



# **Galway City Surface Water Network - Provision of Consultancy Services for Drainage Assessment, Surveys and Modelling**

## **Service Requirements and Project Brief**

### **July 2026**

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# 1. Introduction

## 1.1 General

Galway City Council (GCC) seeks to appoint a suitably qualified multidisciplinary design team to provide consultancy services encompassing the roles of Designer and Project Supervisor Design Process (PSDP) for the development and application of hydraulic models and the hydraulic assessment of the Galway City surface water network. The commission includes the review of existing data, targeted surveying, hydraulic model development/ upgrades and a comprehensive capacity assessment of the surface water drainage network within the Galway City Council Municipal Area.

The commission will be engineering-consultancy led with responsibility for coordinating all technical disciplines, scoping and managing required investigations, developing and updating models and ensuring full integration of all workstreams throughout the project. Key service elements include data review, survey specification and management, hydraulic model development and network capacity assessment, forming the basis for evidence-led planning and design recommendations.

The primary objectives of the commission include:

- Develop an InfoAsset Database for the project and outline the requirements to build, update and develop a baseline surface water hydraulic model to a moderate to high level of confidence;
- Scope, procure and manage the surveys (on site/ desktop) and data required to address data gaps and support model confidence;
- Update existing hydraulic model and develop a high confidence baseline model using all findings including survey findings;
- Establish the existing hydraulic performance of the network using the updated model and other datasets;
- Assess network capacity to accommodate current flows and future development, including climate change & urban creep allowances, and identify key structural, operational and hydraulic constraints across the system.
- Evaluate improvement options to address identified shortfalls in current and future service levels, and to determine optimum solutions having regard to whole-life cost, environmental performance and operational practicality.

This commission will support:

- GCC capital works planning;
- Network maintenance prioritisation and investment planning;
- Development management and planning assessments;
- Flood-risk mitigation and climate adaptation;

- Sustainable Urban Drainage System (SuDS) and Nature Based Solution (Nbs) integration and optimisation.

The successful applicant (hereafter referred to as the Consultant) shall be responsible for the successful delivery of the services instructed by the Contracting Authority under this Contract, as set out in the Service Requirements document. This Service Requirements document identifies the full range of tasks that may be required; however, the Contracting Authority is under no obligation to proceed with all tasks or stages. The Contracting Authority retains full discretion to determine which elements shall be undertaken during the Contract Period. Fees shall apply only to the tasks, stages and model-development activities actually instructed and delivered. No fees shall be payable for any task not undertaken, and the Consultant shall be deemed to have priced for and taken account of this in their tender submission.

Conversely, Galway City Council may, subject to funding availability, require additional works of a similar scale, nature and complexity to be delivered in the future. Galway City Council reserves the right to utilise this Contract for the delivery of such services, where agreed with the Consultant.

## **1.2 Study Area Overview and Key Drivers**

The study area covers the entire Galway City Municipal Area (boundary shown in red on in Figure 1) as well as other relevant nearby areas and hydraulically connected catchments. This includes:

- All catchments within Galway City including those influencing the Ardaun corridor or any other GCC defined strategic area.
- Any upstream or downstream catchments located outside the municipal boundary but hydraulically linked.
- All surface water assets under GCC ownership or responsibility (e.g. surface water sewers, trunk sewers, critical nodes, gullies, catch basins, inlets, open channels, mechanical devices, separators, retention/ detention basins, cross connections and outfalls);
- Any other relevant assets, including those owned by neighbouring local authorities, Uisce Éireann or stakeholders/ private parties required to maintain hydraulic continuity.

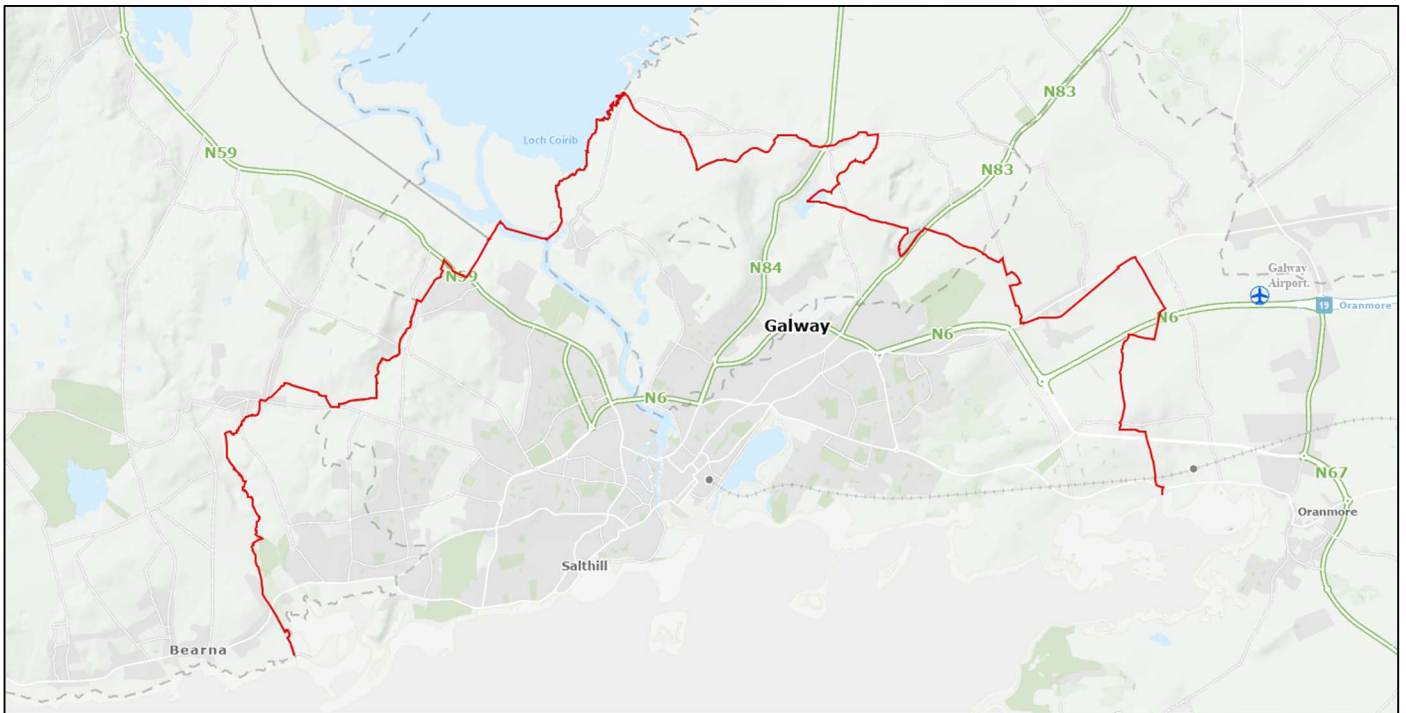


Figure 1: Galway City Municipal Boundary

The key drivers for this Project include the following:

- **Hydraulic Capacity**
  - Several sections of the surface water network are expected to be operating at or close to capacity under existing conditions.
  - Localised surface water flooding has been recorded in various areas, indicating insufficient conveyance, limited downstream capacity or sensitivity to blockage.
  - A high confidence hydraulic model is required to quantify current performance, identify constraints and assess the network’s ability to accommodate future development and climate-change allowances.
- **Structural Condition**
  - Parts of the network are ageing and there is concern regarding the structural integrity of certain assets.
  - Defects, deterioration and infiltration are expected as issues in some locations.
  - A coordinated structural assessment is required to understand condition, prioritise rehabilitation and ensure that structural deficiencies do not compromise hydraulic performance or increase flood risk.
- **Operational Performance**
  - Operational issues including blockages, debris accumulation, misconnections and localised surcharging are occurring across the network.
  - The model must support operational planning by identifying sensitive locations, confirming root causes and informing targeted maintenance strategies.
- **Growth and Development Pressures**

- Galway is experiencing sustained growth and GCC continues to receive significant numbers of connection enquiries associated with Large Residential Developments (LRDs) and planning applications.
- GCC requires a robust evidence base to determine which network sections have available capacity to accept additional flows, where upgrades may be required and how development should be phased to avoid adverse impacts on the receiving network.

### **1.3 Intellectual Property**

In addition to Clause 6 of the Services Contract, the Consultant shall note that all deliverables, data, models, survey outputs and any other materials produced under this commission shall become the intellectual property of Galway City Council. The Consultant shall assign all rights, title and interest in such materials to Galway City Council and shall not reproduce, publish, share or otherwise use them for any purpose outside the scope of this Contract without the prior written consent of Galway City Council.

### **1.4 Existing Data Sources and Model Data Available**

Following contract award, Galway City Council will provide the Consultant with access to existing data. Primary available data sources include:

- Existing Hydraulic Models in InfoWorks ICM and Associated Reports/ Documentation – Refer to Sections 1.4.1 and 1.4.2;
- GIS Information (ArcGIS shapefile format) and AutoCAD data relating to the network;
- Previous reports and data including Galway Sewerage Scheme Report Volumes (2011);
- As-Built data for some existing assets (limited);
- CCTV Survey information for sections of the network (limited);
- Lidar Data – DTM, DSM and Orthophotography (limited).

The Consultant shall also be responsible for obtaining all other relevant data and information required including from stakeholders such as:

- Galway County Council;
- Uisce Éireann;
- Government Departments;
- Land Development Agency (LDA);
- Office of Public Works (OPW);
- Industrial Development Agency (IDA Ireland);
- Central Statistics Office (CSO);
- Major Urban Housing Delivery Sites (MUHDS);
- National Transport Authority (NTA) and Transport Infrastructure Ireland (TII);

- National Parks and Wildlife Service (NPWS);
- Environmental Protection Agency (EPA).

#### 1.4.1 Original Hydraulic Model

A hydraulic model of the Galway and Oranmore sewer networks (surface, foul and combined) was built originally in 2007 and was developed in Wallingford InfoWorks v6.5, using SUS manhole survey data. The model was considered a Type II model **at that time**, as defined in the WaPUG Code of Practice (2002), suitable for identifying hydraulic constraints, assessing CSO performance, and determining requirements for potential network upgrade works. While the model was verified to a high standard at the time of development and was considered reliable for assessing system hydraulic capacity, it is based on legacy modelling standards and does not meet current industry expectations for model accuracy, verification, or data completeness.

As part of the model development, a full manhole survey was undertaken November 2004 and August 2005. This survey covered all manholes within the Galway catchment and recorded cover levels, chamber and shaft dimensions, pipe sizes, and invert levels. Initial model construction utilised SUS2000 GIS datasets, a platform designed specifically for sewer network asset management.

#### 1.4.2 UÉ Model Update

Uisce Éireann developed a verified 2D hydraulic model of the foul/ combined network as part of Stage 2 of their Drainage Area Plan (DAP) process. This model was subsequently updated during Stages 3 and 4 of the process in 2025 using revised sewer records and digitised sub-catchments incorporating population, trade and contributing area data for new developments. **Model data and some elements of the associated InfoNet database (such as the model build reports) will be made available to the Consultant upon Award.**

The model is verified to Type II standard under the *CIWEM UDG Code of Practice for the Hydraulic Modelling of Urban Drainage Systems* for the foul/ combined network, with variable confidence levels across individual catchment areas. While the model is verified, this verification applies only to the foul and combined systems. The model remains primarily focused on these systems, and the surface water network is largely unchanged from the original version (refer to Section 1.4.1), except for targeted updates at specific locations where surface water assets discharge to, or otherwise influence, the combined network.

The updated models were constructed, calibrated, and verified in InfoWorks ICM (2021) in accordance with Uisce Éireann’s modelling specifications, summarised in Table 1 (All available for download at: <https://www.water.ie/iwstandards/explore>). These specifications set out the required data standards, verification criteria, hydrological inputs and model performance requirements.

Table 1: Summary of UÉ Model Specifications

Document Name	Document No
Wastewater Gravity Sewers	IW-TEC-800-01
Wastewater Pumping Stations and Rising Mains	IW-TEC-800-02
Storm Water Overflow	IW-TEC-800-03

Wastewater Network Storm Water Tanks	IW-TEC-800-04
Sewer Rehabilitation Specification	IW-TEC-800-05
Wastewater Network Hydraulic Model Build and Verification Standard	IW-TEC-800-06
Wastewater Network Hydraulic Model Build and Verification Audit Standard	IW-TEC-800-07
Wastewater Network Short Term Flow and Rainfall Survey Standard	IW-TEC-800-08
Wastewater Network Below Ground Asset Survey Data Capture Standard	IW-TEC-800-09
Wastewater Network Sewer Pipe CCTV Survey Standard	IW-TEC-800-10
Wastewater Network Data Collection and Scoping Standard – Drainage Area Planning Stage 1	IW-TEC-800-11
Wastewater Network Risk Assessment and Needs Identification Standard – Drainage Area Planning Stage 3	IW-TEC-800-12
Guidance Note on the Application of Rainfall Data in Wastewater Network Modelling	IW-TEC-800-13
Guidance Note on the Application of Urban Creep and Misconnections Allowances in Wastewater Network Future Modelling Scenarios	IW-TEC-800-14
Wastewater Network Concept Design Approach Standard - Drainage Area Planning Stage 4	IW-TEC-800-16

## 2. Project Scope of Works

### 2.1 Overview

The primary deliverable under this Contract is development of a 2D Type II surface water network model(s), as defined in the *CIWEM UDG Code of Practice for the Hydraulic Modelling of Urban Drainage Systems*. The requirements of this Contract are, in general, analogous to the development of a Drainage Area Plan (DAP) in accordance with Uisce Éireann DAP Stages 1 - 4 but applied specifically to the surface water network and undertaken to a lesser degree of verification appropriate to this commission.

Although the DAP framework formally relates to wastewater systems, the equivalent expectations regarding modelling standards, data quality and general technical processes shall apply to the surface water system for the purposes of this Commission, with verification requirements applied proportionately to the intended baseline-model scope. Accordingly, all services shall be

undertaken in general compliance with the Uisce Éireann DAP Standards listed in Table 1 insofar as those provisions are relevant and applicable to surface water networks.

### **Key Note**

The modelling shall be developed to a high technical standard, following the general principles, structure and good-practice expectations of the CIWEM Code of Practice and Uisce Éireann DAP process.

For this Commission, the baseline model developed is **not** required to achieve full DAP-level verification, and the extent of surveying will **not** match that required for full verification. However, the model shall still adopt the core methodologies, data-quality expectations and modelling workflows set out in the CIWEM Code of Practice and DAP framework. The objective is to deliver a robust, fit-for-purpose and substantive baseline model for Galway City Council that can be expanded, refined and verified further as required. Furthermore, the Options Assessment/Optioneering Stage (equivalent to DAP Stage 4) shall be progressed as a pilot exercise for key interventions rather than producing full DAP compliant outputs (Refer to Section 2.4.7 for more detail).

## **2.2 General Obligations**

### **2.2.1 Summary Duties**

The Consultant and his appointed team shall:

- Perform the role of Designer and Project Supervisor Design Process (PSDP) for the project;
- Review all data including existing drainage models, databases GIS datasets, Lidar Data, survey records and asset information;
- Assess the adequacy, completeness and reliability of available data;
- Identify gaps in network data including new infrastructure locations, connectivity, levels, condition and operational controls;
- Define the scope of required surveys (e.g. CCTV, manhole surveys, level/ depth monitoring, flow monitoring, topographical surveying, Impermeable Area Surveying, GPR etc.);
- Prepare a coordinated survey procurement package;
- Procure and manage the delivery of third-party survey contract(s) & manage any appointed external consultants/ contractors;
- Liaise with key stakeholders including (but not limited to) internal GCC departments, Uisce Éireann and the EPA;
- Update the hydraulic models and databases to an agreed standard suitable for GCC planning and design needs. This is expected to be Type II standard under the CIWEM UDG Code of Practice;
- “Verify” the model(s) using survey and monitoring data and document model confidence;
- Provide clear recommendations on constraints, opportunities and required upgrades;

- Complete hydraulic assessment of the network and optioneering for key risks across both the current timeline and the future design horizon.

Full details of services required are provided in the Sections below.

### **2.2.2 Project Team**

The multidisciplinary team is expected to include expertise in project management, hydraulic modelling, GIS and asset data management, civil/ drainage engineering, survey specification and management, SuDS and climate adaptation. The consultant's project team shall consist of the following expertise as a minimum:

- Project Director:
  - The individual shall have a recognised NFQ Level 8 or equivalent degree and a minimum of fifteen (15) years' experience in management of projects of similar nature, scale and complexity.
- Project Manager:
  - The individual shall have a recognised NFQ Level 8 or equivalent engineering or project management degree and a minimum of ten (10) years' experience in management of projects of similar nature, scale and complexity including drainage projects.
- Civil Design Lead:
  - The individual shall have a recognised NFQ Level 8 or equivalent civil engineering degree, a minimum of ten (10) years' experience in water services and shall be Chartered with Engineers Ireland or equivalent.
- Civil Engineer:
  - The individual shall have a recognised NFQ Level 8 or equivalent civil engineering degree and a minimum of seven (5) years' experience.
- Senior Hydraulic Modeller:
  - The individual shall have a relevant honours degree (Level 8 or international equivalent) in engineering, science or geomatics and a minimum of ten (10) years' experience in the scoping, management and delivery of drainage surveys and hydraulic/network modelling for urban drainage systems.
- Hydraulic Modeller:
  - The individual shall have a relevant honours degree and a minimum of five (5) years' experience in network modelling.
- Senior Technician:
  - The individual shall have a relevant degree and a minimum of ten (10) years' experience in developing engineering drawings in CAD and GIS.

- Technician:
  - The individual shall have a relevant degree and a minimum of three (3) years' experience in developing engineering drawings in CAD and GIS.
- Person Responsible for Project Supervisor Design Process (PSDP):
  - The individual shall have a relevant degree and hold the requisite PSDP training and competency in accordance with the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (Construction) Regulations 2013. The individual shall also have a minimum of 5 years' experience in the discharge of PSDP duties on comparable civil engineering projects.
  - Training completed shall include the satisfactory completion of a structured PSDP course delivered by a recognised professional body or other reputable training organisation.
- Administrator:
  - The individual shall have a minimum of three (3) years' relevant experience.

### **2.2.3 Applicable Standards**

The Consultant shall ensure that all modelling and survey works comply with the most relevant and applicable standards for drainage infrastructure and network model development including but not limited to the standards listed below (note that this list is non-exhaustive).

- Hydraulic Modelling Standards
  - CIWEM UDG - Code of Practice for the Hydraulic Modelling of Urban Drainage Systems.
  - Uisce Éireann Modelling Standards (model build, verification tolerances, QA) - Refer to Table 1 – All freely available for download at: <https://www.water.ie/iwstandards/explore>.
  - TII DN-DNG Drainage Standards (where road drainage interacts).
- Survey & Data Standards
  - All surveys are to be carried out in accordance with the Uisce Eireann Below Ground Asset Survey Data Capture Standard (IW-TEC-800-09).
  - Wastewater Network Short Term Flow and Rainfall Survey Standard IW-TEC-800-08).
  - Wastewater Network Sewer Pipe CCTV Survey Standard IW-TEC-800-10.
  - PAS 128:2014 – Utility detection.

### **2.2.4 Insurance Requirements**

The following insurance requirements are applicable for the Contract:

- Public & Employers Liability - Consultant to hold €6.5m Public Liability Insurance and €13m Employer's Liability Insurance covering Designer and PSDP roles.
- Professional Indemnity Insurance – Consultant to hold €1.25m against each and every claim.
- Insurance policies must indemnify Galway City Council against any claims arising over the Contract Period related to this specific project.
- Equivalent cover for sub consultants - All sub consultants shall maintain the same insurances for the contract duration as above.

### **2.3 Project Stages and Deliverables**

The project shall be delivered in defined stages as set out below. Certain stages may run concurrently and shall be priced accordingly. The Consultant is responsible for delivering all services and tasks within each stage and must obtain GCC approval before progressing to any subsequent non-concurrent stage. As detailed in Section 1, GCC reserves the right to proceed with any, all, or none of the stages, and the Consultant will be paid only for the stages completed.

- Stage 1: Review and Surveying:
  - Stage 1A: Inception.
  - Stage 1B: Data Review and Model Audit.
  - Stage 1C: Targeted Surveys.
- Stage 2: Hydraulic Model Build and Verification.
- Stage 3: Hydraulic Risk Assessment and Needs Identification.
- Stage 4: Pilot - Key Improvement Options Assessment.
- Stage 5: Handover - Final Reporting and Deliverables.

#### **Note on Surveys (Refer to Section 2.4.3 and 2.4.4)**

Both short-term flow surveys (12 weeks) and longer term surveys (26 weeks) shall be undertaken on site. During Stages 1 and 2, the Contractor shall identify and prioritise key survey locations to ensure a continuous cycle of on-site surveying, data validation, model build and verification.

The Contractor shall maintain a programme that ensures uninterrupted progress across survey, validation, and modelling activities. No delay to the programme will be accepted arising from inadequate sequencing, poor survey phasing or ineffective programme management.

The anticipated programme for delivery of each stage of the project is set out in Table 2 below.

**Table 2 Project Stages and Delivery**

<b>Description</b>		<b>Deliverable Date (from Contract Award)</b>
Stage 1A	Inception	1 month
Stage 1B	Data Review and Model Audit	2 months
Stage 1C	Targeted Surveys	10 months
Stage 2	Hydraulic Model Build and Verification	14 months
Stage 3	Hydraulic Risk Assessment and Needs Identification	18 months
Stage 4	Pilot - Key Improvement Options Assessment	21 months
Stage 5	Handover - Final Reporting and Deliverables	21 months

For tendering purposes, the Consultant shall be deemed to have allowed in their Price for an additional six months of general project management and related costs in the event that the project duration is extended. This is reflected in Items 0.1 to 0.7 of the Pricing Schedule. Following this six-month allowance, general items may increase on a pro-rata basis, subject to prior agreement with Galway City Council (GCC).

The specific deliverables and reporting requirements for each Stage are set out in the relevant subsections of Section 2.4. The Consultant shall submit each reporting deliverable initially in draft format. Draft deliverables shall be prepared to a standard that enables the Contracting Authority to undertake an effective and informed review. Unless otherwise agreed, a deliverable shall not be deemed complete until the Contracting Authority has approved the deliverable submission and agreed to progress onto the next Stage.

## **2.4 Detailed Description of Stage Services**

### **2.4.1 All Stages**

The following general items form part of the scope of services for the duration of the Contract and are deemed included within the tendered Price (lump sum fee):

- Compliance with the requirements of the Safety, Health and Welfare at Work Act (2005) and the General Application Regulations 2007.
- The Consultant shall be appointed as Designer and PSDP for the full project duration and shall fulfil all duties under the Safety, Health and Welfare at Work (Construction) Regulations 2013 (as amended).
- The Consultant shall include for in person attendance (GCC Offices) and presentation at a series of half day workshops throughout project lifecycle including:
  - Inception Workshop;

- Model Audit and Survey Scoping Workshop;
- Model Verification Workshop;
- Hydraulic Assessment Workshop;
- Optioneering and Cost Estimation Workshop.
- Meetings:
  - Attendance at fortnightly online progress meetings and routine reporting to Galway City Council.
  - The Consultant shall organise, record and issue minutes for all workshops as well as fortnightly meetings. Minutes shall be issued within 3 days of the meeting.
- Progress Reporting:
  - Monthly progress reports shall be prepared by the Consultant and issued at every second fortnightly meeting, providing clear updates on works completed, design progress and programme status. These shall be submitted a minimum of 2 business days in advance of the meeting being held.
  - The consultant shall prepare and submit financial reports/ updates on a monthly basis to be embedded within the monthly progress reports.
- Programme:
  - The Consultant shall develop a programme in Gantt chart format and present it in MS Project and PDF format. The programme shall clearly set out all timelines and dates for all Deliverables.
  - In the event of any change to scope or cost, the Consultant shall issue an early warning and a notice of change to Galway City Council at least one month in advance and prior to proceeding. Written approval is required before implementing any change in scope, and no additional costs shall be payable unless expressly agreed by Galway City Council.
- The Consultant shall develop a Project Risk Register and maintain it throughout the project. Ongoing Project Risk Assessment and Designer's Risk Assessments shall also be completed, maintained and supported by a Consultant developed template.
- The Consultant shall coordinate and complete consultation with various stakeholders as required including GCC departments, Uisce Éireann and third party stakeholders such as the EPA, NPWS, OPW, NTA, TII, Inland Fisheries, Waterways Ireland, Galway County Council, Developers, LDA etc.
- The Consultant shall be deemed to have included within the tendered Price (lump sum fee) the full cost of complying with this Service Requirements document and all other incidental requirements necessary for the proper execution of the Contract. No claims for additional payment shall be considered on these grounds.
- The Consultant shall be deemed to have included for all expenses (travel, subsidence etc.) associated with this Contract in their tendering price.

- GCC may engage an independent technical specialist to act as Auditor on behalf of GCC during the development and progression of Stages 1 to 3. The Consultant shall be responsible for and have included in his Price (lump sum fee) for engaging with and coordinating the Auditor if required (refer to Section 2.4.5 for more detail).

#### **2.4.2 Stage 1A: Inception**

As part of the Inception Stage, the Consultant shall:

- Attend and participate in an in-person Project Inception / Network Appreciation Workshop at GCC offices. As part of this workshop, the Consultant shall deliver a comprehensive presentation outlining the project including the proposed delivery strategy, project personnel and multidisciplinary team structure, programme, key risks and key opportunities. The Consultant shall also review and discuss previous reports, studies and surveys undertaken within the agglomeration, outline the historical data available, and confirm whether any outstanding relevant data can be provided to the project.
- Develop and submit an updated project programme reflecting the agreed scope and timelines.
- Complete a full site walkover with Galway City Council personnel and relevant stakeholders, focusing on key locations along the network. For tendering purposes, this is assumed to require up to **two full days**.
- Complete an initial desktop study and scoping exercise, including obtaining all relevant data from Galway City Council and others.
- In line with the roles of PSDP and Designer, the Consultant shall prepare and deliver a Preliminary Health & Safety Plan at project initiation stage, to be updated and maintained thereafter. Furthermore, the Consultant shall carry out design risk assessments, taking into account site-specific requirements identified through liaison with the Local Authority and other operations teams (e.g. Uisce Éireann).
- Prepare and issue a Data Request Register/ Log to Galway City Council and maintain it for the duration of the project.

#### **2.4.3 Stage 1B: Data Review and Model Audit**

##### **2.4.3.1 Deliverables During Stage 1B**

This stage shall be treated as analogous to Uisce Éireann DAP Stage 1 (applied specifically to the surface water network) and shall include for data collection, model auditing and a comprehensive review of all available information, including previous network surveys, historic records and any existing hydraulic models. Data Collection and Scoping shall generally be completed in accordance with Chapter 3 of CIWEM UDG Code of Practice for the Hydraulic Modelling of Urban Drainage Systems and Uisce Éireann Wastewater Network Data Collection and Scoping Standard - IW-TEC-800-11.

A summary of documentation deliverables during Stage 1B are detailed in Table 3.

Table 3: Stage 1B Documentation Deliverables

Stage 1B Deliverables
InfoAsset Database
Model Audit Report – Draft and Final

#### **2.4.3.2 InfoAsset Database Development**

All available information including databases, drainage records, model files, GIS datasets and related material will be issued by GCC to the Consultant at project commencement. This data shall be reviewed, checked for fitness for purpose and used (with additions as required) to develop the Stage 1B InfoAsset Database.

Validation of all usable data shall be carried out using the appropriate rules aligned with the Wastewater Network Below Ground Asset Survey Data Capture Standard (IW-TEC-800-09) and the Wastewater Network Sewer Pipe CCTV Survey Standard (IW-TEC-800-10) and other relevant standards.

#### **2.4.3.3 Model Audit**

For this deliverable, the Consultant responsibilities shall include, inter alia, the following:

- Undertake a comprehensive review of all available data including those within the Stage 1B InfoAsset Database as well as records and data relating to services, utilities, ground conditions, levels and gradients etc. The Consultant shall be responsible for sourcing and collating all other available information and data not provided by GCC.
- Evaluate all available models/ data/ modelling reports, GIS, as-built drawings, previous studies, LiDAR and survey data for their accuracy and reliability.
- Identification of data gaps, inconsistencies and issues with the data. Confirmation of model readiness and level of accuracy for hydraulic assessment.
- Produce a Comprehensive Model Audit Report detailing:
  - Data quality.
  - Key assumptions.
  - Proposed model extent.
  - Confidence levels.
  - Gaps and required surveys (if any) for improving the existing model performance and for updating the model.
  - Recommendations and preparation of a Project Execution Plan to guide project progression and next steps.
  - Model risk register.

#### **2.4.4 Stage 1C: Targeted Surveys**

Stage 1C shall include the scoping, procurement, management, contract administration and supervision of all network surveys and other investigative works required to enable progression to subsequent Stages. A summary of documentation deliverables during Stage 1C are detailed in Table 4.

**Table 4: Stage 1C Documentation Deliverables**

<b>Stage 1C Deliverables</b>
Survey Scoping Report
Network Surveys Tender/ Contract Documents – Draft and Final
Network Surveys Tender Assessment Report – Draft and Final
Network Survey Findings Report – Draft and Final

##### **2.4.4.1 Survey Scoping**

Following completion of the Model Audit, the Consultant shall define a targeted survey and further investigation suite based on the findings of the Audit. As detailed in Section 1, the extent of surveying will not match that required for DAP level full verification, therefore, the Consultant shall prioritise key areas and critical assets in the initial phase, with scope to expand as required. This may include network surveys such as manhole surveys, CCTV surveys, flow and rainfall monitoring and other investigative works required to improve model accuracy. The Consultant shall prepare a Survey Scoping Report which shall confirm the list of critical assets to be surveyed, including key pipelines, outfalls and other priority infrastructure addressing:

- Manholes and outfalls on key lines;
- Level/ depth monitoring and flow surveys at strategic locations;
- Impermeable Area Surveys (IAS) or Contributing Area Surveys (CAS);
- CCTV at key locations and where connectivity or condition is uncertain;
- Known problem areas.

The Consultant shall liaise with GCC to confirm the availability and reliability of ‘as-constructed’ and planning drawings for recent developments. All available asset and survey information shall be collated, digitised where required and incorporated into the project database.

##### **Foul and Combined Network**

Where the surface water network is identified as being hydraulically linked to the wastewater (combined or foul) network or watercourse (river or coastal), or where such linkages are suspected, the relevant wastewater/ watercourse elements shall be incorporated into the surface

water model build. Permission shall be obtained from Uisce Éireann before undertaking any surveys on the wastewater system.

#### **2.4.4.2 Model Audit and Survey Scoping Workshop**

Before moving onto survey procurement, the Consultant shall allow for one half-day workshop to present the findings and recommendations of the Model Audit Report and Survey Scoping Report.

While the full scope of surveys required shall be detailed as part of Survey Scoping, the extent of surveys brought forward for procurement shall be agreed at the end of this Workshop.

#### **2.4.4.3 Survey Procurement and Management**

The Consultant shall scope, procure and manage all survey contract(s), acting as Employer’s Representative for all surveys, investigations and studies. All on-site survey and investigative works will be funded directly by GCC.

The anticipated surveys include:

- Manhole surveys - levels, inverts, connectivity and chamber condition;
- CCTV surveys;
- Flow monitoring;
- Level/ depth monitoring;
- Impermeable Area Surveying (IAS);
- Rain gauge installation (if required);
- Topographical survey (of critical overland flow paths);
- Outfall inspections (access, screens, flap valves, tidal influence etc.).

#### **Assumed Survey Quantities**

The Consultant shall set out the rationale for the overall survey approach, demonstrating how the proposed scope aligns with the model requirements and project objectives. The Consultant shall also provide a clear justification for all survey quantities proposed during survey scoping.

While the final number and extent of surveys will depend on the Consultant’s recommendations and findings, for tendering purposes the Consultant shall assume the following indicative quantities for procurement:

**Table 5: Indicative Survey Quantities**

Survey Type	Qty
Short Term (12 weeks) Flow/ Depth Monitors	250
Long Term (26 weeks) Flow/ Depth Monitors.	4

River/ Tide Level Monitors	6
Short Term Rain Gauges (12 weeks)	8
Long Term Rain Gauges (26 weeks)	1
Manhole Surveys	300
Outfall Surveys	10
Impermeable Area Survey, ha (subject to refinement post desktop study)	40
Targeted Topographical Survey, ha	10
Ground Penetrating Radar, km	2
CCTV Survey, km	5

In general, all surveys, associated data and reporting outputs shall be delivered in compliance with the Uisce Éireann Below Ground Asset Capture Standard (IW-TEC-800-09) and all relevant standards detailed in Table 1 (including Wastewater Network Sewer Pipe CCTV Survey Standard, Short Term Flow and Rainfall Survey Standard etc.).

### **Procurement and Management**

For tendering purposes, it is assumed that a single tender process will be undertaken to cover all Network Survey requirements. A four-week tender period shall be assumed and included for in the Consultant's programme. The Consultant shall also allow in their programme for the time required to appoint the contractor and mobilisation to site.

The Consultant shall:

- Prepare all tender documents (including ITT, Contract Conditions, Specifications and Schedules, Form of Tender, Pricing Document, Background Information, Preliminary Traffic Management Plan, Preliminary Safety and Health Plan etc.) using the relevant Public Works Contract forms.
- Upload all tender documentation to the eTenders portal.
- Respond to all eTenders queries from prospective tenderers and issue amendments promptly to avoid extending the tender period.
- Convene an assessment panel with GCC and design team representatives to evaluate tenders in accordance with the Instructions to Tenderers.
- Prepare a comprehensive Tender Assessment and Recommendation Report, detailing the procurement process, evaluation outcomes and recommended appointment.
- Notify all tenderers in writing of the outcome (successful and unsuccessful).
- Issue the Letter of Acceptance to the successful tenderer and obtain all required pre-commencement documentation.

- Finalise appointments and contract documents with the appointed contractor in coordination with GCC.
- Address all queries arising during the tender award stage.

### **Contract Administration and Site Supervision**

The Consultant shall administer and manage the Network Surveys contract and shall act as Employer's Representative, prepare payment certificates and attend monthly progress meetings with GCC and the appointed Contractor. **For tendering purposes, the Consultant is not required to provide a Resident Engineer.**

Key duties during the Construction Stage include:

- Quality checking and validation of all survey data;
- Ensuring and including for modeller on site attendance at critical asset surveys (manholes and outfalls);
- Scoping and ensuring operation of rain gauges ahead of flow surveys;
- Scoping additional surveys where needed or where network issues arise;
- Weekly and monthly review of flow, depth, river and tidal data;
- Liaising with GCC Roads on Traffic Management (including requirements for road opening licences).
- Chair monthly site progress meetings, issue minutes within 3 days, coordinate site supervision staff, visit site monthly, and issue necessary instructions (excluding cost-increasing instructions without approval).
- Ensure high-quality survey outputs and allow sufficient programme time.

The Consultant shall submit an initial draft Network Survey Findings Report once 80% of surveys are complete and the short-term monitoring period has concluded. The final report shall be issued following completion of the long-term monitoring period.

#### ***2.4.5 Stage 2: Hydraulic Model Build and Verification***

This stage shall be treated as analogous to Uisce Éireann DAP Stage 2 (excluding survey procurement and management) in terms of process but applied specifically to the surface water network. As stated in 2.1, the model is not required to achieve full DAP level verification, however, the final model should satisfactorily replicate historical observations and should also be verified with flow data sets. All hydraulic model build and verification activities shall broadly be undertaken in accordance with Chapters 4 & 5 of CIWEM UDG Code of Practice for the Hydraulic Modelling of Urban Drainage Systems and Uisce Éireann's Wastewater Hydraulic Model Build and Verification Standard (IW-TEC-800-06) unless otherwise indicated.

A summary of documentation/ file deliverables during Stage 2 are detailed in Table 6.

**Table 6: Stage 2 Deliverables**

<b>Stage 2 Deliverables</b>
Model Build & Verification Report – Draft and Final
Baseline Model and Associated Files/ Documentation (refer to Chapter 8 of CIWEM UDG Code of Practice & IW-TEC-800-06)

#### **2.4.5.1 Model Update and Verification**

The InfoAsset database developed during Stage 1B shall be updated to incorporate all Stage 1C survey data.

The Consultant shall then develop an updated InfoWorks ICM hydraulic model compliant with the requirements of a 2D Type II baseline model, as defined in the CIWEM UDG Code of Practice for the Hydraulic Modelling of Urban Drainage Systems. At final handover, all completed hydraulic models supplied to Galway City Council shall be provided in InfoWorks ICM format, with all supporting data and information retained within the associated database.

During the model build process, the Consultant shall undertake an initial analysis of the existing urban drainage systems within the study area, using both short- and long-duration design storms. This assessment shall identify hydraulic capacity constraints and the locations and causes of performance deficiencies. These locations shall be cross-checked against existing drainage records, including known flooding locations. The Consultant shall assess compliance and propose solutions to address issues such as frequency of surcharge and frequency of flooding in surface water or linked combined systems.

The Consultant shall undertake a Type II model build and Consultant-led verification of the study area using data collected during Stage 1C and other appropriate available data identified during Stage 1. The build, calibration and verification activities shall generally follow the principles of Chapters 4& 5 of CIWEM UDG Code of Practice for the Hydraulic Modelling of Urban Drainage Systems and Uisce Éireann’s Wastewater Network Hydraulic Model Build and Verification Standard, insofar as they relate to storm testing, event checks and model performance requirements.

The full independent verification process required under the Uisce Éireann DAP is not required as part of this commission. Instead, the Consultant shall prepare and submit a comprehensive Consultant-led Model Build and Verification Report, detailing:

- the verification procedures applied including the calibration process, verification results, model limitations, and justification that the model has achieved a moderate level of confidence consistent with a Type II model.
- the datasets used;
- the confidence levels assigned in accordance with CIWEM verification processes (refer to Chapter 6 of the CIWEM UDG Code or Practice); and

- all assumptions, limitations and deviations.

For the purposes of tendering the Consultant shall assume that Model verification procedures shall include storm event verification, dry weather flow verification (where applicable) and historical flood verification. As a minimum, the Consultant shall:

- Demonstrate that the model reproduces known flooding and surcharge locations and reflects recorded network performance.
- Delineate the Study Area into Subcatchments and verify each subcatchment using all available rainfall, flow and depth monitoring data.
- Verify monitored storm events using rainfall and flow/depth data, demonstrating satisfactory agreement between observed and simulated hydrograph shape, peak flow, timing of peaks, water levels and flow rates.
- Verify dry weather flows, where monitoring data is available and document any limitations where such data is unavailable.
- Indicate the level of confidence achieved for each verified subcatchment, including justification for any deviations from expected performance.
- Document all limitations arising from gaps in monitoring data or uncertainties in model inputs. Where the required level of verification cannot be achieved due to limitations in the available data, the Consultant shall identify the reasons, quantify the implications for model confidence, and recommend any additional monitoring or investigations necessary to achieve the required confidence level.

Once the baseline model has been updated to the agreed verification standard, the Consultant shall undertake a review and simulation performance assessment to ensure that:

- it is fit for purpose;
- it is properly initialising (any initialisation issues shall be corrected); and
- there are no modelling inconsistencies (any inconsistencies shall be corrected).

Copyright on the model and all data used to create it, including all developmental scenarios, shall become the sole property of GCC upon completion of the study.

**Following submission of all information, Galway City Council may procure an independent auditor to review the model and reports and provide minor recommendations for improvement. The Consultant shall consider these recommendations and allow for their incorporation within the Price (lump sum fee).**

#### **2.4.5.2 Model Verification Workshop**

The Consultant shall allow for one half-day workshop at the Local Authority offices to present the findings and recommendations of the Model Build and Verification Report, together with the Auditor's recommendations and an explanation of how the Consultant has addressed and complied with these.

### **2.4.6 Stage 3: Hydraulic Risk Assessment and Needs Identification**

This stage shall be treated as analogous to a simplified Uisce Éireann DAP Stage 3 applied specifically to the surface water network. Services for Stage 3 shall generally be undertaken in accordance with Chapter 7 of CIWEM UDG Code of Practice and Uisce Éireann's Wastewater Network Risk Assessment and Needs Identification Standard.

A summary of documentation/ file deliverables during Stage 3 are detailed in Table 7.

**Table 7: Stage 3 Deliverables**

<b>Stage 3 Deliverables</b>
Hydraulic Risk Assessment and Needs Identification Report
Needs Models (Current and Future) and Associated Files/ Documentation (refer to Chapter 8 of CIWEM UDG Code of Practice & IW-TEC-800-06)

#### **2.4.6.1 Current and Future Model Needs Assessment**

The Consultant shall use the Current Model (i.e., the verified base model) to develop both a Current Needs Model and a Future Needs Model. To do this, the Consultant shall:

- Delineate the Study Area into hydraulically linked Sub catchments for subsequent assessment. Note that this process should already have commenced as part of model verification.
- Hold a Needs Meeting with the Local Authority:
  - This meeting shall include discussion and agreement on current catchment issues and risks, anticipated growth within the city, proposed developments and expected increases & distribution of impermeable areas across the city for inclusion in the Future Needs Model.
- Evaluate Future Growth and Impermeable Area Changes:
  - The Consultant shall review the most up-to-date statutory planning documents, including the Galway County and Galway City Development Plans (and Draft Plans), the National Planning Framework, the Regional Spatial and Economic Strategy and any relevant Local Area Plans or Urban Framework Plans. This review shall identify land-use policies, zoning objectives and anticipated development patterns within the study area to inform future loading and network performance assessments.
  - The Consultant shall also have regard to other key national guidance documents, including the Sustainable Residential Development and Compact Settlements

Guidelines for Planning Authorities, together with any other relevant Government publications that influence development form, density and infrastructure demand.

The Consultant shall submit draft versions of both the Current Needs Model and the Future Needs Model following completion of all standard stability-check model runs, for review and approval by the Local Authority.

#### **2.4.6.2 Risk Analysis**

The Consultant shall assess both the Current Needs Model and Future Needs Model surface water networks using a full suite of design storm events (e.g., M560, FEH13, FSU etc.), covering return periods from 1 year up to 100 year. An appropriate range of storm durations shall be applied (typically 15, 30, 60, 90, 120, 180 and 360 minutes) to ensure peak system response is captured.

The specific return periods and storm durations to be used in the modelling shall be agreed with GCC during Stage 3 initiation, however, for tendering purposes, the Consultant shall be deemed to have allowed for the following indicative suite of design storm events and durations:

- Return periods: 1-year, 5-year, 10-year, 20-year, 30-year, 50-year and 100-year
- Storm durations: 15, 30, 60, 90, 120, 180 and 360 minutes

Each return period shall be assessed across the full range of storm durations.

#### **2.4.6.3 Risk Priority List**

The Consultant shall use the Current Needs and Future Needs models to assess all flooding, surcharge and other risks in both the current and future systems, generate a risk priority list and identify needs for current and future development horizons.

The following events/ modelling scenarios shall be evaluated for both the base and future models, using the full range of storm durations. The results of these shall be presented to GCC during progress meetings.

- 1-year return period - surcharge assessment;
- 5-year return period - surcharge assessment;
- 20-year return period - surface flooding;
- 30-year return period - surface flooding;
- 50-year return period - surface flooding;
- 100-year return period - surface and property flooding;
- 100-year + climate change (30% uplift for climate change) - future model only;
- 100-year + climate change + urban creep (30% uplift for climate change and 10% for urban creep) - future model only;
- Blockage scenarios - screens, culverts, outfalls and critical nodes at locations agreed with Galway City Council.

A priority list shall be established within the *Hydraulic Assessment and Needs Identification Report*, detailing all primary and contingency risk locations and the rationale for their inclusion. Unless justified by significant flooding or an exceptional localised risk, locations shall not be defined as single nodes. Instead, they **risk locations shall be identified as discrete hydraulic risk areas**, comprising hydraulically linked elements where flooding or surcharge is driven by a common root cause. Each risk area shall represent a meaningful cluster of model nodes, assets or network segments that collectively exhibit a performance deficiency, rather than isolated point locations, except where a single node demonstrably presents a standalone high-risk condition.

For tendering purposes, the Consultant shall allow for the identification and assessment of 40 primary flood-risk locations (discrete hydraulic risk areas) in the current system, 40 primary flood-risk locations (discrete hydraulic risk areas) in the future system, and an additional 10 contingency locations for each (i.e., 50 locations in current conditions and 50 in future conditions). These locations shall reflect areas where flooding volume, likelihood, consequence and network criticality indicate elevated risk. The Consultant shall clearly justify why each location has been identified as a primary risk location (discrete hydraulic risk area), including consideration of:

- flooding volumes and likelihood;
- the importance or sensitivity of the flooding location;
- potential impacts on property, infrastructure, or operations;
- root causes of the identified risks.

#### **2.4.6.4 Hydraulic Risk Assessment Report**

The Hydraulic Risk Assessment and Needs Identification Report shall include, at a minimum, the following:

- Introduction & Executive Summary;
- Background Information - description of existing network, data sources, surveys, model build summary and relevant planning context;
- Priority Risk List - a consolidated list of hydraulic risk areas for both current and future horizons, including clear justification for each location selected (e.g., flooding volumes, likelihood, consequence, criticality, and root cause);
- Flooding Volume Tables - current and future flooding volumes and locations for all modelled scenarios, provided in Excel and GIS shapefile formats;
- Surcharge & Flooding Maps - current and future surcharge and flooding extents for all scenarios, provided in AutoCAD and GIS shapefile formats;
- Outfall Performance Assessment - performance of major outfalls under peak conditions, including constraints, tidal influences (where relevant) and any operational issues;
- Residual Capacity Analysis - identification of spare hydraulic capacity available to accommodate future development and strategic growth;

- Needs Identification – both summary and detailed information of required upgrades, extensions, operational improvements and strategic interventions arising from the risk assessment;
- Climate Change Impacts - assessment of climate-adjusted scenarios (e.g., 30% uplift) and implications for future system performance;
- Blockage Scenario Findings - results of blockage testing at screens, culverts, outfalls and critical nodes, including sensitivity analysis;
- Appendices - including, but not limited to:
  - Current and Future Needs Models in InfoWorks ICM format;
  - Survey data and verification checks;
  - Detailed flooding and surcharge outputs
  - Any supplementary calculations, assumptions, or GIS layers

#### **2.4.6.5 Hydraulic Assessment Workshop**

Before progressing to the Option Assessment / Optioneering Stage, the Consultant shall allow for one half-day workshop to present the findings and recommendations of the Hydraulic Risk Assessment and Needs Identification Report.

The extent of optioneering shall be agreed at the conclusion of this workshop.

#### **2.4.7 Stage 4: Pilot - Key Improvement Options Assessment**

This stage shall be treated as directly analogous to a simplified Uisce Éireann DAP Stage 4 applied to surface water network and will involve optioneering improvement plans and intervention studies to address the network needs. Services for Stage 4 shall include general works undertaken in accordance with Uisce Éireann’s Wastewater Network Concept Design Approach Standard - Drainage Area Planning Stage 4 (IW-TEC-800-16) and Chapter 7 of CIWEM UDG Code of Practice. **Note that this stage is intended only as a pilot exercise and a full suite of intervention development is not required. Only a small, itemised set of the most critical risk locations (discrete hydraulic risk areas) will be progressed to intervention/ improvement option assessment.**

A summary of documentation/ file deliverables during Stage 4 are detailed in Table 8.

Table 8: Stage 4 Deliverables

Stage 4 Deliverables
Improvement Options Assessment Report and Maps
Preferred/ Recommended Interventions Models (Current and Future) and Associated Files/ Documentation (refer to Chapter 8 of CIWEM UDG Code of Practice & IW-TEC-800-06)

#### **2.4.7.1 Risk Intervention/ Improvement Options Overview**

Based on the Priority List developed during Stage 3, the Consultant shall identify and test feasible intervention options at key risk locations. For tendering purposes, the Consultant shall allow for intervention assessment of the top 10 current risk locations (discrete hydraulic risk areas) and the top 10 future risk locations (discrete hydraulic risk areas) identified in the Priority List. Interventions shall address:

- Current system needs, where improvements, rehabilitation works or network strengthening are required to resolve existing deficiencies and/or accommodate new development.
- Future strategic needs, where larger-scale drainage infrastructure is required to support future land-use requirements, taking account of the capacity and limitations of the existing networks and other factors.

Interventions may include:

- Pipe network upsizing;
- New pipelines;
- Local storage;
- Flow controls;
- SuDS retrofits (swales, basins, permeable paving, wetlands);
- Structural repairs;
- Outfall upgrades.
- Targeted maintenance (desilting, jetting, root removal, infiltration reduction).

#### **2.4.7.2 Intervention/ Improvement Options Development Steps**

The following steps shall be adopted at the key risk locations:

- The Consultant shall undertake an investigation of failure mechanisms. The top 10 current-risk and top 10 future-risk locations (discrete hydraulic risk areas) from the Priority List shall be assessed for interventions as a pilot study.

- The proposed interventions for each risk location shall be discussed and agreed at the progress meetings. The Consultant shall also consider opportunities for cost efficiencies by addressing multiple risks through strategic or hybrid solutions.
- A minimum of three technically feasible options shall be developed by the Consultant for each risk location. Interventions shall then be developed, with consideration given to phasing, sequencing and integration of solutions.
- Each technical solution shall be evaluated and costed on a Whole Life Cost basis, using an independent cost estimate prepared by the Consultant. Costs shall include allowances for statutory consents, land and wayleave acquisition and planning considerations. All cost assumptions shall be clearly stated. Independent Cost Estimate Requirements shall include:
  - Cost estimates shall be based on unit cost × quantity and a clear breakdown of unit cost composition shall be provided;
  - Where possible, costs shall be informed by recent tender submissions and quotations from suppliers, manufacturers or service providers.
- The Consultant shall deliver a presentation summarising the technical solutions and recommended interventions/ improvement options for each risk location.

#### **2.4.7.3 Improvement Options Assessment Report**

An Improvement Options Assessment Report and associated maps shall be prepared. Each intervention/ improvement option shall consider and provide information on:

- Hydraulic benefit;
- Flooding/ surcharge benefit;
- Operational and structural benefit;
- Cost estimate prepared using the Independent Cost Estimate;
- Constructability and environmental considerations (brief summary);
- A3 maps of recommended upgrades and extensions required to address flooding. All maps shall be provided in PDF (A3) and ArcGIS formats;
- Summary tables identifying capacity constraints and upgrade works required;
- Relevant Appendices.

#### **2.4.7.4 Optioneering and Cost Estimation Workshop.**

The Consultant shall allow for one half-day workshop to present the findings and recommendations of the Improvement Options Assessment Report.

#### **2.4.8 Stage 5: Handover - Final Reporting and Deliverables**

As part of Stage 5 (Handover), the Consultant shall provide the finalised versions of all reports and deliverables. This shall include as a minimum the following:

- Final InfoAsset Database
- Reports
  - Final Model Audit Report;
  - Final Survey Scoping Report;
  - Final Network Survey Findings Report;
  - Final Model Build and Verification Report ;
  - Final Hydraulic Risk Assessment and Needs Identification Report;
  - Final Improvement Options Assessment Report and Maps.
- Finalised ICM Models, Files and Supporting Information (including those listed in Chapter 8 of CIWEM UDG Code of Practice, IW-TEC-800-06 etc.):
  - Baseline “Verified” Model;
  - Current Needs Model;
  - Future Needs Model;
  - Current Preferred Interventions Model;
  - Future Preferred Interventions Model.
- Finalised GIS Deliverables corresponding to all model stages (Baseline, Current Needs, Future Needs, Current Preferred Interventions, Future Preferred Interventions);
- Finalised Executive Summary and Presentation for Key Stakeholders and Elected Members. As part of this the Consultant shall include for attendance at and presentation of the project to Elected Members and key stakeholders at a plenary meeting or similar meeting of the Council.