Environment Agency
NEC4 professional services contract (PSC)
Scope

Project / contract Information

Project name	Broads Asset Maintenance
Project SOP reference	ENV6004936R
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Author	[redacted]

Revision history

Revision date	Summary of changes	Version number
23/03/2021	First issue	1
28/04/2021	Additions to cover requirement for efficiencies, commercial meetings and carbon recording	2

This Scope should be read in conjunction with the version of the Minimum Technical Requirements current at the Contract Date. In the event of conflict, this Scope shall prevail. The *services* are to be compliant with the following version of the Minimum Technical Requirements:

Document	Document Title	Version No	Issue date
412_13_SD01	Minimum Technical Requirements		18/03/2020

Details of the *services*

Details of the *services* are:

The *services* to be provided by the *Consultant* are the technical advice and specifications and designs required to support the delivery of asset maintenance activities in the Broads.

The *services* are described in detail in the Outcome Specification section. The *services* are described as ‘routine’ or ‘non-routine’. Routine refers to known deliverables that will form the baseline programme. Non-routine refer to deliverables that will be determined by inspection or analysis and managed as a compensation event.

Additional details to support the specification are included in appendices A1 to A8.

Objective

This is a collaborative project. The *Client, Consultant* and the contractor will work together in an open and positive manner to deliver excellent asset management in Broadland.

Excellent asset management will be proactive planning and delivery of maintenance that keeps assets in a target condition appropriate to the risk. The existing strategic approach to sustaining an overtopping regime across the Broads flood risk systems will be managed though continued monitoring and maintenance of crest levels.

Given the rural nature of many of Broadland’s flood risk management assets, there will be an emphasis on a best value approach to planning and delivering maintenance. Also given the high landscape and environmental value of Broadland, civil engineering will need to be fully integrated with environmental consideration.

To demonstrate best value there is a requirement to identify and provide efficiencies in the delivery of the *services* and also work with the *Client* to identify and demonstrate efficiencies in whole life asset cost and carbon through effective asset management.

Knowledge sharing is a key aspect of the collaboration. The *Consultant* is required to engage in a knowledge sharing programme, which is necessary as asset management in Broadland transitions from a twenty year supplier led Public Private Partnership project.

The outcome required from knowledge sharing is that the *Client* develops the depth of local asset and operational knowledge required to make well informed future management decisions and has the information and knowledge to package and tender future maintenance work.

Outcome Specification

The *services* are described in the following specification sections 1 to 12 and reference appendices A1 to A8. This provides a specification for the Services to be provided by the *Consultant* and describes how the *services* will fit with the work of the *Client* and the contractor to effectively deliver asset maintenance through collaboration.

1 Raised Defences: Flood Embankment grass cutting

Deliverables:

Routine	Ecology advice and monitoring
	Advice on cut specification
	Utility and services searches
	Production of programme and drawings (showing mapping, specifications, and hazard information)

Requirements:

1.1. The management of embankment vegetation is to continue with a grass cutting programme similar to that provided through the Broadland Flood Alleviation Project (BFAP).

1.2. Embankment vegetation will be managed for the purpose of maintaining a resilient grass sward and allow inspection. The specification for the cuts will balance the engineering need with the local ecological requirements and wider biodiversity potential.

1.3. The cut specification options used through BFAP will be adopted. There will however there will be some changes to align with the *Client's* maintenance standards (see Appendix A2) and adapt to changing environment and ecological needs. Anticipated changes to the BFAP approach include:

- A general requirement to cut the top of the riverside slope
- A general requirement to cut embankment crest vegetation on the landward and riverside of crest piling
- Increased consideration of pollinators in cutting specification and programme

1.4. Typically around 205km of flood defence embankments within the Broadland Area, of this a minimum cut frequency of 1 cut per year on all of these embankments and 2 per year on overtopping areas. Some localised exceptions do exist where grass cutting is undertaken less frequently due to agreed factors including ecology and stakeholder involvement. This is to be captured and accounted for in annual programmes.

1.5. A grass cutting schedule is included in Appendix A4, this includes embankment lengths and associated cut options as per the 2019 BFAP specification. This is taken as a typical grass cutting schedule.

1.6. Timing of grass cutting within the programme will need to take into account local ecological factors as well as the practicalities of access, scale and cost.

2. Raised Defences: Flood embankment tree and scrub removal

Deliverables:

Non-routine	Ecology advice and monitoring
	Post inspection assessment (see Section 9)

Requirements:

2.1 In general trees and scrub should not be present on the crest and slopes (landward and riverside) of raised flood embankments. However there are areas within the Broads where trees and scrub are present on flood embankments. This is generally the case where the BFAP team considered there to be an acceptable balance between flood risk, ecology benefit and best value.

2.2 Inspections will be led by the *Client* and undertaken in line with the *Client's* CAMC2 guidance. Embankments with large trees will be recorded as 'Condition 5' and therefore below required condition. Where the removal of such trees is not likely to be simple or low cost, the *Consultant* will carry out a risk based assessment (as outlined in Section 9) to determine the need and urgency for action.

2.3 It is assumed that the removal of bushes and smaller trees will be simple and low cost in most areas; as a default, the contractor will remove these from flood embankment crests and slopes as

part of routine vegetation management. In exceptional circumstances where flood risk is considered to be low, leaving scrub in place will be considered by assessment undertaken by the *Consultant* (as outlined in Section 9).

3. Raised Defences: Flood embankment crest level maintenance

Deliverables:

Non-routine	Ecology monitoring and assessment (including HRAs), and mitigation plans
	Materials sourcing plan
	Utility and services searches
	Design, specifications and drawings including hazard information

Requirements:

3.1 Broadland is effectively a system of interrelated flood compartments. Defence crest levels for each compartment have been designed and maintained to provide a predictable overtopping regime. The overtopping regime adopted through BFAP sustains a potential pattern of frequency and effect of overtopping based on 1995 defence, ground and sea levels and with allowance for sea level rise. The current strategy is to continue to sustain this overtopping regime.

3.2 As set out in Section 8, crest level surveys undertaken by the contractor will be used to monitor settlement, identify low spots and inform a forward programme of crest raising works required to sustain the overtopping regime.

3.3 Where a need for crest raising is identified, the works will need to be designed with particular initial consideration given to material sourcing, ecology and environmental management and consents.

3.4 Wherever possible the topping-up works will take place to the crest of the embankment in order to avoid the need to excavate the landward slope of the bank and encroach on the folding. Topping up will be in designed layers with a suitable key into existing embankment structure.

3.5 The raised crest level will need to be to a design level for which consideration has been made to ongoing settlement and nearby compartment crest levels.

3.6 Most crest level works will require the planning and undertaking of works to mitigate harm to ecology particularly protected species.

4. Raised defences: Flood wall maintenance

Deliverables:

Routine	Ecology advice associated with long vegetation cutting
Non-routine	Ecology advice associated with tree and shrub removal

Requirements:

4.1 There is around 56km of walls within the portfolio of flood defence assets in Broadland that form significant elements of flood defence assets. An approximate breakdown is shown in Table 2.

Wall type	Approximate length (km)
Flood walls	
Concrete flood walls	9.5
Steel flood wall (not crest piles)	0.6
Masonry flood wall	1.5
Crest Piles Mostly steel or plastic, but some asbestos	15.0

Table 2: Flood defence walls and crest piling

4.2 Inspections of these assets will be undertaken in line with Section 9 ‘Asset Inspections and

condition assessment'.

4.3 Maintenance will be undertaken by others in line with the *Client's* standards for wall maintenance set out in Appendix A2.

4.4 All walls will require periodic cutting of vegetation where present to allow inspection. The minimum period for this will be every 2 years. The need to cut long vegetation will generally apply only to crest piling; most of the concrete and masonry walls are in more urbanised or managed environments. The *Consultant* is to provide advice on ecology and any required mitigation associated with the cutting of long vegetation and the removal of larger shrubs or trees.

5. Erosion protection maintenance

Deliverables:

Routine	Visual inspection (supporting the *Client* as outlined in Section 9)
Non-routine	Ecology advice (as required for intermittent maintenance)
	Utility and services searches
	Design and specification of new or replacement erosion protection
	Technical information for statutory consents (e.g. for removal or replacement of assets)

Requirements:

5.1. Erosion protection forms part of the flood defence in some areas and needs to be checked and maintained. A breakdown with approximate total lengths is given in Table 3.

Erosion protection type	Approximate length (km)
Piling (steel, timber and concrete)	30
Rip-rap stone	4
Blockwork revetment (e.g. Armorflex)	8
Open stone asphalt	6
Gabions	3
Scour protection matting	1
Geotextile tube	3
Other (e.g. River Ant post and netting)	1

Table 3: Erosion protection assets

5.2. The *Consultant* will support the *Client* with visual inspection of all erosion protection assets in line with the requirements and tasks set out in Section 9. Inspection will generally need to be undertaken from the water and on suitably low tides. A survey boat will be provided and helmed by the contractor.

5.3. The visual inspections may identify intermittent maintenance tasks to be programmed. Where significant maintenance works is identified the *Consultant* will provide necessary designs and technical advice. This includes ecology advice and information to support statutory consents.

6. Conveyance channel maintenance (cut and clear)

Deliverables:

Routine	Ecology advice, including review of programme and site inspections
	Utility and services searches
Non-routine	Production of specifications and drawings for any required desilting or significant in-channel works, including hazard information
	Supporting technical information for statutory consents

Requirements:

6.1. The boundary of the Broadland Asset Performance Area is shown in Appendix A1. The Main Rivers which the *Client* is responsible for are also shown. The main rivers in the Broads consist of tidal watercourses and fluvial watercourses. All of these main river watercourses need to provide adequate conveyance for the level of flood risk.

6.2. The tidal main rivers in Broadland generally provide adequate conveyance without maintenance intervention by the *Client*.

6.3. There is approximately 100km of fluvial main river watercourses, as listed in Table 4. These are mostly gravity fed watercourses and 55km have required some active channel maintenance through the BFAP project. The typical maintenance frequency is also shown in Table 4.

6.4. Conveyance channel maintenance shall be deemed to include the cutting and clearing of material likely to cause a risk of flooding to adjacent land and Property. Cut and clear generally refers to the clearance of in-channel vegetation and removal of undesirable and obstructive woody debris or low branches. Cut and clear forms the majority of the annual channel maintenance programme and is specified by routine inspection by the *Client* and undertaken by the contractor.

6.5. Conveyance channel maintenance does not include continuous silt clearance or minor dredging works, however there is an occasional need for de-silting works and reactive clearance of obstructions.

Watercourse	Length (m)	Typical channel maintenance frequency
Hassingham Beck	1833	Annual
Cantley Watercourse	1702	None
Limpenhoe Landspring	2854	None
Spixworth Beck	13332	Annual
Beighton Drain	2086	Annual
Surlingham Landspring	891	None
Barsham Beck	5213	Annual
Mettingham New Dyke	3140	Annual
Lake Lothing Landspring	4780	None
Lillywater Landspring	3947	None
Blundeston Landspring	2778	Annual
Gunton Watercourse	1841	None
Haddiscoe Landspring	8418	None
Colemans Drain	931	5 year
Barnby 100 Drain	3999	None
Moulton Drain	1223	Annual
Trowse Newton Drain	1095	None
Stone Beck	6944	None
Acle Landspring	4940	Annual
Witton Run	7369	None
Hellington Beck	6476	Annual
Carleton Beck	4733	Annual
River Chet	8047	Annual
Total	**98572**	

Table 4: Fluvial main river watercourses

6.6. The ongoing channel maintenance programme will continue to focus on the same 55km of watercourses.

6.7. The *Consultant* will support the annual cut and clear programme of work by providing ecology advice and carrying out utility and services checks. The ecology advice may include appropriately timed ecology surveys and assessment of the need for mitigation and monitoring

6.8. The *Consultant* will provide design and technical advice for identified desilting work. This will also include ecology advice and technical information required to support any necessary statutory consents.

7. Structures inspection and maintenance

Deliverables:

Non-routine	Technical assistance with bridge inspections

Requirements:

7.1. This section covers the maintenance required for the various catchment and moveable flood defence structures including:

- 30 catchment structures, including outfalls, sluices, spillways and screens. These are simple mechanical or static structures
- 1 pumped outfall, Acle Pump, which is the only mechanical-electrical asset in Broadland.
- 30 moveable flood defence structures, all of which are manually operated flood gates and flood boards.

7.2. This section also covers the maintenance required for bridges maintained by the *Client* including:

- Single lifting pedestrian bridge, mechanical winch operated (Clayrack Marshes)
- Fixed pedestrian bridges at Geldeston Locks

7.3. A schedule of these flood defence structures is included in Appendix A5. Maintenance checks and servicing covered by the schedule will be undertaken by the contractor.

7.4. The *Consultant* will assist the *Client* with inspection of bridge structures.

7.5. For fixed elements of bridges inspections will include the deck structure, supporting structure, abutments and associated public safety measures such as hand railings, fencing and signs.

7.6. For mechanical elements of bridges (e.g. the lifting bridge at Clayrack Marshes), the *Client* will specify an appropriate regime of inspection in accordance with LOLER and PUWER regulations and appropriate to the level of use and assessment of risk.

8. Topographical surveys & crest level monitoring

Deliverables:

Routine	Use of topographic data to update crest level monitoring data sets
	Interpretation of crest level data
	Supply of datasets and interpretation (inc. digital shapefiles for low spot mapping)
	Advise on forward programme of crest level management

Requirements:

8.1. There is a good record of topographic surveys including a database of defence crest levels from annual surveys. This has given Broadland an excellent basis for understanding embankment settlement rates and predicting maintenance intervention.

8.2. Regular crest level surveys will be undertaken by the contractor with a minimum of a full crest level survey every 2 years.

8.3. Crest level data will be used directly by the *Client* to update asset information on AIMS.

8.4. The *Consultant* will also use crest level data to update the database of crest levels and its interpretation. Interpretation includes:

- The identification and mapping of low spots
- Calculation of settlement rates
- Residual life associated with maintaining the current service level

8.5. The *Consultant* will provide the above datasets and interpretation to the *Client*. The *Consultant* will use the interpretation to advice the *Client* on programming of crest level management in order to maintain the existing overtopping regime.

9. Asset inspections and condition assessment

Deliverables:

Routine	Assist with asset inspection on site, including: • Advice on access • Share asset knowledge (e.g. known issues, key elements, works and maintenance history)
Non-routine	Post inspection engineering assessment of below target condition assets

Requirements:

9.1. Appendix A7 outlines the process for undertaking visual inspections of assets. The *Client* will apply this to verify inspection units and asset elements and in setting the inspection programme. It is expected that the inspections will generally be undertaken by flood compartment and will be coordinated with the grass cutting programme.

9.2. The *Client* will lead on undertaking inspections with assessment in accordance with the CAMC2 (2012) guidance, or any subsequent updates. The *Consultant* will support the programme of inspections through knowledge sharing on site during the inspections.

9.3. The frequency of asset inspections will be determined by the *Client* through a review of the consequence and risk of failure associated with each asset, as outlined in Appendix A7. In general assets in Broadland are considered medium risk by default and therefore the typical minimum frequency of visual inspection will be 24 months.

9.4. Where an asset is considered to have a higher probability of failure or where failure will have significant consequences then it may be appropriate to inspect the assets more frequently. Also additional inspections may be necessary, for example following loading on defences due to high water levels.

9.5. The inspections will assess the condition grade of the asset taking into account weighting applied to each element of the asset. The target condition of assets will be reviewed by the Client, however the default target is Condition Grade 3.

9.6. Assets which by visual inspection are assessed as below this target condition will need to be managed in accordance with the Post Inspection Process outlined in Appendix A3. In line with this process remedial measures that are likely to be complex or costly will require an assessment of the risks associated with the failing elements and the necessity and urgency of remedial works. In some circumstances the assessment may judge the asset to be 'fit for purpose' and it may be appropriate to override the visually assessed condition grade. The assessments may be specific to an asset or more widely to a flood compartment as appropriate to the issue.

9.7. The *Consultant* will undertake the engineering assessments as required. The *Client* will provide quality assurance and approval.

10. Incident Management

Deliverables:

Non-routine	Technical advice and design work to support emergency or recovery works
	On site services, including observation, monitoring, recording and condition reports

Requirements:

10.1. The *Client* has an incident management process with Incident Duty Officers rostered 24/7 that can give direction and information during events or reported incidents. Operational support for incident response will be provided in Broadland primarily by the contractor.

10.2. The *Consultant* is not required to provide rostered standby provision as part of this contract. However technical advice or design work may be required to support emergency or recovery works.

10.3. During and following flood events or other incidents, the *Consultant* may be required to provide observation and recording of incidents as well as reactive inspection of assets.

11. Remedial Works

Deliverables:

Non-routine	Design associated with remedial works
	Ecological assessment and advice
	Technical information to support consents
	Scoping work to support business case development for capital works

Requirements:

11.1. Given the extent of earth embankments, variable ground conditions and high level of public access defects requiring remedial action will occur. Common issues that will likely need to be addressed as a maintenance activity include:

- leaks, erosion and cracking of earth embankments
- erosion protection repairs
- repair and replacement of PSRA measures
- crest piling repairs
- structure repairs (e.g. replacement flaps, boards, seals etc.)

11.2. The requirements for remedial works will be identified by inspection as outlined in Section 9.

11.3. The *Consultant* will provide ecology advice for any remedial works. This will include assessment and where required mitigation plans.

11.4. The *Consultant* will provide geotechnical of structural designs and advice where necessary for remedial works. This will also include technical and ecological information required to support any required statutory consents.

11.5. Works that improve the level of service or extend the design life of assets will be considered capital works. In such a case a business case will need to be developed and appropriate approvals sought. The *Consultant* may be required to provide scoping information through this contract, however the production of business cases and delivery capital works will generally be provided through separate contracts.

12. Knowledge Sharing

Required deliverables:

Routine	Lead on producing knowledge sharing programme
	Appropriately experienced operatives and managers to contribute to relevant knowledge sharing meetings and site visits.
	Develop a scope and specification for the tender of maintenance delivery beyond 2023.

Specification:

12.1. A key aspect of the collaborative approach to asset management will be cooperation and sharing of knowledge. As part of a successful transition from the Broadland Flood Alleviation Project will be the development knowledge by the *Client* and capture of this within Asset Management Plans. The *Consultant* will support the production of these plans through the sharing of asset and area specific knowledge with the *Client*.

12.2. The *Consultant* will lead on the development and delivery of a knowledge sharing programme. This will include a schedule of discussion meetings, site visits and where appropriate joint working.

12.3. The *Consultant* will coordinate with the *Client* and the contractor to deliver a knowledge sharing programme that achieves the following general outcomes:

a) The *Client* has the knowledge and information to produce costed asset management plans covering routine and capital interventions required to maintain assets in target condition in the short and medium term (next 30 years).
b) The *Client* is able to able to make informed risk based decisions on the operation and maintenance of assets and bid for funding for operational delivery to sustain the current level of service.
c) The *Client* has the information and knowledge to package maintenance works for delivery through internal teams, partner organisations or tender with external suppliers.

12.4. The *Consultant* will coordinate with the *Client* and the contractor to ensure the knowledge sharing programme covers the following specific learning points:

a) How the flood risk systems respond to flood events and how the flood compartments interrelate.
b) Which assets that are most critical or most vulnerable with regard to managing flood risk.
c) Flood events and incident response, lessons learnt from past events.
d) Key relationships, concerns and conflicts within the area. Particularly with regard to landowners/occupiers and associated access to and operation of assets.
e) Operation of all moveable assets and those that are operated by third parties through formal and informal arrangement.
f) The BFAP strategy and where and why this may differ from the typical Environment Agency approach to asset maintenance approach.
g) The BFAP environmental strategy, ecology records and how this has influenced the delivery of improvement and maintenance works delivered through BFAP

12.5. The programme will need to be kept simple and practical with efficiency in coordinating meetings and site visits where possible with delivery of other tasks.

13. Whole Life Assessment

Required deliverables:

Routine	Calculate whole life asset maintenance costs
	Calculate whole life asset carbon emissions

Specification:

13.1. Initial calculations of whole life cost and carbon associated with each asset or appropriate groups of assets (e.g. flood compartment) will be based on the existing maintenance regime. This will provide a baseline.

13.2. Whole life asset costs will include the cost of routine maintenance activities as well as intermittent maintenance activities over the design or anticipated life of the asset and eventual decommissioning or replacement.

13.3. Whole life carbon emissions will include carbon and carbon equivalent emissions associated with the maintenance activities (including material sourcing) as well as intermittent maintenance over the design or anticipated life of the asset and eventual decommissioning or replacement.

13.4. Cost and carbon calculations are to be revised in line with significant programme and asset management decisions. Revised calculations can be compared to the baseline to provide a measure of asset management efficiency.

13.5. All calculations are to be kept simple and logical and must be provided to the Client in MS Excel format.

1. Drawings, site information or reports already available

The *Consultant* has access to asset data, information and documents through the Broadland Flood Alleviation Project. The Broadland Flood Alleviation Project provides the most up to date and comprehensive library of information for FCRM assets in the Broads. All information and documents handed over to the *Client* on completion of the Broadland Flood Alleviation Project will remain available to the *Consultant*.

2. Specifications of standards to be used

As outlined in the Outcome Specification section and associated appendices A1 to A8

4. Constraints on how the *Consultant* provides the *services*

a) The *Consultant* is to work in collaboration with the *Client* and will work within the standards and procedures outlined in the Outcome Specification section and associated Appendices A1 to A8.

5. Requirements of the programme

a) The programme complies with the requirement of Clause 31 and also includes alignment and submission of the BEP and Master Information Delivery Plan (MIDP).
b) The first version of the programme should include the 'routine tasks' as outlined in the Outcome specification section.
c) An overarching operational delivery programme will be managed by the contractor. *Services* provided by the *Consultant* that are critical to operational delivery will need to be programmed in collaboration with the *Client* and the contractor.

d) The programme should be revised monthly to show actual progress and resources used as well as changes to forward programme.

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

a) ASite
b) SharePoint Online site
c) FastDraft

7. Working with the *Client* and *Others*

a) Project team – Others

This project is a collaboration between the *Client,* the *Consultant* and the contractor. The Project team structure and general roles and responsibilities are set out below.

Role		**Description of general responsibilities**
Client	Asset Performance Team	Lead on asset management and be responsible for programme approval, asset performance, engagement and inspections. Includes project Senior User
	Project Manager	Administers the PSC contract. Has oversight of the programme and ensures products are produced to the required quality, time and cost.
Contractor	[redacted]	Responsible for operational delivery including maintenance works, facilities and provision for emergency response.
	Senior Representative	Represents the interests of the contractor and attends progress meetings.
Consultant	CDF Lot 1 supplier Jacobs UK Ltd.	Responsible for technical delivery including design, technical monitoring, programme development, design, ecology advice and asset knowledge sharing.
	Senior Representative	Represents the interests of the *Consultant*; attends progress meetings.

b) Communications

Monthly Progress Meetings:

The *Consultant* is required to attend a monthly progress meeting with the *Client* the contractor. This meeting will include the following:

i. Review latest programme
ii. Health and safety update
iii. Surveys and inspections
iv. Knowledge sharing
v. Early warnings

This meeting is to be attended by the *Consultant's* Senior Representative. The meeting will also be attended by the Senior User and Project Manager on behalf of the *Client*, and the Senior Representative of the contractor.

The duration of the meeting should be approximately 1 hour and is to be held in a meeting room in the collaborative office provided by the contractor. In the event this is not possible a virtual meeting will be held using Microsoft Teams.

Quarterly Commercial Meetings:

The *Consultant* is required to attend a commercial meeting every three months with the *Client* and the contractor. This meeting will include the following:

i. Review latest programme
ii. Review latest forecast and potential efficiencies
iii. Actual carbon, forecast carbon and potential efficiencies
iv. Update and review risk register

The duration of the meeting should be approximately 1 hour and is to be held in a meeting room in the collaborative office provided by the contractor. In the event this is not possible a virtual meeting will be held using Microsoft Teams.

c) Co-operation

As a collaboration between the *Consultant, Client* and the contractor there is a requirement for co-operation as set out in the Outcome Specification section.

d) Co-ordination

As a collaboration between the *Consultant, Client* and the contractor there is a requirement for co-ordination as set out in the Outcome Specification section.

Appendix 1 BIM Protocol – Production and Delivery Table

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