

Environment Agency NEC4 professional services contract (PSC) Non-Technical Scope

Project / contract Information

Project name	Broadland Futures Initiative (Phase B - Modelling)
Project 1B1S reference	ENV0001344C
Contract reference	32272
Date	27 January 2021
Version number	V4
Author	

Revision history

Revision date	Summary of changes	Version number
14 Oct 2020	First issue	V1
22 Oct 2020	Various changes following internal review by Client	V2
18 Dec 2020	Various changes following collaborative review with Consultant	V3
27 Jan 2021	Minor change to Consultant risk table	V4

This Scope should be read in conjunction with the versions of the two Minimum Technical Requirement documents current at the Contract Date (see section 2.2 for details of these), together with the project Technical Scope. In the event of conflict the Technical Scope shall prevail.

Overview

The following section provides an overview of the Broadland Futures Initiative (BFI) to which this NEC PSC contributes.

The BFI project will produce a plan defining flood risk management policy and implementation measures across the Norfolk and Suffolk Broadland, the Eccles to Winterton coastal frontage and Great Yarmouth (see Figure 1). The plan will consider the next 100 years and will be for all Risk Management Authorities (RMAs) and stakeholders. The benefits provided by the project are that future flood risk will be managed to an agreed and accepted level; there will be broad agreement on the actions required to achieve this level of risk; and a degree of confidence concerning the likelihood of the actions being funded.

Figure 1: The BFI plan area



Given the 100 year perspective of the plan a key consideration is the impact of anticipated climate change during this time. Of particular importance is climate related sea level rise, but also changes in rainfall affecting fluvial flows, water resources and water quality. Against this background the BFI will seek to realise the ambitions of the national flood and coastal erosion risk management (FCERM) strategy for England of creating 'climate resilient places' where a community or place is able to adapt and be resilient to all sources of flooding or coastal change.

Because of inherent uncertainty concerning the nature and rate of future climate change, especially in the medium to long term, the plan will need to adopt an agile approach. Consequently the detail in the plan for the medium and long term with respect both policy and implementation measures, and the geographical scale of these will be less clear. To deal with such uncertainty the project will use an 'adaptation pathways approach'. Through this we will identify key points in future when certain indicator thresholds are met (but the timing of which

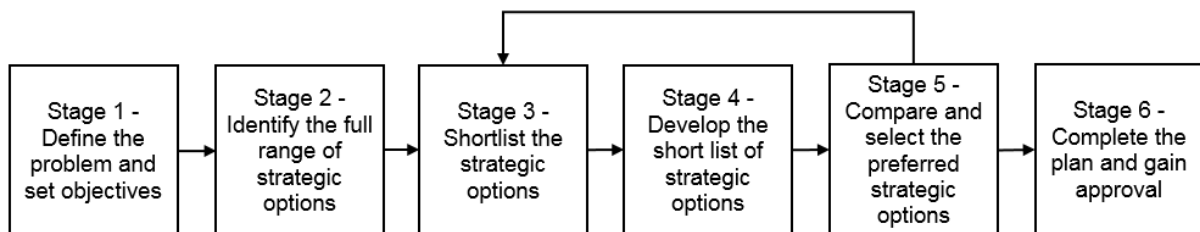
are unsure) where decisions will need to be made concerning the next steps, potentially from a range of alternatives. The BFI will therefore provide a route map from the present situation to the future.

The implementation measures will be those activities intended to deliver the desired policy outcomes. This will consider the full range of conventional flood risk and coastal management techniques together with more novel approaches. These measures may be both structural and non-structural in nature.

The project is being led by the *Client* and Others, principally the Broads Authority. The *Client* is leading on the technical information required in order to produce the plan while the Broads Authority leads on the stakeholder engagement. The remaining Others, comprising members of the Initiative Project Team, include county and district councils (who can provide economic development inputs), Internal Drainage Boards, Natural England, the National Farmers Union, Water Resources East and RSPB.

The overall process to produce the plan will follow the stages (numbered 1 to 6) shown in Figure 2, based on *Client* guidance for production of flood and coastal risk management strategy plans (OI 84_09).

Figure 2: BFI plan development stages



To date work has been taking place on Stage 1, which is due to complete in autumn 2021. Key to the subsequent stages will be the ability to understand the feasibility, benefits and dis-benefits of the possible strategic flood risk management options. This in turn requires the ability to understand the hydrological behaviour of the plan area, both today in normal and extreme conditions, and in the future with climate change.

Through the Collaborative Delivery Framework (CDF) Lot 1 Jacobs have been appointed as consultants to produce a range of products arising from Stage 1. This has included a review of the existing hydraulic modelling covering the plan area. The conclusion of the review was a recommendation that a new hydraulic model is produced to cover the Broadland rivers, updating and replacing the current model developed by Broadland Environmental Services Ltd, plus a number of standalone models for particular tributaries. In addition some updating is required for existing coastal models.

Separate to the BFI the Environment Agency Norfolk and Suffolk Partnerships and Strategic Overview (PSO) team have identified the definite need in their work for new hydraulic modelling covering Broadland. This new flood risk modelling is required to support the following work activities; flood risk planning (e.g. responding to planning applications); strategic flood risk assessments (SFRAs); incident response; permitting and asset planning/function; strategic planning and Outcome Measure delivery; environmental schemes (e.g. saline incursion, restoration).

The BFI model review concluded that both the BFI and PSO requirements can be met by the new hydraulic model for the Broads and the standalone reach models, therefore such an approach is being taken forward by both teams jointly through this contract.

The contract Scope comprises three separate documents:

1. Non-Technical Scope (this document) which describes the overall aim of the modelling work and the general arrangements for its management.
2. Technical Scope providing the detail of the technical requirements. This is derived in large part from an inception report produced by Jacobs during Stage 1 following on from the model review and recommendations.
3. Environment Agency Minimum Technical Requirements for Modelling.

1.Objectives

The work set out in the contract Scope is focussed on assessing the fluvial, tidal and coastal flood risk from the principle main rivers of the Yare, Waveney and Bure, associated tributaries, and the coast, to the Broadland system. This involves the creation of a new Broads hydraulic model, an update to the existing coastal models, and the development of a number of standalone flood risk models for the area. A new hydrological assessment will be derived. New baseline and other scenarios will be run through the models to inform *Client* activity.

The BFI and PSO teams together have the following project motives:

- Developing a suite of hydraulic models to support the development of the BFI framework for managing future flood risk in the Broadland study area.
- Improving confidence in flood risk information amongst the *Client* and Others (including partners in the BFI project and the public), ensuring up to date data (of known provenance & quality) is utilised effectively and outputs reflect flood history and are consistent and robust.
- Reviewing and updating the flood risk mapping products for the Broadland area and coastal frontages. This will be used to inform the *Client's* flood risk planning and permitting work along the main river, as well as to identify potential communities and properties at risk. It will also be used by Local Planning Authorities to update their Strategic Flood Risk Assessment (SFRA) and inform their planning decisions.
- This study must identify the communities and properties at greatest flood risk in order to inform the *Client's* approach to incident response, flood risk alleviation, asset investment and maintenance.
- For planning purposes and to inform optioneering for the BFI Strategy, the impacts of a range of climate change allowances need to be considered in this study.
- This data will also be used to update the *Client's* National Flood Risk Assessment (NaFRA), identifying areas at Risk of flooding from Rivers and the Sea (RoFRS).
- The model outputs will be used to make improvements to the flood warning service. With a steady move towards a forecast led, impact based warning service the *Client* needs to better model a range of return periods and derive hazard mapping so that the *Client* can:
 - Provide good, accurate, timely and pertinent information in the *Client's* flood warnings that the public and the *Client's* professional partners can act on;
 - Provide good and comprehensive information to the *Client's* national incident room and ultimately government ministers on the potential impacts so that they can decide on the scale of the response required;

- Produce and distribute useful graphical representations of this for a varied audience from government down to Bronze control, so that the most appropriate, effective and efficient actions can be taken on the ground.

2. Outcome Specification

2.1. *Consultant* technical services and outputs

The required technical services and outputs are detailed in the Technical Scope and in the Minimum Technical Requirements for Modelling.

2.2. Specifications of standards to be used

The services are to be compliant with the following versions of the Minimum Technical Requirement documents:

Document	Document Title	Version No	Issue Date
412_13_SD01	Minimum Technical Requirements	2	18 March 2020
NEC4 Minimum Technical Requirements for Modelling_v2.1	NEC4 Minimum Technical Requirements for Modelling_v2.1	2.1	20 September 2020

3.3. *Consultant* project management

The requirements for the management of the work shall include the following:

3.3.1. The *Consultant* shall attend at:

- a) Start-up meeting
- b) Technical workshops
- c) Site visits
- d) Model handover

3.3.2. The *Consultant* shall take minutes from all meetings, record details of all key decisions agreed with the *Client*, and ensure management of actions arising from these meetings inclusive of capturing actions in a log, prioritising the actions, assigning action owners, setting action deadlines, tracking action progress and close out, and highlighting impacts to the project of delays in completing actions. Meeting minutes shall be issued to the *Client* within a week of the meeting taking place.

3.3.3. The *Consultant* shall chair fortnightly progress updates, and host these via Microsoft Teams, or via equivalent means, throughout the duration of the contract. The Consultant will use Microsoft Power Point presentations for these progress updates, structure and content of which to be agreed with the *Client*. Power Point

presentations to be provided to the *Client* at least 24 hours ahead of progress updates.

- 3.3.4. In technical matters the *Client* will receive independent advice from another consultant (currently JBA Consulting). This consultant has the status of Other and is to be included in the fortnightly progress updates, other meetings as determined by the *Client*, and circulated with meeting minutes.
- 3.3.5. The *Consultant* shall provide monthly project progress reports, including a financial update and forecast, updated project programmes, a summary of work completed in month, an overview of upcoming stages and milestones, using a reporting template format to be agreed with the *Client*. These reports must be provided by the 10th of every month unless stated otherwise by the *Client*.
- 3.3.6. The *Consultant* shall provide input into the Early Warning Register at each fortnightly progress update, by reporting new risks, and progress made on risk mitigation.
- 3.3.7. The *Consultant* shall provide a list of data requirements necessary to enable service delivery. This list shall be provided to the *Client* at the project start-up meetings, if not before, and shall be updated at fortnightly intervals thereafter.
- 3.3.8. The *Consultant* shall provide quarterly input into the project efficiency register (CERT Tool) by identifying and quantifying individual efficiencies, and descoping opportunities.
- 3.3.9. The *Consultant* shall obtain data from Others in order to provide the services, and reasonably ensure it is correctly licensed for use by the *Client*. The cost of licencing to be borne by the *Client*.
- 3.3.10. The *Consultant* shall provide comprehensive responses to *Client* queries about the project and deliverables, to the *Client's* reasonable satisfaction, until the contract is completed.
- 3.3.11. The *Consultant* shall provide and respond to contractual communications on FastDraft. Early Warnings to be issued on FastDraft and risk mitigation meetings arranged in accordance with the contract.
- 3.3.12. The *Consultant* shall own the following identified risks, which have the potential to impact on delivery.

Risk	Effect	Risk Cap
Model stability difficult to achieve	Extra costs and delay due to additional time required to resolve instabilities	180 hours in total across all models.
Model calibration takes longer than anticipated	Extra costs and delay due to additional time required to calibrate model	90 hours in total across all models. Note where the target of 150mm cannot reasonably be achieved an explanation will be provided to the <i>Client</i> .
Model results and outputs not approved by the <i>Client</i> , requiring additional analysis / post processing	Extra costs and delay due to rework	Completion of two review rounds each comprising a single collated set of non-contradictory <i>Client</i> comments and subsequent comprehensive <i>Consultant</i> response.
Jacobs staff working on project accidents / illness	Extra costs and delays due to hand-over and familiarisation period	None.
Extent and complexity of scoped work underestimated/ misunderstood	Increase in costs	None.
The accuracy of digitising the [REDACTED] cross-sections is not of sufficient quality for modelling purposes (i.e. an error in digitising not the original data).	Impact on model quality and calibration.	None.
Hardware failures / software updates / network problems delaying model runs / processing/ limited licences available	Delay in programme and increase in costs	None.
Iterations to scale hydrological inflows has not resulted in the desired target flows. Additional investigations and iterations required	Delay in programme and increase in costs	120 hours in total across all models.
Model run times are longer than 8 hours for the new Broads and standalone models; and the pre-update run times for existing coastal models.	Extra costs and delay due to additional time required	None.

Liaison and data sharing with Jacobs colleagues at BESL is not as forthcoming as expected resulting in poor communication and collaboration throughout project.	Delay to progress and slow project mobilisation. Potential increase in costs due to rework.	None.
Poor availability of key staff (Jacobs and Jacobs staff in BESL).	Only a selected number of individuals are aware of existing walls/ embankments in individual communities, or are able to understand veracity of flood maps. Poor availability/ turnover/ sickness of these individuals will delay development of flood extents and 'without flood risk management' scenario outputs.	None.

3.3.13. The *Consultant* is responsible for any new data requirements. The *Consultant* is to scope, procure and manage the acquisition of any new surveys or data requirements and third party data, unless otherwise instructed. Should data originate from a third party the *Consultant* will make the *Client* aware of any risks associated with the data.

3.4. Requirements of the programme

The overall requirements of the programme include the following:

- 3.4.1. The *Consultant* shall provide a detailed programme in Microsoft Project format, meeting all requirements of NEC PSC Clause 31 of the *conditions of contract*. The programme must show critical path activities, float, and all the activities to be undertaken by the *Consultant* and other members of the project team. Activities requiring *Client* input shall be clearly identified. All major project and modelling milestones detailed in the Technical Scope will need to be incorporated.
- 3.4.2. The *Consultant* shall provide a baseline version of the programme at the start-up meeting, and this shall be updated monthly in accordance with NEC PSC Clause 32 with actual and forecast progress against the baseline. Slippage against baseline shall be clearly indicated.
- 3.4.3. The programme shall also include alignment and submission of the BEP and Master Information Delivery Plan (MIDP).
- 3.4.4. The *Consultant* will allow 15 working days for the *Client* review of deliverables. Review periods for large or complex models shall be agreed with the *Client*. For the new Broads model this is anticipated to be at least 20 working days.
- 3.4.5. The *Consultant* will provide 10 working days notice of submission for the *Client* review of deliverables.
- 3.4.6. The *Consultant* shall allow 20 working days for the initial data collection by the *Client* following the data review by the *Consultant*.

- 3.4.7. The *Consultant* shall allow 20 working days for the *Client* to arrange any necessary site visits.
- 3.4.8. The *Client* must approve in principle the proposed methodology, and input data to be used, for achieving the aims and objectives in the scope prior to the *Consultant* commencing the full hydrological assessment and hydraulic model development. The method statement must be updated in response to the *Client's* comments to the *Client's* satisfaction.
- 3.4.9. The final deliverables and reporting must be approved by the *Client* prior to project sign off. More detail of specific acceptance criteria are contained within the technical scope. Acceptance would not be unreasonably withheld.

4. Services and other things provided by the *Client*

The *services* and other things that will be provided to the *Consultant* by the *Client* shall include the following:

- 4.1.1 Any other data relevant to the projects owned by the *Client* which is requested by the *Consultant* will be provided along with a data licence.
- 4.1.2 All of the data listed as being supplied to the *Consultant* as part of these studies remains the IP of the *Client*.
- 4.1.3 Asite
- 4.1.4 FastDraft

5 Drawings, site information or reports already available

See the Technical Scope for previous studies, drawings, and data sources / requirements. Other data requirements shall include:

- 5.1.1 The *Client* is responsible for the accuracy & sufficiency of existing data owned by the *Client*. The *Client* will only cover costs of sourcing new data, if existing *Client* supplied data is proven to be incomplete or to contain mistakes or errors.

Appendix 1 BIM Protocol – Production and Delivery Table

All Client issued information referenced within the MIDP requires verifying by the *Consultant* unless it is referenced elsewhere within the Scope.

The MIDP is hosted in the BFI project Asite workspace.