

Norfolk Vanguard Offshore Wind Farm

Outline Operational Drainage Plan

Document Reference: 8.21

Deadline 8

Date: 30 May 2019

Revision: Version 2

Author: Royal HaskoningDHV

Photo: Kentish Flats Offshore Wind Farm



Table of Contents

1	Operational Drainage.....	1
1.1	Principles for the development of an operational drainage plan (Work Nos. 8A, 8B, 10A, 10B and 10C)	1

1 OPERATIONAL DRAINAGE

1. The permanent above-ground infrastructure associated with the onshore project substation (Work No. 10A, 10B and 10C) and National Grid substation extension (Work No. 8A and 8B) will result in a change from existing greenfield agricultural land use to create a permanent increase in impermeable area.
2. Within Environmental Statement Chapter 20 *Water Resources and Flood Risk* and Appendix 20.1 *Flood Risk Assessment* a commitment has been made that surface water drainage requirements for the operational onshore project infrastructure will be designed to meet the requirements of the National Planning Policy Framework (NPPF) and National Policy Statement (NPS) EN-5. Runoff will be limited, where feasible, through the use of infiltration techniques which can be accommodated within the area of development. The drainage strategy will be developed according to the principles of the Sustainable Drainage Systems (SuDS) discharge hierarchy. Generally, the aim will be to discharge surface water runoff as high up the following hierarchy of drainage options as reasonably practicable, that is: i) into the ground (infiltration); ii) to a surface water body; iii) to a surface water sewer, highway drain or another drainage system; or iv) to a combined sewer.
3. This document provides further details of the principles that will inform the final Operational Drainage Plan. The final Operational Drainage Plan is secured through Requirement 32 of the draft Development Consent Order (DCO).

1.1 Principles for the development of an Operational Drainage Plan (Work Nos. 8A, 8B, 10A, 10B and 10C)

4. Detailed infiltration testing to be undertaken in accordance with Buildings Research Establishment (BRE) Digest 365 *Soakaway Design* within the above ground operational areas associated with the onshore project substation (Work Nos. 10A, 10B and 10C) and for National Grid substation extension (Work Nos. 8A and 8B) for the design of SuDS features along the length and proposed depth of any proposed SuDS features.
5. If infiltration is proven to be unfavourable, then Greenfield runoff rates for the site shall be agreed. The post development runoff rates will be attenuated to the equivalent Greenfield rate for all rainfall events up to and including the 1% annual probability (or 2 l/s/ha). Where applicable confirmation should be sought from the relevant Internal Drainage Board that the proposed rates and volumes of surface water runoff from the development are acceptable
6. Provision of surface water infiltration / attenuation storage should be sized and designed to accommodate the volume of water generated in all rainfall events up to and including the critical storm duration for the 1% annual probability rainfall event , including allowances for climate change.
7. Detailed designs, modelling calculations and plans of the drainage conveyance network

will be prepared to demonstrate the:

- 3.33 % annual probability critical rainfall event to show no above ground flooding on any part of the site.
 - 1% annual probability critical rainfall event plus 20% climate change event to show, if any, the depth, volume and storage location of any above ground flooding from the drainage network ensuring that flooding does not occur in any part of a building or any utility plant susceptible to water (e.g. electricity equipment required) within the development.
8. The design of any drainage structures will include appropriate freeboard allowances. Plans to be submitted showing the routes for the management of exceedance surface water flow routes that minimise the risk to people and property during rainfall events in excess of 1% annual probability rainfall event.
 9. Details of how temporary works or temporary storage areas that will generate surface water runoff will be controlled to prevent a temporary increased risk of flooding. These details will also include what strategy/plans will be provided to reinstate land to the pre-development state.
 10. Finished ground floor levels should have a freeboard such that all infrastructure is 300mm above expected flood levels from all sources of flooding, including fluvial flooding associated with the ordinary watercourse, tidal flooding and any above ground storage or flooding from the proposed drainage scheme.
 11. All surface water management features will be designed in accordance with The SuDS Manual (CIRIA C697, 2007), or the updated The SuDS Manual (CIRIA C753, 2015).
 12. A maintenance and management plan will be drafted as part of the final Operational Drainage Plan detailing the activities required and details of who will adopt and maintain the all the surface water drainage features for the lifetime of the development. This will also include any ordinary watercourses and any structures such as culverts within the development boundary.