



Construction Environmental Management Plan (CEMP)

Gordonbush Extension

(Project Ref. LN000087)

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PART 1 – CONSTRUCTION ENVIRONMENTAL MANAGEMENT

1 INTRODUCTION

1.1 Construction Environmental Management: Aims & Objectives

- 1.1.1 This document provides information on Environmental Management and details on outline Construction Methods (Part 2 of this CEMP) for the wind farm project. This document has been prepared for the Planning Authority and statutory consultees and outlines the proposed environmental management methodology to be employed during the construction of the wind farm, if consented.
- 1.1.2 The principal objective of this document is to provide information on the proposed infrastructure and information on how SSER (the *Employer*) intend to avoid (where possible), minimise and control adverse environmental impacts associated with the development. Furthermore, this document aims to define good practice as well as specific actions to be implemented following receipt of a planning consent.
- 1.1.3 The information contained within the CEMP will form part of the Civils Works Contract. The methods and principles contained herein, as well as within referenced legislative instruments and published guidance documents, are adhered to by the *Contractor* in developing the detailed design, construction method statements and other plans relating to environmental management as required by the Contract.
- 1.1.4 The *Contractor* submits all relevant information as detailed in this document to the *Employer* for acceptance in accordance with the contract provisions. No works commence prior to the *Employer's* acceptance.
- 1.1.5 The *Employer* provides an updated CEMP to the Planning Authority post-consent / pre-works (CEMP v1.1). The *Employer* provides the *Contractor* with an electronic copy of the CEMP v1.1 which the *Contractor* develops and maintains for the duration of the works (CEMP Version 2.0).
- 1.1.6 This document is read and implemented on site in conjunction with industry best practice, published guidance documents, and other documents referred to within the CEMP (see Section 17).

1.2 Roles, Responsibilities and Structure of the CEMP

- 1.2.1 The *Contractor* appoints an appropriately competent person or persons (*Contractor's* Site Environmental Representative) to undertake relevant environmental tasks as detailed in this document prior to, during and upon completion of the construction works. It shall be assumed that the role will be a full-time role and the relevant person will be based on site unless otherwise agreed by the *Employer* prior to commencement of construction.
- 1.2.2 The *Contractor* demonstrates the competence of the Site Environmental Representative to the *Employer* via submission of relevant information (e.g. CV, training records, membership records) for acceptance prior to commencement of construction works.

- 1.2.3 The *Contractor* is responsible for obtaining all necessary consents, licences and permissions¹ for his activities as required by current legislation governing the protection of the environment.
- 1.2.4 A copy of this document and related files and documents will be kept in the site offices for the duration of the site works and will be made available for review at any time. Upon completion of the construction works, the *Contractor* submits a complete CD copy of the final set of information to the *Employer* for their records.
- 1.2.5 Where the *Contractor* has standard documents within his own company / corporate Environmental Management Plan which might cover a particular requirement of this CEMP, these will either be inserted or cross referenced within the relevant Section of the detailed CEMP (v2.0).
- 1.2.6 A **Checklist** has been included in Section 18, providing the *Contractor* with a summary of the minimum information to be provided to the *Employer* pre- during and post-construction. The information / documents listed in the Checklist represent the minimum information to be provided to the Employer / Planning Authority at the stages indicated in the Checklist.

¹ For example, discharge consents, abstraction licenses, Waste Management License (WML) Exemption, Permission, notification or consent for road closure, opening or diversion.

2 PROJECT ENVIRONMENTAL CONSTRAINTS

2.1 Schedule of Mitigation, Commitments Register and Planning Conditions

- 2.1.1 Mitigation measures are described in the relevant chapters of the Environmental Statement (ES). If not already provided in the ES, a Schedule of Mitigation will be prepared post-consent and will be provided as part of a revised and updated CEMP (v1.1) in Table 1 below. Table 1 will be updated following receipt of planning consent to include any additional commitments made following submission of the planning application (e.g. in an ES Addendum)

TABLE 1.0 SCHEDULE OF MITIGATION	
ES Section	Mitigation Specified within the ES
	<i>To be provided post-consent (CEMP version V1.1)</i>

- 2.1.2 Following receipt of planning consent, the Mitigation Schedule will be updated and incorporated into a Commitments Register which will detail all mitigation measures referred to in the ES as well as any ES Addenda, further information and additional documentation provided to, and approved by the Planning Authority prior to commencement of the works.

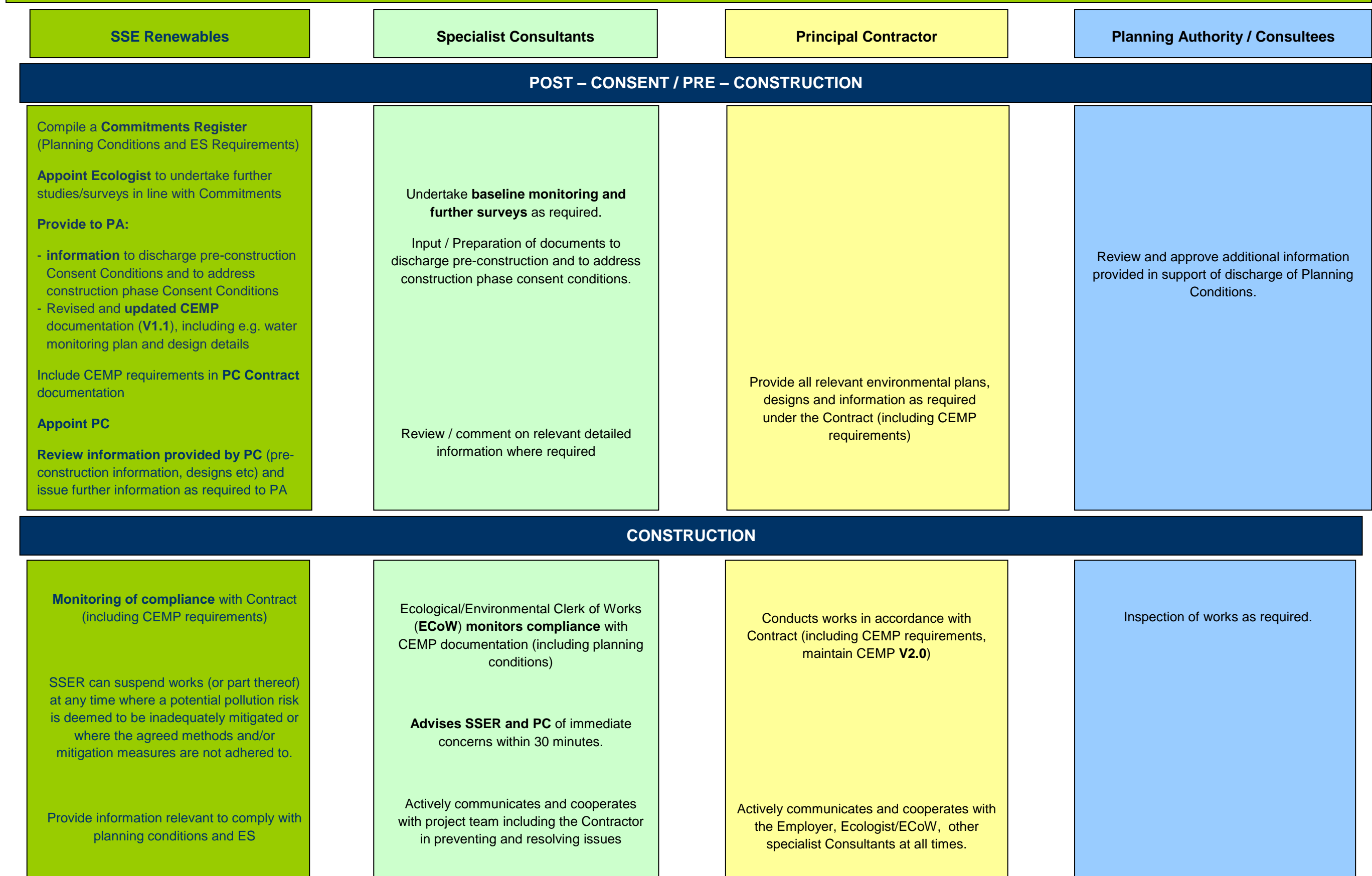
2.2 Planning Conditions

- 2.2.1 Table 2.0 below will be updated to include details of relevant planning conditions attached to any consent to be received, and will detail which section(s) of the updated CEMP documentation covers specific planning conditions.

TABLE 2.0 RELEVANT PLANNING CONDITIONS AND RELATED DOCUMENTATION		
Planning Condition		Related CEMP Section / other document
	<i>To be provided post-consent (CEMP version V1.1)</i>	

- 2.2.2 The Commitments Register and Planning Conditions will be included in a revised and updated CEMP (v1.1) document for review by the Planning Authority prior to commencement of any construction works.
- 2.2.3 Figure 1 illustrates the general parties and their responsibilities for obtaining, reviewing, issuing and accepting documentation in regard to environmental management post-consent.

FIGURE 1:
GENERAL DOCUMENTATION AND INFORMATION FLOW POST-CONSENT



3 CORRESPONDENCE & GENERAL COMMUNICATION

3.1 Roles & Responsibilities

- 3.1.1 The Contractor provides a **Communication Plan** illustrating roles, responsibilities and communication routes for environmental management during the works. This plan will make reference to or incorporate communication during an environmental emergency or incident (Section 17).

3.2 Correspondence, Records & Reports

- 3.2.1 The *Contractor* provides a complete record of all relevant communication and reports associated with all aspects of environmental management. As a minimum the *Contractor* maintains records of the following where applicable to the project:

- A) Minutes and attendance record of start up meeting (on-site meeting prior to commencement of construction works);
- B) **Environmental risk register** (as part of the SHE risk register required under the SHE Specification);
- C) Minutes of weekly meetings covering environmental (ecology, archaeology, hydrology) issues (meetings may be combined with e.g. progress meetings);
- D) **Communication Plan** (Section 3.1);
- E) *Employer* and *Contractor* **Audit Reports** (Section 3.3);
- F) **Records of toolbox talks** (Section 4);
- G) **Dust / noise monitoring records** (Section 5);
- H) **Waste Management Plan** and records (Section 6);
- I) **Drainage Maintenance Register** (Section 7);
- J) **Water Quality Monitoring Records** (Sections 8);
- K) **Peat Management Plan and Excavation Register** (Section 14);
- L) **Geotechnical Risk Register** (Section 14); and
- M) **Licensing and Consents**: copies of all permissions, consents, licenses and permits and related correspondence.

- 3.2.2 General Correspondence: All other relevant internal and external communication records relating to environmental management.

- 3.2.3 Table 3.0 illustrates the main environmental tasks and responsibilities generally applicable to a project of this kind.

3.3 Environmental Audits

- 3.3.1 The *Contractor* undertakes a programme of environmental audits, including audits of his sub-contractors, on a quarterly basis (as a minimum) and provides an audit report to the Employer

within 2 weeks of the audit being undertaken.

- 3.3.2 Audits may be completed at any time by the *Employer*, but at least one per quarter. The *Contractor* maintains a record of all completed audit forms and records of corrective action and close outs.

3.4 Risk Assessments and Method Statements

- 3.4.1 The *Contractor* provides risk assessments and method statements (RAMS) for all works and tasks prior to these being undertaken. These documents take into account and address all of the environmental aspects of the planned works and will include proposed mitigation measures.

3.5 Notice Boards

- 3.5.1 The *Contractor* provides and maintains project environmental notice board(s) which are positioned to ensure that all operatives have the opportunity to review a notice board on a daily basis. As a minimum this will include one notice board to be placed in each compound.
- 3.5.2 The environmental notice boards are maintained by the *Contractor's* Environmental Representative and shall be updated at least monthly. As a minimum, the notice boards contain:
- Description of the key environmental risks and intended risk mitigation measures; and
 - Accompanying Environmental Constraints/Eco Map illustrating the location of the key risks and required exclusion zones / buffer zones and location of emergency response equipment, as required by the CEMP.
- 3.5.3 Key contact numbers and responsible personnel identified within the Environmental Incident and Emergency Response Plan (EIERP).

Table 3.0
CONSTRUCTION PHASE - MAIN TASKS AND RESPONSIBILITIES (ENVIRONMENTAL)

Task	Principal Contractor					Contractors / Sub-Contractors	Employer					Independent Water Quality Consultant	Visitors	Planning Authority / consultees
	Project Manager	Site Agent	Site Foreman	Geo-technical Consultant/ Engineer/ GCoW	Environmental Manager / Site Engineer		Project Manager	Site Manager	Env. Manager	Env.Site Engineer	Ecologist / ECoW			
Provide information (in accordance with contractual timelines)	☑													
Start Up Meeting	✓	x	x	x	x	(x)	✓	✓		x	x			(x)
Site Inductions	☑	x	x	x	✓	x	x	x	x	x	✓		x	x
Obtaining all relevant permissions, consents, licenses and permits	☑													
Weekly progress meetings including Contractor, Employer, GCoW, Environmental Specialist/Manager/Engineer) updates/issues	☑	x	(x)	(x)	✓	(x)	(x)	x		(x)	✓			(x)
Monthly Environmental Report					☑						☑			
Liaison with regulator / statutory consultees	☑							✓			✓			
Environmental Checks and monitoring (e.g. dust, oils and chemicals storage, drainage mitigation, waste management, plant etc)	✓	✓	☑	✓	☑	✓				☑	x			
Environmental monitoring (Water Quality)					✓					✓		☑		
Record keeping (e.g. waste documentation, licences, training, incidents, mitigation designs, material, waste and risk registers etc)	☑			✓	☑		☑	✓		✓	✓			
Environmental audits / inspections	✓				☑				☑	✓				☑

KEY:

- ☑ Lead / Responsible (may apply to several roles)
- ✓ Provide support (may apply to several roles)
- x Attend / take action (may apply to several roles)
- (x) Optional / as required

Note: This table only shows the main tasks/responsibilities. Following agreement between the Employer, the Contractor, tasks/responsibilities may be re-assigned.

4 SITE INDUCTION AND TRAINING

- 4.1.1 The *Contractor* ensures that all contractor employees, sub-contractors, suppliers, and other visitors to the site are made aware of the specific environmental issues relating to their work. Accordingly, environmental specific induction training will be prepared and presented to all categories of personnel working and visiting the site
- 4.1.2 As a minimum, the *Contractor* provides inductees with the following information:
- Identification of specific environmental risks associated with the work to be undertaken on site by the inductee (e.g. exclusion zones, fuel handling, spill kit locations, sensitive habitats, drainage control/mitigation, spill control, silt pollution control, waste minimisation and recycling, reporting of environmental observations); and
 - Environmental Incident and Emergency Response Procedures (including specific Environmental Communication Plan requirements – refer to Section 17 for further information).
- 4.1.3 The *Contractor* provides a convenient sized copy of an **Eco Map** to all inductees showing sensitive areas, exclusion zones, wash out areas, watercourses, refuelling exclusion areas, location of skips, etc. The map shall be updated and re-issued as required. Any update will trigger a tool box talk (see below) to comment and stress on necessary change.
- 4.1.4 The *Contractor* submits a **tool box talk schedule** at least 1 week prior to commencement of works. The proposed schedule (to be considered as a live document) shall be consistent with the programme of works. Additional tool box talks shall be added as required based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc.
- 4.1.5 The *Contractor* provides as a minimum one environmental related tool box talk or other environmental related training session per month on the above topics, along with any other environmental issues which arise on site. Additional tool box talks shall be added as required based on circumstances such as unforeseen risks, repeated observation of bad practices, perceived lack of awareness, pollution event, etc.
- 4.1.6 Where necessary, the *Contractor* requests the assistance of specialist personnel on site (e.g. ECoW, GCoW, ACoW, *Contractor's* Site Environmental Representative, etc.) to undertake specific toolbox talks or parts thereof as required.
- 4.1.7 The *Contractor* provides, as a minimum, training on the use of spill kits (on ground and in surface waters), to be provided on a regular basis (to account for staff/subcontractor changes etc).
- 4.1.8 The *Contractor* maintains a record of all toolbox talks or other environmental related training sessions delivered, their content and the attendees.

5 POLLUTION PREVENTION & MITIGATION

5.1 Responsibility

- 5.1.1 The *Contractor* is responsible for pollution prevention for the duration of the contract and until such time as permanent measures, such as permanent drainage and silt mitigation controls, are deemed to be adequate and appropriately constructed.
- 5.1.2 This responsibility will include the actions of any third party who is sub-contracted by the *Contractor* or otherwise involved in the project.
- 5.1.3 It is the responsibility of the *Contractor* to contact SEPA, other statutory and non-statutory bodies in the vicinity of and downstream of the proposed project so that the requirements and interests of these parties are adhered to and protected throughout the duration of the Contract.
- 5.1.4 The *Contractor* is familiar with and executes works in accordance with the guidance provided in the SEPA Pollution Prevention Guidelines and other guideline documents as detailed in Section 17.
- 5.1.5 The *Contractor* ensures that all staff and subcontractors working on site will be familiar with pollution prevention and mitigation measures as detailed in this document; this includes subcontractors, *Employer's* direct contractors and other *Employer's* representatives working on the site.

5.2 General Pollution Prevention Measures

- 5.2.1 The following points (not exhaustive) indicate general pollution prevention measures in accordance with those highlighted within the guidelines referenced in this document and the Environmental Statement. Pollution Prevention measures relating to specific tasks are also detailed in the respective sections of this document.
 - i. Any material or substance which could cause pollution, including fuels/oils, wet cement, raw concrete or silty water will be prevented from entering groundwater, surface water drains or watercourses by the appropriate use of and appropriate placement of (temporary) silt fences, cut-off drains, silt traps and drainage to vegetated areas where appropriate. Any sign of failing water treatment measures or sight of silted or contaminated water entering any watercourse on site will be reported immediately.
 - ii. Any silty water generated on site will ideally be settled out as much as possible through drainage mitigation measures (silt traps, etc.) and channelled into vegetated (not blanket bog or similarly protected) areas at least 50 metres from watercourses.
 - iii. External fuel delivery lorries will only be allowed as far as the site compound where there will be a **bunded refuelling / fuel storage area constructed on an impervious concrete base**. Delivery lorries will transfer fuel to the onsite fuel tank or truck located within the bunded refuelling area so as to minimise the amount of fuel being driven around the site and minimise external drivers accessing the site. The onsite fuel truck will only be operated by personnel who will have received specific training.
 - iv. All static fuel tanks will be located in the designated fuel storage and refuelling area constructed on an impermeable hard base draining to a below ground oil interceptor located

- a minimum of 50m from a watercourse. Oil interceptors will discharge via soakaway or over suitable vegetation with no direct discharge to a watercourse. Deviations from this specification will only be permitted with the approval of the *Employer* and ECoW.
- v. Signage and collision protection measures will be installed to prevent accidental damage to all static fuel tanks. Plant nappies will be placed below external fuel hose outlet points during all fuel transfer activities.
- vi. Fuel supplies for generators and static generator units will also be positioned on an impermeable bunded surface or housed within a container with integral bund / drip tray.
- vii. **All refuelling will be carried out at least 50 metres from watercourses.** Where this buffer distance cannot be achieved a minimum distance will be agreed with the ECoW. Fuel pipes on plant, outlets at fuel tanks etc will be regularly checked and maintained to ensure that no drips or leaks to ground occur. The following precautions will also be installed on fuel delivery pipes:
- Any flexible pipe, tap or valve must be fitted with a lock where it leaves the container and be locked when not in use.
 - Flexible delivery pipes must be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use.
 - The pump or valve must have a lock and be locked when not in use.
 - Warning notices including “No smoking” and “Close valves when not in use” shall also be displayed
- viii. **Areas of permanent waste oil / fuel / chemical storage will be located 50m away from watercourses or drainage paths.** Where this is not possible, advice will be sought from the ECoW and a minimum distance will be agreed with the *Employer*.
- ix. All fuel, oils and chemicals will be stored on **an impervious hard base within a bund** able to contain at least 110% of the volume stored. If required, accumulated uncontaminated rainwater will be discharged on a regular basis so as not to compromise the required 110% volume capacity. No tanks or containers may be perforated or dismantled on site. A competent and appropriately licensed operator shall empty all contents and residues for safe disposal off-site.
- x. **Spill kits** will be available within each plant on site and also located close to identified pollution sources or sensitive receptors (fuel storage areas, water course crossings, etc).
- xi. Irrespective of the buffer distance and location of refuelling, **interceptor drip trays** (or similar, e.g. plant nappies, – open metal drip trays are not acceptable) will be available. Interceptor drip trays will be positioned under any stationary mobile plant to prevent oil contamination of the ground surface or water.
- xii. All stockpiled materials will be stored in designated areas and isolated from any surface drains and **a minimum of 50 metres** away from watercourses. Aggregate or fine materials storage will be enclosed and screened/sheeted.
- xiii. It is of paramount importance to minimise disturbance to flora and fauna whilst carrying out the construction works, and to ensure that disturbed habitats will regenerate quickly after completion of the works.

- xiv. Topsoil and vegetation must be stored separately from subsoil and shall be retained and reinstated on all areas of stripped ground as soon as possible to prevent erosion and leaching/loss of nutrients. Where reasonably practicable, turfs shall be reinstated with the vegetated side facing upwards, in order to speed up the re-generation process, minimise the need for re-seeding, and help maintain the original species mix.
- xv. Concrete is highly alkaline and corrosive and can have a detrimental impact on watercourses and wildlife. It is illegal to allow cement and wash-out water to enter a watercourse. Washing-out of concrete wagons on site shall only be permitted when the *Contractor* has provided a designated, suitably prepared wash-out area with signage identifying the area as suitable for concrete wagon wash-out.
- xvi. The concrete 'washout' in the designated area shall not be emptied into any watercourse and shall be disposed of in accordance with the Site Waste Management Plan.
- xvii. No tools, equipment or materials may be washed in watercourses. Mortar mixing and material storage areas must be away from watercourses.
- xviii. Sulphate resistant concrete shall be used where geological conditions dictate, to prevent long term corrosion of concrete (local release of alkaline compounds) due to sulphate attack.
- xix. When undertaking construction involving wet concrete in proximity or within a watercourse, consent will be sought from the appropriate agency (SEPA) and work will not commence without this.
- xx. Vandalism, theft and tipping are common causes of pollution and the project area will be adequately protected by fencing and locked access to discourage unauthorised access. Any occurrence of tipping on the site will be reported to the site management who will then inform the local environmental authority and the police if necessary.

5.3 COSHH

- 5.3.1 The *Contractor* is responsible for ensuring that all materials ordered or brought to site listed as hazardous under the Control of Substances Hazardous to Health (COSHH) Regulations are accompanied with a hazardous information sheet. The *Contractor* complies with the COSHH Regulations.
- 5.3.2 The *Contractor* is responsible for carrying out a risk assessment of each substance and ensuring that all appropriate storage, protective equipment and if necessary emergency procedures are put in place on site.
- 5.3.3 All COSHH materials must be stored in appropriate containers, must be indelibly and legibly labelled to identify the contents, hazards and precautions required.
- 5.3.4 Chemicals on site must be stored in a bunded area and in accordance with their materials safety data sheet / COSHH assessment, which must be readily available and up to date.
- 5.3.5 Any spent (contaminated) spill kits, absorbent granules, sheets or fibres must be disposed of in accordance with COSHH regulations and Site Waste Management Plan requirements.

5.4 Pollution Monitoring & Controls

- 5.4.1 The *Contractor* carries out regular inspections of oil/fuel storage areas and plant. The frequency and responsibility for undertaking these inspections will be recorded by the *Contractor* and

communicated to the *Employer* prior to commencement of the works.

- 5.4.2 Regular (at least weekly initially) on site meetings will be held with the *Contractor's* Environmental Representative and the ECoW to confirm the appropriate use of mitigation measures identified within the *Contractor's* method statements in relation to pollution control. These meetings will highlight any further issues / measures which may be relevant either prior to commencement or during the works.
- 5.4.3 To ensure compliance of the works with this document and pollution prevention requirements, the *Employer* regularly monitors the *Contractor's* works. **Should the *Employer* identify any failure to comply with the requirements of this document or the *Contractor's* own method statements the *Employer* may stop the associated works until such time as the failure is rectified.** Any associated cost or time delay incurred will be borne by the *Contractor*

6 WASTE MANAGEMENT

6.1 Site Waste Management Plan (SWMP) Implementation and Records

- 6.1.1 In accordance with best practice the *Employer* requires a Site Waste Management Plan (SWMP) for all their construction sites. The *Contractor* utilises one of the available WMP templates e.g. Smart Waste or WRAP waste management plans², or similar.
- 6.1.1 The SWMP provides details on how waste reduction is to be implemented at the site and also how this is to be monitored throughout the construction phase. The *Contractor* nominates a site representative who takes responsibility for implementation and monitoring of the SWMP.
- 6.1.2 The *Contractor* ensures all relevant information is taken into account in preparing his SWMP (for example intrusive ground investigation data, supply chain assessments, options appraisals etc).
- 6.1.3 The *Contractor* is responsible for obtaining and complying with all required waste management licenses or exemptions as required to complete the works.
- 6.1.4 The *Contractor* provides details of their proposed waste contractors (carriers, transfer station, waste recipient etc) to the *Employer* as part of the SWMP, according to the provisions of the contract.
- 6.1.5 The requirements of the SWMP are communicated to all site operatives during their induction. Furthermore, all operatives on site attend waste reduction toolbox talks on a monthly basis to increase awareness of recycling/waste reduction.
- 6.1.6 The SWMP includes the following as a minimum:
- i. Identification of the *Employer*, the *Contractor*, the person(s) who drafted the SWMP and the person(s) who will be responsible for its implementation, monitoring and review during and upon completion of construction works.
 - ii. The *Employer* expects the *Contractor* to optimise the level of recycling of materials removed from the site (measured in terms of tonnage).
 - iii. A waste inventory and procedures to address the following:
 - A site plan showing all waste disposal and recycling locations;
 - A description of each waste type expected to be produced in the course of the project, with the relevant European Waste Code assigned to it;
 - An estimate of the quantity (tonnage) of each different waste stream / type of waste expected to be produced during each construction activity; and
 - A written statement demonstrating what actions are to be taken to minimise the volume of each type of waste produced prior to commencement of the activity generating the waste.
 - Identification of the waste management actions proposed for each different waste type,

² Information on WRAP and SMART SWMPs can be found on <http://www.wrap.org.uk/content/site-waste-management-plans-1> and <http://www.smartwaste.co.uk/page.jsp?id=97>

including re-using, recycling, recovery and disposal. For example, minimum provisions should include:

- Provision of bins to segregate waste and recyclable materials within all welfare facilities in line with the identified waste streams in Section 6.3 as a minimum;
- Provision of separate skips for general waste and separate recyclable materials within the main site compound in line with the identified waste streams in Section 6.3 as a minimum;
- Provision of secure bunded containers to store waste oils/fuels/lubricants and oily rags prior to removal from site; and
- Re-use of materials such as concrete formwork and reinforcement “seating” steel.

iv. Requirements of the waste *Contractor* to include as a minimum:

- Waste Transfer Notes (WTN) for all materials removed from site comprising the following information:
 - European Waste Code (EWC);
 - Description of waste removed from site;
 - Date and time waste removed from site;
 - Weight (in tonnes) of waste removed from site;
 - Name of Waste Contractor Operative; and
 - Location of waste disposal site which is to be used.
- Weigh waste/recyclable material, i.e. waste facility will include weigh bridge.
- Provide services to segregate recyclable material from waste if necessary

6.1.7 The *Contractor* provides adequate numbers of separate bins (e.g. for paper, cans/plastic, kitchen waste etc) and skips / waste containers (e.g. for wood, metal, hazardous waste, general waste) to facilitate waste segregation and recycling.

6.1.8 The *Contractor* provides a site plan showing all waste disposal and recycling locations.

6.2 SWMP Monitoring and Auditing

6.2.1 The *Contractor's* Environmental Site Representative checks the contents of the site waste and recycling skips on a weekly basis. Non-compliance will be highlighted at the weekly progress meeting and appropriate actions taken e.g. a toolbox talk to all site operatives.

6.3 Anticipated Construction Waste Streams

6.3.1 A number of difference waste streams are likely to arise during construction of the wind farm. The *Contractor* identifies all waste streams³ and provides an estimate of expected waste volumes

³ For example food waste, paper, plastics, glass and other typically domestic refuse and sewage, concrete, waste chemicals, fuel and oils, packaging, e.g. paper, plastics and wood, waste metals, polluted water from plant, vehicle and wheel washes.

for each waste type generated within the waste stream.

6.3.2 The section below sets out a non-comprehensive list of waste streams that may arise during construction of an on-shore wind farm:

- Waste from welfare facilities, e.g. food waste, paper, plastics, glass and other typically domestic refuse and sewage;
- Concrete;
- Waste chemicals, fuel and oils;
- Packaging, e.g. paper, plastics and wood;
- Waste metals;
- Cleaning activities, e.g. polluted water from plant, vehicle and wheel washes;
- Turbine decommissioning: turbine components and excavated foundation materials;
- Excavated materials that may be unsuitable for reuse on site; and
- Green waste from tree felling or scrub clearance.

6.3.3 The *Contractor* includes all materials which enter the waste stream within his waste inventory and addresses waste management procedures for all types of waste within his SWMP. Procedures for dealing with green waste or waste excavated materials may be included within the Peat Management Plan or a Felling / Woodland Plan if applicable.

7 TEMPORARY DRAINAGE

7.1 Scope and Minimum Requirements

- 7.1.1 In accordance with current requirements under The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (CAR), a site licence for drainage is expected to be required and this will be applied for prior to commencement of construction.
- 7.1.2 A key aspect of a construction site licence will be the Pollution Prevention Plan (PPP). This will contain details of:
- how to minimise, control and treat the site run-off;
 - maintenance and monitoring regimes; and
 - general site management to prevent pollution.
- 7.1.3 The *Contractor* submits all temporary drainage designs and drawings as required to support the PPP at least 4 weeks prior to the start of the works. Where approval of these designs is required by Local Planning Authority and their Consultees, the *Contractor* allows 4 weeks for these approvals. The *Contractor* undertakes maintenance of all temporary and permanent drainage solutions as and when required at a frequency at least weekly whilst Principal Contractor, the *Contractor* maintains a **Drainage Maintenance Register** and issues this to the *Project Manager* on a weekly basis.
- 7.1.4 The *Contractor* designs all new drainage to accommodate a 1:200 year + climate change storm event, as a minimum.
- 7.1.5 The *Contractor* designs and constructs a drainage system including all silt mitigation measures necessary to prevent the pollution of existing drainage systems and watercourses for construction and post construction activities.
- 7.1.6 As a minimum all temporary drainage is installed as the track is constructed, where possible the permanent drainage is installed as the *works* progress. In the event that temporary drainage is installed at the time of construction the permanent drainage is installed within 3 months of that section of track being completed.
- 7.1.7 All drainage associated with the *works*, with the exception of that carrying purely Greenfield run-off, is not permitted to discharge directly into any existing drainage or watercourse without at least 2 treatment volumes.
- 7.1.8 Except where necessary to facilitate the crossing of a watercourse, no works will be undertaken within 50m of any watercourse identified on the 1:50,000 OS map, or 25m of any other watercourse (except where an element of infrastructure may be downslope of a watercourse).
- 7.1.9 The *Contractor* does not discharge water on either a temporary or permanent basis unless he has acceptance from the relevant landowners and the ECoW, and complied with the requirements of the relevant Authorities, Utilities and Service Providers.
- 7.1.10 The *Contractor* does not discharge any drainage within 50m of a watercourse unless accepted otherwise by the Project Manager and the ECoW.
- 7.1.11 Access for livestock to each watercourse is maintained or replaced where required as a result of the design and execution of the works.

7.2 Clean Water Diversion

- 7.2.1 Where possible, green field run-off will be kept separate from silty water or other potentially contaminated water. Where appropriate, interceptor ditches and other drainage diversion measures will be installed – in advance of any excavation works – in order to collect and divert green field run-off away from construction disturbed areas.
- 7.2.2 The *Contractor* channels separately silty and clean water drainage to vegetated areas at least 50 metres from watercourses to allow the settlement of solids. Where settlement over vegetation is not ecologically sound (e.g. involving intact blanket bog, requiring only rain-fed nutrients), or is not practical or adequate to deal with the volume of silt generated, the *Contractor* provides and maintains silt traps or settlement lagoons.

7.3 Silt Mitigation and Settlement Ponds

- 7.3.1 The *Contractor* erects and maintains silt fences to protect all watercourses, which may be affected by the works. The *Contractor* maintains these weekly to the satisfaction of the *Project Manager* and the ECoW.
- 7.3.2 All drainage associated with the works, with the exception of that carrying purely greenfield run-off, is not permitted to discharge without receiving the equivalent of at least 2 treatment volumes as a minimum.
- 7.3.3 The *Contractor* undertakes maintenance of all temporary and permanent drainage solutions as and when required and at a frequency of at least weekly whilst Principal Contractor, the *Contractor* creates and manages a Drainage Maintenance Register and issues this to the *Project Manager* and ECoW on a weekly basis.
- 7.3.4 Silt laden run off should be expected from any areas of recently exposed soil or rock. This silt laden run-off will be captured and directed via berms or ditches towards specially constructed sediment control structures.
- 7.3.5 Siting of settlement ponds will take into consideration access requirements for reinstatement and maintenance (for example: periodic silt removal, expansion of ponds or incorporation of additional silt mitigation measures, etc.).
- 7.3.6 The *Contractor* discusses and agrees the location of lagoons and other drainage mitigation measures with the ECoW prior to associated works taking place.
- 7.3.7 Details of typical settlement ponds and silt mitigation measures are indicated on Drawing 1 as included in this CEMP. Additional filtration measures may include flow attenuation measures such as weirs, rock bars and / or anchored and embedded straw bales within settling ponds or between series of ponds.

7.4 Borrow Pit Drainage

- 7.4.1 Schematic representation of a typical borrow pit drainage arrangement is provided on Drawing 4 as included in this CEMP.
- 7.4.2 The *Contractor* incorporates interceptor (cut-off) drains to prevent water ingress to the area of works from the surrounding topography.
- 7.4.3 The *Contractor* incorporates a toe drain to control water ingress and flow around the base of the excavation.

7.4.4 The *Contractor* channels borrow pit drainage to settlement ponds located a minimum of 50m from any watercourse.

7.4.5 The *Contractor* constructs all necessary drainage prior to commencing excavation of the borrow pit.

7.5 Turbine Foundations and Crane Hardstandings

7.5.1 Schematic representation of a typical turbine base and crane hardstanding drainage arrangement is provided on Drawing 5. Further details on relevant construction methods are provided in Part 2 of this CEMP.

7.5.2 Foundation excavations for turbines are generally below the level of the surrounding ground and hence surface water ingress from up slope or groundwater seepage may occur, leading to standing water within the base of the excavation. A '**permit to pump**' procedure will be in place prior to water being pumped from an excavation. The *Contractor* seeks the ECoWs approval prior to granting a 'permit to pump'.

7.6 Construction Compounds, Substation and Control Buildings

7.6.1 Schematic representation of a typical drainage arrangement around construction compounds and welfare/ control building excavations are provided on Drawing 6. Further details on relevant construction methods are provided in Part 2 of this CEMP.

7.6.2 As with tracks and borrow pits, green field run-off and development run-off will be kept separate and appropriate silt mitigation measures will be deployed. Pumping of water from excavations is subject to a 'permit to pump' (see 7.5).

7.6.3 The construction compound(s) is/are free draining with oil interceptors and contain a bunded area for maintaining vehicles and plant, or other pollution control measures, as appropriate / required to protect existing water courses and private water supplies.

7.6.4 The laydown area(s) are free draining with oil interceptors and contain a bunded area for maintaining vehicles and plant, or other pollution control measures, as appropriate / required to protect existing water courses and private water supplies.

7.7 Access Track Drainage

7.7.1 The *Contractor* designs all new drainage to be installed alongside the access tracks, where appropriate. The dimensions of the ditches will be sized to accommodate the development run-off from site infrastructure and green field run-off from adjacent ground resulting from a 1:200 year + climate change storm event.

7.7.2 The *Contractor* designs the frequency of relief drains crossing the access tracks to ensure the longitudinal track drainage ditches do not surcharge during the 1:200 year + climate change storm event.

7.7.3 The *Contractor* installs all permanent drainage concurrently with all adjacent infrastructure, in particular the *Contractor* installs the permanent drainage in tandem with the access track construction such that no section of access track is trafficked until the associated drainage is complete.

- 7.7.4 If the *Contractor* constructs any parts of the *works* without its designated drainage system in place, or a sufficient temporary alternative, the *Project Manager* may instruct the *Contractor* to exclude all non essential traffic from that area until the drainage system is in place.
- 7.7.5 The *Contractor* provides pipe culverts for cross drainage. Pipe culverts extend beyond the edge of access track construction materials by at least 1m. Check dams are installed immediately above a cross drain inlet.
- 7.7.6 The *Contractor* provides silt traps / catch pits at the inlet of all cross drains to prevent the pipes becoming blocked and prevent erosion at the inlet points. Silt traps / catch pits are designed to allow access by gully suckers to remove silt during the operational phase of the wind farm, and are designed to present no risk to livestock and animals, whilst permitting unrestricted water flow into the catch pit.
- 7.7.7 The *Contractor* provides erosion protection at all inlets and outlets to protect against the erosive force of flow during high rainfall events. The type of erosion protection may vary and will be influenced principally by the flow capacity of the culvert / relief drain, velocity and turbulence of flow and sensitivity of the outfall environment.
- 7.7.8 The *Contractor* erects and maintains silt fences to protect all watercourses, which may be affected, within 50m of any element of the *works* or drainage outfall. The *Contractor* maintains these.
- 7.7.9 All drainage channels are sufficiently wide as is practicable to allow wildlife to safely enter/exit the channel. Slope angles are a minimum of 1(v):3(h), except where the *Contractor* can demonstrate a more efficient design.
- 7.7.10 The *Contractor* provides scour / erosion protection to slow the flow of water.
- 7.7.11 The *Contractor* provides permanent check dams / water bars (flow barriers or dams constructed across the drainage channel) at regular intervals within drainage ditches. Check dams are required in order to reduce the velocity of water and therefore allow settlement of coarser sediment particles, as well as silt at low flow conditions. Reduction in velocity will also prevent scouring of the drainage channel itself.
- 7.7.12 Check dams are constructed of clean aggregate graded 50mm – 300mm and are embedded into the side walls and invert of the excavation by at least 100mm. The number and location of check dams will be dependent on the slope gradient, flow and volume of water though the minimum frequency of check dams 1 per 75m length of ditch.
- 7.7.13 Green field run-off and development run-off will be kept separate where possible and will be channelled separately to suitably vegetated areas at least 50 metres from watercourses to allow the settlement of solids on site. Schematic arrangements for tracks and watercourse crossings are illustrated on Drawing 2 included in this CEMP, a schematic section of a typical cut and fill track drainage is provided on Drawing 3.

7.8 Peat and Soil Storage Drainage

- 7.8.1 The *Contractor* considers the location of any temporary peat or soil storage areas such that erosion and run-off is limited, leachate from the stored material is controlled and stability of the existing ground, particularly in peatland areas, is not affected. The *Contractor* also gives consideration to the impacts of poor drainage control in any areas where peat is used in reinstatement (see sections 14 and 15).

- 7.8.2 Interceptor ditches, down slope drainage collection systems, containment berms (embedded where appropriate), and appropriate drainage mitigation measures will be required as with other infrastructure described above.
- 7.8.3 The *Contractor* carefully selects the locations and design of the peat and other spoil storage requirements including methods for reinstatement works and incorporated drainage elements. Such design will be prepared in consultation with the ECoW, the Geotechnical Clerk of Works (GCoW) and *Employer* prior to works commencing. Peat management, storage and resintatement will be undertaken in accordance with the Peat Management Plan (PMP) (refer to Section 14 and 15) and shall comply with the Good Practice During Wind Farm Construction guidance⁴ and SEPA's guidance on the excavation and reuse of peat⁵.

⁴ Good Practice During Wind farm Construction, A joint publication by Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency, Forestry Commission Scotland, Version 1, October 2010

⁵⁵ Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, a joint publication by Scottish Renewables and the Scottish Environment Protection Agency, Version 1 January 2012

8 WATER QUALITY MONITORING

8.1 General Requirements

- 8.1.1 In line with best practice, the *Employer* undertakes surface water quality monitoring where an impact on surface water bodies cannot be ruled out. The *Employer* considers it best practice to obtain baseline surface water quality data prior to commencement of the works, and to monitor water quality during the works, in order to identify any significant changes of water quality which may be attributed to the construction works. The surface water monitoring programme is implemented and maintained by the *Employer* and either undertaken by the *Employer's* environmental staff or by an environmental consultant appointed by the *Employer*.
- 8.1.2 Where a decrease in water quality resulting from construction works is observed the *Contractor* will undertake remedial measures and will bear the costs of all associated sampling and investigation. The *Contractor* may wish to undertake confirmatory sampling and analysis at any point during the works at his own cost.
- 8.1.3 A surface water monitoring plan will be prepared following receipt of planning consent. The plan will detail proposed monitoring locations, monitoring frequency and analytical parameters based on the findings of the ES and the monitoring undertaken prior to and during construction of the existing Gordonbush Wind Farm. The Water Quality Monitoring Plan will be submitted to the Planning Authority post-consent / pre-commencement of works.

8.2 Surface Water Quality Monitoring Locations

- 8.2.1 Monitoring of water quality will be carried out on selected watercourses; specific monitoring locations will be identified post-consent during the detailed design phase (pre-commencement of works).

8.3 Monitoring Frequency and Analytical Parameters

- 8.3.1 Surface water quality monitoring will usually be undertaken at the following intervals:

Pre-construction (baseline) monitoring:	Quarterly, commencing 12 months prior to any construction works taking place to ensure monitoring of seasonal variations.
During construction:	Monthly, commencing within 2 weeks of start of works, and ad-hoc if deemed necessary, e.g. following a pollution incident
Post construction:	Monthly, for (minimum of) three months following completion of civil engineering construction works.

- 8.3.2 Monitoring of specific locations may cease within 3 months of works ceasing in any area, following consultation with SEPA where necessary.
- 8.3.3 The surface water quality monitoring will include the monitoring of field parameters at each location prior to the collection of water samples at each location for analysis at a UKAS accredited laboratory.
- 8.3.4 The field parameters monitored during each monitoring round and obtained via use of a hand-held monitoring device, are pH, electrical conductivity, temperature, and dissolved oxygen. Monitoring results will be recorded in the field.

8.3.5 Water samples at each location will be obtained and submitted to a UKAS accredited laboratory. Generally, analysis for the parameters listed in Table 4.0 will be undertaken, however the final analytical suite will be agreed post-consent during the detailed design phase (pre-commencement of works).

8.3.6

Table 4.0 PROPOSED LABORATORY ANALYTICAL PARAMETERS	
Analytical test	Rationale
Electrical conductivity	Useful indicator of the overall salinity of surface or spring water
pH	Overall water quality parameter which could indicate effects on water acidity due to changes in land use and disturbance of peatlands.
Temperature	General physical indicator
Dissolved oxygen	Likely to be high in all streams but needs determining as an important indicator of water quality.
Turbidity	Measurable on site, and the most noticeable indicator of impact to a water course
Total suspended solids (TSS)	TSS: measure of water quality for construction developments and hence a TSS limit is generally specified for discharges from construction sites.
Biochemical oxygen demand (BOD)	A measure of the biologically degradable substances in water and a standard surface water quality parameter.
Chemical Oxygen Demand (COD)	Measure of possible releases from disturbed peat turf and peat.
Dissolved organic carbon (DOC)	Key component of carbon cycle and known to be sensitive to development on peatland. Organic carbon can help to reduce metal toxicities. May correlate closely with colour.
Soluble iron	Solubility can be affected by pH. High iron concentrations may precipitate out if physical conditions change.
Ammoniacal Nitrogen	Nutrient, known to occur as pulse after ecosystem disruption.
Total reactive phosphorus (orthophosphate)	Standard nutrient parameter, known to occur as pulse after ecosystem disruption and may lead to eutrophication (algal blooms).
Nitrate	End product of nitrogen pollution. Principal nutrient and standard nutrient parameter. Indicator of background pollution and needed for assessing any impact of ground disturbance during construction.
Chloride as Cl	Indicator of rainfall inputs and site weathering, often related to geology of catchments, partly controls electrical conductivity readings.
Total Petroleum Hydrocarbons (TPH) (CWG by GC-FID)	Monitor impact from potential hydrocarbon releases on site during construction works.

8.4 Surface Water Quality Monitoring Reports

8.4.1 A monthly monitoring report on the findings of the monitoring exercises will be prepared and provided to the *Employer* and the *Contractor* within 1 week of receipt of analytical results.

8.4.2 The pre-construction monitoring results, along with extensive water quality monitoring data

obtained from the baseline and construction monitoring of the existing Gordonbush Wind Farm, will inform baseline values (average and maximum baseline levels), and the monthly monitoring reports for the period covering the construction and post-construction works will highlight any results exceeding the baseline conditions.

8.5 **Contractor's Visual and Field Water Quality Monitoring**

8.5.1 The *Contractor* ensures that all personnel and visitors on site are encouraged (at site inductions) to report visual indications of changes in water quality (e.g. discolouration or other evidence of contamination) in any watercourses on site.

8.5.2 **The *Contractor* undertakes visual inspections of the watercourses on site**, including the monitoring locations referred to in section 8.2 above, at least once a week. The *Contractor's* monitoring records will include the following minimum information:

- Antecedent and current weather conditions;
- Current construction activities within the vicinity and in particular up stream or up gradient of the observation point;
- Visual assessment of water colour, turbidity and flow rate;
- Evidence of chemical contamination;
- Visual evidence of silt or sediment pollution within the water column or on the bed of the watercourse/standing water body; and
- Details on any communication, corrective action and / or mitigation undertaken as a result of any water quality issues observed during the monitoring visit.

8.5.3 Where evidence of pollution is observed to the water environment, emergency response procedures will be implemented and the incident will be reported to the *Employer* within 30minutes (section 16). Remedial measures will be implemented immediately and details of action taken will be recorded.

8.6 **Private Water Supplies (PWS)**

8.6.1 Where the ES has identified potential impacts on PWS from the proposed works, mitigation measures as specified in the ES will be implemented. Monitoring requirements of any PWS will be determined post-consent, and information on any mitigation / monitoring measures proposed additionally to those included in the ES will be submitted to the Planning Authority pre-commencement of works (CEMP v1.1).

8.6.2 The ES identified one licensed surface water abstraction and six private water supplies within 5km of the Development site boundary. None of these water supplies are at risk from the proposed Gordonbush Extension.

9 WATERCOURSE CROSSINGS

- 9.1.1 The Controlled Activities (Scotland) Regulations 2011 (CAR regulations) regulate engineering activities in or in the vicinity of rivers, lochs and wetlands, including engineering activities like river crossings and culverting. Works may require (depending on the nature of the works) Registration with, or a Licence from, SEPA.
- 9.1.2 SEPA will not normally require an authorisation for engineering activities in minor watercourse that are not shown on the 1:50,000 scale Ordnance Survey maps (Landranger series).
- 9.1.3 The proposed routes for the site tracks have been designed to ensure that no new watercourse crossings are required, with the existing access tracks constructed as part of Gordonbush Wind Farm utilised where possible. However, cross track culverts may be required to ensure maintenance of natural hydrological flow paths, e.g. small drainage channels or naturally wet areas or flush zones. Where culverts are required, the *Contractor* adheres to general good practice and relevant guidance, in particular CIRIA Report 689 and Scottish Government publications (refer to Section 16).
- 9.1.4 The *Contractor* consults with the ECoW prior to commencement of the works in “crossing zones” (i.e. areas identified during detailed design stage as requiring culverts or other hydrological mitigation).
- 9.1.5 The ECoW carries out surveys immediately prior to construction or upgrading to identify areas of mammal activity in wet areas and ditches.
- 9.1.6 All culverts will be individually sized and designed to suit the specific requirements and constraints of its location. The natural bed and banks of any existing drainage channel, ditch or watercourse will remain unaffected by any new structure. Erosion protection is generally required at the outlet of culverts (and to a lesser extent at the inlet), however, by appropriately sizing and designing the structure, erosion can be minimised reducing the need for any engineered protection.
- 9.1.7 The *Contractor* obtains all necessary permissions required under the CAR regulations prior to the execution of any works affecting a watercourse.

10 ECOLOGICAL PROTECTION

10.1 Scope and Objectives of the Habitat and Species Protection Plan

- 10.1.1 Implementation and monitoring of a Habitat and Species Protection Plan will be the responsibility of the Ecological Clerk of Works (ECoW). The ECoW will be a qualified ecologist and a Member of the Institute of Ecology and Environmental Management (IEEM).
- 10.1.2 The ECoW is appointed and employed by the *Employer*, the appointment being subject to approval by the Planning Authority after submission of details of qualifications and experience. The role and duties of the ECoW are further detailed in Section 10.5 below.
- 10.1.3 The Habitat and Species Protection Plan applies to the immediate pre-construction and the construction period of the development.

10.2 Definitions, coverage and scope

- 10.2.1 Species protection may be defined as the set of measures used to minimise the risk of disturbance, injury or death to species of nature conservation interest. Particular attention is paid to species protected under EC and/or UK legislation.
- 10.2.2 Habitat protection may be defined as the set of measures used to minimise the risk of damage or destruction to the terrestrial and aquatic habitats of the site, including groundwater dependent terrestrial ecosystems (GWDTE), and downstream ecosystems.
- 10.2.3 The generally applicable and best practice protection and mitigation measures to be applied at the site are summarised below. **Following receipt of Consent the habitat and species protection plans will be revised and updated to incorporate site specific requirements as detailed in the ES and stipulated in relevant planning conditions, together with any mitigation requirements identified during post-consent (pre-works) species surveys.**

10.3 Habitats Protection Plan

Aquatic Habitats:

- 10.3.1 The purpose of the aquatic habitat protection plan is to maintain a high water quality to support aquatic habitats used by any existing aquatic species like otters, water voles and fish and associated eco systems, both within the development site and downstream of the site, including salmon spawning grounds.

Terrestrial Habitats:

- 10.3.2 Protection of terrestrial habitats (through avoidance and minimisation of damage and loss) like active blanket bogs, groundwater dependent terrestrial ecosystems (GWDTE) is required as these habitats are recognised as important under the EC Directives.
- 10.3.3 All site working practices need to consider their possible effects on sensitive habitats and soils and mitigate significant negative effects as far as is reasonably possible.

Habitat Protection Measures:

- 10.3.4 Proposed measures for both aquatic and terrestrial habitat protection are generally as follows:

- A **50m buffer** will be maintained between working areas, machinery and watercourses in all

areas except at watercourse crossing points (any buffer zones less than 50m have to be authorised by the ECoW, the minimum buffer zone is 20m). Buffer zones will be demarcated, where necessary, by the ECoW. The *Contractor* will discuss and agree the requirement for demarcation with the ECoW and the *Employer* prior to commencement of any works;

- Details on watercourse crossings design and work, taking into account habitat and species protection are provided in Section 9 of this CEMP;
- A Water Quality monitoring programme, to be implemented prior to commencement of the construction works and undertaken in the pre, during and post construction phase of the development is detailed in Section 8 of this CEMP;
- Construction activities around watercourses will adhere to general good practice measures and Pollution Prevention Guidance produced by SEPA. Relevant guidance documents are referenced in Section 17 of this CEMP; and
- Pollution prevention measures will be installed and maintained as appropriate, Sections 5 and 7 provide details on pollution control and drainage mitigation measures.
-

10.3.5 The **Contractor** ensures the protection of habitats as detailed in this CEMP. The *Contractor*

- Includes information on habitat and species protection and legal requirements in the daily inductions and toolbox talks, in consultation with the ECoW (see Section 10.5);
- Ensures that all staff, contractors subcontractors and visitors are aware of the emergency response procedures to be followed in the event of a pollution incident;
- Microsites development infrastructure to reduce the damage to sensitive habitats, in consultation with the ECoW and the GCoW and ACoW, as necessary;
- Makes best use of excavated turf and peat as part of reinstatement procedures (see Sections 14 and 15 (Excavated Materials and Reinstatement);
- Adheres to buffer distances relating to watercourses / lochs / springs and species as detailed in this CEMP and revisions thereof;
- Prevents discharge or run-off of silty or polluted water to ground / habitat / watercourses; and
- Consults the ECoW ahead of any clean water discharge to ground / habitat / watercourses.

10.4 Species Protection Plan

Birds

10.4.1 All bird species are protected by law⁶. All breeding birds encountered within the development

⁶ Under the Wildlife and Countryside Act 1981 (Appendix 1) it is an offence to kill them or damage their nests and eggs. Species listed in Schedule 1 of the Act are specially protected, so that it is an offence merely to disturb them while nesting. Other specially protected species are listed on Annex 1 of the EC Birds Directive, which also prohibits willful disturbance at the nest. However, if disturbance to the nest of any other bird species without special protection

area access site or at pinch points are protected.

10.4.2 Where construction is scheduled during the nesting period (March to July inclusive), the following measures to protect nesting birds will be implemented by the **Contractor**:

- A pre-construction survey, started in March, to check whether any birds are settling to nest close to proposed access tracks or construction sites, where there might be a risk of the nest being destroyed;
- Monitoring of construction sites throughout the nesting season, to detect birds settling to nest on areas close to construction activity;
- Implementation of deterrence measures within potential construction sites to move any such birds discovered at an early stage of settling;
- Postponement of construction activities which would risk disturbance or the destruction of a bird's nest, until deterrence or nest protection measures have been put in place; and
- Protection of any nests discovered.

Mammals

Otters and Water Voles - Pre-Construction measures

10.4.3 Within 3 months prior to commencement of the development on site (or during the suitable survey period prior to commencement of works), a pre-construction otter and water vole survey will be carried out by the *Employer*. This will be conducted by a suitably qualified and experienced ecologist. Surveys will not be undertaken during, or after heavy rain or periods of flood.

10.4.4 If required, the ECoW will make relevant licence applications (e.g. licence to disturb) to SNH on behalf of the *Employer* and will oversee and/or undertake related mitigation measures in accordance with any licence obtained.

10.4.5 Prior to works commencing, the ECoW marks buffers around all known otter shelters (and water vole burrows, if applicable) using a marking method and distance approved by the planning authority in consultation with SNH.

Otters and Water Voles - Measures during construction

10.4.6 The *Contractor* informs the ECoW at least one week ahead of works commencing in or near watercourses, and consults the ECoW on any mitigation measures required as part of the works.

10.4.7 The *Contractor* does not commence construction activities and blasting within 100m from a watercourse used by otters until two hours after sunrise, ceasing two hours before sunset; machinery lights will be directed away from watercourses. Sunrise and sunset time can be obtained from the internet (www.timeanddate.com);

10.4.8 The *Contractor* ensures that:

- all open excavations are ramped to enable easy exit by otter and other species;
- culvert pipes stored on site are capped, or if caps are not available, pipes are stored vertically, to prevent otter entrapment; and
- design of any permanent or temporary lighting is such that it is directed away from watercourses and that an unlit corridor of 30m either side of watercourses is maintained.

were sufficient to prevent parent birds from incubating their eggs or feeding their nestlings, so that the brood died, this could be regarded as an offence under the 1981 Act.

- 10.4.9 During the construction period, the ECoW carries out further checks, including checks ahead of the construction front.
- 10.4.10 The ECoW maintains a mapped record of checked areas and a log of otter and water vole surveys and informs the *Contractor* and *Employer* as soon as possible of any potential restrictions and limitations to the planned works as a result of the checks/survey findings.
- 10.4.11 The ECoW notes key areas of otter and water vole activity and any potential shelters outwith a licensable distance from construction and monitors activity at these areas and shelters regularly during construction.
- 10.4.12 All site personnel report any sightings of otters and water voles and any potential otter shelters / water vole burrows encountered on site to the ECoW as soon as possible.

Badgers - Pre-Construction measures

- 10.4.13 Although badgers were not reported during surveys undertaken for the Gordonbush Extension EIA, within 3 months prior to commencement of site works (or during the suitable survey period prior to commencement of works) pre-construction checks for badgers will be undertaken by a suitably qualified ecologist. Checks will be undertaken within 150m of any proposed construction works.
- 10.4.14 If any evidence of badgers is reported during pre-construction surveys, ahead of construction works, the ECoW marks out exclusion zones around any identified badger setts. These exclusion zones will extend to 200m from any sett. No construction activity is permitted within 150 m of any badger sett unless license conditions allow otherwise.
- 10.4.15 If required, the ECoW will make relevant licence applications (e.g. licence to disturb) to SNH on behalf of the Employer and will oversee and/or undertake related mitigation measures in accordance with any licence obtained.
- 10.4.16 The ECoW maintains a mapped record of checked areas and a log of badger surveys.
- 10.4.17 The ECoW provides induction material and tool box talks ensuring all staff and visitors on site are aware of the legal obligations, restrictions on site and applicable protection measures / behaviour in relation to badgers.

Other Species (Red Squirrels, Bats, Reptiles, Fish etc) - Pre-Construction Measures

- 10.4.18 Within 3 months prior to commencement of the development on site (or in relevant suitable species survey season, prior to commencement of works) pre-construction species surveys relevant to those species identified in the ES will be carried out by a suitably qualified and experienced ecologist on behalf of the *Employer*.
- 10.4.19 If required, the ECoW will make relevant licence applications to SNH on behalf of the *Employer* and will oversee and/or undertake related mitigation measures in accordance with any licence obtained.
- 10.4.20 Pre-works survey findings will further inform any additional mitigation measures deemed necessary for the construction works phase. This information will be included in the updated CEMP (v1.1).

10.5 The Ecological / Environmental Clerk of Works (ECoW)

Background and Term of Appointment

- 10.5.1 The *Employer* considers it best practice to provide an ECoW for the duration of the construction works, irrespective of whether or not this role is required as part of a Planning Consent.
- 10.5.2 The ECoW will generally be appointed 3-4 months prior to work commencing on site. The role will be full-time for the duration of the main construction period (construction of infrastructure and associated facilities) and may be reduced to a part time role (2-4 days/week) thereafter (turbine deliveries, electrical works etc) subject to Contractor performance and general consensus between ECoW, *Employer* and the Planning Authority (where required).
- 10.5.3 The ECoW will be a member of the Institute of Ecology and Environmental Management (IEEM) with suitable experience.

ECoW tasks

Overview

- 10.5.4 The ECoW advises and assists the *Contractor* in avoiding, minimising and mitigating adverse effects. The *Contractor* consults with the ECoW prior to undertaking specific works as detailed below, and considers the ECoWs advice at all times.
- 10.5.5 Where the ECoW disagrees with works being undertaken by the *Contractor*, resulting in a breach of planning conditions or measures detailed in the ES and the CEMP, the ECoW informs the *Employer* immediately. On advice of the ECoW the *Project Manager / Employer* may halt the works or parts thereof.
- 10.5.6 The following are anticipated to represent the main tasks which translate these aspects of the role into action. This list is not intended to be exhaustive, and will require modification during the construction period as and when circumstances dictate.

Micrositing

- 10.5.7 The ECoW (in consultation with the Archaeological Clerk of Works and the Geotechnical Clerk of Works, if applicable and required) advises on micro-siting, where required. The *Contractor* consults the ECoW prior to micro-siting being undertaken.

Drainage Management and Watercourses

- 10.5.8 The ECoW conducts weekly inspection of site pollution prevention measures (silt fences, settlement ponds, check dams etc) and visually assesses their effectiveness. This includes inspection of water management measures installed by contractors such as excavation pumping and diversion channels. The ECoW:
- Assesses, in advance of works, habitats and species on ground that may be affected by drainage management;
 - Reviews drainage management proposals associated with temporary peat storage and reinstatement works in advance of such works commencing; and
 - Surveys in advance of any works near or crossing a ditch or watercourse, the condition of the watercourse and for protected terrestrial and aquatic species, using an established specialist if necessary.

Excavated materials and reinstatement

- Reviews working areas and route corridors, in consultation with the Archaeological Clerk of works (ACoW) as necessary;
- Agrees proposals for side casting and temporary storage areas as development proceeds;
- Monitors the condition of stored turf; and
- Agrees any required hydroseeding specification, including seed mix and fertiliser quantities, if required, in liaison with SNH.

Ecological Protection Tasks

- Erects and maintains markers and notices for limits around watercourses, exclusion zones and other areas with protected species or habitats;
- Considers requests and granting of permission to enter within habitat and protected species exclusion zones;
- Conducts weekly checks for protected species and sensitive habitat (peatland, watercourses) within and adjacent to construction areas, and maintains a register of all habitat inspections carried out;
- Implements species protection plans, if ground checks suggest this is necessary for the protected species detailed in Section 10.4 above;
- Implements the Terrestrial Habitat Protection Plan and Aquatic Habitat Protection Plan, including surveys and checks specific to those plans; and
- Executes the terms of any Licence to Disturb, aquatic species and birds, or disturb/destroy their places of shelter, which might be required as a result of future surveys and searches.

On-site communication and liaison with Consultees

10.5.9 The EcoW will always inform the *Employer's* Project Manager and *Contractor* of areas of particular concern, who will then make a decision as to the subsequent action.

10.5.10 The EcoW is involved in the delivery of biodiversity-related Toolbox Talks as part of the site induction process. All staff will know of the circumstances when the EcoW should be contacted, and the relevant phone numbers.

10.5.11 The EcoW liaises with the statutory consultees as required and agreed with the *Employer* in line with any Planning Authority requirements (if applicable).

Meetings and Recording

10.5.12 The EcoW attends a weekly (or fortnightly, if agreed) meeting which will include representatives from the *Employer*, *Contractor*, sub-contractors. The purpose of these meetings is to:

- review the effectiveness of the ecological and environmental mitigation;
- review the construction progress on site in the context of ecological and environmental mitigation;
- discuss construction programme for the following week, and fortnight look-ahead; and

- agree actions on these matters.

10.5.13 The ECoW keeps a record of the following:

- animal sightings and signs (including birds, in addition to other site ornithological monitoring), particularly those noted in searches one or two days in advance of construction;
- the habitats on ground to be developed via survey at least a week in advance of construction work; and
- record of tasks carried out and written record of all verbal advice given.

10.5.14 The ECoW maintains a **GIS database** of key recordings made during the construction period. Field records will use, if necessary, differential GPS technology captured into a field GIS system.

10.5.15 The ECoW assists the *Employer* with the supply of relevant information for compliance assessment.

10.5.16 The ECoW provides monthly reports (template will be provided by the *Employer*).

10.5.17 The ECoW produces a final report to the *Employer* documenting the environmental and ecological effects of the construction period. The evidence for effects will be based on findings included in the minutes of weekly/fortnightly meetings, together with other recording information maintained by the ECoW. The report will relate results to residual effects predicted in the site's ES documents. The report will be made available to the *Contractor* and the Planning Authority.

11 ARCHAEOLOGICAL PROTECTION

- 11.1.1 Any construction works involving ground disturbance will pay due attention to the potential presence of unknown and recorded archaeological subsurface features or structures. To ensure this, the following measures will be put in place:
- 11.1.2 **Archaeological support will be provided by an Archaeological Consultant appointed by the Employer.** The consultant will prepare a methodology for the identification, preservation and recording of archaeological remains at the site (Written Scheme of Investigation'). The contents of the WSI will generally be agreed with the Planning Authority's archaeologist.
- 11.1.3 The services provided by the consultant will include a walkover survey of the precise locations of the wind farm's ground impacts (tracks, turbine bases, etc) prior to commencement of construction works. Any archaeological features identified will be fenced off / demarcated prior to commencement of construction works. Information on such areas will be included in the site induction / toolbox talks.
- 11.1.4 A 'Contractors Guidelines' document will be prepared by the consultant, which provides brief and clear guidelines for all construction contractors undertaking any ground works including topsoil and overburden stripping, cable laying, turbine base foundations or access track construction. The guidelines contain details of arrangements for calling upon professional archaeological support (the Archaeological Consultant) in the event that buried remains of potential archaeological interest are discovered during the absence of a watching brief.
- 11.1.5 As part of the WSI / Contractors' Guidelines' a call-out procedure will be put in place which should ensure the presence of an archaeologist on site, generally within 24 hours of a call-out.
- 11.1.6 The *Contractor* familiarises themselves with the contents of the above documents and ensures that their contents is communicated to relevant staff, subcontractors and plant operators via the induction and toolbox talks prior to commencement of any ground works.

12 FORESTRY WORKS

- 12.1.1 This section is not applicable as no forestry works are required as part of the Gordonbush Extension development.
- 12.1.2 Should minor tree lopping or clearance be required at a later date (e.g. for public road improvements if required), environmental requirements for the works will be detailed in a separate method statement to be provided by the *Contractor*.

13 LANDUSE AND PUBLIC ACCESS

13.1 Agricultural Land & Livestock

- 13.1.1 The *Contractor* liaises with relevant landowners prior to commencement of works. The *Contractor* undertakes a site walk-over of relevant areas with the landowner (and *Employer* as appropriate).
- 13.1.2 The *Contractor* will provide a risk assessment for all works on agricultural land, land used for livestock, or game rearing and shooting. The risk assessment will identify potential hazards/sensitive areas and proposed mitigation measures, as identified through consultation with the landowner or estate manager / game keeper.
- 13.1.3 The risk assessment, method statements and mitigation measures will address the following potential issues (this is not an exhaustive list and the *Contractor* will amend as applicable)
- General access restrictions (gates, fences, unstable ground);
 - Stock movement (type of stock, numbers, location of stock and requirements/timetable for movement, access restrictions, specific risks e.g. cattle/bulls etc);
 - Season-depending risks/restrictions (lambling season, crop harvesting, shooting etc);
 - Cattle grids and gates (proper use, repair and installation of cattle grids, gates etc);
 - Fencing (requirement for removal/replacement/repair of fencing, location of electrical fencing etc); and
 - Surface water (drainage, surface water bodies, livestock drinking water supplies and routes).

14 EXCAVATED MATERIALS

14.1 Contractor Requirements

- 14.1.1 In advance of each main phase of works, the *Contractor* (in consultation with ECoW, and other specialists where required), provides a **method statement detailing expected volumes, material classification, storage and reuse procedures for all excavated materials anticipated from that particular work area.**
- 14.1.2 The *Contractor* liaises with SEPA on all aspects of waste management, if required, to ensure compliance with all appropriate regulatory controls prior to and during construction works.
- 14.1.3 In accordance with SEPA's guidance on the excavation and reuse of peat⁷⁷ the existing Stage 1 Peat Management Plan (PMP) (2015 ES Technical Appendix 9.3) provides information on expected peat volumes requiring excavation and reuse as part of the construction works. The report concludes that there is unlikely to be any surplus peat excavated during the works and all peat is likely to be suitable and required for reuse in reinstatement and restoration activities. Peat is therefore not considered likely to be classed as waste.
- 14.1.4 A Stage 2 PMP will be developed post-consent (pre-works). This will include a revision of the volume estimates based on additional site-specific data obtained from intrusive ground investigation and detailed design information. The *Contractor* reviews and utilises this information when planning the works. Works will be planned so as to avoid prolonged storage of materials and to avoid or minimise generation of surplus excavated materials. Any excavated materials for which the *Contractor* has no identified and predetermined use (without the requirement for treatment) may be classed as waste and requires to be dealt with in accordance with the *Contractor's* developed Site Waste Management Plan.

14.2 Excavations

- 14.2.1 The *Contractor* creates, and maintains, an **Excavation Register**, which is updated weekly and details the location and extent of all open excavations and the current and original location of all stockpiled material. The *Contractor* makes this available to the *Project Manager* upon request.
- 14.2.2 The *Contractor's* attention is drawn in particular to the risk of slope instability and peat slides at wind farm sites. The *Contractor* ensures that under all conditions, the ground surface stability is fully maintained both during investigation and construction of the wind farm.
- 14.2.3 The *Contractor* undertakes sufficient additional studies and intrusive Site Investigations, where required, to establish the prevailing ground conditions at the Site and the likely ground conditions following completion of the construction and installation works. This includes geotechnical and geo-environmental investigations, hydro-geological and hydrological investigations or other investigations to ensure that the ground conditions are fully understood. Particular attention should be paid to peat or similar organic deposits, even on shallow slopes.

⁷⁷ Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste, a joint publication by Scottish Renewables and the Scottish Environment Protection Agency, Version 1 January 2012

14.2.4 The *Contractor* undertakes turf and soil stripping and excavation works in line with best practice as described in relevant guidance documents in Section 17, in particular:

- *Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste (2012)*; and
- *Good Practice During Wind farm Construction (2010)*.

14.2.5 The *Contractor* employs a construction management team and plant operators of proven experience of working in a peat environment for all peat drainage, excavation (including cable trenches), track construction and reinstatement & restoration works

14.3 Handling and Temporary Storage of Excavated Material

14.3.1 Where material is not required for immediate reinstatement, temporary storage may be required. To minimise handling and haulage distances, where possible excavated material will be stored local to the site of excavation and/or local to the end-use site where it is required for re-profiling, landscaping or structural purposes. The *Contractor* agrees storage location(s) with the ECoW prior to commencement of excavations.

14.3.2 Where the *Contractor* excavates topsoil, peat vegetation, or other organic soil these are segregated by material type and stored separately in stockpiles. Peat soils are stockpiled no higher than 1m. The turfs are stored separately, with vegetation facing upward. Where required, the *Contractor* waters the turfs to maintain them as suitable for reinstatement and restoration. Where practical the *Contractor* reuses topsoil/peat immediately, however, if the material cannot be immediately reused, it is stockpiled for no longer than 6 months.

14.3.3 Where material is required to be stored for longer than 6 months, for instance where peat is stripped from borrow pits or temporary construction compounds and these infrastructure elements may be in use for the period of construction. In these cases it is essential that good practice guidance on appropriate storage is followed to ensure that the materials can be reused for reinstatement of these elements when works are completed in these areas.

14.3.4 Where the *Contractor* makes stockpiles these are located in non-trafficked areas. The *Contractor* only handles topsoil or peat twice: once from the excavated area to a stockpile and secondly from the stockpile to its final position unless agreed, in advance, with the *Project Manager* and the ECoW.

14.3.5 Stockpiles will be isolated from any surface drains and a minimum of 50 m away from watercourses, unless otherwise agreed with the ECoW. Stockpiles will include appropriate bunding to minimise any pollution risks where required.

14.3.6 The *Contractor* provides information to inform the Geotechnical Risk Register. The *Contractor* consults with the Geotechnical Clerk of Works (GCoW) to agree on the required elements of the Geotechnical Risk Register that are to be provided by the *Contractor*.

15 REINSTATEMENT

- 15.1.1 The *Contractor* undertakes reinstatement. Reinstatement works are those undertaken during construction and aim to address any damage inflicted on the landscape as part of the construction *works*. Reinstatement is undertaken in parallel with, or as soon as possible following, the construction *works* in each area, such as the re-dressing of road and track verges and turbine bases (and other areas that may be disturbed as a result of the construction process). Where redressing proves unsuccessful re-seeding and hydro-seeding may be part of reinstatement measures. Reinstatement is primarily undertaken using in-situ and Site-sourced materials (turfs and topsoils).
- 15.1.2 Prior to commencement of works, the *Contractor* provides a **Reinstatement Plan** to include proposed methods for reinstatement of materials in landscaping and re-profiling of: track verges; turbine bases; construction compounds; borrow pits; cable trenches; other disturbed areas and redundant construction features (such as drainage ditches, settlement ponds or other sediment control measures, concrete wash out pits and other features which may not be required as part of the permanent works). Reinstatement proposals will provide details on methods proposed for replacement of turves and re-seeding where appropriate. If reseeded is required, this will be undertaken, where possible, using native species of local provenance.
- 15.1.3 Excavated peat from cut and fill sections of access tracks will be used for dressing the side slopes of floating track sections. No mineral soil will be used for dressing the side slopes of tracks to prevent silt run off.
- 15.1.4 Where practicable, reinstatement and re-profiling of, and around, infrastructure and borrow pits will be carried out as the work front progresses, or as soon as is practical after the substantial completion of the works themselves in a particular area. Early reinstatement and re-profiling is required to minimise visual impact and temporary storage / stockpiling of soils and to promote vegetation and habitat reinstatement as early as possible.
- 15.1.5 Where feasible, to prevent scour and run off and facilitate vegetation re-establishment, any down-slope embankments will be graded such that the slope angles are not too steep and there is a gradual transition with the surrounding / existing ground profile.
- 15.1.6 Outline design proposals for borrow pit re-profiling, including details on reinstatement material origin and classification, placement method, final ground profiles and surface dressing will be submitted by the *Contractor*, signed off by their GCoW and agreed by the ECoW prior to commencement of re-instatement.
- 15.1.7 The *Contractor* maintains comprehensive records of the location, depth and volumes of all materials used in reinstatement of the borrow pit.
- 15.1.8 Reinstatement of vegetation will be focused on natural regeneration utilising peat or other vegetated turves or soils stripped and stored with their intrinsic seed bank. To encourage stabilisation and early establishment of vegetation cover, where available, peat turves or other topsoil and vegetation turves in keeping with the surrounding vegetation type will be used to provide a dressing for the final surface.
- 15.1.9 Following completion of the access tracks the side-cast topsoil and vegetated material will be used to dress off the batters of the new track as part of an ongoing reinstatement process. The turves should be re-instated as soon as is practicable

15.1.10 The *Contractor* undertakes all works in such a way as to allow reinstatement of disturbed areas to proceed as early as possible and in a progressive and sustainable manner.

15.1.11 Any accidental damage or other impacts caused during the works are repaired and reinstated or restored by the *Contractor* to the *Employer's* satisfaction and in accordance with the Planning Consent and any agreements with the landowners, all prior to taking over by the *Employer*.

15.2 Reinstatement Monitoring

15.2.1 Within 3 months of completion of works in any area, the ECoW will inspect the *Contractor's* reinstatement efforts to determine, subject to the season impact on growth, satisfactory placement of sub-soil, topsoil and turves or reseeded.

15.2.2 The *Contractor* will undertake remedial works if the ECoW determines that initial reinstatement is sub-standard or unlikely to deliver required vegetation establishment within at least one growing season.

15.2.3 The ECoW (or other qualified *Employer's* representative) will undertake a final inspection of all reinstated areas at the end of the first growing season following completion of reinstatement. The *Contractor* will undertake remedial works within the defects period if the final inspection finds that the establishment of vegetation is not satisfactory (examples of unsatisfactory vegetation establishment may include failed turfs due to poor reinstatement practices or drying out, slow or poor natural regeneration due to inadequate topsoil / subsoil, or injurious weeds are evident).

16 ENVIRONMENTAL INCIDENT & EMERGENCY RESPONSE

16.1 General Requirements

16.1.1 The *Contractor* prepares a detailed Environmental Incident and Emergency Response Plan (EIERP) in line with PPG21, in particular sections 2.1-2.4. and PPG22.

16.2 SEARS and Environmental Auditing

16.2.1 A SSE Safety and Environmental Awareness Report (SEAR) is required to be completed for any potential or actual environmental incident or emergency which occurs or is noted on site. Blank SEAR forms will be provided by SSE Renewables.

16.3 Summary Sheet for Machinery / Plant Operators

16.3.1 The *Contractor* provides a 1 page Summary Sheet containing the key information for incidents response to be used as a quick reference for any on-site personnel witnessing an incident. A laminate copy of this Summary Sheet will be located with all plant / machinery / on-site vehicles. A Communication Plan (to be followed in the event of a spillage) will be provided by the *Contractor*, in liaison with relevant stakeholders and will be provide to the *Employer*, according to the Contract provisions, prior to commencement of the site works.

Key Information to be provided to the ***Project Manager and/or the ECoW within 30 minutes*** of an incident (irrespective of the scale / severity of the incident):

- E.g. What substance was spilled;
- Approximate volume and time of spillage;
- Accurate Location of spill (GPS or grid reference if possible, or bridge ID/number referenced on map etc);
- All measures taken;
- Help required i.e. manpower, machinery, expert advice, disposal, etc; and
- Whether the spill has reached a watercourse.

17 REFERENCE DOCUMENTATION

- **SEPA/EA Pollution Prevention Guidelines (PPGs):**
 - PPG01 (2001) General guide to the prevention of pollution
 - PPG02 (2011) Above ground oil storage tanks
 - PPG03 (2006) Use and design of oil separators in surface water drainage systems
 - PPG04 (2006) Treatment and disposal of sewage where no foul sewer is available
 - PPG05 (2007) Works and maintenance in or near water
 - PPG06 (2012) Working at construction and demolition sites
 - PPG07 (2011) Refuelling facilities
 - PPG08 (2004) Safe storage and disposal of used oils
 - PPG13 (2007) Vehicle washing and cleaning
 - PPG21(2009) Pollution incident response planning
 - PPG22 (2012) Dealing with Spills
 - PPG26 (2011) Storage and handling of drums and intermediate bulk containers
- *Developments on Peatland: Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and the Minimisation of Waste*, a joint publication by Scottish Renewables and the Scottish Environment Protection Agency, Version 1 January 2012.
- *Good Practice during Windfarm Construction*, Version 3, a joint publication by Scottish Renewables, SNH, SEPA, Forestry Commission Scotland (FCS) and Historic Environment Scotland (HES) (2015).
- SEPA Regulatory Position Statement, Developments on Peat, National Waste Policy Unit, 9 February 2010.
- Engineering in the Water Environment, Good Practice Guide, Construction of River Crossings, First edition, SEPA, April 2008.
- *Prevention of Pollution from Civil Engineering Contracts: Special Requirements* publication (SEPA, 2006).
- The Waste Hierarchy, National Waste Strategy: Scotland. **SEPA**, September 2006. (http://www.sepa.org.uk/waste/moving_towards_zero_waste/waste_hierarchy.aspx).
- **Scottish Natural Heritage (SNH):**
 - Floating Roads on Peat, Forestry Civil Engineering and SNH, August 2010.
 - Constructed tracks in the Scottish Uplands, 2nd Edition, June 2013.
- **British Standards Institute (BSI):**
 - Code of Practice for Earth Works, BS6031:2009
 - Code of practice for noise and vibration control on construction and open sites. Noise, BS5228-1: 2009.
- **Forestry Commission:**
 - Forests and Water UK Forestry Standard Guidelines, 5th Edition 2011
- **CIRIA Publications:**

- Control of Water Pollution from Construction Sites – Guide to Good Practice (SP156)
- Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors (C532)
- Control of Water Pollution from Linear Construction Projects – Technical Guidance (C648)
- Control of Water Pollution from Linear Construction Projects – Site Guide (C649)
- Culvert Design Guide, C689, CIRIA, 2010;
- Environmental Good Practice – Site Guide (C650)
- Site Handbook for the Construction of SUDS (C698)
- The SuDS Manual (Report C753). CIRIA, 2015.
- **Institute of Environmental Management and Assessment (IEMA):**
 - Practitioner Series No.11: Waste Management: A Guide for Business in the UK, September 2008.
- **Scottish Government:**
 - River Crossings and Migratory Fish: Design Guidance, Scottish Government, April 2000.

CAR Regulations

- 1 The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (“CARs”) as amended by Water Environment (Miscellaneous) (Scotland) Regulations 2017.
- 2 *"The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended) A Practical Guide"* Version 8.2, Feb 2018.
- 3 *"Supporting Guidance, Sector Specific Guidance: Construction Sites"*, SEPA, WAT-SG-75, Version v1, Feb 2018.

18 CHECKLIST – Required *Contractor's* Information

The information listed in the table below will be provided by the *Contractor* to the *Employer* according to the provisions of the contract, as indicated.

Pre-commencement of works:	Yes/No
Name and CV of nominated and appropriately qualified person for site based single point of contact for all environmental matters (Section 1)	
Communication Plan (Section 3)	
Risk Assessment & Method Statements (Section 3)	
Schedule of toolbox talks (Section 4)	
Eco Map (Section 4 and 10)	
A Site Waste Management Plan (SWMP, Section 6)	
Details of proposed waste contractors and site plan showing waste collection / storage points (Section 6)	
Drainage Maintenance Register (Section 7)	
CAR licences/authorisations if required (Section 9)	
Reinstatement Plan (Section 14 and 15)	
Environmental Incident and Emergency Response Plan (Section 16)	
During and post-completion of works:	Yes/No
Records of relevant communication, meetings and reports (Section 3)	
Records of site inductions and tool box talks (Section 3)	
Records of communication with SEPA, SNH, PMO (Section 3 and 5)	
Eco Map (Section 4 and 10)	
Records of all environmental checks/inspections (Section 5)	
COSHH documentation (Section 5.3)	
Site Waste Management Plan and related information (Section 6)	
Drainage Maintenance Register (Section 7)	
Records of water quality monitoring (Section 8)	
Excavation Register (Section 14)	
Records of borrow pit reinstatement (Section 15)	
Input data for Geotechnical Risk Register	

Note: The above list only relates to requirements of this CEMP. As part of the Contract, other information provisions will be required from the *Contractor*.

PART 2 – CONSTRUCTION METHODS

19 INTRODUCTION

19.1 General

- 19.1.1 The following sections describe the general methods of construction which are stipulated in the Employer's Civil Works Information generally included in the Civils Work Contract forming the basis for the Contractor's detailed design.

19.2 Working Hours and Noise

- 19.2.1 Construction activities will generally be stipulated as part of a planning consent, between April and September hours will be normally limited between 07.00 and 19.00 hours Mondays to Fridays, and 07.00 to 14.00 hours on Saturdays, and between October and March normally limited between 07:30 and 17:00 Mondays to Fridays and 07:30 and 14:00 on Saturdays with no working activities on Sundays during any period. In the event of work being required outwith these hours, e.g. abnormal load deliveries, commissioning works or emergency mitigation works, the Planning Authority will be notified prior to these works taking place, wherever possible.
- 19.2.2 Operation of crushing equipment located within / next to borrow pits will generally be limited to 08.00 to 18.00 hours Mondays to Fridays and 08.00 to 13.00 hours Saturdays, with no operation on Sundays.

19.3 Plant and Equipment

- 19.3.1 The works shall be undertaken in strict accordance with the Provision and Use of Work Equipment Regulations "PUWER" (as amended) covering all types of plant and equipment found on construction sites.
- 19.3.2 All site operatives will be appropriately trained and experienced and hold certification of training achievement issued by CITB or other construction industry approved schemes.
- 19.3.3 All site plant and equipment shall be fitted with effective silencers / insulation. Regular noise monitoring will be undertaken by the *Contractor* at specific areas around the site to monitor noise effecting nearby properties.
- 19.3.4 A non-exhaustive list of plant that may be utilised during the construction activities detailed in this Construction Method Statement is as follows; 360° tracked excavators, tipper trucks, dumper trucks, tractor dozers, vibratory rollers, ground ripping plant, mobile crushers and screeners.

20 SITE ACCESS CONSTRUCTION

20.1 Signage

- 20.1.1 Sufficient signage will be employed on site, for both site personnel and the public, to clearly define the boundary of the works where they coincide with areas accessible to the public.
- 20.1.2 Ecological awareness signs (e.g. potential otter crossing) are also required in certain areas of the site.

21 ONSITE PREPARATORY CONSTRUCTION

21.1 Introduction

- 21.1.1 Onsite preparatory construction concerns the formation of the Temporary Construction Compound (TCC), laydown areas and associated works required to establish the site offices, welfare facilities and storage arrangements for materials, plant and equipment in connection with the wind farm construction phase.
- 21.1.2 The TCC is a temporary work for the duration of the construction phase of the project. Following commissioning, the TCC shall be dismantled and all plant, welfare facilities and equipment removed from the site. Reinstatement of this area shall be in line with the requirements stated within the main CEMP document. At Gordonbush Extension, part of the TCC will be utilised by the Operations Building.
- 21.1.3 The main TCC will comprise of site offices for the Principal Contractor, the Wind Turbine Supplier (WTS), any other sub-contractors, project support staff (i.e. the ECoW and ACoW) and *Employer*, together with all the necessary welfare facilities for the workforce.
- 21.1.4 The *Contractor* and any subcontractors will be familiar with, and take account of, the Planning Conditions relevant to the construction works and the requirements of the CEMP prior to construction work commencing.
- 21.1.5 Prior to the works commencing at site, a pre-condition survey of the existing tracks and associated field boundary features (fences, walls and gates) will be undertaken by the *Contractor* in conjunction with the *Employer* and landowners, where appropriate, to visually record the existing conditions. This will entail the preparation of a Pre-condition Survey Report, which will include text, diagrams and photographs clearly referenced to the locations at site.

21.2 Temporary Construction Compound Preparation

- 21.2.1 The *Contractor* designs and constructs an area of hardstanding, as specified in the Civil Works Information, of sufficient load bearing capacity, as the temporary construction compound(s). Where appropriate a geo-textile layer is used to maximise the effectiveness of stone removal when the compound is removed.
- 21.2.2 The compound(s) include all Site accommodation and welfare facilities, bunded fuel tanks and other liquid storage areas with segregation, bunded refuelling areas, general and protected storage areas, vehicle parking, security, lighting and services, communications and laboratory/testing or holding facilities, signage, pedestrian and vehicular circulation routes, and safety barriers. The *Contractor* provides recycling facilities at the Site compound and professional collection thereof.
- 21.2.3 The compound(s) are free draining with oil interceptors and contain a bunded area for maintaining vehicles and plant, or other pollution control measures, as appropriate / required to protect existing water courses and private water supplies.
- 21.2.4 The typical construction activities associated with the TCC are detailed below:
- Stripping of any topsoil / peat and careful stockpiling of this material as per CEMP requirements;
 - Excavating the remaining superficial soil materials and stockpiling of this material on the

surrounding undisturbed area in accordance with CEMP requirements;

- Installation / construction of temporary surface water drainage in accordance with CEMP requirements;
- Laying and compacting crushed rock in layers to form a hardstanding. Crushed rock material will be site won from local excavations and have a low fines content to reduce the risk of sediment contamination;
- Installation of potable water supplies and foul water disposal systems;
- Delivery of offices, mess area, toilets and associated infrastructure on flat bed lorries;
- Erection of offices, mess area, toilets, and installation of all bunded areas to contain generator and fuel stores;
- Erection of fencing around the perimeter of the TCC; and
- Following the completion of all construction activities, the TCC shall be reinstated according to the methods set out in the CEMP.

21.2.5 Welfare facilities will be provided for site operatives under the Construction and Design Management Regulations 2015 including sanitary conveniences, washing facilities, drinking water, changing rooms and accommodation for clothing not worn during working hours and rest facilities.

21.2.6 Toilets during the construction phase will be chemical toilets or soakaway, depending on ground suitability and discussion with SEPA. Where chemical toilets are used, the waste will be emptied on a regular basis by a registered waste disposal contractor. Toilets will be located within the TCC areas.

21.2.7 Potable water will be supplied via a borehole or surface water extraction subject to licences/authorisations obtained from SEPA under CAR. The water will be used for messing purposes during the construction phase.

21.2.8 If additional water is required to be impounded and / or abstracted from site water bodies for site based activities (i.e. dust suppression, etc), the CAR apply and advice will be sought from SEPA prior to any abstraction.

21.2.9 The duration of the works may extend into winter months. If required, external lighting will be required to be provided at the TCCs. Lighting columns will be erected in proximity to security gates and any site offices / welfare facilities and stores. Compound lighting shall face inwards to reduce light pollution and environmental impact effects.

21.2.10 All areas of the site including accommodation areas shall be kept clean and tidy with a regime of good housekeeping established to facilitate mobility of personnel and plant/equipment around the site and eliminate potential hazards and environmental pollution.

22 BORROW PITS

22.1 General Method of Work

22.1.1 To construct the access tracks (including passing bays) and formation of new hardstanding areas for the crane pads, temporary construction compounds and laydown areas crushed rock is required. It is proposed to source this material, where possible, from on-site borrow pits, to

reduce the need to import materials. In addition, and where suitable, some rock types may be utilised as a source of aggregate for concrete batching for the turbine foundations.

22.1.2 Site surveys of each borrow pit location have been undertaken and details of the position, size, potential yield and restoration proposals have been developed. “Areas of Search” have been developed for each consented borrow pit location within which the maximum extents of the borrow pit shall be situated.

22.1.3 Following assessment of information from a further ground investigation, the precise location and details of the borrow pits, including maximum size and depth, a fully detailed plan incorporating contours and a programme of implementation will be submitted to and approved in writing by the Planning Authority.

22.1.4 The rock will be extracted using recognised quarrying techniques and crushed to provide the required properties (material size or “grade”). The rock extraction method will vary from location to location, and is dependent upon the nature of the material encountered, depth of weathering and level of fracturing. A combination of digging, ripping and blasting shall be utilised, followed by crushing, as appropriate.

22.1.5 The borrow pit works will be subject to significant health, safety and environmental constraints, including:

- Segregation and fencing off of processing plant with only authorised personnel permitted to enter. These works will be carried out on a level working platform;
- Bunding and fencing of borrow pit high wall to prevent plant / personnel falling into the void;
- Surface water / drainage mitigation to prevent pollution, silt run off and inundation into the void;
- Exclusion zones implemented during blasting works; and
- Fitting of spray bars to the processing plant to keep dust down during dry / windy periods.

22.2 Borrow Pit Establishment

Demarcation

22.2.1 Prior to any borrow pit works beginning at each location it shall be surveyed and the “Area of Search” pegged out. In areas of recently cleared forestry consideration shall be given to the freshly exposed ground profile / topography.

22.2.2 Once the extent of the borrow pit will be established a temporary Heras type fence shall be erected to this boundary with appropriate warning signs. Where necessary a Rylock sheep fence shall be erected to protect grazing livestock from entering the working area. All fencing and warning signs will be checked on a regular basis and repaired/replaced as necessary.

22.2.3 Once a proposed borrow pit location has been surveyed and pegged-out, the Ecological Clerk of Works (ECoW) and Archaeological Clerk of Works (ACoW) shall be consulted prior to any further development of the location. Once the ECoW and ACoW have given their approval for the demarked location, borrow pit preparation may commence.

Borrow Pit Preparation

22.2.4 Surface vegetation (turves) shall be cut and placed to one-side. This material shall be monitored,

and watered (as appropriate) to be retained for reinstatement purposes once the borrow pit workings are completed.

22.2.5 The removal of the existing superficial soil materials (“overburden”) would typically be undertaken using a combination of crawler tractor dozers and backtrackers with the material loaded by mechanical loading shovel onto 30 tonne articulated dump trucks and transported (within the “Area of Search” of the individual borrow pit) to designated stockpile locations adjacent to the worked area and retained for reinstatement purposes. Where different overburden materials are present these will be stored according to type. Overburden shall be stockpiled carefully, with consideration given to slope gradient, proximity to watercourses or other sensitive receptors, and shall avoid loading areas of deeper (> 1m deep) peat. This excavated overburden will be lightly tracked to seal the windrows to prevent erosion.

22.2.6 Care will be taken not to traffic undisturbed soils unnecessarily and to limit the working area as far as possible to avoid unnecessary ground excavation and disturbance.

Drainage

22.2.7 Borrow pit drainage requirements are detailed within the drainage section 7 of this CEMP.

Programme of Implementation

22.2.8 Borrow pits will not be opened up until rock extraction is required and each borrow pit will be restored as quickly as possible following completion of extraction works. Borrow pits shall be established as the works progress in accordance with their proximity to the active areas of work.

22.2.9 Where it is necessary to cease production in borrow pits and return later in the works to extract rock for a particular product, the borrow pit will be securely fenced off during this period of inactivity.

22.2.10 Borrow pits will be reinstated as soon after cessation of production as possible. However, in some instances borrow pits may be required to be kept open for longer, for example where they may be suitable for the situation of an on-site batching plant, or where there is a need for additional laydown areas. These would be agreed with the ECoW in advance.

22.3 Borrow Pit Working

22.3.1 Following the exposure of the rock head, the material will be dealt with either by digging, ripping or blasting, or a combination of techniques. A combined approach may be required due to variability in the strength and integrity of the rock within individual pits and from pit to pit.

22.3.2 Ripping will be carried out with large tractor dozers, typically a CAT D9 fitted with a towed ripper. Following passes by this ripper, a 360° excavator will load the broken material into dump trucks for transportation to the pre-crusher stockpile. Where the gradients are too steep or heights of faces inappropriate for ripping, a 360° excavator located at the bottom of the working face may be utilised to “pick” the rock face. In both cases where any pieces are too large for the crusher, they will be broken with a 360° excavator fitted with a hydraulic breaker.

22.3.3 A maximum of 5m high benches would be worked in accordance with standard construction practice. Where the rock is prohibitively resistant to allow digging or ripping, blasting will be undertaken. This would be undertaken by a competent specialist sub contractor utilising good blasting practice and would be in compliance with the relevant health and safety regulations (The Quarries Regulations 1999) and other relevant provisions. The blasted rock will subsequently be ripped/dug as required and treated as described above. Blasting operations will be kept to an absolute minimum and only utilised where in-situ rock material cannot feasibly be removed by

mechanical equipment.

22.3.4 Mobile crushing and screening plant will be established within each borrow pit and all crushing and grading and stockpiling of material will take place within the confines of the identified borrow pits.

22.3.5 Stone excavation will be typically carried out using a 45 tonne or 65 tonne excavator loading dump trucks for haulage to the processing plant. The processing plant will be located adjacent to the extraction area with an area cleared to stockpile the processed material. The processing operation will comprise of:

- Initial screening to segregate the oversize material requiring crushing;
- Secondary breaking of large rocks using a hydraulic breaker attached to a tracked excavator; and
- Crushing of oversize rock using a mobile tracked crusher and secondary screening if required using a 3 way split screen.

22.3.6 A number of products will be produced in this operation including:

- Track base material (nominally 125mm down product);
- Track capping material (nominally 50mm down product);
- Belt end fines for cable sand; and
- Clean single size product for concrete aggregates if the rock type permits.

22.3.7 Each product will be separately stockpiled. Due to the limited available space at most of these locations it is intended to match as closely as possible processing productions with the capacity to incorporate the product into the works whilst maintaining a cushion to allow for plant down time etc.

22.3.8 The stockpiled material won within each borrow pit will be transported to its location of use, with the broad spread of borrow pits ensuring that travel distances are minimised.

22.4 Reinstatement

22.4.1 The borrow pit areas will be backfilled in accordance with reinstatement plans to be provided by the *Contractor*.

22.4.2 On completion of the backfilling with construction spoil, surface profile restoration will be undertaken using the stockpiled overburden materials dozed back into place and finished off with turves.

22.4.3 The *Contractor* will provide records of the borrow pits reinstatement works (original levels, reinstated levels, material utilised) to the *Employer*.

22.4.4 All borrow pits (unless specifically requested by the ECoW) shall be reinstated as soon as possible after the working of them is complete. Once reinstated a borrow pit shall be inspected periodically to monitor for any settlement or surface erosion that may occur, or deterioration of the surface vegetation.

22.4.5 Consideration shall be given to the need for watering a restored area during prolonged dry periods, to encourage re-establishment of vegetation. Should the ECoW identify any

unacceptable degradation to a reinstated borrow pit then further restoration management techniques shall be considered, including re-profiling of the surface or reseeded of vegetation, as appropriate.

23 WTG & ANEMOMETER MAST FOUNDATION CONSTRUCTION

23.1 Construction of Turbine Foundations

23.1.1 The Wind Turbine Generators (WTG's) will be erected on either reinforced concrete gravity or piled foundations. The foundation type will be determined following the Ground Investigation Works.

23.1.2 Proposed turbine foundation locations are inspected by the *Contractor* to ensure that all potential ecological and archaeological constraints have been identified, demarcated and/or mitigated for prior to the on-set of construction in that area. The final location of the turbines will be within approved micro-siting allowances of the consented positions in accordance with Planning Conditions. The turbine coordinates are supplied by the *Employer* and any proposed micro-siting by the *Contractor* must be first agreed with the *Employer*. The regularity of inspections (hourly, daily, weekly, as appropriate) during construction shall be determined in advance for each particular section, based on anticipated ground conditions, known ecological or archaeological sensitive receptors, prevailing weather conditions, and anticipated rate of progress.

23.1.3 Construction of the turbine foundations shall be the responsibility of the *Contractor*.

23.1.4 The limits of each of the foundation excavations will be surveyed and pegged out at least two weeks in advance of any proposed works, and the ECoW and ACoW shall be consulted to ensure all necessary pre-construction checks have been completed.

23.1.5 The depth of concrete will vary across the base, depending on its shape and dimensions, tapering from around 0.5m at the outer edges to around 2m where it meets the central plinth. A maximum of 500m³ of concrete will likely be required for each turbine foundation, which will be sourced off-site. All concrete works shall implement pollution prevention controls in line with this CEMP.

23.1.6 The turbine foundation design will minimise the excavation requirement where appropriate.

23.1.7 The position of each turbine will be clearly marked with co-ordinates provided by the *Employer* and agreed with the Planning Authority.

23.1.8 The typical construction activities associated with the turbine foundation are detailed below:

- Stripping of surface vegetation (turves) and careful stockpiling of this material as per CEMP requirements;
- Excavating the remaining superficial soil and rock materials and stockpiling of this material as per CEMP requirements;
- The stockpiled materials are to be retained for reinstatement purposes;
- Soil will be excavated to a depth of approximately 3.5 metres. Where rock is encountered this will most likely be removed by mechanical excavation to the required depth and material stockpiled as described above. The potential impacts associated with the use of hydraulic breakers or other such vibratory equipment in the vicinity of sensitive ecological receptors or

watercourses shall be assessed and appropriate mitigation measures implemented where required in consultation with the ECoW;

- Temporary fencing shall be erected at locations where there are safety implications for any persons likely to be present on the site e.g. around open excavations. Signage will be displayed clearly to indicate deep excavations and any other relevant hazards associated with the foundation excavation works;
- Following excavation, a layer of site won crushed rock will be placed in the excavation to allow the blinding concrete to be placed and finished to the required line and level as per the WTS requirements. Ducting that is required to enter the WTG through the underside of the foundation would be placed in the layer of site won rock prior to the placement of the blinding concrete;
- Where piling is required, the piles will be installed prior to the placement of the blinding concrete;
- The steel reinforcement arrangement for the foundation will then be constructed on the blinding concrete layer;
- Formwork to allow placement of concrete will be fixed as required to form the foundation. Formwork will be either re-useable or sacrificial dependent on its application in the concrete pour. Where formwork is re-useable, it will be cleaned after each use and re-sprayed or painted with mould oil within the blinded foundation excavation prior to being fixed in place. The placement of containers with mould oil will be strictly monitored to ensure that storage is only in bunded areas (i.e. in the TCC) or on a sealed hardstanding as required by this CEMP. Spraying of mould oil and storage of such sprayed materials will be undertaken in such a way as to avoid pollution. Sacrificial formwork will remain in-situ with the foundation following completion of the pour;
- Sulphate resistant concrete or other suitable concrete, as appropriate for the prevailing ground conditions, will be used in the turbine base. Prior to pouring the base concrete, the overall quality of the steel fixing will be checked to ensure there is sufficient rigidity to cope with the weight of personnel and small plant during the pour. The quantity, size and spacing of the reinforcement bars will be checked against the construction drawings to ensure compliance with the design detail. The position of the foundation insert, or other appropriately designed foundation mechanism supplied by the turbine manufacturer will be checked to ensure that the level is within the prescribed tolerances. A check will also be carried out to make sure the correct cover from edge of reinforcement to edge of concrete is maintained throughout the structure. A chamfer will be formed on all external corners;
- The line of ducts will be checked so as not to leave sharp corners that will cause cable snagging and that all bend radius comply with the design illustrated on the construction drawing. All earthing cable or strip connections will also be examined to prove their adequacy to withstand the rigors of the concrete placing process;
- The concrete pour will commence after the blinding concrete has been cleaned of debris and other loose material. Vibrating pokers will have been checked to ensure they are driven by compressed air and in good working order. The pour will proceed under the control of the *Contractor*. Personal Protective Equipment (PPE) will be worn by the site operatives and as detailed in the Construction Phase Health & Safety Plan. Pouring will follow best working practice procedures and fresh concrete will be protected from hot and cold weather as

required. All concrete works shall implement pollution prevention controls in line with CEMP requirements;

- Re-useable formwork will be carefully loosened, removed and cleaned no earlier than 24 hours from the finish of the pour; and
- Backfilling to the turbine base will proceed in layers of approximately 0.3 metres with compaction as necessary.

23.1.9 A checklist for each foundation will be prepared to show compliance with the documents of each step of the installation process. These lists, once completed, will be stored in the *Contractor's* QA file along with relevant cube test results, and be available for inspection at all times.

23.1.10 Following the completion of all construction activities, the area surrounding the base shall be reinstated according to CEMP requirements.

24 ACCESS TRACK CONSTRUCTION

24.1 Introduction

24.1.1 The overall site design has been developed in accordance with recommendations adopted from the surveys undertaken for the Environmental Statement and to reflect the requirements and specifications for transporting wind turbine components to the consented turbine locations.

24.1.2 The extent of construction disturbance will be limited to around the perimeter of, and adjacent to, access track alignments, including associated earthworks, and shall be monitored by the ECoW and ACoW as required.

24.1.3 Proposed access track alignments will be inspected by the *Contractor*, ECoW and ACoW prior to the on-set of construction in that area. The regularity of inspections (hourly, daily, weekly, as appropriate) during the construction period shall be determined in advance for each particular stretch, based on anticipated ground conditions, known ecological or archaeological sensitive receptors, prevailing weather conditions, and anticipated rate of progress.

24.1.4 In general, as part of the design mitigation wherever practicable all proposed site infrastructure has been sited at least 50m from any watercourse.

24.2 General Construction Criteria

24.2.1 It is anticipated that all access tracks will be constructed from aggregate won from local excavations and constructed to the best practices for wind farm access tracks. If site won material does not conform to the required engineering specification for the final running surface then imported crushed rock material may be required.

24.2.2 In general, the internal site track layouts have been designed to reflect the site topography and design criteria established by the WTS. The internal track length at site will be kept to a minimum to follow the existing topography and tie-in with infrastructure.

24.2.3 Access tracks shall be constructed to a minimum running width of 4.5m, plus shoulders of approximately 0.5m on either side, to accommodate the maximum transport requirements and specifications of the WTS. Track shoulders may be up to a width of 2m to accommodate cabling along the access track alignment,

24.2.4 Access tracks will be formed from a sub-base of general fill won from local excavations, and finished off with a cap-stone / wearing course of graded crushed rock, to provide suitable

delivery of the WTG components. Wearing course stone shall be of a suitable material that is not susceptible to breaking down / weathering to a high fines content material.

24.2.5 Maintenance of the running surface will be carried out on a regular basis, as required, to prevent undue deterioration. Loose track material generated during the use of access tracks will be prevented from reaching watercourses by maintaining an adequate cross fall on the tracks. Periodic maintenance of tracks by way of brushing or scraping will be carried out to minimise the generation of wheel ruts. In dry weather, dust suppression methods may be required for track and hardstanding areas. The site access tracks, hardstandings and trackside drains will be inspected on a daily basis by the *Contractor*. Records of such inspections will be held on site for review by the ECoW / Planning Authority (PMO) / *Employer*.

24.2.6 Where floating roads are installed, the contractor will denote this on the site's 'as built' and issue to the Planning Authority.

24.3 Unstable Ground

24.3.1 Unstable ground is herein considered to be any ground conditions encountered along the proposed alignment, or within the immediate vicinity and influence, of the access tracks that has insufficient strength in its existing state to support the proposed load conditions or to remain in-situ for the duration of the construction works, or that has experienced natural failure (i.e. not as a consequence of the wind farm construction works) prior to, but along the alignment of, or within the immediate vicinity and influence of, the proposed access track alignment such as to require re-alignment of the works, or major civil engineering solution to maintain the proposed alignment.

24.3.2 If any unstable ground is encountered during access track construction, the following procedure shall be adopted:

- Access track construction in the immediate area of the unstable ground shall cease with immediate effect;
- The *Contractor* immediately consults a suitably qualified and experienced geotechnical engineer; and
- If relocation within approved micro-siting allowances of the proposed access track alignment is possible and acceptable to the ECoW/ACoW (as appropriate), without potential for further ground instability to occur, then construction may recommence along the newly agreed alignment, and any stabilisation / mitigation measures that may be required of the unstable ground shall occur in parallel.

24.4 Track Construction – Cut Tracks

24.4.1 Access tracks will be formed on suitable underlying material (soil or rock with sufficient bearing capacity) in the following manner:

- Stripping of surface vegetation (turves) and careful stockpiling of this material as per CEMP requirements;
- Excavating the remaining superficial soil materials (overburden) and stockpiling this material as per CEMP requirements;
- Where different overburden materials are present these will be stored according to type. This material will be monitored and watered (as appropriate) to be retained for reinstatement purposes;

- The exposed suitable track formation shall have rock fill material tipped from dumper trucks directly onto the proposed access track alignment; and
- This material will then be either spread by a dozer or placed by a hydraulic excavator and compacted in layers, typically using vibratory rollers.

24.4.2 Turning areas will be formed to facilitate the turning of dumper trucks. These turning areas can serve as passing places during the construction period before being reinstated at the end of the works using subsoil/topsoil.

24.5 Track Construction – Floated Tracks



24.5.1 Where suitable underlying material is not available at shallow depth (< 1m) to construct a cut track from, a floating track would be utilised. A floating track design does not involve excavation and would be utilised on the site in areas where peat depth is greater than 1m. Floating tracks are formed in the following manner:

- Geogrid material is laid onto the existing unbroken ground surface at a width to suit the track construction and alignment;
- Layers of crushed stone are placed on the geotextile by an excavator to construct the track;
- Dependent on the depth of material required to form the access track, additional layers of geogrid material may be placed over the initial layers of crushed stone to support subsequent layers to form the running surface; and
- Where possible, excavated peat turves will be placed along the shoulders of the floating track as part of site reinstatement works.

24.6 Track Construction – Upgrade to Existing Tracks

24.6.1 Dependent on the wind turbine manufacturer's transport requirements, upgrades or amendments to the alignment of the existing access tracks may be required to facilitate delivery of turbine components. Where amendments to the existing access tracks are required this may require removal of the previous reinstatement work. Once the widening is constructed any newly disturbed ground will be reinstated to the standard required by this CEMP. Although these are relatively minor works, construction of the widenings will be undertaken using similar methods and to the standard required by this CEMP.

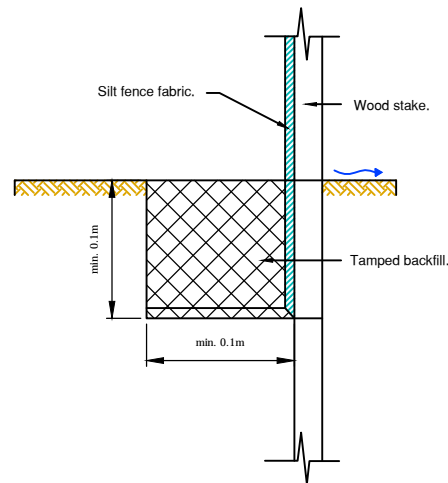
Legend

-  Silty water
-  Clean water

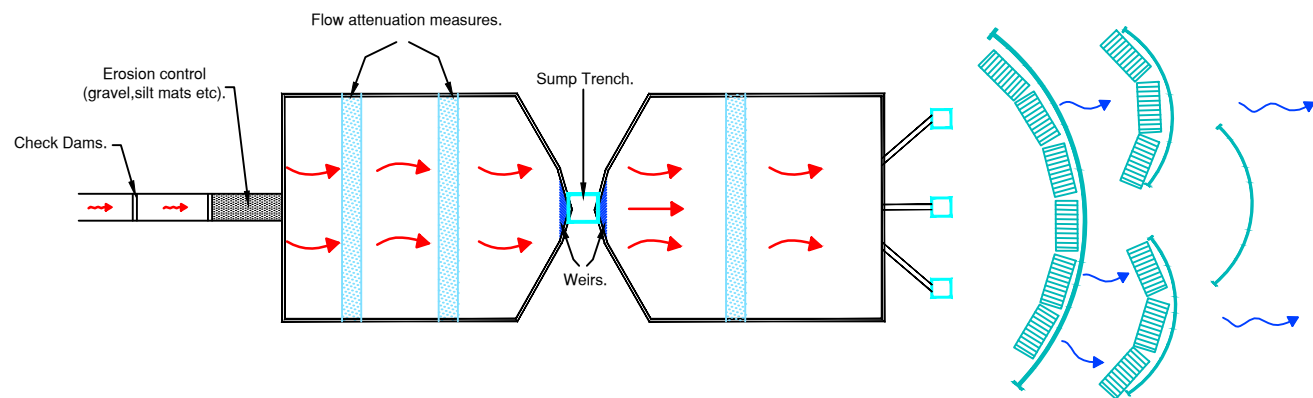
Notes

1. Dimensions and number of settlement ponds or requirements for flow attenuation measures will depend on volume and velocity of water and silt load characteristics.

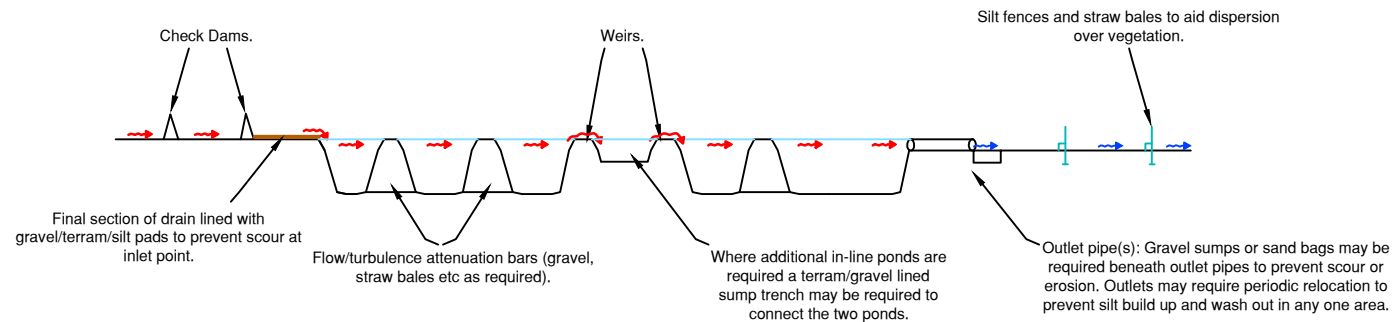
Silt Fence Detail.



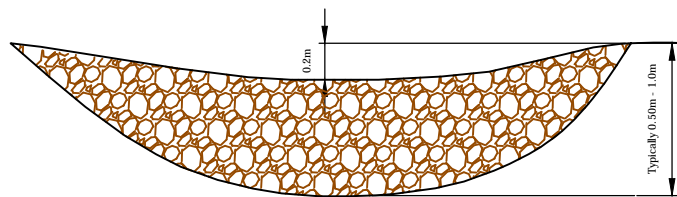
Plan View: In-line Settlement Ponds (typical for higher flow, higher silt load conditions).



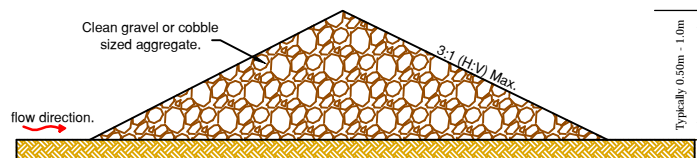
Schematic Section: In-line Settlement Ponds.



Rock Check Dam Elevation.



Rock Check Dam Section.



Plan View: Single Settlement Pond. (Typical for low flow, low silt, load conditions).

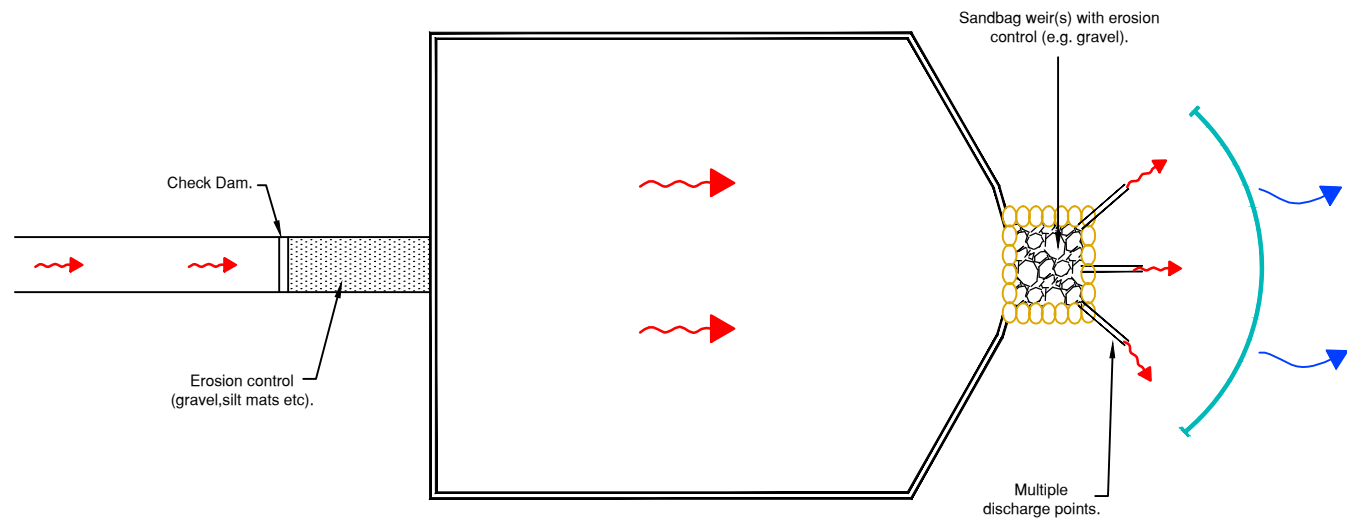
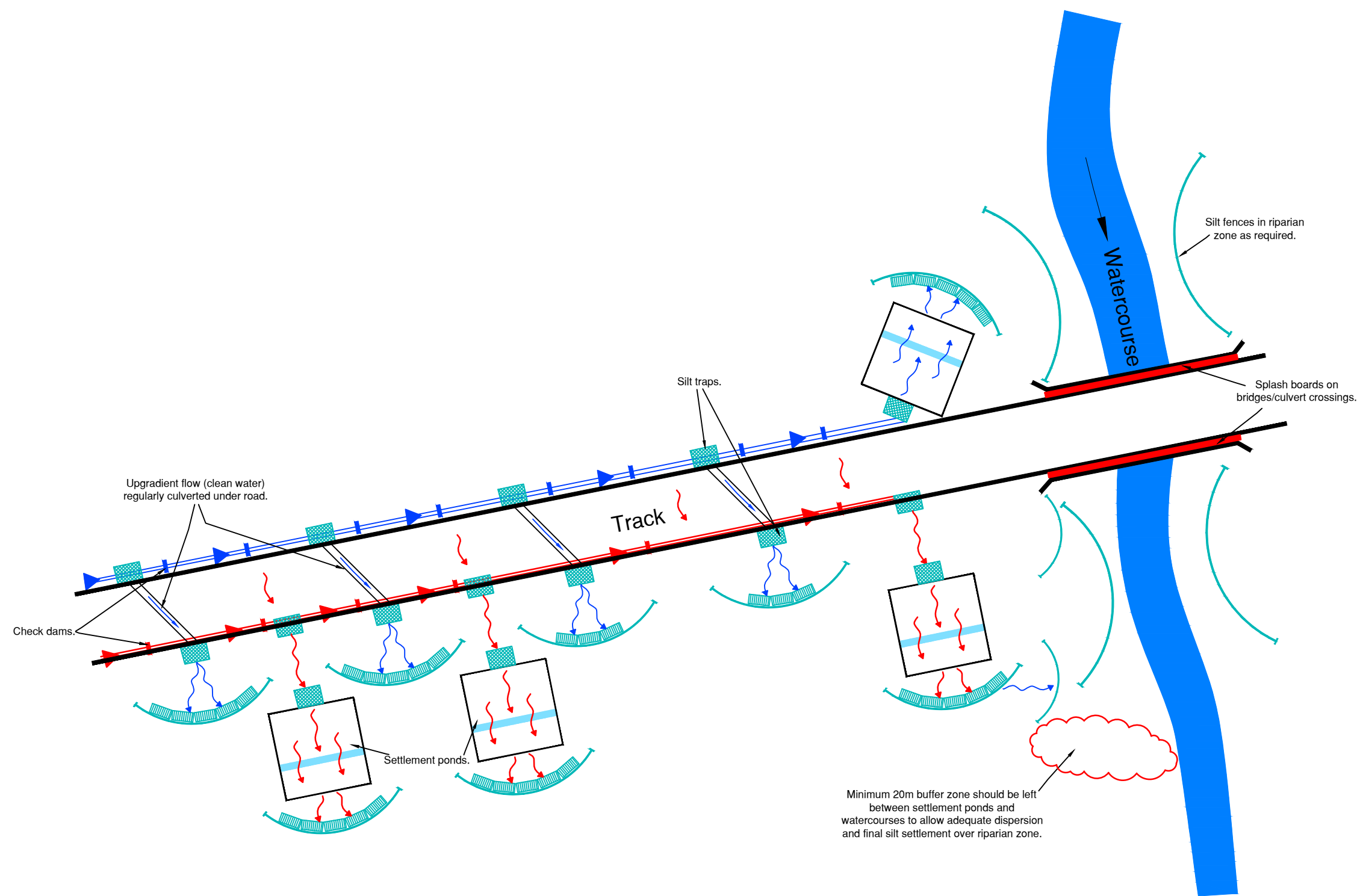






Figure 01
Typical Details of Settlement Ponds
and Silt Mitigation Measures



Legend

-  Silty water
-  Clean water
-  Silt trap
-  Silt fence and straw bales

Notes

1. In order to reduce volumes of potentially silty laden run-off, 'clean' (upgradient) surface run-off to be kept away from exposed soil areas and seperated from construction works run-off where possible.
2. Typical details for settlement ponds, check dams and silt fences are shown in Figure 01.

Figure 02
Schematic Drainage Arrangements
for Tracks and Watercourse Crossing

Notes

1. Refer to Figure 01 for typical details of settlement ponds, check dams and silt fences.
2. Refer to Figure 02 for further details on track drainage arrangements.
3. Where topography or other constraints preclude the segregation of clean / dirty water drainage (as illustrated on this drawing), the road surface cross fall shall be towards the upslope drainage ditch. Flow rates and volumes within such a combined drainage system may be higher and therefore sediment and silt attenuation measures shall be implemented accordingly to control expected increase in flow, erosion and sediment / silt load.

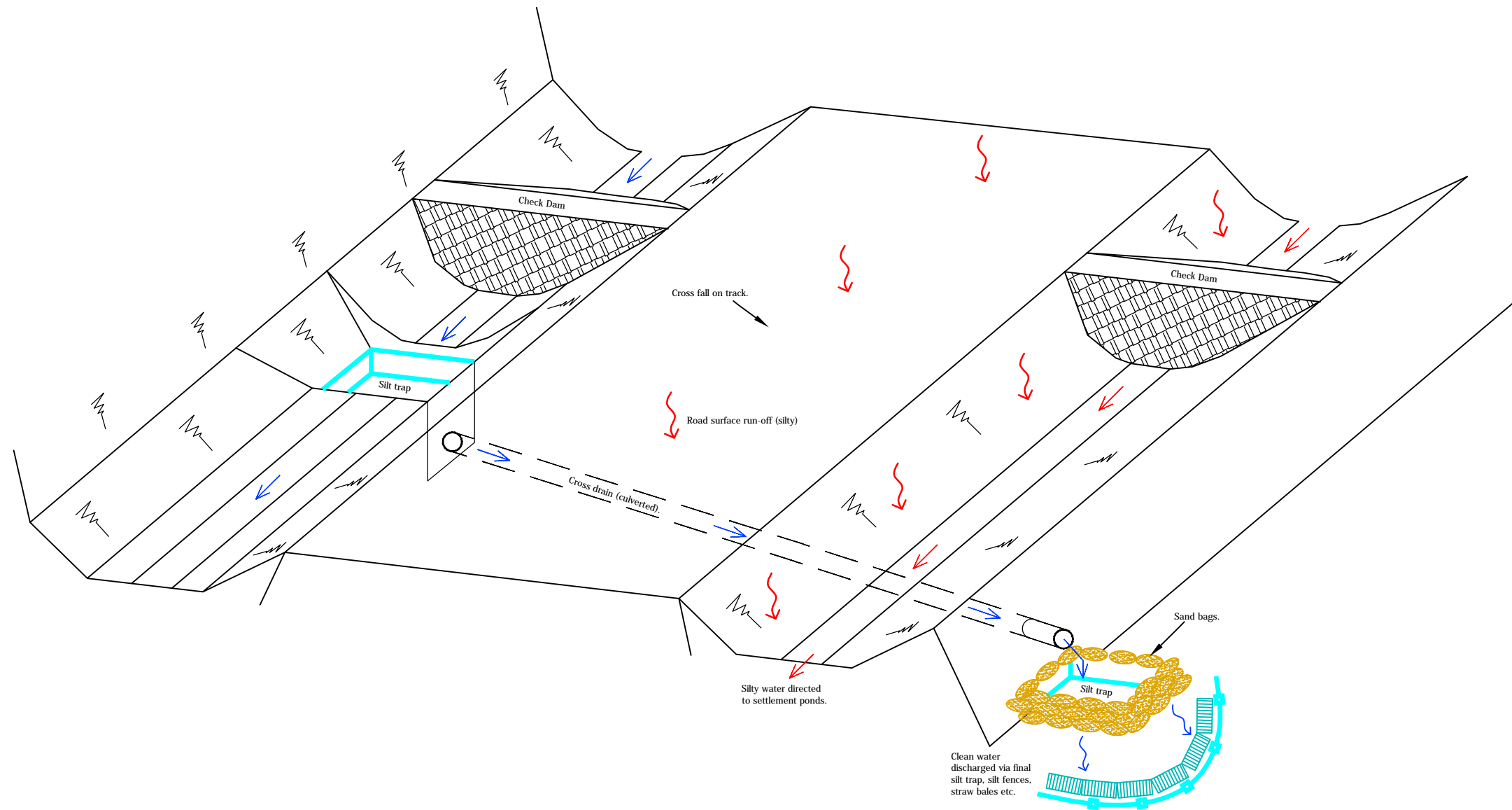
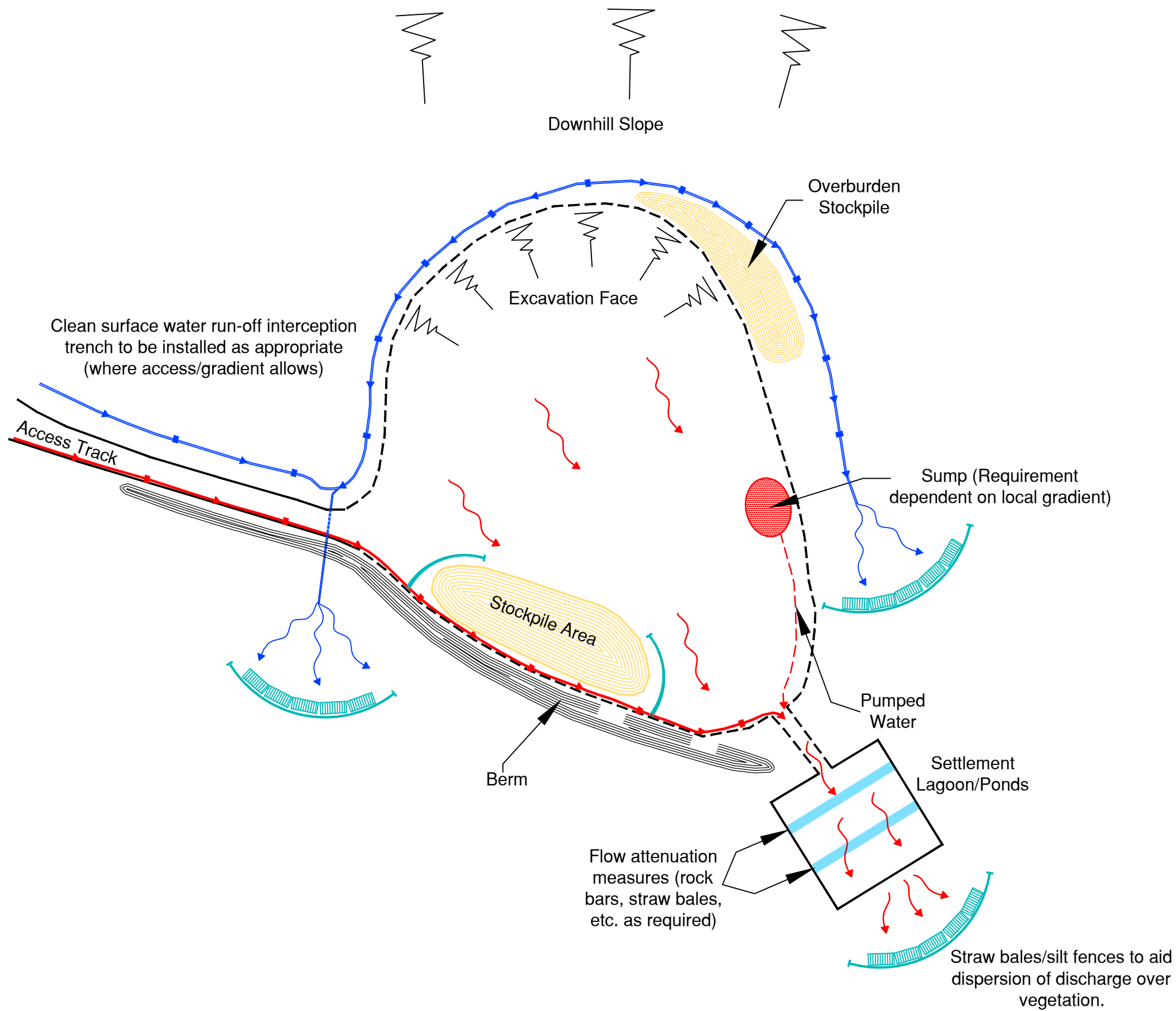


Figure 03
Schematic Section of Typical Cut and Fill Track Drainage Arrangements

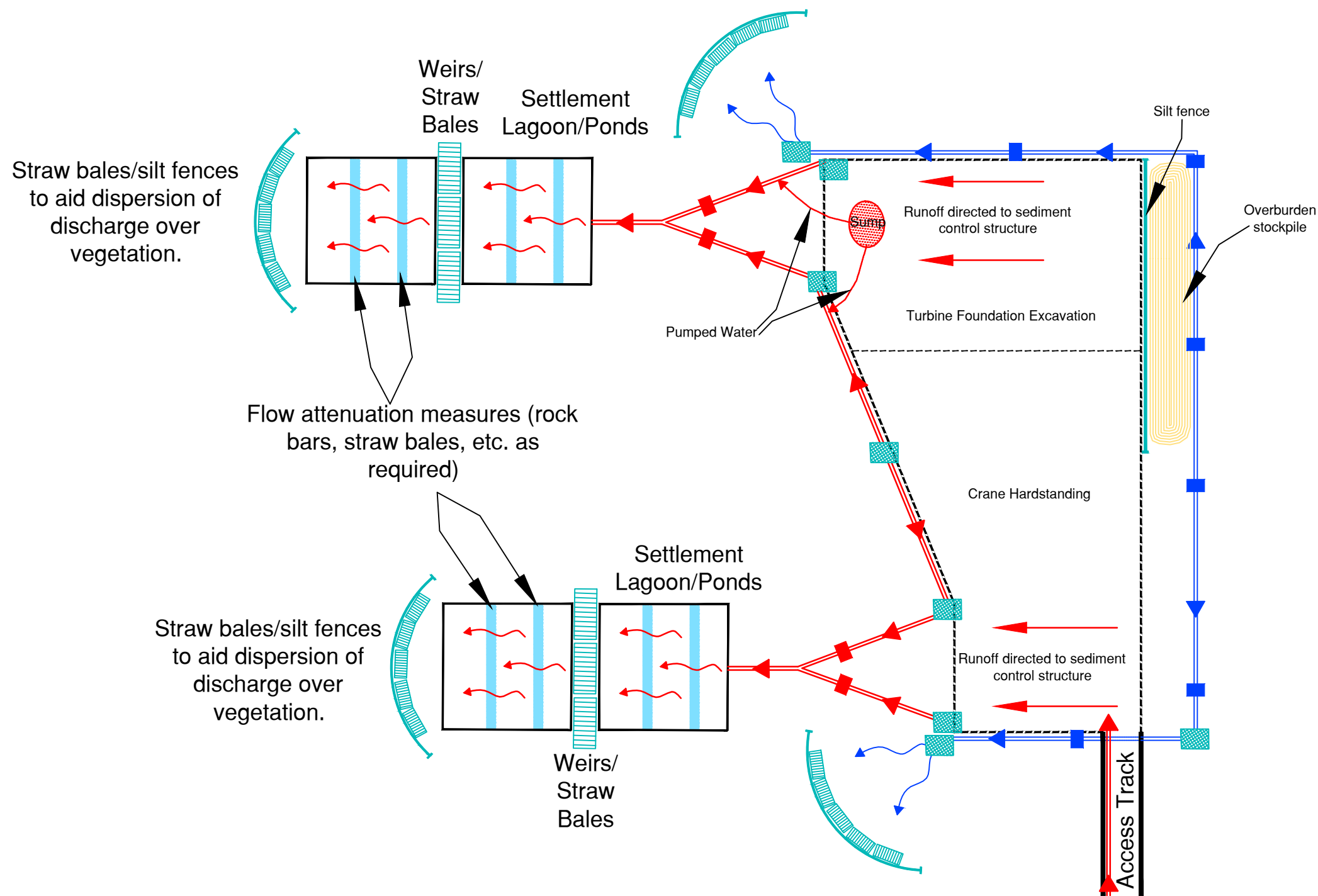


Legend

- Borrow pit boundary
- Potentially silty run-off/drainage
- + Check dams
- Clean water run-off/drainage
- Silt fence and/or straw bales to aid dispersion (and protect stockpile)

1. Borrow pit configurations will vary from that indicated on this drawing (for instance borrow pits are likely to be off-line of continuing access tracks); However, the general principles of clean / dirty water drainage segregation, stockpile erosion and run off control, and general sediment and silt control shall apply irrespective of the final borrow pit configuration.

Figure 04
Schematic Borrow Pit Drainage Arrangements



Legend







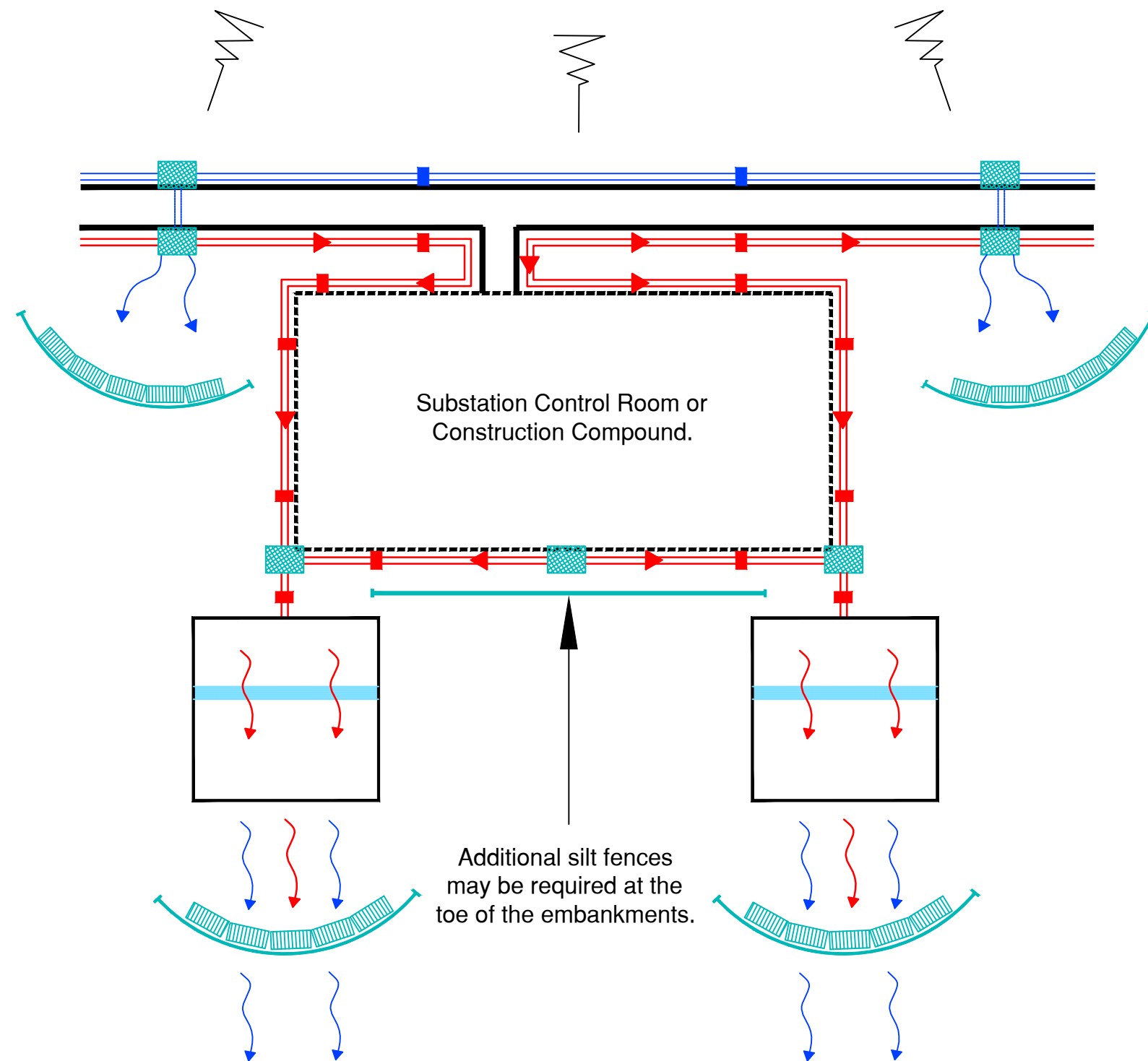
-  Potentially silty run-off/drainage
-  Clean water run-off/drainage
-  Silt fence and/or straw bales to aid dispersion (and protect stockpile)
-  } Check dams
-  } Check dams
-  Silt traps

Figure 05
Schematic Drainage Arrangements
for Turbine Bases and Crane Pads
Hardstandings

Gordonbush Extension
Wind Farm
Environmental Statement



Legend






-  Potentially silty run-off/drainage
-  Clean water run-off/drainage
-  Silt fence and/or straw bales to aid dispersion (and protect stockpile)
-  Check dams
-  Check dams
-  Silt traps

Figure 06
Schematic Drainage Arrangements
for Substation Control Room