lifting in and their lifting out – costs to be determined upon receipt of the details by the works engineer.

Site Permit fees

One month £150.00
One to 6 months £200.00
Greater than 6 months – by negotiation only

Specific tasks

Some typical costs are included below for specific tasks, you should note that these can vary dependent upon the complexity of your scheme and the amount of staff time required to consent your scheme:

Bridge or Structure Inspection -

- From Towpath - £450
- From Towpath (some of inspection team in the water) - £1070
- By boat or rope or under bridge unit/working platform - £1,370
- Plus pontoon charges at £10/sq. m/week
- By divers (with or without boat) - £2,150

In addition to the above guide costs you will still be responsible for the initial sign on fee.

Scaffolding / Safety fencing / Heras fencing / Boarding

A charge is made based on the duration, length and width of these items. The minimum charge is £5 / linear m / sq. m/ week. The maximum charge is £25 / linear m / sq. m/ week. The actual charge for your scheme will be determined by the Works Engineer.

Large scaffolds requiring an extensive use of land will be managed through a licence (see Section 4).

NB: Any vessel or craft on the waterway for which the Third Party has obtained the permission of the Works Engineer for use in completing the works shall be licensed, used and moored in accordance with the Trusts Bye-Laws.

CODE OF PRACTICE FOR WORKS AFFECTING THE CANAL & RIVER TRUST

PART 2

DETAILED INFORMATION

April 2018

CONTENTS

1.0 BRIDGES

1.1 Introduction

This section refers to new bridges, bridge widening, major bridge refurbishment, temporary bridges and conveyors. Proposals for constructing new bridges or altering existing bridges across Waterways are conducted in distinct phases:

- feasibility and design
- construction
- maintenance

Feasibility and design are essentially iterations of the same process. Within this document these steps are not listed separately. It is imperative that all pertinent aspects relating to the interests of the Trust are identified at an early stage. There are aspects of construction and future maintenance, which need to be considered at the feasibility and design stages.

1.2 Feasibility and Design

The bridge site should be selected by considering the needs of the proposed scheme and also the effect of the bridge on the canal corridor. The latter criterion will include consideration of the following:

- navigational needs: locations adjacent to existing locks, bridges, bends etc. should be avoided where possible
- environmental and landscape impact on the canal corridor
- the needs of towing-path users (including those with disabilities); vehicles may be used for towing-path maintenance or access
- the protection and/or relocation of services in the towing path
- deterrence of vandalism.

The use of Design and Build contractors needs careful consideration. Unless the critical parameters are defined before a contractor is appointed, an unsatisfactory result and/or escalating costs to the Promoter might result. The Promoter remains responsible for the proposals.

Navigational clearances need to be established. These will vary from navigation to navigation and from site to site owing to considerations of craft dimensions, one or two way boat working, horizontal alignment and visibility, proximity to other structures, dredging and other maintenance activities. In each case the

The Works Engineer will agree the following:

- headroom over navigation
- headroom over towing-path (minimum usually accepted 2.7m)
- navigation width
- towing-path width
- navigation depth
- forward visibility.

Headroom will normally be defined relative to maximum navigable flood level on river navigations or overflow weir level on a canal. On river navigations the clearance must be maintained over the full width of the navigation channel. Minimised headroom leads to difficulty in maintaining the waterway and constructing and maintaining the bridge. These problems include:

- temporary works clearances during construction
- temporary works clearances during maintenance
- access for dredging plant.

If sufficient headroom for these purposes cannot be achieved, a low maintenance structure is needed. Dredging can sometimes be simplified by separating carriageways (i.e. introducing a light well in-between sections of the bridge, or by providing alternative means of dredging other than the use of waterborne plant. See section 14 for guidance on contamination.

In order to maximise the time before dredging becomes required it may be necessary to dredge before construction; at the promoters expense. Where dredging occurs, ensure that the dredged material that requires disposal is done so in an environmentally friendly and sustainable manner and in compliance with current legislation for contaminated material.

Headroom clearances relating to arched bridges need careful consideration. A profile, which will achieve the desired visual and clearance objectives, is needed. It is usual to use parabolic arches, with raised and set back spring points to achieve the optimum result.

Super elevated roads requiring bridges with less than generous headroom should be avoided, because of safety considerations. Waterway users can be misled regarding the clearance and be unprepared for the headroom reduction.

The Works Engineer may require physical or mathematical modelling of the navigation to ensure that safe passage of craft can be maintained at all times.

If the Works Engineer permits any narrowing of the canal, such narrowing will normally take place symmetrically about the centre line of the navigation. The alignment of the canal banks is of particular interest to the Trust. The drawings must illustrate a sufficient length of the canal to enable the realignment works to be viewed in context. Any re-alignment must be designed to 120 year design life.

Consideration must be given to aspects of the forward visibility for waterway users. It may, for instance, be necessary to increase the span of a bridge when a new structure is constructed in the vicinity of a bend on the Waterway.

If it is essential to build bridges in close proximity to locks it may be desirable to increase the vertical clearance or install open parapet rails in order that vessels approaching the lock from below can determine in advance if the lock is in use. The lock landing will need to be maintained at all times or a suitable alternative agreed with the works engineer.

Bridges across river navigations should generally clear the navigation in a single span. Where it is necessary to have piers within the river, special attention will be needed to ensure that such piers have a minimal effect on the navigation and are adequately fendered, signed and lit. Aspects to be considered include:

- clearances
- proximity to adjacent structures
- speed of flow in flood conditions & scour protection
- fendering
- Signing the correct navigational channel
- Any lighting within Harbour Areas or Tidal Waters should be compliant with IALA (International Association of Lighthouse Authorities) regulations.

Construction methods and the effect on navigation must be considered at the design stage. The towpath should generally pass under the same span as the navigation.

The towpath under the bridge should be surfaced in material consistent with the character of the Waterway. Surfacing (including gradients, cross fall or width) should not hinder the use of the path by people with disabilities and should offer access compatible with or superior to surrounding towpath.
Weep holes should be laid to a back fall with drainage at the rear of the abutment. They must not be designed to drain onto the towpath or into the waterway without a utilities agreement and suitable outfall design.

In urban areas, where pigeon nuisance is a problem, the matter should be addressed through appropriate detailing.

Towpath accesses from highways must be retained and should be improved or provided where appropriate. These should be enhanced for people with disabilities, where possible and appropriate.

There should be no 'dead areas' prone to vandalism in towing-paths under bridges, and where possible access to water's edge should not be fenced off.

It is preferable that there be no pedestrian access to offside abutments of canal bridges in order to prevent graffiti.

Bridges over 15 m in length will be treated as tunnels as far as safety precautions are concerned. Please consult with the works engineer.

It will generally be necessary to provide bank protection, durable for the life of the bridge, under the new bridge owing to considerations of:

- increased navigation depth
- difficulty in installing such protection later in limited headroom circumstance
- protection of the structure from scour
- fendering
- support to the towing path
- the new bank protection must interface with the existing with a detail designed to minimise the possibility of erosion and leakage at this point.

Piles should be capped to match the local vernacular. Mitigation measures will be needed where bank protection affects wildlife habitats.

Bridge abutments and spans have been found to be ideal bat roosts, especially where there are small crevices leading to voids within the structure. It is an offence, intentionally or recklessly, to damage or destroy any structure used by bats, or to disturb them whilst occupying the structure. Professional surveys of existing structures are recommended at an early stage of any widening or refurbishment scheme to avoid delays. Where possible the provision of bat habitat within or near to bridges should be included in bridge design.

The noise impact upon the canal environment resulting from the new bridge crossing must be considered. If noise levels are too great mitigation measures must be introduced. It may be necessary to install noise control measures.

The impact of the bridge on the canal environment will require detailed consultation. Not only are bridge aesthetics of great importance but also the setting of the bridge on the local and wider landscape must be considered. Offsite planting should be considered, however planting should avoid the use of plants / trees with intrusive root systems.

When considering the aesthetics of the bridge there are two main options. The bridge should either be a striking dramatic modern structure or it should reflect the scale, style

material, proportions and heritage of the navigation as a whole. In either case the Trust requires a high quality, well designed and detailed proposal.

The waterway corridor is a linear one. Bridges are seen by waterway users as part of a sequence of structures, most of which are contemporary with the construction of the waterway. Users view bridges at leisure whether travelling on foot, at walking pace from a boat, fishing at close quarters or from a distance.
Aspects which must be considered with regard to bridge aesthetics include:

- expression of function e.g. a beam bridge should not have false arch facades
- Scale - proportions and mass
- order - avoid chaos
- materials and facings. There is a presumption towards an appropriate brick or stone. The facing material and bond pattern, which will reflect local themes, must be selected in agreement with the Trust before a contractor is appointed. Where appropriate, the incorporation of recycled materials should be considered by the Promoter. The sourcing of local materials is also important in achieving a sustainable project
- colour
- architectural features such as string courses, pilasters, pilaster caps and patterned brickwork; it is important that the bridge expresses its structural form and that such architectural features are inherent in the design and not 'add-on extras'
- parapet type:-open parapets allow road users a view of the canal and have the advantage of a weight saving over masonry parapets. On small scale canal bridges solid parapets are usually appropriate. In some cases it may be appropriate to "box in" an open parapet above the deck with masonry parapets above the wing walls – the 'masonry book-end': in areas of high vandalism special measures will be needed to protect waterway visitors from abuse
- wingwall direction and skew angle: the wingwall direction should generally be parallel to the transport mode being carried across the canal; wingwalls to skewed bridges must not be parallel with the canal; traditionally wingwalls are curved in plan and battered; consideration should be given to curved wing walls particularly on pastiche structures.
- the effect of road alignment and super-elevation
- embankment landscaping, which should be integral with the design of the bridge; native plants appropriate to the area and location should be used; if possible the planting should be carried out in advance of the works and should extend beyond the site to provide screening, avoidance of intrusive root systems is required.
- Street / towpath lighting
- bridge name/number and date plates – the Trust require the bridge to be numbered on both sides and the works engineer will provide details of the style and actual number
- parapet/approach safety fence interface
- access ramps, steps, barriers, gates, stiles etc.

Computer generated images of proposed bridges gives an excellent view of the impact of new structures on the landscape and should be provided where necessary or on request.

Further reading on bridge aesthetics is available as follows:

Highways Agency	'*The Appearance of Bridges and other Highway Structures*' HMSO (1996)
Graham Tilly (2002)	*'Conservation of Bridges'* (Gifford / Highways Agency) Spon
Fritz Leonhardt (1982)	*'Brücken Bridges - Aesthetics and Design'* - Architectural Press
Conference papers	'*The Architecture of Bridge Design'* (1994)
Conference papers	'*The Aesthetic Refurbishment of Bridges'* (1995)

Conference papers '*Good Looking Bridges'* (1993)

1.3 Construction

The design of the structure should take into account the bridge construction method.

Continuity of navigation and towing-path usage is presumed. It may be possible, in some circumstances, where it is necessary in the interests of safety or otherwise, to carry out a local towing-path diversion. Such a diversion should be safe, commodious, maintained and signed. Pedestrians should be allowed to use the towing-path as soon as it becomes possible for them so to do.

Bed profiling should be carried out before and after the works in order to confirm that construction debris is removed.

It is usually possible to place bridge beams without interfering with traffic, by performing the lifts in the intervals between passing boats. In such circumstances a method statement will need to be agreed with the Works Engineer. Lookouts must be provided. The presumption is that canal traffic should not be delayed. Construction taking place adjacent to and above the navigation must be carried out with the clearances specified at the design stage. Fendering, lighting, screening and signing will be necessary where appropriate.

Experience indicates that piling lines, which are acceptable on a drawing, are not satisfactory on site, without minor amendment. It is imperative therefore that all piling lines are agreed with the Works Engineer before piles are driven.

Throughout the construction phase all possible measures should be taken to reduce environmental impacts on the waterway and surroundings. (See section 14)

1.4 Maintenance

The bridge should be designed to minimise the need for future maintenance to those parts of the bridge, which affect navigation and to address how essential maintenance is to be carried out without affecting the interests of the Trust.

Where permanent access gantries are provided, a full operational agreement with the Trust is needed, even where there are generous navigation clearances. A safe system of work must be agreed, incorporating, where necessary, lookouts, catch nets etc. The Trust must be advised when access gantries are to be used.

Method statements, programmes and temporary works drawings must be agreed before carrying out any significant aspects of bridge maintenance.

Hard and soft landscaping must be maintained in accordance with a predefined plan.

2.0 SERVICE CROSSINGS

2.1 Introduction

This section refers to all services (e.g. pipes, cables etc.) installed on the Trust's land perpendicular to or crossing the waterway, either overhead or beneath. See Section 4 of this part for services beneath the tow path.

This section primarily relates to canals, where considerations of integrity and water tightness are paramount, however it is relevant to river navigations.

Proposals for the installation, enlargement or maintenance of underground services should be considered in the following distinct phases:

- Feasibility/design
- Construction
- Maintenance.

It is imperative that all relevant issues relating to the interests of the Trust are identified at an early stage. Also there are aspects of construction and future maintenance which need to be considered at the feasibility and design stages.

Note: Overhead crossings are not permissible on environmental grounds. Whenever the opportunity arises to remove an existing service crossing, for instance when it is in need of renewal, the service will be diverted under the waterway.

Crossings will normally be perpendicular to the waterway.

Trenchless techniques will be presumed. Only if trenchless schemes cannot be carried out can other methods be considered. Other methods need to be justified and discussed in detail with the Works Engineer. The use of any other method must not cause damage to or rely on the strength of canal beds or walls. Some methods of coffer dam can cause damage to the bed of the canal (e.g. sheet piles) it is highly unlikely that the Works Engineer would deem these methods as suitable for purpose.

In some circumstances it may be possible to carry services in the surfacing over bridges, be they owned by the Trust or others. It may also be possible to install ducts between beams. The option of external attachment should not be considered. The Trust would raise strong objections on environmental, aesthetic and bridge maintenance grounds. There is usually minimal cover over bridges. Services must be laid on sand to distribute loads. Services are likely to be disrupted by bridge maintenance.

Marker posts should be provided at the rear of the towing path and on the offside.

Where services are to be abandoned they should be removed to the satisfaction of the works engineer. This is particularly important for services under the canal which may need to be remediated.

2.2 Feasibility & Design - All Techniques

In principle, services should be installed with minimum of disruption to the Waterway, either during construction or during subsequent maintenance and use. In addition, normal operational activities such as bank protection and dredging should not be hindered by the presence of such installations.

The service crossing site should be selected by considering actual ground conditions, existing infrastructure and the needs of the underground service.

A site investigation will be required, involving a minimum of two boreholes (one on each side of the canal) to a minimum depth of 10 m or 3 m below the anticipated invert depth of the crossing, whichever is deeper. A depth profile across the full width of the canal or river will be required, showing the depth of water, the depth of silt and the level and material of the hard bed of the canal. The information should be related not only to Ordnance Datum but also to canal weir level, or in the case of a river low summer level. In mining subsidence areas the canal can be over 10 m deep, sometimes part filled with loose unconsolidated settlement.

Because of their industrial heritage, land in the corridor of some waterways, including bed silts, may be contaminated. A contamination assessment is necessary before any works are carried out which involve the excavation or disturbance of potentially contaminated materials, see section 14. Consultation with the Environment Agency is recommended.

It should not be assumed that there is any impermeable lining in the canal. In medium / high risk locations, to be determined by the Works Engineer, the canal may need to be drained prior to any works. A condition survey should be completed before works start, after completion of the works and after an agreed maintenance period.

A drawing showing the boreholes, bed survey information and the profile of the service and a description and interpretation of the ground model, based on the site investigation, should be produced for the Submission.

After receiving copies of the logs of the boreholes, bed survey and such other information as he or she may require the Works Engineer shall inform the Promoter whether the proposed method of construction can be considered and, if so, if the proposed depth is acceptable. The depth given at this stage may be modified by the Works Engineer depending on the soil strata revealed in the thrust and reception pits, in trenchless systems or during piling for open excavations. If the method is not permitted or if the Promoter considers the depth too great, he should submit an alternative method of construction for the Works Engineer's consideration.

Before any disturbance is caused to the canal structure, the Works Engineer may require a line of permanent interlocking steel sheet piles or reinforced vegetative bank protection, usually for at least 5 metres either side of the centreline of the crossing to be installed to each side of the canal, but in high risk areas a greater length of protection may be required. This permanent piling may be required to provide an area of protection within the canal bank against possible leakage or breaching, or to relieve the need to pile subsequently in the vicinity of the crossing. Where piling is essential for design reasons it may be appropriate that they be hidden for landscape and environmental reasons. Permanent sheet piling must be agreed with the Works Engineer as to length, section, depth, alignment, capping, ties, anchors and marrying-in with any existing canal bank protection and shall be shown on the approved drawings.

Permanent piling or walling, such as specified bank protection, must be designed by a competent person to withstand all external forces. The Works Engineer may require

calculations. These calculations should clearly give design details of both the permanent and temporary conditions.

A suitable valve system, to enable a rapid shut down to be effected in the case of emergency, shall be provided where appropriate. The valves are to be fixed at least 5 m clear of the Trust's land. Any sleeve or carrier pipe shall be capable of withstanding all normal canal, towing path and access road loading, and must extend to 3 m beyond the Trust's land. These isolation points must be able to be utilised upon request from the Trusts engineers, and potentially at short notice – it is not the responsibility of the Trust to ensure your networks is backfed and you must be prepared to implement shut down upon request.

Any concrete surround or sleeve must extend a distance or not less than 3 m beyond either water's edge.

All electricity, telecommunication, etc. cables should generally be placed within a strong and durable duct of galvanised steel, thick walled Polyethylene type or similar material. In the case of electricity cables, metallic ducts must be plastic lined. Normally all pipes will be grouted in position in the duct.

All pipes carrying pressurised material, which in the case of pipe failure may affect the Trust's property, must at the Works Engineer's discretion be placed within a suitable sleeve or duct.

2.3 Feasibility & Design - Trenchless Techniques

Trenchless techniques are accomplished without excavation or disturbance, therefore reducing the overall operational, maintenance and capital costs associated with projects, while also minimising environmental concerns.

The principal criterion of the Trust is leakage from the canal. Very small settlements can often be accommodated in the absence of structures. The Works Engineer may request settlement calculations.

Directional drilling has proved successful for small diameter flexible services such as cables and water pipes in soft and hard ground. Difficulties have been experienced with larger bores needing multiple reams.

Auger boring can lead to the creation of voids in granular ground and collapse of the bed has occurred.

Success has been achieved with earth-pressure balance micro–tunnelling machines used under unlined canals in soft ground.

When man entry techniques are proposed the safety of the miners must be paramount. Draining and closure of the canal may have to be considered.

If compressed air working is envisaged, the possibility of a blowout disrupting the bed and lining must be considered.

Difficulties of accuracy of the bore have been experienced when pipe ramming.

Pipe bursting of existing culverts is not normally viable due to considerations of disrupting the bed and creating an annular leakage path through the rubble.

In trenchless systems, the minimum depth to the crown of the pipe shall be of the order of 3.5 metres below hard bed level. This dimension will be varied as necessary depending on ground and trenchless techniques.

No part of a thrust or reception pit or shaft is to be nearer than 5.0 metres to water's edge or impinge on any embankment, but in areas of high risk the Works Engineer will likely require a greater offset. In Instances where this risk can be designed out, a suitable detailed design is required. It should be noted that this design may require external checks at the promoter's expense

The method statement must consider and address possible eventualities, such as seepage or leakage from the canal.

Pits or shafts should be raised by at least 300 mm above maximum canal water level, so that, if water from the canal were to enter the bore, it would be contained. In directional drilling a bund may be needed to contain leakage.

Any Contractor carrying out boring operations must be a member of the relevant approved trade association (e.g. the Pipe Jacking Association).

Where blasting is deemed necessary for the construction of the service the Promoter shall submit a full method statement which includes blasting arrangements and impact details. Agreement with the Works Engineer will need to be reached on frequency limits and the predicted Peak Particle Velocities. Vibrograph monitoring will be required during the Works.

Generally, back grouting of overbreak is necessary. The details of the proposed grout mix, phasing and pressures must be agreed. Mixtures particularly injurious to an aquatic environment should not be considered, although all cement based grouts are potentially polluting due to their lime content. Under no circumstances shall the pressure be allowed to exceed overburden pressure. Grouting records should be submitted to the Works Engineer as work proceeds. Constant monitoring of grout-take should be maintained and if there is any evidence of grout leak to the canal, the operation should be suspended immediately.

If any leaks to the waterway are discovered they should be reported immediately to the Works Engineer who may have to inform the Environment.

2.4 Construction - Trenchless Techniques

The Works Engineer shall be given a minimum of 48 hours' notice to allow him or her to inspect:

- the location of sheet piling for the thrust and reception pits and their approach trenches before piling commences
- the completed thrust and reception pits
- the completed work before the contractor leaves the site.

A record of the penetration of each pile in the thrust and reception pits and approach trenches as described above shall be kept on site and made available to the Works Engineer on request.

Pumping from any bore or pit is to be carried out only with prior consent from the Works Engineer and if found necessary, it must be passed through a settling tank to determine whether an undue proportion of fines is being withdrawn. Hoses are to be taken over the top of shafts and under no circumstances are holes to be cut in the piles. No contaminated water

must be recirculated to the canal. Environment Agency consent for the disposal of this water may be required.

The boring and jacking operation once commenced is to be continuous and carried out in accordance with safe, standard practice. Unless otherwise agreed 24-hour working will be required.

Where pipe-jacking, pipe ramming or auguring techniques are employed, it is required that the progress of the bore be kept under constant supervision, distances from the head of the boring pit are to be painted at 500 mm intervals on the pipes. The points at which the pipe shall pass beneath each of the two canal banks and the deepest part of the canal are also to be indicated on the pipe.

Where an approved directional drilling technique is employed, constant monitoring shall be carried out in order to confirm the depth and alignment of the bore.

Surface monitoring of settlement will generally be required.

Under no circumstances must an auger be projected forward of the jacking shield.

In the event of canal water appearing at the face of a tunnel or in the boring pit in remote techniques, whatever action is necessary must be taken immediately and the Works Engineer informed of the incident and action taken before any work can then continue. It should be noted that face boards must be available for boarding up the exposed face of a thrust bore or tunnel.

In the event of a bore proving abortive, work shall not be recommenced until after the Works Engineer has accepted alternative proposals. In such cases the pipe is to remain in position and be filled along with any over break with grout of an agreed mix.

The removal of piles and backfilling and adequate backfilling of pits employed within the Works and associated reinstatement is to be carried out to the satisfaction of the Works Engineer, in order that support is not lost.

The Works Engineer shall be empowered to order the work to be suspended at any stage for any express reason and this instruction must be acted upon immediately. The Works Engineer shall not accept any liability for any costs or claims, which may arise by the Promoter as a result.

The contractor shall install a permanent marker on both sides the waterway to indicate the line of the crossing. Details to be agreed with the Works Engineer.

3.0 WATER DISCHARGE

This section is applicable to canals and navigable rivers where the Trust is riparian owner and those navigations identified in Statutory Instrument No 1195 *'The Inland Waterways of British Waterways Board Order 1965'* as amended. The requirements relating to navigation are applicable to other river navigations.

3.1 Introduction

The Trust is not a land drainage authority. Water levels in canals are maintained in dry spells using reservoirs, river abstractions, pumping from ground water sources and re-circulatory pumping at locks ('back pumping'). Water levels are controlled in wet periods using overflow weirs and manually controlled sluices. Without these, the canal would overtop and may breach its banks, causing damage to property and possible loss of life. When the canals were constructed, they were usually a closed system, isolated from the effects of storms. Therefore storm water discharges do not assist in dry periods and can cause severe difficulties in wet conditions. Where a new (or modified) discharge is proposed, it will be reviewed to determine if the benefits to the Trust outweigh the risks of acceptance and approval by Water Management and Environment Teams, the Waterway and the Utilities Team will be required. In the majority of situations, there is no obligation on the Trust to accept discharges.

3.2 Feasibility, Design, Operation & Maintenance – Flood Risk considerations

The only discharge which will normally be considered is uncontaminated surface water in small quantities at suitable locations. The Canal and River Trust undertakes a staged process to review the impact of all new or modified discharges to its network, in addition to any considerations that are made by the Environment Agency and/or the Local Planning Authority via the normal planning process.

If the applicant, as part of their site drainage plan, wish to discharge surface water into an inland waterway owned or managed by the Trust then an application should be submitted to the Trust who will provide details of the application review process and associated fees. In order to deliver a successful outcome for all parties it is vital that the Trust is consulted as early in the process as possible, potentially even before the land is purchased.

The Trust supports the principles of Sustainable Drainage Systems (SUDS) which should be followed. Guidance is given in the CIRIA publication C523 'Sustainable Urban Drainage Systems – Best Practice Manual' – This refers to the CIRIA Sustainable Urban Drainage Design Manuals C522 for England and Wales. The Flood & Water Management Act 2010 introduces changes to the legislation relating to SUDS, and subsequent editions of this document will reflect those changes, once enacted/commenced.

The details of on-site flow attenuation measures (such as SUDS) giving details of design, information about storage or drainage of water in excess of attenuation should be provided as well as any details of maintenance and adoption agreements for SUDS. If the SUDS are not maintained in the long term, then they will fail to provide the design attenuation and the Trust will be exposed to the full un-attenuated additional flood risk. Any SUDS such as underground storage, ponds, soakaways, flow restrictors etc. must have a suitable maintenance regime in place to ensure their effective operation over the life expectancy of the development.

In addition to the above information, the details of the proposed connection with the canal should be provided together with an estimate of the peak velocity of the discharge orthogonal to boat movement.

Discharges are not usually permissible directly above and below locks, adjacent to moving bridges and at mooring sites. Navigational difficulties would ensue as a result of the transverse flows. In order to minimise navigational difficulties associated with transverse flows of water the discharge energy must be minimised in the discharge structure design or by storage. Discharge velocity generally must not exceed 0.3 m/s measured at 90° to the direction of the navigable channel.

Discharges into the Waterway may require consent from the Environment Agency (EA). The Promoter will be responsible for obtaining any necessary consent and providing proof to the Works Engineer that this has been done. It must not be presumed that EA consent confers the Trust consent.

New developments must be designed in accordance with the National Planning Policy Framework (NPPF), along with its associated Technical Guidance and Practice Guide. In addition "Planning Policy Statement 25 (PPS25) Practice Guide" in England or "Technical Advice Note (TAN) 15" for Wales still applies. These documents set out how flood risk is to be managed during the design and planning process.

If mitigation measures are required, it must be agreed at an early stage whether the new or modified structures are to be procured by the Trust or the Promoter and which party will own and maintain them in the long term. It is usual that the structures are designed and built by the Promoter to an acceptable design and that the Trust assumes long term responsibility for the water control structures only, on its own land, on acceptance of an agreed commuted sum.

Discharges are not usually permissible in short canal pounds between locks. Difficulties could result from the capacity of by-wash weirs, surcharging the pounds and dewatering for the maintenance of locks.

3.3 Feasibility, Design, Operation & Maintenance – Pollution/Water Quality

The Trust will not generally accept sewage or trade effluent. Only in exceptional circumstances where there is adequate treatment, evidence of a treatment plant maintenance schedule and adequate dilution will applications be considered.

For **surface water drainage** applications, Form 6 will need to be completed. There is an expectation that pollution control measures such as traps, gullies, oil separators, silt traps, swales or detention ponds will be required where appropriate. All pollution control measures should conform to the relevant Environment Agency publications and Pollution Prevention Guidance (PPG) notes. It is unlikely that these will be permitted to be built on land owned by the Trust. Normal practice would be to construct them on the Promoters land with adequate access provided to allow them to be regularly maintained.

The Promoter must supply their long-term maintenance plan, with emergency contact numbers for all oil separators, silt traps, swales and other pollution control devices for approval by the Trust. Suitable isolating systems such as valves must be included at the design stage, to allow maintenance and provide protection to the receiving waterway from pollution incidents.

During operation, it may be necessary to require that water samples are taken at intervals and analysed. It may be necessary for the Trust or its agents to inspect from time to time the area drained to the Waterway to ensure that the pollution risks remain acceptable. Alternatively, it may be acceptable for the inspection to be carried out by the discharger using a standard self-assessment procedure.

Calculations and plans will be required for the drainage network. The plans should define the pipe runs and illustrate the uses to which the drained areas are to be put and any other factors that may affect the quality of the surface run-off.

Where **water is discharged at a higher temperature** to that of the normal canal water, consideration will have to be given to the environmental impact. This will involve modelling outputs, with consideration to: the size of the receiving waterway, flow, design of the discharge outlet, and hot water plume dispersal from the outfall. In some cases additional water may have to be passed along the waterway at the Promoters expense to give the required dilution of the discharge. Any additional water required for dilution will be treated as an abstraction, and also included in the discharge quantity for design of mitigation measures.

3.4 Feasibility, Design, Operation & Maintenance – Navigational Impact

The point of discharge is installed perpendicularly to the canal centre line in both axes. The point of discharge should not protrude past the surface of the canal wall such that it affects the mooring of a craft at the same location.

The pipe diameter for above water surface discharges is limited by the available distance between the normal water level and the underside of the coping stone. Several smaller pipes should be used where feasible.

The point of discharge must be installed such that water cannot flow from the canal or be abstracted using the point of discharge. For gravity discharges a stilling chamber / sand trap / oil interceptor is typically provided on the neighbouring land. For pumped discharges the discharge pipe is typically installed above normal canal water level to avoid siphoning.

At locations where craft will be manoeuvring at low speed the limit to the velocity of discharge will be reduced in proportion to the reduction in craft speed. The discharge velocity generally must not exceed 0.3 m/s measured at 90° to the direction of the navigable channel. The Works Engineer will specify the craft speed. A stilling basin is usually needed to comply with this requirement. In most cases physical or mathematical modelling will be necessary.

Scour protection may be needed.

Discharge structures should be designed to minimise the visual impact on the canal, to allow the quality of the discharge to be monitored and to prevent loss of water from the canal into the drainage system. The structure should be accessible in safety for maintenance and sampling. Where this is not possible, for instance on river navigations, a remote sampling point and a flap valve are needed. Outfall structures should normally be designed for the discharge to take place below the normal water surface, preferably via a stilling chamber arrangement, wherever practicable. Above surface outfalls are only accepted in exceptional circumstances, due to the visual impact and risk of navigational difficulties, although offside outfalls above surface are less likely to cause problems than towpath side.

Fenders and signing of structures may be necessary. In particular pumped discharges will need to be signed to advise waterway users of their intermittent operation.

Discharge structures should be capable of carrying the loads imposed by the use of the towing path maintenance vehicles.

Towpath levels should not be raised to accommodate pipework.

The discharge of water to canals can lead to the transfer of water in an open channel to waste weirs. In some instances the issues discussed under 'Water Transfer' within Section 11 (Water Abstraction) of this Code of Practice may be applicable.

3.5 Surface Water Discharge Guidance – Producing an Outline and Detailed Impact Assessment

3.5.1 Introduction

It is extremely important for the Canal & River Trust (the Trust) that applicants wishing to discharge surface water into inland waterways follow the principles of UK planning policy and in particular that any assessments are consistent with the processes outlined in the accompanying technical guidance to those policies.

The responsibility for producing a site specific Flood Risk Assessment (FRA), as per UK planning policy is with the applicant and the FRA should accompany any planning application.

The Trust requires that the assessment should reflect the additional risk and a two stage process is adopted of an outline impact assessment (section 3.5.2) followed by a more detailed impact assessment (section 3.5.3), if necessary. This document provides guidance to assist applicants in producing outline and detailed impact assessments which will be acceptable to the Trust.

3.5.2 Producing an outline impact assessment

The addition of surface water to a waterway is likely to increase the flood risk if the peak flow rate and volume are greater than the existing inflow. This increase will occur in all sections of canal until the water is discharged from the system. The purpose of the outline impact assessment is to quantify the pre and post development flow rates and volumes, for the Trust to review.
For river navigations the applicant will need to discuss with the Trust whether our agreement is required in addition to any permission from the Environment Agency, riparian land owners and planning authorities.

3.5.2.1 Determining change to inflows to the waterway

The applicant will need to determine the quantity of water currently entering the waterway (pre-development scenario) and compare that with the post development quantity (post-development scenario). For both scenarios this will include the derivation of a full flood hydrograph for the development site. Where SUDS[1] schemes are proposed the applicant should demonstrate that any increase in inflow to the waterway is acceptable to the Trust and that the long term maintenance is adopted either by a local authority or sewerage undertaker[2].
The use of drainage software models to produce the pre and post development hydrographs is encouraged. Various drainage simulation models are available commercially, for example the Trust currently utilise the WinDes modelling suite produced by Micro Drainage (V2013.1) when auditing drainage designs.

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[1] SUDS: Sustainable drainage systems or sustainable (urban) drainage systems: a sequence of management practices and control structures designed to drain surface water in a more sustainable fashion than some conventional techniques (may also be referred to as SuDS).

[2] The Flood & Water Management Act received Royal assent in April 2010, but Schedule 3 of the Act, which is concerned with SUDS is yet to be commenced. At the county and unitary level the Act establishes a SUDS approving body (SAB).
The SAB will have responsibility for the approval of proposed drainage systems in new developments and redevelopments (in accordance with National Standards for Sustainable Drainage). The Act also requires the SAB to adopt and maintain approved SUDS that serve more than one property.

3.5.2.2 Calculating pre-development inflows

Greenfield Runoff

The current land use, for the development site, is important in determining the pre-development runoff. For greenfield sites the applicant will need to determine the greenfield runoff rates for the 1 in 100 year flood event (1% annual exceedance probability). The pre-development rate will include a 20%[3] increase in peak flow to account for climate change.

The methods that the Trust will accept for determining this flow are summarised in Table 1 below. These reflect recent research and are in line with EA guidance[4] that FEH methods should be used in preference to older methods (IH 124, ADAS 345 etc.). Guidance on the choice of method for small catchments (<25km^2) should be based on (Faulkner et al., 2012):

"It is recommended that flood estimates on small catchments should be derived from FEH methods in preference to other existing methods. The current versions of the FEH statistical approach or the ReFH rainfall-runoff model should be used except on highly permeable catchments (BFIHOST>0.65), where ReFH should be avoided, and possibly on urban catchments (URBEXT2000>0.15), where the results of the ReFH model can be less reliable. Checks should be carried out to ensure that the flood estimates are within expected ranges based on what is known about the history of flooding and the capacity of the channel (including evidence from previous flood marks).

For catchments smaller than 0.5 km^2 and small plots of land, runoff estimates should be derived from FEH methods applied to the nearest suitable catchment above 0.5 km2 for which descriptors can be derived from the FEH CD-ROM and scaled down by the ratio of catchment areas. The decision to translate FEH estimates from catchment scale to plot scale should be accompanied by an assessment of whether the study site is representative of the surrounding catchment area."

[3] Technical Guidance to the National Planning Policy Framework (2012). Department for Communities and Local Government

[4] Environment Agency, Flood estimation guidelines Version 4

Table 1: Hydrological methods to determine Greenfield runoff

Method	Comments	Limitations
FEH statistical method	Use QMED equation revised in 2008 (Kjeldsen *et al.*) Use FEH CDROM version 3.0 (released in September 2009) Use WINFAP-FEH version v3.0.003 (released in November 2009) in conjunction with the current HiFlows-UK dataset (website) version 3.1.2, released in December 2011. Preferred method if catchment is highly permeable (approx. BFIHOST>0.65)	>50 ha. For catchments <50 ha, downscaling is acceptable. Return period 2-200 years. $URBEXT_{1990}$ up to 0.5.
Revitalised Flood Hydrograph Method (ReFH) (2005, 2007).	ReFH has superseded the Flood Estimation Handbook (FEH) rainfall-runoff method and tends to give results consistent with the statistical method. • Use FEH CDROM version 3.0 (released in September 2009) Analysts should refer to http://www.ceh.ac.uk/Feh2/FEHReFH.html for guidance on the ReFH method and to download the free spreadsheet (version 1.4) implementation.	0.5 -1000 km^2 For catchments <50 ha, downscaling is acceptable. Calibrated for return periods up to 150 years. Only reliable for $URBEXT_{1990}$ <0.125.

The inflow hydrograph should be determined for different storm durations. As the catchments tend to be quite small the durations should start at 15 minutes and include up to 1440 minutes. These durations could be extended if the catchment size requires it.
If the development land is below the level of the waterway then the applicant will still be required to determine the 1 in 100 year return period water levels in relation to the waterway to demonstrate that there are currently no other flow paths to the waterway.

Brownfield Runoff
Where the development land is currently brownfield the applicant should determine the 1 in 100 year inflows to the waterway. If the existing drainage system is known then it should be modelled using best practice simulation modelling, to determine the peak flow rates. If the system is not known, then the brownfield runoff should be calculated using the methods for greenfield runoff, described above, but with an appropriate adjustment for $BFIHOST/URBEXT_{1990}$. The rationale for this adjustment should be provided. The pre-development rate will include a 20%[5] increase in peak flow to account for climate change.

Pumped Inflows
Where the development land is below the level of the waterway and flood water is pumped to the waterway then the capacity of the pump will be required. The applicant will also have to submit any other flow sources for the 1 in 100 year return period flood (including a 20%[6] increase in peak flow to account for climate change), e.g. if the pump is only designed to cope with the 1 in 30 year flood, explain what happens to the additional water in a 1 in 100 year event.

3.5.2.3 Calculating post development inflows

The applicant should derive the 1 in 100 year return period flood flows into the waterway plus a 20%[7] increase in peak flows for climate change and a further 10%[8] increase in peak

[5] Technical Guidance to the National Planning Policy Framework (2012)
[6] Technical Guidance to the National Planning Policy Framework (2012)
[7] Technical Guidance to the National Planning Policy Framework (2012)

flows for urban creep (if the discharge is from a residential development or mixed use development). For mixed developments the 10% increase for urban creep should only be applied to the residential proportion. The percentage increases are not compound and the maximum increase is 30%. The applicant will have to demonstrate all flow paths to the waterway including pipe flow, pumped flow and overland flow. For example, if a piped network is only designed for a 1 in 30 year return period flood then the applicant will need to provide details of any overland flows which will enter the waterway in the 1 in 100 year event (plus climate change and urban creep).
The inflow hydrograph will be determined for different storm durations. As the catchments tend to be quite small the durations should start at 15 minutes and include up to 1440 minutes. These durations could be extended if the catchment size requires it.

3.5.2.4 Comparing pre and post development inflows

Once the above analyses have been undertaken, the applicant will be able to complete the relevant sections within Form 6 of the Code of Practice, for submission to the Trust. Upon review of this Form by the Trust, further work may be required by the applicant to assess the impact of the proposed discharge on the receiving waterway, in the form of a detailed impact assessment, guidance on which is given below. Further information on the specific submission requirements at both the outline and the detailed impact assessment stages are given at the end of this Chapter.

3.5.3 Producing a detailed impact assessment

The aim of the detailed impact assessment is to determine any increase in waterway water level as a result of a new/modified discharge and potentially propose mitigation works so that any change in flood risk can be reviewed by the Trust. The geographical extent of the detailed impact assessment must include the waterway length from the point of discharge into the waterway (including to the upstream lock) to the point of exit from the waterway (including the downstream lock) - see below.

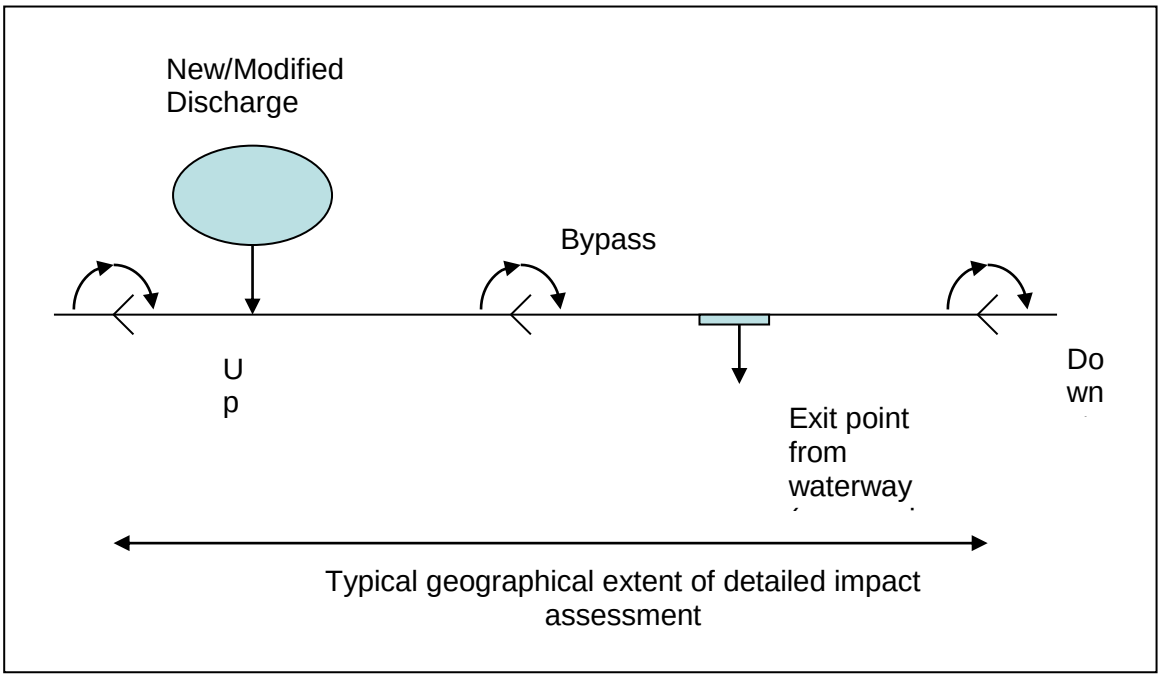

Figure 1: Illustration of typical geographical extent of a detailed impact assessment

[8] Future Impacts on Sewer Systems in England and Wales Ofwat Report (2011) reports a median increase in impermeable area due to urban creep of 12% to 2040.

3.5.3.1 Predicting impact on waterway water levels

The inflow for the different storm durations should be input into a hydraulic model to determine the storm duration which gives the maximum canal water level. This storm duration will be the design storm duration for any mitigation works. The methods used to determine the water levels will range in complexity depending on the required accuracy of the solution.

Steady State Models

Steady state models may be used (be it commercially produced software or via gradually varied flow backwatering calculations (Chow, 1973 and Chadwick and Morfett, 1999). However, since such methods do not incorporate temporary storage or routing effects they will result in the conservative design of mitigation works. Generally, the degree of conservatism will be greater the longer the time of travel of flood flows along any watercourse and the greater the temporary flood storage present.

Hydrodynamic Models

The use of hydrodynamic models will not introduce the conservatism of the steady state approach in terms of the mitigation works. Various hydrodynamic models are available commercially, for example the Trust currently uses the hydraulic modelling suite ISIS produced by Halcrow (2012) when considering flood studies. The Trust has near comprehensive coverage of hydrographic data for the waterway system, which may be loaded directly into this modelling suite.
When water levels are forecast to exceed the bank levels and water would pass out of the waterway (offside or towpath on waterways) then the channel banks should be considered to act as weirs (or 'spills'). It is not acceptable to assume that all the flood water would be contained within the channel, this is commonly termed 'glass walling' of the banks.

Hydraulic Model assumptions and data requirements

When undertaking a hydraulic analysis reference should be made to BW (2012) for details of:

- How to hydraulically resolve in channel flow (e.g. guidelines for derivation of hydraulic roughness' for backwatering or hydrodynamic modelling);
- How to resolve head losses at bridges, tunnels and aqueducts.
- How to resolve hydraulic structures (e.g. side weirs, by-weirs, culverts etc.)

Table 2 below provides details of typical data requirements for the steady state, and hydrodynamic methods. The Trust often holds much of this information (available upon request) however, there may be a need for the applicant to undertake or commission a survey to supplement existing data.

Table 2: Typical data requirements for hydraulic methods

Characteristic	Typical data requirements
Watercourse	Cross sections are typically required at 50m longitudinal interval and lateral spot height separation of 1m. Bed type recorded (e.g. silt/ clay puddle, concrete, brickwork etc.). Cross sections are generally required at the centreline of each channel constriction (e.g. bridge or stop plank narrow) and at each portal of tunnel or limits of aqueduct. Bank heights (for waterways offside and towpath levels) should be defined at each cross section as well as at any low spots. Photograph of watercourse at each cross section to evaluate hydraulic roughness.
Structures Culverts Weirs Locks Sluices	Diameter, invert levels (inlet & outlet), culvert material. Photographs of inlet chamber/ intake and outlet. Crest height, crest length, crest breadth, depth of channel immediately upstream of weir, any slot depths, any towpath support widths. Effective height of top of lock gates (top beams), gate length, gate width, weir slot length, height of effective weir slots (to underside of balance beams) for both head and tail gates Gate opening width, maximum vertical gate opening, invert level of gate, culvert dimensions (see above) should sluice discharge into culvert.

Detailed guidance on key specific properties of each structural type is given in BW (2012); all levels should be quoted to a common datum throughout.
In addition to the model data requirements the following model boundary condition should be used. To determine the flow from the upstream pound(s), 100 mm over the upstream bypass weir crest(s) should be assumed. If this level is high enough for water to flow over the top lock gates then this should be allowed for in the modelling. If this assumption does not result in at least 50mm being discharged out of the system over storm weirs then the u/s flow(s) should be increased iteratively until this minimum level is reached.
For river navigations with higher flows and more complex water control structures the model boundary conditions should be agreed with the Trust during the application process.

3.5.3.2 Modelling Results

The outputs from the modelling should be presented as pre and post development 1in100 year water levels (including a 20% increase in peak flow to account for climate change and an additional 10% increase in peak flow to account for urban creep for the post development situation) at a spatial resolution agreed at the application stage. In general, water levels will be produced at each model cross section and reported in the detailed impact assessment. These water levels will be reported against bank levels, both offside and towpath side.
The applicant will also submit a copy of any hydraulic calculations and/ or hydraulic model data and result files along with any topographical surveys.

3.5.3.3 Mitigation Works

The previous sections have described the technical methods for determining the changes in water level in the waterway. If the analysis shows that the proposed discharge will increase water levels then the applicant must propose mitigation measures which will limit the increase in flood risk to a level acceptable to the Trust.

Improvements to existing and proposed new infrastructure

There are a number of improvements which could be made to a waterway length to mitigate the effects of the discharge. These could include:

- Raising bank levels
- Increasing the capacity of existing bypass and storm weir structures
- Increasing the size of a sluice
- Automation of structures
- Installing new weirs, culverts and sluices

These options should be discussed with the Trust and once agreed revised calculations should be made on waterway water levels.

SUDS schemes

As an alternative to waterway improvement works the applicant could propose a SUDS scheme to attenuate in part or in whole the flood inflows at source. The technical design of SUDS schemes is well understood and described in detail in CIRIA's SUDS Manual C697 (2007). The applicant should provide all relevant information so that the scheme can be technically reviewed by the Trust. In particular the applicant should comment on the maintenance requirements of the scheme and provide evidence of an agreement to adopt the scheme either with a sewerage undertaker or local authority (see footnote 2). If this evidence cannot be provided then the scheme will be assessed as if the SUDS scheme was not operational. In this instance the applicant should propose mitigation measures within the waterway.

3.5.3.4 Impacts on downstream watercourses

The identification of mitigation and improvement works could result, if built, in an increase in flow from the waterway to downstream watercourses. The consequences of this may require, in certain circumstances, the applicant extending the scope of the impact assessment to the downstream watercourse. This will be discussed and agreed with the Trust during the application process. The Trust may wish to undertake this assessment and would expect to recover the associated costs from the developer.

3.5.4 Submitting the impact assessment(s)

The applicant should contact the Trust as soon as possible in the development process to discuss the possibility of discharging surface water into its network, using the completed outline impact assessment as the basis for this. Table 3, below, provides a list of the required information that should be submitted, at the outline and detailed impact assessment stages, and should be read in conjunction with Form 6 of the Code of Practice. Table 3 can be used as a check list for submission.

Table 3: Requirements for submission to the Trust

Impact Assessment stage	Information to be provided by applicant/promoter	Included? (Yes/No)
Outline	Written description of the development site (accompanied by photographs if appropriate) detailing: Pre-development use and proposed development extent and characteristics of the site. Existing site drainage arrangements and proposed drainage scheme Relationship of site to the Trust's waterway	
Outline	Plan of site showing: development site catchment area, outline or detailed drainage design and relationship to any part of the Trust's system (e.g. waterway pound(s), river navigation, reservoir, feeder channel etc.).as hard copy or digitally (AutoCAD® DWG, DXF™, and DWF files)	
Outline	Details of catchment parameters: area, soil, percentage impermeable, percentage permeable etc. used to estimate pre and post development site runoff.	
Outline	Description of method of runoff estimation employed for pre and post proposed development.	
Outline	Digital copies of all pre and post development discharge hydrographs, with a summary table of peak discharge rates for all relevant scenario/return periods/durations.	
Outline	Digital copies of drainage design calculations and/ or drainage model data and result files for both pre and post proposed development.	
Detailed	Description of the method of hydraulic analysis employed (if applicable)	
Detailed	Digital copy of any survey work commissioned for the investigation (if applicable)	
Detailed	Table comparing forecast pre and post proposed development water levels (quoted to nearest mm) and flows. Table should also include bank levels (towpath and offside for waterway channels) for each location where	

Impact Assessment stage	Information to be provided by applicant/promoter	Included? (Yes/No)
	water levels are produced and also any low spots identified (if applicable)	
Detailed	Digital copies of hydraulic calculations and/ or hydraulic model data and result files for both pre and post proposed development (if applicable)	
Detailed	Location and dimensional details of proposed mitigation works (if applicable)	

3.5.5 References

1. National Planning Policy Framework (2012), Department of Communities and Local Government
2. Technical Guidance to the National Planning Policy Framework (2012). Department for Communities and Local Government
3. Technical Advice Note (TAN) 15: Development and Flood Risk (2004), Planning Policy Wales, Welsh Assembly Government
4. Environment Agency Flood estimation guidelines version 4 (Issued 26/06/2012) available on request from EA.
5. Kjeldsen, T.R., Jones, D.A. and Bayliss, A.C. (2008) Improving the FEH statistical procedures for flood frequency estimation. Science Report SC050050, Environment Agency
6. Faulkner, D., Kjeldsen, T., Packman, J and Stewart, E. (2012). Estimating flood peaks and hydrographs for small catchments: Phase 1. Science Report SC090031/R, Environment Agency.
7. The revitalised FSR/FEH rainfall / runoff method, Flood Estimation Handbook Supplementary Report No.1, Kjeldsen, T.R (2007)
8. Future Impacts on Sewer Systems in England and Wales: Summary of a Hydraulic Modelling Exercise Reviewing the Impact of Climate Change, Population and Growth in Impermeable Areas up to Around 2040. Ofwat (June 2011)
9. Kjeldsen, T. R. (2009). Modelling the impact of urbanisation on flood runoff volume. Proc. Instn. Civ. Engrs. Wat. Man. 162, 329-336
10. Kjeldsen, T. R. (2010). Modelling the impact of urbanization on flood frequency relationships in the UK. Hydrol. Res. 41. 391-405
11. Chow, V.T., 1973. Open-channel hydraulics. International Edition. Published by McGraw-Hill Book Company. ISBN 0 07 085906 X.
12. Chadwick A.J. & Morfett J.C., 1999. Hydraulics in civil and environment engineering. Published by E & F.N. Spon. Third Edition. ISBN 0 419 22580 3.
13. British Waterways Approved Standard: Hydraulic Design of Canal Works v3.2 (February 2012). Available upon request from Canal & River Trust Water Management team.
14. CIRIA, C697 The SUDS Manual (2007)

4.0 SERVICES IN THE TOWPATH

4.1 Introduction

This section refers to all services (statutory undertakers or private pipes, cables etc.) installed within the Trusts towpaths. For service crossings please see Part 2 of this document.

This section primarily relates to canals, where considerations of integrity and water tightness are paramount however, it is also relevant to river navigations.

Works within the towpath relating to services are either works to existing services or works to install new services. With regard to the abandonment of services; the third party will be required to remove all services from Trust property

4.2 Works to Existing Services within the Towpath

A service record search shall be undertaken by the Third Party; in addition the Works Engineer will identify any BSKYB apparatus in the area as per section 5 of this document.

Prior to any construction works the depth of the existing service/s should be ascertained. This could be via several techniques including but not limited to:

a) Ground proving radar.
b) Trial Hole/s or exploratory dig/s.
c) Accurate as built records.

It should be noted that any surveys being undertaken on the Trusts land will also require permits to be in place prior to commencement – see section 7 of this document

Once the depth of the service/s has been established this should be forwarded with your proposed solution to the works engineer for assessment, your submission should take account of:

- Works should be designed to where possible keep the towpath open throughout the works (temporary scaffold arrangements might be considered)
- Ensuring a towpath minimum width of 1.2m remains (where applicable).
- The depth of the excavation and any temporary works required to facilitate – are the works in an embankment or cutting?
- Trenchless techniques should be adopted where possible.
- Proximity to historic and heritage structures.
- Removal of arising's from the excavation.
- Prevention of contaminates, solids and fluids entering the waterway.
- Avoiding affecting the clay core lining of the canal.
- Access to the work site.
- Programme your works to minimise disruption to waterway users.
- Invasive weeds such as Japanese Knotweed
- Its proximity and effect upon other services.
- Re-instatement of the area, including plant access.

4.3 Works to Install New Services within the Towpath

There are a number of factors needing to be considered when establishing the feasibility of the installation, its location, depth and size, such as:

- Proximity to the waterway wall
- Is the service within an embankment or cutting – will temporary works be required?
- Existing hedges, trees and habitats
- Presence of invasive weeds such as Japanese knotweed.
- The location of the canal lining (puddle clay or otherwise)
- The location of tie rods for trench sheets both present and potential for in the future.
- Mooring points including the boater's use of mooring spikes.
- The presence of contaminated land.
- Site accessibility
- Dewatering/drainage

A site visit with your Works Engineer might be advantageous at this point.

A service record search shall be undertaken by the proposer; in addition Canal & River Trust will identify any Sky Network Services apparatus in the area as per section 5 of this document.

Prior to any construction works the depth of any existing services should be ascertained. This could be via several techniques including but not limited to:

a) Ground proving radar.
b) Trial Hole/s or exploratory dig/s.
c) Accurate as built records.

It should be noted that any surveys being undertaken on the Trusts land will also require permits to be in place prior to commencement – see section 7 of this document

Once the depth of any services has been established this should be forwarded with your proposed solution and re-instatement details to the works engineer for assessment.

Upon receipt of your proposal the Works Engineer will pass on details of your proposal to our Utilities department who will assess if:

a) You have an existing national agreement with the Trust permitting new installations in accordance with this code of practice.
b) You require an agreement with us for the placement of your apparatus within our land.

Should an agreement already be in place your Works Engineer will continue the assessment of your proposal. Should a new agreement be necessary then our utilities representative will contact you to begin negotiation and development of the agreement. You should note that this can be time consuming where typically 6 months is required to establish the agreement (in some instances this can be shorter or longer). Upon receipt of the signed agreement your works engineer will continue the assessment of your proposal.

Upon confirmation of an agreement being in place your Works engineer will in most cases require a site visit and a copy of your proposed method statements and risk assessments together with a copy of your Public Liability Insurance. Your method of working will then be assessed and any comments returned for your action, you will then be issued with a permit as per part 1 of this document.

5.0 WORKING NEAR BSKYB CABLES AND APPARATUS

5.1 Introduction

BskyB Telecommunication Services Ltd (BSKYB) telecoms cables and apparatus are present on over 600km of the Trust's network. The Trust has a contractual obligation to allow BSKYB 'quiet enjoyment' of its property where BSKYB apparatus is present. It therefore vital to ensure that no damage whatsoever takes place to the BSKYB network by the Trust, its agents, contractors or customers.

Any works that are to be undertaken in the vicinity of the BSKYB network shall be notified to the Utilities team by a Trust member of staff, usually the Works Engineer. This process should be actioned at the planning stage of the work, in conjunction with searches made to other utility companies. **Only Trust staff are authorised to notify BSKYB via the Utilities Team and this information will not be available from any other source.**

5.2 Emergency Procedures

In the event of work classed as an emergency (leak stopping, bank slippage, etc.) requiring immediate attention, the Utilities Team should be contacted without delay; they will then contact BSKYB and arrange a site inspection. If an emergency occurs out of normal working hours then the BSKYB 24/7 emergency telephone number should be used (08000 273 242) and the Utilities Manager notified as soon as possible.

5.3 Procedure

The responsibility for ensuring this pre-start on site procedure is complied with rests with the works engineer.

At the design stage your works engineer will check if BSKYB apparatus is within the area proposed for works and if so, a notification form, will be completed and sent to the Utilities Team. This form is the prompt to BSKYB that work is required under, over or adjacent to their network. After being alerted by the notification form BSKYB will contact the nominee, sending drawings and advice regarding working next to its network. The nominee will also be contacted directly by a BSKYB representative to discuss the nature of the work and organise a site visit with all concerned.

A minimum of 14 days notice should be given to BSKYB before work is due to commence; and method statements and risk assessments should be submitted at this time.

If after meeting with BSKYB at the design stage it is recognised that a lift and shift operation must take place to the said network for the designated work to take place; a minimum of 3 months notice should be given to BSKYB

It should be stressed that no physical exploratory work on the site should be undertaken before a joint site visit with BSKYB

6.0 BUSINESS BOATING

Introduction

Business boating means all boating related activity on the Trust's waterways that is not for personal private use. It is the role of the Business Boating Team to manage and authorise these activities. Personal private use of a boat is authorised by a Standard Boat Licence. Business boats are authorised by a Business Boat Licence. However most boating businesses require a base with moorings to operate from and these can be owned by the Trust or connected to our property in some way. It includes holiday boat hire, day boat hire, passenger boat operations, roving traders, boatyards, mooring sites and marinas. The majority of these activities require some form of property contract from the Trust and can result in the following types of works.

- Off-line mooring basins (including marinas, lay-bys, navigable arms and historic widened mooring areas).
- On-line moorings (moorings along the existing line of the Trust's waterways)
- Dry and wet docks connected to the Trust's waterways
- Slipways.
- Boat lifting.
- Upgrades and improvement works to existing boating facilities.

This Code of Practice does not apply to any Business Boating proposals. These are covered by the Business Boating Team and its procedures which include the asset protection principles included in this Code.

Applications from existing or proposed business boating customers should, in the first instance, refer to the Business Boating pages of the Trust's website at http://canalrivertrust.org.uk/boating/boating-businesses .

For any applicants who do not have access to the internet, the following address should be used for correspondence:

Business Boating Team

Canal & River Trust

Fearns Wharf

Neptune Street

Leeds

LS9 8PB

Tel: 03030 404040

7.0 SITE INVESTIGATIONS

7.1 Introduction

Adequate site investigation is a requirement for the majority of works covered within this code. The information arising from site investigations forms a key part of the assessment by the Trust of the overall submission. It is therefore important that the level and quality of information is consistent with the complexity of the proposed works. The site investigation should be sufficient to reduce the risks associated with unforeseen ground conditions to a tolerable level.

In line with industry practice, the site investigation should be under the overall supervision of a competent Ground Specialist, who should have appropriate experience of the type of development proposed. The investigation must be carried out to the standards defined in BS 5930:1999+A2:2010 Code of practice for site investigations as a minimum: where a departure from the standard is used, justification must be provided. Soil testing must be carried out to BS 1377 (1990), by a UKAS accredited laboratory.

Attention is drawn to the fact that, for the purposes of the Construction, Design and Management Regulations, site investigation is considered to be a construction activity. Compliance with the regulations must be ensured by the promoter.

7.2 Geotechnical Desk Study

The site investigation should include a desk study phase, which should include a walk-over survey of the site. It is often found that reference to historic maps provides useful information on the history of development of a waterway site, particularly in more developed areas. A useful interactive website which can be used to supplement further desk study is http://magic.defra.gov.uk/ .

The desk study should include:

- an initial ground model
- recommendations for further investigation as appropriate, to further define the ground model
- a preliminary geotechnical hazard list and risk register, which should be updated throughout the later phases of investigation.

7.3 Ground Investigation

Prior to commencing the ground investigation, all borehole/ trial hole positions and accesses should be agreed with the Works Engineer, and checked for positive identification of any services or other underground structures. A check should also be made for recorded archaeological sites, and the listed status of any structures which may be affected, together with any land designation (such as SSSI status). Details of the proposed investigation, together with any environmental or heritage impacts, must be included in the environmental appraisal for the site (see section 2).

Care should be taken not to disturb wildlife when carrying out any intrusive investigations (boreholes, trial pits, etc). Of the wildlife most likely to be encountered, [redacted] (and their setts), nesting birds, bats, water voles and all reptiles require special attention as they are all legally protected.

No borehole shall be drilled or trial pit excavated which has the potential to conflict with the integrity of the canal corridor. All such boreholes, especially those within 5m proximity of the canal, should receive the prior authorisation of the works engineer.

Waterway walls are not structural retaining walls, merely erosion protection. They are often up to two hundred years old. Please do not assume that canal towpaths can support borehole & window sampling rigs, many of which are bulky and difficult to manoeuvre. A prior discussion with the Works Engineer would be required prior to submitting proposals which rely upon towpath access. Approval may only be issued for lightweight plant which is physically restrained from approaching the edge of the canal. A condition survey and risk assessment will be required.

The impermeable lining to the canal should be identified, located and avoided where at all possible. However, if it will be necessary to affect the navigation channel, within the existing Waterway width, for temporary or permanent works, then bed profiling for a sufficient distance either side of the Works should be carried out. In such cases where it is necessary to carry out bed profiles, and/or identify bed materials, impermeable linings etc, any investigations must be agreed in detail with the Works Engineer in order to minimise the risk of damage to the canal. The Works Engineer may reserve the right to carry out these investigations using his or her own contractor at the Promoter's expense.

Due to the heritage and nature of the canal environment, there is always a possibility of soil being contaminated. This should be factored into the design of any Site Investigation.
Other constraints which must be observed are:

- At no time shall the Waterway or towing-path be blocked. Signage and suitable fencing or other barriers must be used to segregate the public from the working area and the operation of noisy or dust-generating plant should be supervised by banks-men.
- No plant or equipment used for the investigation works should be stored on Trust land without prior consent.
- No trial pits are to be excavated on embankment slopes below the level of the canal or within five metres of the toe of such embankments
- No water is to be pumped into or out of the canal
- No borehole or trial pit spoil or grout shall be allowed to enter the canal and all such arisings shall be removed from the Trust's property in compliance with waste management legislation
- Boreholes are to be sealed and backfilled with cement-bentonite grout of an agreed specification. Where alternative backfilling is required (for example for a particular installation), this is to be by prior agreement
- Trial pits are to be carefully backfilled and adequately compacted in layers

- Any variations from these constraints require the written agreement of the Works Engineer.
- All plant on Trust land should use environmentally friendly fuels and oils (see section 14)
- The contractor should refer to section 14 with regard to the transport of materials on Trust property e.g. Bentonite.

7.4 Reinstatement

All access roads used, and fences and hedges disturbed during the investigation are to be fully reinstated to the Works Engineer's satisfaction. The Works Engineer may reserve the right to carry out such work using the Trust's own contractor at the Promoter's expense.

Where it is necessary to leave apparatus such as piezometers or survey stations on the Trust's land, the design of the installations, including details of covers etc, must be acceptable to the Works Engineer. A Commercial Agreement may also be required.

7.5 Provision of information

Relevant logs, test data and other field information must be submitted. The preferred format is electronic (e.g. .pdf format) copies, as well as AGS data (current version). Where the submitted documents do not feature the details of the ground investigation contractors / consultants used, these details should be provided separately.

Interpretative reports should be provided as an electronic copy (e.g. Word or .pdf) version. All exploratory holes must be accompanied by a 12-figure national grid reference, as well as a level to Ordnance Datum.
Where it is not practical to provide levels to OD (for example where no benchmarks are present locally), then it may be acceptable to provide a relative level to an agreed datum (not water level), with a suitable witness drawing of any temporary benchmark used.

7.6 References

ICE (1993) 'Site Investigation in Construction Series 1 to 4', ICE Site Investigation Steering Group, Thomas Telford, London.

8.0 DEMOLITION

8.1 Introduction

The Trust actively encourages the use of Sustainable Demolition in order to salvage as many components as possible for re-use. In addition to Sustainable Demolition, effective waste management through the reduction in waste generation during the construction phase and sustainable transportation of waste material has significant commercial benefits in addition to creating a more efficient demolition procedure.

It should be noted that the majority of demolition works will require planning consent and the Trust will be a statutory consultee.

8.2 Pre-Demolition

All demolition works shall be carried out in accordance with:

- BS 6187 Demolition
- COSHH regulations
- Health and Safety Commission publications
- CDM Regulations

Method Statements and Risk Assessments should be provided to the Works Engineers. It is third parties responsibility to ensure notifications and where required consents are obtained.

The third parties Health and Safety File should include reference stating that Trust agreement must be obtained before any works of maintenance, alteration or demolition are undertaken.

The planning and undertaking of any demolition work needs to identify, assess and address risks associated with pollution & the surrounding environment, see section 14.

As part of the planning process, desk studies, asbestos surveys, site investigations and contaminated land assessments are required to identify contaminated land issues in advance of the works. A waste management plan to deal with resulting issues must be drawn up and agreed with the Works Engineer. All surplus excavation material shall be removed from site unless prior consent has been given by the Works Engineer for on-site disposal or other use.

Many species of bats, birds and other fauna that inhabit the waterside are legally protected and surveys to establish their presence are required prior to commencing the works. In addition demolition should not cause the spread of invasive species, see Section 14.

The use of explosives shall comply with the Home Office Regulations and shall only be permitted after full consultation with all relevant authorities including the Works Engineer.

The Trust owns and maintains many old structures, which could be adversely affected by vibration associated with certain demolition methods. An agreement on acceptable vibration allowance is required with the Works Engineer prior to works commencing. Consideration also needs to be given to nearby residents and the potential disturbance vibrations may have on wildlife.

Waterside structures often contain features of archaeological or heritage value that need to be preserved, rescued or recovered for future use. Prior to any demolition works, the Trust can provide advice as needed but the promoter should check with the local authority on any consents that are required, see Section 15.

8.3 Demolition Works

Demolition works adjacent to and over the canal are likely to require adequate screening to prevent debris from landing on Trust property. There should be no debris encroaching upon the Trust land.

Dust suppression is likely to be required during demolition works, particularly near densely populated areas, sites with typically strong winds or mooring sites alongside the canal. Debris piles are to be kept to manageable sizes as per the waste management plan to inhibit the release of dust into the atmosphere and, must not create run off towards the waterway.

Once demolition works have been completed, a canal bed survey or similar might be required to be undertaken by the promoter to ensure that no material has entered the waterway. The promoter may wish to carry out a pre-start survey.

The passage of boats on the navigation and the use of the towpath must be maintained unless otherwise agreed.

Monitoring during demolition works is likely to be required to check design allowances are not being exceeded. If damage to a Trust structure is detected, the third party shall be responsible for the full & immediate reinstatement (to the Trust's written satisfaction) of the affected structure and any associated costs.

Extreme caution needs to be taken when removing structures located below canal water level (e.g. cellars, basements), as they may also be retaining ground water, which is associated with the Canal adjacent, furthermore you might need to instigate temporary works to ensure the waterway structure remains in place throughout your works.

The canal environment, particularly derelict structures, can be home to bats, birds and other protected wildlife, and consideration should be given to the need to protect them during the works.

Where contaminated material is encountered (e.g. asbestos sheeting), steps outlined in the waste management plan must be followed to protect workers and the public from contact with the material or with gases or liquids arising from it. All necessary permits remain the responsibility of the promoter.

The Promoter is encouraged to recycle construction waste, where appropriate. Additionally, the Trust requires that materials suitable for re-use in other areas of the network (e.g. Such as copings and castings) must be carefully removed and transported to a storage area. The Trust retains ownership of all such materials unless agreed upon prior with the Works Engineer.

9.0 CANAL AND RIVER STRUCTURES

9.1 Introduction

All work near structures must be carried out with great care and forethought. It is the Promoter's responsibility to demonstrate that there will be no detrimental impact on existing structures.

Many existing structures were built before slope stability, foundation design etc were understood. Materials and methods now taken for granted were not available. Compaction of embankment fill was not possible. It was not practice to prepare engineering drawings until the 1820's. Calculations were not undertaken until later in the 19th Century.

Old structures often have factors of safety close to unity. Factors of safety for embankments and cuttings reduce with time. Old structures are therefore particularly vulnerable to nearby works. Ill-considered excavations at the toe of an embankment, for instance, can have disastrous consequences.

9.2 Services and Hidden Hazards

Buried within the towpath and also present overhead are large number of services all of which have the potential to cause injury or disruption to the local community if damaged. Risks from striking underground high voltage electricity cables and gas services are significant. Some of these services maybe unfamiliar to vendors as they include strategic oil pipelines, fibre optic cable networks, and occasionally private services such as oxygen mains linking parts of adjacent factories together.

Increasingly the Trust has its own apparatus within the towpath providing power to locks and other structures and waterway monitoring / communication infrastructure.

Many of our structures are old and were never designed to accommodate the activities of the 21st century. Some modern plant and equipment can gain access to the canal in a way that was never envisaged when the system was constructed. It is worth remembering that the original canal system was operated by men and women with horses!

Some of the canalside buildings have fallen into disuse and entering them can present particular hazards ranging from weak floors through to abandoned materials which may be unstable or harmful.

Preserving the heritage of the canal system sometimes means that trip hazards and some unguarded falls may not be safeguarded in the way you may expect.

Some of our structures particularly those below ground, such as culverts, can harbour poor air conditions sometimes with fatally low oxygen levels.

9.3 Hidden Hazards

Part 1 Section 7 highlights some types of hazard that might be encountered in the canal and waterway environment.

Whilst the examples outlined are believed to be comprehensive, they cannot be seen as exhaustive as with 3000km of canals and waterways there can be specific hazards and conditions which maybe unique at a location. You are advised to seek more detailed information.

The Trust canals in general are not hazardous environments but there are some elements that need to be considered when working, or seeking access along, our property.

The canal system does not have an easy reference system for locating yourself when compared to most works where an address is often enough for suppliers and emergency services to locate your works. Site staff and suppliers need to be given accurate information to allow them to locate you from the adjacent road system. This may be a problem in both rural and urban areas.

Large areas of the canal network have poor reception for mobile phones and you should test coverage prior to the start of the works. Be aware that different networks have different coverage so there may not be universal coverage. Towpath conditions can vary throughout the year with some surfaces becoming wet and slippery particularly during the winter months. Some lengths of canal can be very exposed and changing weather conditions can present new hazards.

9.4 Right of Support

The Trust enjoys a right of support under Common Law. It is important that support is not removed by excavation, dewatering undermining etc. In areas of mining subsidence canals can be of great depth due to bank raising - 10m is not unknown. Factors of safety are often not great and ill-considered actions can be disastrous.

A less obvious consequence of excavating near to canals is that of increasing hydraulic gradients. Not all canals are lined. Seepage rates are increased. Permanent leakage or piping failure can result.

9.5 Support to New Works

The Trust offers no support to new works. Loads should not be placed near to cuttings, over tunnels etc. without being independently supported. Should a Trust structure withdraw support from later development, the Trust would accept no liability. When building over tunnels, for example, not only should the new structure span independently the old but the effect of a collapse of the tunnel should be considered.

9.6 New Aqueducts, Locks etc

If it is necessary to build a structure which is of major significance to the Trust such as a new lock, a canal re-alignment, a mooring basin or the construction of a new aqueduct carrying the canal over a road, watercourse etc, the Trust reserves the right to carry out the design and supervise the construction on behalf of the Promoter.

9.7 Heritage issues, Listed Buildings and Scheduled Ancient Monuments

See section 15

9.8 Cofferdams

When dewatering a section of canal, the usual options are to use stop planks, piling, clay stanks and fabric dams. Stop planks are rarely located at convenient points, resulting in extensive dewatering leading to safety and environmental concern. Piling is generally not allowed because of the damage to the lining caused by withdrawal. Clay dams can displace fluid silts over considerable distances, leading to access difficulty for removal by conventional plant and can cause water quality problems with dispersed silt on removal. Fabric dams are readily portable, can be supplied with flumes for water transfer, but are subject to undercutting, vandalism and boat impact. Inflatable dams may not be used. If large quantities of water could escape from the canal, it is usual to use secondary containment.

Fabric dams and stop planks must be protected from boat impact. All Cofferdams should be checked on a regular basis by a competent person.

The third party is responsible for obtaining Environment Agency consent for the installation of any Coffer Dam.

9.9 Canal Linings

Although not all existing canals have an artificial watertight lining, works must be designed so that the canal is watertight. Works should be designed such that they do not penetrate the canal lining. Puddle clay is the most common lining material used in existing canals. It was rarely used with a thickness less than 500 mm however replacement may require a greater thickness. Modern compaction plant needs clay of a somewhat lower moisture content, which is therefore less impermeable, and a minimum thickness of 1000 mm is now normal. There is evidence that canals in sandy areas were lined in the 18th Century with manure to accelerate the rate at which the surface is sealed.

Modern lining materials include reinforced concrete, butyl and geotextile/bentonite membranes. Bentonite must not be used in areas with high sulphate levels, or with lime stabilised materials. Membranes must be protected from boat propellers, boat-shafts and dredgers.

The old and new linings must be tied in using a suitable agreed detail.

Puddle clay must be placed in accordance with the requirements of *The Trust's Specification for Puddle Clay (available upon request from the Works Engineer).* The Trust reserves the right to request copies of test certificates. Compaction of puddle clay into pile pans must receive special attention. Lime stabilised clays must not be used.

Interlocking sheet steel piles cannot be regarded as a lining unless backed in puddle clay, used in soils of low mass permeability, and / or clutch sealant such as 'Wadit' or 'Britseal' ~~is~~ can be used.

9.10 Water Level Control Structures and Cross Sections

The water level is normally controlled by waste weirs, by-washes and sluices and fluctuations in level can occur for a number of reasons, particularly during storms at the site and upstream, and during dewatering downstream. Care should be taken to define normal water level and maximum water level at the survey stage in consultation with the Works Engineer. Detailed surveys of weirs and sluices together with cross-sections of the Waterway may be required and these shall be submitted before and after the Works at the Promoter's expense. The Contractor should particularly note when planning any work in relation to the Waterway that the Trust cannot guarantee any particular water level or depth and not prevent any fluctuations to such water level depth or speed of flow in any Waterway.

Requests to lower and maintain water levels slightly below those normal for that location are particularly difficult to achieve without alterations to structures, will usually cause navigation problems and even if possible will require constant monitoring and adjustment, all at the Promoter's expense.

All designs should consider flood defence and fish migration legislation. The third party is responsible for agreeing any design with the Environment Agency.

9.11 Water Control

At his own expense the Promoter will be required to maintain navigation feed flows and flows being transferred to abstractions past the site and to also deal with storm flows reaching the site at all times including outside normal working hours.

If pumping/dewatering is required, refer to section 14.

9.12 Bank Protection

The third party may encounter many forms of bank protection and any alteration or addition will have to be tied into the new works. The interface will need to be detailed to prevent an erosion pocket forming.

Although the nature of the Works often dictates a 'hard' bank protection system, the introduction of the Water Framework Directive means that any installation of hard bank must be to satisfy an engineering/safety need. The third party may have to agree their design with the Environment Agency and obtain consent, see Section 14.7.

It is often necessary to use a structural system of bank protection, such as interlocking sheet steel piling, for instance to act as a cofferdam to allow bridge footings to be built below water level or to allow the Trust's plant to pass along the towing path under a new bridge. Piling is also used in open cut service crossings to act as a water cut-off. Non-structural systems require the canal bank to slope into the channel and navigation must be considered in the design.

Although galvanised trench sheets are often used on smaller canals without pile capping, it is usual to install a reinforced concrete capping beam to structural piles. This beam should generally be made to accord visually with vernacular building materials for instance by laying brick or stone masonry to the upper face and fendering the vertical face.

Concrete and masonry walls are sometimes used but are difficult to construct without dewatering.

Where possible, 'soft' systems which allow a natural vegetation to develop at the water's edge, should be employed. A range of techniques are available, including reed planted coir fibre rolls, brush wood rolls and hazel wattles. Sometimes timber washboards, gabions and stone filled mattresses, pitching and dry stone walls are appropriate. Guidance is contained in the Environment Agency R&D Publication No. 11 *Waterway Bank Protection: A Guide to Erosion Assessment and Management*.

The interface between the water's edge and the canal bank is one of the most valuable of the waterway habitats. Where installation of bank protection will involve disturbance to this area, surveys for the presence of water voles or white clawed crayfish are required at the early stages of the project. If found, the method of bank protection must be agreed with the Works Engineer to ensure their habitat is conserved, as required by law. In addition, all soil and plants (including reeds and aquatic vegetation) which are removed should be reinstated adjacent to the works. Where original plants cannot be reinstated equivalent planting agreed with the Works Engineer must be carried out. See section 14 for further guidance.

Future maintenance of bank protection systems must be addressed at the design stage.

9.13 Fendering

The permanent and temporary works must be fendered to protect the works from craft *and vice versa*. Modern narrow canal craft have overhanging bows and the steering skill of some boatmen leaves something to be desired. Fendering materials include cast iron (used sometimes for heritage reasons), steel bullhead rail, recycled timber or timber obtained from legal and sustainable sources, polyethylene (which has low friction properties) and polyethylene faced rubber (which absorbs energy). The durability and maintenance of fendering must be considered and addressed at the design stage.

Bolt heads must not project. There should generally be no external angles; radii should be employed.

Any drilling of the waterway wall or coping stones must be agreed with the Third Party Works Engineer.

9.14 River Navigations

River navigations are affected by currents, floods and in some cases tides. There will be a deep navigation channel, not necessarily in the centre of the river. Elsewhere there may be insufficient depth to navigate. It is less easy to control vessels travelling in the same direction as the flow than those travelling against it. The former can move at considerable speed and need sufficient visibility and space to manoeuvre. Temporary and permanent works in the river can produce turbulence affecting navigation. The effects will vary in different river conditions. Environment Agency consent as drainage authority will be needed as well as that of the Trust as navigation authority. The effects of all works on river navigations will need careful and specific consideration. Sailing vessels use some river navigations.

The Trust has powers and duties as Navigation Authority on those rivers listed in Statutory Instrument No 1195 *"The Inland Waterways of the Trust Board Order 1965"* as amended. The Trust is usually the freeholder for artificial sections but in general not so for natural river channels. Where the Trust is not the landowner, there will be no need for a contract with the Promoter however the principles of this Code will apply, particularly with regard to the contents of the Submission. The Trust has Bye Law powers to control works affecting river navigations. The Bye Laws are published on the Trust website. The procedure outlined above must be followed except where it refers to the contract.

10.0 DIVING OPERATIONS

10.1 Introduction

All diving operations in waterways under the Trust's control must be in accordance with the Diving at Work Regulations 1997 and the Trust Mandatory Standard – Diving Operations in CRT Controlled Waters (available upon request from your Works Engineer).

No individual or organisation, other than the Emergency Services in support of an ongoing search, rescue or investigation, may conduct diving operations in waterways under the control of the Trust without first seeking prior consent to do so.

10.2 Procedures

Consent should normally take the form of an exchange of documents or letters that incorporates the issue of the hazard information as a drawing or summary and in some cases may specify actions the third party is required to take to meet the requirements of the Trust.

The Trust cannot accept any responsibility for providing hazard information to any diving activity that occurs without its prior knowledge.

Once consent has been granted to conduct diving operations and any separate arrangements for isolation of plant or equipment are completed, the responsibility for authorising or controlling the diving operation remains with the promoter or contractor, not with the Trust.

10.3 The Dive

A validated copy of the correspondence and form AP-006 3rd Party Consent to Dive together with the authorisation for access, must be available at the proposed worksite

The Trust will request that any diving operation be ceased at the earliest opportunity – without compromising the safety of the diver or support team - where no prior knowledge of the activity has been provided or no documented proof of consent exists at the dive site.

The responsibility for liaison between the Trust and the third party contractor/client lies with the Works Engineer. However, the consent to dive can only be authorised by one of the Trust's Dive Contract Administrators.

Third parties should allow at least four weeks to obtain the consent to dive.

The divers' 'A' flag must be displayed at all times and must be displayed either side of the works in conjunction with warning signs 'Caution – Diving Operations Ahead'.

11.0 WATER ABSTRACTIONS

11.1 Introduction

The Trust will consider applications for the purchase of untreated water which is surplus to its navigational requirements. The Trust can also offer the use of canal water as a cost effective and eco-friendly way of cooling and/or heating waterside developments. Water abstraction is possible subject to the availability of water and by negotiating an acceptable charge. It may be appropriate to return a proportion of the abstracted water, as in the case of cooling and/or heating buildings where no contamination has been added. Where water is to be returned at a higher temperature to that of the normal canal water, consideration will have to be given to the environmental impact. This will involve issues such as the size of the canal, the normal flow along the canal, the design of the discharge and how the plume of hot water disperses downstream of the discharge. In some cases additional water may have to be passed along the canal at the Promoters expense to give the required dilution of the discharge.

Other points to note:

- The quality of water and the continuity of supply cannot be guaranteed
- Information regarding typical water quality can be supplied
- It may be necessary for maintenance and engineering purposes to de-water the canal. In such circumstances, it is usually possible to maintain continuity of water supply by over-pumping, however abstractions and discharges may have to cease if they are within the dewatered section, for the duration of the works.

Abstractions should be negotiated with the Water Sales Account Manager based at Milton Keynes, Telephone Number 01908 351884.

Internal consultations then take place with the relevant Waterway and Water Management Team to ensure that the abstraction is acceptable and installation works managed correctly. This will be the same for the return water in the case of water used for heating or cooling buildings.

Abstractions in England and Wales which take quantities of water greater than 20 m^3 per day will require a licence from the Environment Agency (Section 66 of the Water Resources Act 1991 as amended by the Water Act 2003). Abstraction Licences must be applied for, and are normally held, by the Trust. There is a statutory process under the Water Resources Act 1991 involved in obtaining an Abstraction Licence which can take around 6 months to progress; it is not therefore usually possible to abstract larger quantities at short notice.

11.2 Feasibility and Design

Abstraction is not usually permissible from short canal pounds between locks, owing to the difficulty of maintaining levels.

Abstraction is not usually possible directly adjacent to locks, moving bridges and mooring sites owing to the navigational difficulties which would ensue.

Abstraction structures are normally required. The structures must have a facility to stop the abstraction flow and should have safe access for the Trust staff at all times in order to cater for eventualities and emergencies. The design of the structure should facilitate de-watering for maintenance and consider the aesthetics and heritage of the canal.

A safely accessible metering facility should be included.

The watertight lining to the canal will need to be appropriately modified to permit abstraction.

Scour protection may be needed.

Suitable isolating systems such as valves must be designed in for maintenance.

In order to minimise navigational difficulties associated with transverse velocities the maximum velocity of the abstracted flow must not exceed 0.3 m/s measured at 90^0 to the direction of the navigable channel.

Measures may be needed to ensure that fish and eels are not sucked in. The Environment Agency produce various documents on this subject including *Diversion and Entrapment of Fish at Water Intakes and Outfalls,* by Dr DJ Solomon, NRA R&D Report No 1, July 1992 is available.

Signing and Fenders may be needed.

Abstraction structures should be capable of carrying the loads imposed by the use of the towing path by maintenance vehicles.

Towing-path levels should generally not be raised.

The Promoter must undertake a full utilities search around the location of the proposed abstraction route on C&RT land.

Grilles may be needed to prevent debris entering the system. Should debris be removed from the grilles, then this should be disposed of promptly, by the third party, and not left on the canal side.

The sale of water from canals leads to the transfer of water in an open channel from feeders or other water sources to the abstraction point. In some instances the issues discussed below under 'Water Transfer' may be applicable.

11.3 Water Transfer

Where canals or rivers are being used to transfer significant volumes of water from one point to another, from a discharge to a weir, or from a feeder to an abstraction point, special consideration is needed. The works summarised below may be necessary:

- raising of freeboard levels to a degree to be agreed with the Works Engineer; considerations of the backwater curve indicate that there should be sufficient freeboard not only between the inlet to the canal and the outlet, but also beyond the outlet and in the other direction from the inlet
- where freeboard levels are to be increased and the canal is carried on an embankment (i.e. proposed water level is above the surrounding land on one or both banks), consideration should be given to the impact, if any on the stability of the embankment
- raising of bridges to give satisfactory clearances with the increased level associated with the hydraulic gradients; reduced headroom leads to serious dangers to boat users
- widening and deepening areas of restricted cross-section in order that flow velocity does not lead to navigational difficulties
- installing bank protection to prevent erosion associated with the flow
- Raise existing puddle clay, clay trenches or other measures to counteract leakage and increased seepage.

Modification works will cause a significant environmental impact and will require careful consideration. The environmental impact will not be restricted to the immediate effect of the Works since the changes in velocity and level and mixing of different water qualities may cause long term environmental effects, both in the waterway and in inter-connected rivers, reservoirs, ground waters, etc. These will need to be assessed at the planning stage.

Consideration must be given to the consequences of interruption of the flow during for example Works of maintenance or construction.

12.0 VEHICLES AND PLANT ON TOWPATHS

12.1 Introduction

The towpaths alongside the waterways were generally never designed for loads any greater than pedestrians or horses and as such there should be no presumption that any vehicles, items of plant or heavy loads in general can be taken onto or placed on a towpath.

The Canal & River Trust (The Trust) has not assessed the capacity of the towpath(s) within the vicinity of the works. Wherever possible the Third Party should design the works to avoid plant and heavy equipment on towpaths. In all cases the suitability of the towpath for load bearing must be assessed by the Promoter and the assessment agreed by the Trust prior to the commencement of any works (please contact the Works Engineer for guidance). The Trust will provide site hazard details and any other information within its possession that may assist the promoter in preparing the assessment.

12.2 Access onto the towpath

The towpath can only be accessed at certain locations. The promoter should assess these access points and consider access alongside potential conflict with other users of the waterways. The promoter should also consider the need to turn vehicles as reversing would create an unnecessary hazard to users and operators.

12.3 Services in and over towpaths

There shall be no load applied to utilities (typically Gas, Water, Telecommunication and Power cables), as these are superficially buried in towpaths.

Some utilities may be installed in cable troughs identifiable by the covers made of concrete slats and concrete panels and a relaxation of the prescription will be considered if it is demonstrated that the effect of the load does not exceed the safe carrying capacity of the covers.

Cables are often carried overhead above towpaths and the promoters method of working should address this risk and include suitable precautions.

12.4 Working on the towpath

The working area, including the area along which access is gained, shall be isolated to separate the works from towpath users. The means of separation shall be identified in the method statements.

Loading and unloading points and parking points should be assessed for suitability and should also be separated from other users.

Vehicles should have fully reversible seats and ideally be tracked.

Vehicles should only be reversed with a banksman present.

A means of stopping rolling vehicles such as vehicle barriers should be incorporated into the method of working.

The need to store materials on the towpath should be avoided and permission to do so should not be assumed. Loads shall be spread in all cases as best practically possible.

All vehicles and plant used on the towpath must have an open cab or at least two means of escape from the cab.

The effect of vibration caused by the vehicles, plant and machinery needs to be taken into account.

The effects of a change of water level in the watercourse should be considered as this can affect the capacity of a towpath.

12.5 Conditions of Working on the towpath

Any Towpath closures shall be the responsibility of the Promotor who is responsible for obtaining any necessary agreement to close or divert the towpath and any public right of way and to maintain all diversions and signage, design and construction of any temporary surface as required. Any access required for the Works shall be the responsibility of the promotor as agreed with the Works Engineer. (Please refer to Part 1 Section 5) for further information.

Safeguards shall be imposed restricting the movements of the plant adjacent the water's edge. This is to be agreed with the Works Engineer.

All plant movements shall be coordinated with the use of banks men and limited to 4mph while traveling along the towing path.

13.0 SCAFFOLDING

13.1 Introduction

When working on or adjacent to the Trust's property it more often than not presents a challenge in erecting and maintaining a scaffold in the unique environment. These guidelines provide information to assist in overcoming these challenges which are not usually encountered when designing and erecting scaffolding.

This guide is to be read in conjunction with the *Part 2 Section 12 – Vehicles and Plant on towpaths*, HSE standards and the British Standards for scaffolding, in particular:

- BS 5973: 1990 Code of practice for access and working scaffolds
- BS 5974: 1990 Temporarily installed suspended scaffolds and access equipment
- BS 5975: 1982 Code of practice for False-work
- BS 1139: 1990 Metal scaffolding: Tubes, Specification for aluminium tube
- BS 2482: 2009 Specification for timber scaffold boards
- BS 12811-1: 2003 Scaffolds - Performance requirement and general design
- CIRIA C686 2009 Safe access for maintenance and repair
- Regulations 6 and 7 of CHSW 1996 - Construction Health Safety and Welfare Regulations
- LBS Appendix C, The Work at Height Regulations 2005
- LOLER 1998 (Lifting Operations and Lifting Equipment Regulations)
- Provisions and Use of Work Equipment Regulations (PUWER)1992
- PPE (Personal Protective Equipment) Regulations 1992
- Manual Handling Regulations 1992
- NASC SG4:05 – National access and scaffolding convention guidance notes
- Working at Height Regulations 2005 (WAHR)
- English Heritage – Scaffolding relating to historic structures.

13.2 General requirements

Scaffolding must not overhang or project into the navigation/towing path airspace and must be cut off and capped. The canal wash walls have never been designed or constructed to take any scaffolding loads, you should not assume that the wash wall or towpath is suitable to rest or found any scaffolding on.

Only in rare circumstances, where no alternative exists, will the Trust consider a scaffold to be founded from the canal bed. It should be noted that the coping stone should not be taken to be structurally suitable for load bearing **and under no circumstances should masonry / coping stones be drilled into.** You should consider securing your structure from being struck by a boat or other canal object, you might need to provide suitable fendering. Fixing bolts should face away from the navigation and towpath and where clearances are tight, it may be necessary to board the underside of the scaffolding to provide a flush soffit.

13.3 Clearances

Width on towpath: There should be a 1.2m minimum clearance between standards for pedestrian access for a run of scaffold of 10 m or less. For runs of scaffold over 10 m it likely that towpath users will need to pass each other beneath the scaffold. Therefore minimum width will need to be 1.5m. In both cases there should be a row of standards between the pedestrian and the canal edge. The standards should be adapted to form a handrail or suitable barrier to the canal.

Where there is no row of standards between the pedestrian and the canal the minimum width

is increased to 2.0 m in all cases.

Width on navigation: A minimum clearance must be agreed with the Works Engineer. Normally this will allow 2 boats to pass safely side by side and will vary depending on the canal or navigation crossed.

Height above towpath: Typically, a minimum of 2.70 m clear headroom must be maintained along the length of the scaffolding.

Height above navigation: A minimum clearance must be agreed with the Works Engineer above normal water level, this will vary depending on the canal or navigation crossed.

13.4 Fendering

Where the scaffolding is in such a position that boat impact could arise, then a suitable protective and deflecting fender must be placed around the scaffolding. As craft can be affected by winds and currents, provision of a wide navigation channel is not enough in itself to remove the need for fenders.

The design of the fendering should take into account any likely changes in water levels, particularly to river navigations and must be agreed with the Works engineer. It should be permeable to flood water especially in areas of flood plain or Main River.

13.5 Protection

When scaffolding is on the towpath, the standards and approach ledgers should be wrapped with high visibility foam. Suitable lighting arrangements might also be required to be in place.

The first boarded lift should be double boarded with polythene membrane sandwiched between boards. Where there is a possibility of materials/debris falling from scaffold then debris netting or encapsulation must be used. In special circumstances this may be reduced to brick guards. Please also ensure that on this first lift no materials/debris can fall between the scaffold and the face of the building.

13.6 Miscellaneous

In addition to the signage requested within Part 1 Section 6, whenever the scaffold can be reached from the water, it would be prudent to place '**WARNING – DO NOT TIE BOATS TO THE SCAFFOLD**'
Where scaffolding is permitted and erected either on or over the Trust's property, fees are applicable – See Part 1 Section 8

Scaffold designs, drawings and load bearing calculations will need to be submitted to the Works Engineer as part of the application.

You should ensure that no more than one identification banner is affixed to the scaffold – this banner should contain 24hr emergency contact details. Additional material might be permitted to be attached to the scaffold however; the Trust will charge an advertisement fee for its use.

14.0 ENVIRONMENT

14.1 Introduction

The third party is required to consider all potential environment impacts throughout the life of the project, and to demonstrate to the Trust that all potential environment risks that affect the Trust will be mitigated against. All activities have the potential to cause harm to the environment; applicants should complete form 1 in Part 3 alongside this section, as this will guide your application and act as a preliminary assessment. Information has been divided into relevant section headings and all sections should be reviewed.

14.2 Environmental Surveys & Research

Research establishments wishing to conduct investigations on Trust property should contact the Works Engineer who can direct you to the local Environment Team. If the research is likely to be of benefit to the Trust we may ask for a copy of the final report and/or data set.

If access is required for ecological surveys by consultants in advance of a planning application, access will be subject to the provision of any survey data results. Prior to designing any survey, the works engineer will discuss your proposals with the Trusts ecologist for comments and considerations – upon receipt of these comments they must be incorporated within your proposal.

Where trapping/translocation is required as part of the proposal, the third party would need to demonstrate that they have all the relevant consents in place from the relevant regulatory bodies.

14.3 Biodiversity & Ecology

There is a great variety of wildlife along the inland waterway network. The Trust has a Biodiversity Strategy Statement, which identifies objectives and actions to promote the conservation and enhancement of a number of habitats and species. The third party will be expected, where it is reasonably practicable / necessary to:

- Reduce any habitat loss within the land owned by the Trust by keeping the working area to the minimum required;
- Provide plans and a summary of any features of interest for all known areas of nature conservation interest which may be affected by the project;
- Develop guidance on ecological best practice methods to be followed in order to mitigate potential ecological effects during the project;
- Produce plans showing the location for all fences/ barriers to be erected for the purpose of controlling animal movements during and post construction, e.g. deer, [redacted] and amphibian fencing;
- Provide plans showing the location of any ecological features, mitigation or enhancement to be implemented (e.g. bat roosting features / boxes, otter holts); and
- Provide individual habitat or species management plans to include the information above (where appropriate) for: terrestrial habitats; aquatic/ habitats; European Protected Species (e.g. great crested newt, dormouse, otter, and bats);

The Trust will require all persons to manage impacts from construction on ecological resources, including the following:

- Designated sites including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), Sites of Special Scientific Interest (SSSIs), Nature Reserves and local wildlife sites (i.e. non-statutory sites designated for nature conservation);
- Protected and notable species;
- Trees, hedgerows and other features of ecological importance (including linear/ecological corridors); and
- Invasive species.

14.3.1 Designated Sites

Some of the waterways and adjacent land are designated under UK legislation as Sites of Special Scientific Interest (SSSI). Some SSSIs are further protected by European law. Any activity taking place in the vicinity of these sites that may be a potentially damaging cannot proceed until Natural England (or Countryside Council for Wales) has been consulted.

The Trust will require the third party to:

- Manage impacts upon all statutory designated sites of ecological interest (including SPAs, SACs and SSSIs) and non-statutory sites of ecological interest;
- Obtain and comply with the requirements of any consents; and
- Develop relevant procedures, including any special measures, to be implemented in the event of a pollution incident, where this occurs on or adjacent to a designated nature conservation site or where protected and/or notable species are known to be present.
- Notify Natural England and obtain consents as required for any works. The Trust has an obligation to inform Natural England of any works that may impact a protected site and will do so, whether consent has been obtained or not.

14.3.2 Protected and Notable Species

Several plants and animals (including birds) which occur on the waterway network are legally protected. These include Floating Water-Plantain, Bats, [redacted], Otters, Water Voles, native Crayfish, nesting water birds and Great Crested Newts. There are statutory requirements relating to the conduct of works, which may affect protected species or their habitats. Formal consent is often required from Natural England (or Countryside Council for Wales) before any work, which may affect a protected species, or its habitat can be carried out.

Where a species protected by European legislation may be affected, consent is required from the Department of Environment, Food and Rural Affairs (in England), or the National Assembly for Wales. The Trust will require the third party to:

- Consult with Natural England, the Environment Agency, local wildlife trusts, and local planning authorities as appropriate;
- Obtain and comply with the requirements of any wildlife licences, including all protected species licences necessary for construction of the project
- Provide procedures to be adopted in the event of unanticipated discovery or disturbance of protected species or important habitats; and
- Programme the work to have due regard to the potential impact on all protected and notable species, avoiding times when they are most vulnerable such as hibernation or breeding seasons.

14.3.3 Trees and Hedgerows

Under Town and Country Planning legislation, trees may be protected by Tree Preservation Orders or by virtue of being in Conservation Areas designated by the Local Authority. Whilst under the Hedgerow Regulations 1997, most countryside hedgerows are legally protected from removal. Felling licences may also need to be obtained from the Forestry Commission. The Trust will require the third party to:

- Obtain written consent from the relevant Local Authority prior to any work on protected trees or hedgerows;
- Protect all retained trees in line with the recommendations in BS 5837: Trees in relation to design, demolition and construction and the following measure implemented as appropriate:
    - Provision of appropriate protective fencing to reduce the risks associated with vehicles trafficking over root systems or beneath canopies;
    - Measures to prevent compaction of soils;
    - Maintenance of vegetation buffer strips, where reasonably practicable;
    - Selective removal of lower branches to reduce the risk of damage by construction plant and vehicles;
    - Standard guidance for working within root protection zones (RPZs) including procedures to follow in the event that significant roots are uncovered during work; and
    - Provision of contractor guidance for working in close proximity to retained aged and veteran trees and areas of retained ancient woodland, and watching briefs as appropriate;
- All tree works should be guided by BS5837: Trees in relation to construction and BS3998: Recommendations for tree work, which includes ensuring root protection is in place; and
- Ensure protected species surveys have been undertaken in advance of the work, recommendations are followed and any necessary wildlife licences are sought.

14.3.4 Invasive Species

Under the Wildlife and Countryside Act 1981, as amended, it is an offence to plant or cause to grow in the wild any plant listed in Schedule 9, parts I and II whilst the Weeds Act 1959 ensures the control of injurious weeds. (Note: invasive species can be found in water as well as on land.)

The Trust will require the third party to:

- Develop appropriate construction, handling, treatment and disposal procedures to prevent the spread of any invasive plants;
- Ensure appropriate measures for the treatment/control of invasive, non-native species (both plants and animals) and injurious weeds will be implemented, taking into account ecological best practice guidance and where necessary extends beyond the boundary of the site;
- Consider that the programme of works will need to reflect that it can take a number of years to eradicate invasive species;
- Obtain and comply with the requirement of any consent including the use of herbicide near water;
- Promote bio-security and minimise the risk that invasive non-native species and diseases are imported through the procurement of soils and plants; and

- Ensure all imported materials should be screened and material specifications must adequately address the potential for the introduction and spread of invasive plants requesting that they are from a source which is free from invasive plants, roots and seeds.

14.4 Landscape and Setting

Landscape is the inclusive environment of waterway corridor, the immediate visual envelope, plus impacts on views in and out of the canal corridor. Landscape includes surfacing, boundary treatments, furniture and built development adjacent to the canal corridor.

Waterways should have a “sense of place” (a recognisable identity); often specific to a certain river, canal or area, these characteristics are important to the cultural heritage of our waterways and are what appeals to our customers; it is therefore important to recognise and protect this through the design process. The Trust will require the third party to:

- Prevent habitat fragmentation by maintaining a continuous green corridor to enable flora and fauna to move past the site, as such creating formal access to the water on the opposite bank to the towpath is discouraged;
- Involve an ecological specialist as required, in relation to vegetation clearance, tree works, the creation of new wildlife habitats and reducing disturbance;
- Involve a specialist to assess shading by structures and maximise solar gains by making best use of the sun and avoiding over shadowing;
- Prevent damage to the landscape and historic features adjacent to the construction site by movement of construction vehicles and machinery;
- Protect existing and new areas of planting through the provision of appropriate protective fencing to reduce the risks associated with vehicles trafficking over root systems or beneath tree canopies;
- Use well maintained hoardings or fencing during construction;
- Use screening and soft boundary treatments such as native trees, hedges and shrubs to create privacy whilst naturally guiding sight lines to and from the waterway as well as providing pedestrian access;
- Consider the towpath as an integral part of a mixed use or residential scheme and ideally where possible upgraded to ensure that increased pedestrian and cyclist numbers can be accommodated as well as being DDA compliant. NB: Measures to control cycle speed should be incorporated;
- Where possible locate car parks and roadways away from the waterway. Where it is not, ensure adequate planting and screening is used to reduce detriment to the canal corridor
- Use appropriate lighting schemes.

14.5 Pollution Prevention

Protecting our assets from damage or harm is important; care needs to be taken during the planning and execution of any project. The Trust require the third party to:

- Develop and implement appropriate measures to control the risk of pollution from construction works, materials and weather events and proactively manage the site to prevent pollution;
- Complete a site drainage plan for the site, including field drain layout and outfalls, irrigation pipes, fixed water supplies for livestock etc;

- Locate hazardous materials, stockpiles and fuel away from the waters edge and surface water drains;
- Prevent solid or liquid waste, sediment, soil or vegetation entering the waterway. Escape of material held in tanks, receptacles and buried pipes must be prevented, waste water from activities such as washing equipment must be contained and not allowed to enter surface water drains;
- Complete a Pollution incident control plan, train staff on actions and using pollution control kit;
- Contain, limit and mitigate any effects as far as reasonably practicable in the event of a pollution incident and notify the Works Engineer;
- Undertake works in accordance with the Environment Agency pollution prevention guidelines;
- Provide full details including size of area to be drained, the land use, water quality assessments, flow rate, discharge point and monitoring regime to the Trust if surface water run-off is proposed to drain into the waterway at any stage of the project, whether temporary or permanent, see section 3. Install where necessary interceptors and other measures so that drains can be shut off in the event of a spillage or fire;
- Obtain consent from the Trust for any surface water discharge connection to our watercourses, the granting of which is not to be assumed on obtaining Environment Agency consent;
- Be aware that drainage from areas with commercial activities such as working boatyards can be subject to trade effluent agreements with the Environment Agency; and
- Manage storm flows and excavation dewatering to prevent sediment contaminated flows e.g.
    - cut-off ditches to control surface water and well point dewatering or cut-off walls for ground water can be used
    - Seed or cover stockpiles and supplement with geotextile perimeter fences
    - use settlement lagoons or silt busters on silt laden water prior to discharge
    - keep sites and roads clean from soil

14.6 Water

Appropriate management of our water is naturally one of the Trusts primary concerns. The Water Framework Directive (WFD) is European Union legislation intended to protect and enhance the water environment, rivers, canals, feeders and reservoirs. A requirement of WFD is that there is no deterioration in the quality of our designated water bodies and as such has the ability to affect many activities on the Trusts holdings such as bank protection, barriers to fish, dredging, abstraction & water supply and discharges.

The Trust is not a Drainage Authority, any works that affect the channel or bank of a Main or Ordinary Watercourse will need Flood Defence/Land Drainage Consent from the Environment Agency or Local Flood Authority respectively. Works including piling, dredging, bridge construction, installation of scaffolding/coffer dams and other structures in channel may require consent. Where works require Flood Defence Consent, it is the responsibility of the application to obtain it well in advance of the works as these consents take several months to obtain. The Environment Agency will look for consideration of the Water Framework Direction in any design and third parties should build its requirements into the project.

NB there is no correlation between navigability and designation of a watercourse as "Main River" or "Ordinary Watercourse".

The Environment Agency may also place restrictions on project design where a site is located on a flood plain to ensure there is no loss of flood storage capacity. Hoarding and fencing in areas at risk of flooding should be permeable to floodwater unless otherwise agreed with the EA/other Local Flood Authority to ensure that the flood plain retains function.

14.7 Bank Protection

The interface between the water's edge and the canal bank is one of the most valuable of the waterway habitats. WFD requires no deterioration of the ecological value of the in channel or marginal aquatic habitat, banks and riparian zone. Changing a soft "unimproved" bank into a hard piled/stone edge is not permitted except where a genuine need can be demonstrated and mitigation agreed with the Environment Agency. This will typically be through a Flood Defence Consent condition and/or Planning Consent condition. It is recommended that the third party:

- Use soft engineering solutions as a preference. These allow natural vegetation to develop at the water's edge should be used in preference to creating hard bank edges with further consideration given to channel integrity, diversity and its function as a fishery;
- Where this is not possible consider how the hard engineered edges may be 'greened';
- Consider the opportunity to remove or soften hard bank reinforcements and revetments;
- Survey for the presence of water voles or white clawed crayfish at the early stages of the project. If found, the method of bank protection must be agreed with the Works Engineer to ensure their habitat is conserved, as required by law;
- Reinstate adjacent to bank works all soil and plants (including reeds and aquatic vegetation) which are removed;
- Provide compensation or mitigation where soft bank is to be lost permanently;
- Consider future maintenance of bank protection systems at the design stage; and
- Incorporate access and egress points such as animal ramps into hard banks with a freeboard to stop entrapment and drawing risk to animals.

14.8 Water management and fish *(pumping, dewatering, stoppages etc)*

Reducing water levels results in the loss, albeit temporarily, of part of an aquatic habitat or alter the water quality to a point where it is unable to support life. This has the potential to affect a number of protected species including crayfish, water voles and great crested newts. Additionally, all species of fish are impacted by alteration to water levels. All fish are protected by law and several fish species have additional protection. Eels, lampreys, bullhead and spined loach are four such species that are relatively frequently encountered in Trust fisheries.

The Animal Welfare Act makes owners and keepers responsible for ensuring that the welfare needs of their animals, including fish, are met. This means that the provision of a suitable environment is necessary to allow fish to exhibit normal behavioural patterns and ensure their protection from pain, injury, suffering and disease. Reducing water levels can lead to increased turbidity from rainfall events and a build-up of ammonia. Prolonged ice cover, especially where the water depth is shallow, leads to lack of gaseous diffusion thus leading to fish mortalities. Oxygen is less soluble at high water temperatures which reduces oxygen availability in a period of increased fish activity.

The Environment Agency ultimately regulates fisheries in England with Natural Resources Wales (NRW) carrying out this function in Wales. CRT are the largest owner of fishing rights and fish stocks in the UK. We have national blanket fisheries arrangements with the EA and NRW that cover our day to day fisheries work. This work is undertaken by our fisheries management term contractor. Third party works also undertaken by the Trusts appointed

fisheries management term contractor would be covered by this national consenting arrangement.

In the event that third parties wish to lower water levels or empty sections of waterway they should:

- Ensure that they have both the permission of the Trust and Environment Agency/Local Flood Authority for any drawdown;
- Consider how temporary dams could be used to minimise the extent of the drawdown in certain situation;
- Consider the location of the abstraction and discharge points of any pumping. The abstraction pumps can be raised off the sediment to reduce the amount drawn through and screened to prevent fish from being drawn through the pump whilst the discharge should be at a rate that will not cause flooding and across a baffle or other deflector to avoid scour and causing suspended sediment pollution;
- Undertake aeration or other suitable mitigation where works may result in de-oxygenation of water as agreed with the Trusts Works Engineer and National Fisheries & Angling Manager;
- When a minimum depth of 750mm in the centre of the channel can't be maintained undertake a fish rescue, preferably using the approved CRT fisheries management term contractor. Provision for a fish rescue must be made for any section of waterway that is to be drained or the water level lowered to the extent that fish populations may be harmed as determined by the Trusts national fisheries and angling manager. Fish must not be flushed through lock paddles or other similar structures at low water level. Additionally, fish must not be flushed into river systems from canals.

- The promoter must have the written approval of the Trusts National Fisheries & Angling Manager for the fish rescue component of the proposed works before any works go ahead.

- Where the Trusts fisheries management term contractor is not used to undertake the fish rescue, the promoter must obtain SAFFA consent to use a relevant fishing instruments and consent for fish transfer from the Environment Agency or Natural Resources Wales. The promoter should then forward a copy of these consents together with the proposed method statement and associated risk assessment to the national fisheries and angling manager at least ten working days prior to the work commencing. These documents will then be assessed and any necessary amendments made as required by the national fisheries and angling manager. As well as fish rescue methodology, the fish relocation sites are to be agreed in advance with the national fisheries and angling manager. When the Trusts national fisheries and angling manager deems it necessary, the Trust may appoint their own fisheries term contactor to monitor and supervise the fish rescue operation and charge the promoter the cost of undertaking this supervision.

- Ensure that where any protected species need to be handled or moved, all necessary authorisations are obtained from the relevant wildlife and environmental regulators, and copies provided to the Trust. Valuable and protected species should be reintroduced to a suitable habitat.

- Following re-watering of the waterway, undertake restocking to reinstate the fishery where required and as agreed prior to the works consultation with the Trusts National Fisheries & Angling Manager
- Capture and humanely destroy any non-native crayfish species and any non-native fish species including zander, sterlets and catfish which may, after agreement with the Trusts national fisheries & angling manager and the Environment Agency or Natural Resources Wales be transferred to other legally licensed locations.
- Install Fish Passes when >50% of a structure is being refurbished or a new structure is being built, such as hydropower schemes.

14.9 Abstraction & Discharge

Water within the Trusts waterways and reservoirs is a private asset and as such all abstractions and discharges require consent from ourselves. Consent from the EA does not automatically confer consent from the Trust. Additionally, consents are given to individuals or companies, it should not be assumed that an existing discharge/abstraction can be retained when a site is redeveloped for a new use, if permission is given to retain and re-use an existing discharge/abstraction, a new commercial contract will normally be required.

It is also possible that there are abstractions from, or discharges to the Trust or neighbouring waters which may be affected by the Works or which may affect the Works. The Promoter should make inquiries, to establish whether such abstractions or discharges exist. Where they do exist, the Promoter should discuss the works with the abstractor or discharger with a view to making suitable arrangements.

14.9.1 Abstraction

Although the abstraction of <20m^3/day of water does not require EA consent, consent is required for any abstraction from Trust watercourses whether permanent or temporary, including agricultural irrigation. The granting of which is not to be assumed on obtaining Environment Agency consent as we will take into account additional parameters. The Trusts Works Engineer or Utilities Team member will consult the Environment Team and Water Engineer to assess whether we are prepared to allow the abstraction and determine conditions this may be subject to.

If the Trust does accept a temporary installation, it will be subject to separate engineering approval and commercial contract.

The Trust gives no assurance as to the quality of the water within its waterways and reservoirs and third parties should ensure that it is fit for purpose at an early stage, particularly if the abstraction is leisure related. The quality of any water abstracted is also subject to change and cannot be guaranteed.

14.9.2 Discharge

The Trust do not accept foul, polluted or contaminated water. Discharges of trade or sewage effluent are not normally accepted on water quality grounds because of the relatively static nature of our waters. It is therefore our preference and best practice outlined in the Environment Agency pollution prevention guidelines that any sewage/trade waste and grey water is connected into mains drainage.

There is a presumption against accepting small domestic discharges (<5m3/day) of treated sewage discharges due to our concerns regarding maintenance, potential pollution and nutrient

enrichment. Other larger discharges may be considered on a site by site basis when subject to a full assessment including detailed information including the specifications of the plant (sewage treatment plant/industrial process), its capacity, discharge quality and quantity, the discharge point and any other overflows (grid references), whether there is a soakaway, the fall of the land and whether there is a shut off mechanism in the event of a pollution or the plant malfunction. We would also need assurance that maintenance has been considered to ensure the operational efficiency and effectiveness. The details including method and frequency of maintenance must be communicated in a written format to the Trust Works Engineer and the management company on site who accept responsibility for planning and implementing the maintenance regime.

We would need to be satisfied that any discharge would not result in a detriment. You would have to demonstrate this and offer monitoring proposal passed to utilities department.

We encourage Sustainable Urban Drainage Systems where appropriate and subject to an hydrological and pollution assessment.

14.9.3 Heating/Cooling

Using the waterway network as provider for heat exchange technology offers significant savings on energy costs; it is a sustainable solution which replaces the need to burn fossil fuels or the need to use large amounts of electricity to power air cooling units. This system is particularly pertinent to new waterside buildings. Contact the Works Engineer to discuss applications, requirements and opportunities for this technology and consents that would be required.

There would be a presumption against accepting heated water at sensitive sites such as protected sites (SACs, SPAs and SSSIs) or areas of known water quality issues.

14.10 Waste

The Trust encourages all third parties to consider the waste hierarchy when planning their projects and minimise and recycle construction waste. The Trust requires that materials reusable for waterway works particularly those which are no longer readily available such as copings and castings be carefully removed and transported to an agreed storage area for use in canal maintenance. The Trust retains ownership of such materials.

Because of their industrial heritage, land and sediment in the corridor of some waterways may be contaminated. Site excavated soils and sediments should be analysed in advance of the project commencing so an appropriate management route can be determined.

Please note that silts and other materials recovered from canal beds or elsewhere might contain chemical contaminants, or biohazards such as used hypodermic needles. In addition, the Trust require the third parties to:

- Manage all wastes in such a way as to prevent harm to human health, amenity and the environment (i.e. not within 10m of a watercourse, borehole, well or water drainage system);
- Store all wastes and materials safely and securely to prevent their escape and prevent contamination of our assets;
- Ensure no waste is disposed of/reused on C&RT property except where has been agreed in writing with the Trusts Works Engineer;
- Maintain responsibility for the management of all waste generated by the project, third parties will be considered the legal “producer” of any waste from the project under the

Duty of Care Regulations and will be solely responsible for complying with all current legislation. This includes material excavated from C&RT property such as canal dredgings and tow path bank fill;

- Register any relevant exemptions with the Environment Agency to cover temporary storage and reuse of waste; and
- Undertake pre-demolition/refurbishment asbestos surveys to identify ACM and ensure it is managed appropriately. A licenced contractor should be used, in accordance with relevant statutory requirements.

14.11 Contamination

As discussed in section 7, the industrial heritage of the canal corridor can be reflected in contamination of the land. The Trust require that third parties:

- Undertake Desk Studies and Site Investigations as required to identify contaminated land issues in advance of the work. Site Investigations should be completed in line with Part 2 Section 7 of this document.
- Model risk to all receptors, not just human health and ensure that all potential pathways are investigated;
- Where contamination is identified and will be disturbed/excavated, agree the necessary steps that will be taken to protect workers and the public from contact with the material or with gases or liquids arising from it with the Works Engineer both during construction and post construction;
- Where contamination is identified as present, a thorough Environmental Risk Assessment outlining how contamination of Trust assets and particularly our surface water network will be protected. Construction activities can change existing pathways and create new ones e.g. through piling, this should be factored into any Risk Assessment. **N.B. It should not be assumed that there is an impermeable lining in the canals**; and
- Where contamination is identified and monitoring undertaken (e.g. boundary monitoring/surface water or groundwater quality monitoring) is undertaken, share monitoring data with the Trust at regular intervals.

14.12 Nuisance

Consideration should be given in design and throughout construction to the impact of the project on adjacent site residents and users of the surrounding amenity. It is expected that third party implement controls and measures to control and mitigate the effect of potential nuisance caused by construction work.

14.13 Noise & Vibration

Best Practicable Means should be applied throughout the project to minimise noise and vibration impact on local receptors. It is expected that the third parties:

- Minimise the impact of noise on our users and neighbours particularly residential boaters both during and post construction. Consider building and landscape design, the use of screens, silencers and 'quiet plant', minimising traffic movements and controlling hours of operation;
- Consider the noise impact on canal environment from new bridge. If noise levels are too great, mitigation measures must be introduced. Noise mounds or barriers are suggested measures, solid parapets are preferred;
- Where appropriate fit and maintain appropriate mufflers on site plant, and enclose noisy equipment;
- Limit site works to normal week day time hours;
- Install noise attenuation barriers, particularly when working in close proximity to residential areas (including schools and office buildings);
- Undertake appropriate measures to mitigate any disturbance through vibration of protected species such as [redacted], water voles and birds;
- Ensure no damage is caused to Trust assets through vibration. No discernible vibration will be acceptable to Trust property unless the level of vibration has been prescribed in advance by the Works Engineer; and
- Where significant levels of noise cannot be avoided the third party should apply for a section 61 consent.

14.14 Dust & Odours

Every effort must be made to minimise the impact of dust and odours during and post construction on our waterway users and neighbours particularly residential boaters. To prevent and/or mitigate for a dust nuisance, third parties should:

- Plan the site layout to locate plant and any dust/odour causing activities away from sensitive receptors and the site boundary where reasonably practicable;
- Proactively employ dust suppression where significant levels of dust have the potential to be or are created including damping down, cover material, road sweeping, wheel cleaning, surfacing of haul road, covered skips and demolition chutes for waste transfer and a ban on burning on site;
- Use site hoarding and screens to minimise off site dust migration;
- Undertake odorous work with respect to wind direction;
- Ensure that plant are fitted with emission control equipment and are regularly serviced; and

- Consider formal odour suppression on the site boundary where significant ground gas has been identified as a potential risk (e.g. excavation of old waste sites)

14.15 Light

Consideration with regards to lighting needs to be paid to both the design and construction phases. Lighting may be appropriate to illuminate the towpath, access points, bridge undercrofts and locks in urban areas and mixed-use developments as well as illumination of landmark features and artwork. The third party:

- Consider the potential for light pollution (potential for breaching Section 79(1) of the Environmental Protection Act 1990 'Artificial light emitted from premises so as to be prejudicial to health or a nuisance'). Minimise the amount of artificial light in the project design and include the specification of low energy components such as LED and lux levels.
- Design lighting for site boundaries to allow safe public access or on site lighting for site safety, however the introduction of waterside lighting should meet a clearly defined need.
- Ensure lighting schemes are designed with protected species (particularly bats) in mind and should therefore not cast over the waterspace, baffles and directional lighting should be used to manage the light beam and white light avoided where possible.
- Ensure lighting design positions lights so as not to unnecessarily intrude on adjacent buildings or waterway users. Where possible they should be activated by motion sensors to minimise their impact.

14.16 Environment References

This section is to be read in conjunction with the following external guidance:

- All designations available at the Magic website **http://magic.defra.gov.uk**
- Contact the Environment Agency to determine if a watercourse is Main River or Ordinary Watercourse 0300 506 506
- BS3998: Recommendations for tree work
- BS 4428 Code of practice for general landscape operations (excluding hard surfaces)
- BS5228: Code of Practice for noise and vibration control on construction and open sites
- BS 5837:2012 Trees in relation to design, demolition and construction – Recommendations
- CLR11 - Model Procedures for the Management of Land Contamination., Defra/Environment Agency
- Environment Agency R&D Publication No. 11 Waterway Bank Protection: A Guide to Erosion Assessment and Management.
- Guidance notes AqHerb01: Agreement to use herbicides in or near water, Environment Agency 2012
- Managing invasive non-native plants, Environment Agency 2010

- National Groundwater and Contaminated Land Centre Report (NC/99/73) Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention
- NJUG: Volume 4 Guidelines For The Planning, Installation And Maintenance Of Utility Apparatus In Proximity To Trees (Issue 2)
- PPG1 General Guide to the Prevention of Pollution
- PPG5 Works and maintenance in or near water
- PPG6 Working at Construction and demolition sites
- PPG21 Pollution Incident Response Planning
- PPG22 Dealing with spills
- PPG2 Above ground oil storage tanks
- PPG3 Use and installation of oil interceptors in surface water drainage systems
- PPS9: Biodiversity and Geological Conservation, UK Government 2005
- PPS10: Planning for sustainable waste management
- WRAP website for advice on sustainable waste and construction.

15.0 HERITAGE

15.1 Introduction

Most of the Trusts waterways infrastructure is well over 200 years old and forms an important part of the national heritage. It is a key value of the Trust that all heritage assets, whether designated (i.e. legally protected) or non-designated, are given the same level of beneficial treatment and protection.

The following paragraphs deal with statutory controls on Listed Buildings and Scheduled Ancient Monuments. Even where no statutory protection is in force, it should be noted that the Trust seeks to protect and enhance all structures, surfaces and features with heritage/historic value.

15.2 Listed Buildings

Many waterway buildings and structures are listed buildings and are subject to historic building legislation. Works to listed buildings often require listed building consent from the local planning authority and this should be negotiated and applied for well in advance of any works. Works to adjoining non-listed structures may also be classed as 'development affecting the setting of a listed building'. Listed buildings also enjoy a measure of 'curtilage' protection.

15.3 Scheduled Ancient Monuments

A number of waterway sites and structures are scheduled monuments and are protected under special legislation. Many works affecting them require scheduled monument consent which must be obtained from the appropriate Secretary of State, via the statutory agencies (Historic England, Cadw). Gaining scheduled monument consent can take time. Works to scheduled monuments almost always require archaeological recording conditions to be met.

15.4 World Heritage Sites

Designation of a World Heritage Site by UNESCO brings no additional statutory controls, but protection is afforded through the planning system as well as through the other designations (listed buildings, scheduled monuments etc) that cover elements, if not the whole, of the site. All UK sites have management plans in place, which are regularly reviewed. Each site typically has a steering group, which comprises its owner/s and other key stakeholders and contributes to the management plan review process.

15.5 Conservation Areas

Conservation Area controls affect many waterway sites and early consultation with the local planning authority is advised before works take place in a conservation area. Demolition of any building or structure (whether listed or not) will require planning permission. Changes to the external appearance of a building in a conservation area may require planning permission that is not required elsewhere as some permitted development rights are curtailed. Alterations to fencing and walling may require planning permission if bordering a public right of way.

Felling, lopping or topping of trees calls for six weeks' notice to be given to the local planning authority and removal of hedging is also controlled. It is the promoter's responsibility to ensure adequate application time and all necessary permits are in place prior to construction.

Under the National Planning Policy Framework (NPPF) conservation areas are designated heritage assets and their conservation is to be given great weight in planning permission decisions.

15.6 Setting and character

While it is difficult to define “character” objectively; any repair, refurbishment or new build should be carried out so as to be in keeping with the general setting and landscape of the waterway corridor.

Selection of materials should seek to match existing or surrounding styles and reinstatement of the site should take account of the need to restore the overall setting of the waterway (for instance replacement or enhancement of vegetation, historic surfaces or features)
The Trust can advise on local distinctiveness in relation to heritage features of the individual canal or river navigation

15.7 General considerations when working on or within the curtilage of Heritage Structures

Much of the waterways historic structures or fabric requires the use of special materials or skills to ensure the unique character and function of a structure is protected. A particular type of stone, brick or mortar may be required when working on the waterways this will require the use of specially trained contractors and the sourcing of materials that may not be readily available. Many canal structures are old and do not conform to modern standards of design or construction
Lime mortars are an important element in historic structures contributing to their character and enabling them to breathe and absorb structural or thermal movement. The appropriate use of lime for heritage repair work is vital to ensure that these structures are taken into the future in the best condition.

15.8 Archaeology

Archaeological remains associated with waterways represent an important and finite resource. They may comprise buried remains of past waterway structures such as old basins, now in-filled; or they may be remains of activities that took place alongside the waterways such as housing, stables, water mills, pumping stations, warehouses and 'ridge and furrow' fields. Archaeology also covers buried objects with heritage value, such as tools, iron furniture or former items of cargo.

Sites of archaeological interest may be Scheduled Monuments or may appear on the County Sites and Monuments Record, now usually known as the Historic Environment Record.

It is the Trust’s policy to ensure that archaeological remains are not destroyed or unnecessarily removed. Offsite preservation and re-use of complete structures must be considered, where applicable. The archaeological recording of structures to be demolished must be undertaken, where applicable. Artefacts should be preserved. The Trust retains ownership of such materials

15.9 Demolition Materials

The Trust requires that materials that have a heritage value or are re-usable for waterway works, particularly those which are no longer readily available, such as copings and castings, be carefully removed and transported to a storage area for use in canal maintenance. The Trust retains ownership of such materials.

16.0 IMPROVEMENTS TO CANAL & RIVER TRUST INFRASTRUCTURE BY OTHERS

16.1 Introduction

Although this Code of Practice is written for works that are promoted by others for their benefit, there are some works that enhance our property. A typical example would be where a local authority would like to improve the surface of a towpath.

In these cases, we advocate the use of the Trust's framework contractors who have a great deal of experience and knowledge when working on our property. Further information is available on request.

The Trust however acknowledges there maybe occasions where delivery by a third party will be of benefit to the Trust and approval can be sought for this approach.

16.2 Agreement

In addition to the application of this Code of Practice to the works, an agreement is required between the third party and the Trust which will include;

- Agreement that, under the CDM Regulations, the third party takes on or procures the
    - Client role
    - CDM Co-ordinator role
    - Lead designer role
    - Principal Contractor role
- Agreement that the Trust will be consulted and will provide engineering & design advice as to the preferred works specification but will not act as a Designer under CDM. Any costs incurred by the Trust will be recovered in accordance with this Code of Practice.
- Agreement that the third party;
    - Prepares an Environmental Appraisal (the Works Engineer can advise on the level of detail needed)
    - Negotiates any third party access required
    - Complies with the Trust's towpath design guidance
    - Carries out services checks
    - Produces a materials and work specification test plan
    - Secures necessary consents (e.g. footpath closures, planning permission, flood defence consent)
    - Carries out external stakeholder communication (e.g. landowners, neighbours, canal societies, amenity groups, waterway partnership etc.) as agreed with the Trust.

- Provides a Health and Safety File inc: As-built drawings, O&M Manuals (where applicable) using the Trust's templates, normally within 28 days of site completion.
- Formally hands back the site to the Trust.

- Confirmation of the contractor's competence to undertake the works including;

  - References
  - Experience of similar work
  - Appropriate insurances & indemnities in place for the works
  - Health & Safety competence, accident statistics, latest AFR
  - Overview of management systems (quality, environment, health & safety)

- A Defect Correction Period of 36 months.

- Agreement of future maintenance liabilities

16.3 Licences

It will be necessary for the third party to enter into an Access and Maintenance Licence Agreement with the Trust in addition to any other permits and indemnities mentioned within this document. All such licences, permits or indemnities must be entered into prior to any works commencing on the Trust's property.

16.4 Fees

Although works under this section relate to improvements to the Trust's canals and rivers, there is still a need for the Trust to supervise works and issue approvals; therefore, it should be noted that the works will still be subject to third party works fees and you are encouraged to factor this into your scheme costing's.

17.0 BOAT SALVAGE

17.1 Introduction

If a vessel needs to be salvaged from the waterway, although it is appreciated that it often needs to be done promptly, it should be understood that such operations need to be planned and implemented very carefully.

There could be several parties involved in the operation to salvage a vessel. To ensure a straightforward application it will be important for the Works Engineer to deal with one organisation only who will be responsible for the payment of all fees. As the application relies heavily on the production of a safe system of work, it is strongly recommended that the lead party is a contractor.

In circumstances where prompt action is required e.g. **if the navigation is blocked or there are major environmental concerns; the Trust current term craft removal Contractor should be utilised.** The Works Engineer will process an application as quickly as practical as per the Code of Practice and standard documentation.

In order to ensure prompt approval is possible, the following details need to be addressed:

- From the third party, the process should be led by a contractor able to ensure that there is an appreciation of the risk management.
- The diving contractor must be a member of The Association of Diving Contractors.
- If a craneage contractor is also used, we would assume them to be a sub-contract to the diving contractor and the lift to be carried out to BS 7121.
- Operations should be planned and implemented under a restriction notice (See Part 1 / Section 5), rather than a stoppage
- The lifting procedure should only be carried out at a site approved for lifting and so towing of the vessel may well be necessary.

If the above list of points are all addressed and there are no further complications, the works engineer will be able to proceed with the approval process in a prompt fashion.