

Inland Fisheries Ireland

River Dodder Barrier Mitigation Project

Topography and Bathymetry survey specification

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Contents

1.	Introduction	1
1.1	Scheme Background	1
1.2	The Parties	1
2.	General Requirements	2
2.1	Site Locations	2
2.2	Survey Extents	3
2.3	Survey features	3
2.4	Access	3
2.5	Working Hours	4
2.6	Survey Programme	4
2.7	Health and Safety	4
2.8	Confined Spaces	4
2.9	Use of Drones and Boats	4
2.10	Safety Statement	4
2.11	Hazard and Risk Assessment	5
2.12	Environmental	5
2.13	Photographs	5
3.	Scope of Works	6
3.2	In Channel Survey – Channel cross sections	7
3.3	In Channel Survey – Additional cross sections downstream	8
3.4	Break of Slope survey	10
3.5	Topographic survey - Structures	11
3.6	Topographic Survey - Top of Bank survey	15
3.7	Topographic Survey – additional areas	15
3.8	Survey Control	17
3.9	Survey Accuracy	18
3.10	Method Statement	18
3.11	Traffic Management	19
4.	Survey Deliverables	20
	Appendix A – Cross Sections based survey location	22
	Appendix B – Notification letter for Access	25
	Appendix C – Break-of-Slope survey location	26
	Appendix D – Top of Bank survey – areas not included	29
	Appendix E - Additional areas for topographic survey	32

1. Introduction

1.1 Scheme Background

Inland Fisheries Ireland (IFI) has commissioned Arup to deliver the River Dodder Barrier Mitigation Project through to the completion of the statutory approval process. The River Dodder, a major urban tributary of the River Liffey, has been heavily modified by the construction of multiple historic weirs, many of which are now redundant. Collectively, these structures act as significant barriers to the free movement of fish and have altered the river's natural sediment and hydromorphological processes. The project seeks to address the legacy and impact of these structures through barrier mitigation and river restoration.

Arup through its delivery of the Integrated Consultancy Services will bring together fisheries, ecology, fluvial geomorphology, hydraulics, civil and structural engineering, planning, environmental assessment and heritage expertise to develop robust and deliverable interventions and mitigations for each of the six weirs considered in this project.

The Project identified six weirs in the south of Dublin between Dartry and Clonskeagh which pose an impediment to the longitudinal connectivity for key migratory species: these include but are not limited to Atlantic Salmon (*Salmo salar*), sea trout (*Salmo trutta trutta*), European eel (*Anguilla Anguilla*) and Lamprey sp. The weirs also alter the natural hydromorphology and sediment transfer of the river. The aim of the Project, as identified in the brief, is to mitigate or removes these barriers to improve fish passage, restore more natural river processes, and deliver wider biodiversity and amenity benefits in line with national and EU policy objectives.

The weirs included in the Project are presented in the table below:

Table 1-1 Description of the weirs of the Project

Name	Material	Hydraulic head	Crest width	Historical purpose
Dropping Well Weir	Masonry	Circa 2.66 m	38 m	Cloth mill and laundry
Milltown Weir	Masonry	Circa 2.08 m	36 m	Iron works
Milltown Drop Weirs (x2)	Masonry / concrete	Circa 0.38 m	10 m	Indeterminate
Smurfit Weir	Masonry	Circa 2.08 m	38 m	Smurfit Papermills
Beaver Row	Limestone bedrock and built structure	Circa 3.65 m	45 m	Mills and laundries

1.2 The Parties

The Parties are defined as follows:

1. **Landowner** – the organisation(s) or individual(s) that own the land where the Survey is to be undertaken.
2. **Client** - the organisation for whom the use of the Survey is ultimately being procured for. This may/may not be the same as the Owner, or Employer.
3. **Employer** - the organisation that is contracting with the *Surveyor* for this Scheme. This may or may not be the same as the Client, or Owner.
4. **Surveyor** - the organisation employed by the *Employer* to execute the Survey as defined in this Specification.
5. **Employer's Representative** - the technical advisor employed by the Client to prepare this Specification and point of

contact for technical queries from the *Surveyor*.

The Parties, their key contact person and contact details where applicable are defined below:

Table 1-2 Parties and key contact persons

Party	Organisation	Contact Person	Role	Email
Client and Employer	Inland Fisheries Ireland	Marguerite Murphy	Project Director	Marguerite.Murphy@fisheriesireland.ie
		James McHale	Project Manager	James.McHale@fisheriesireland.ie
Landowner	Dún Laoghaire Rathdown County Council	TBC Post-tender	TBC Post-tender	TBC Post-tender
	Dublin City Council	TBC Post-tender	TBC Post-tender	TBC Post-tender
	Milltown Golf Course	TBC Post-tender	TBC Post-tender	TBC Post-tender
	Smurfit Papermills site	TBC Post-tender	TBC Post-tender	TBC Post-tender
Employer's Representative	Ove Arup & Partners Ireland Ltd t/a Arup	Brian Sexton	Project Director	Brian.Sexton@arup.com
		Alistair Lobban	Project Manager	Alistair.Lobban@arup.com
Surveyor	TBC – Successful tenderer	TBC – Successful tenderer	TBC – Successful tenderer	TBC – Successful tenderer

2. General Requirements

2.1 Site Locations

The survey will be carried out along the river Dodder in the south of Dublin City. The survey will span from 400m downstream of Beaver Row Weir to 400m upstream of Dropping Well Weir.

The locations of the weirs in south Dublin City are shown in Figure 2-1.

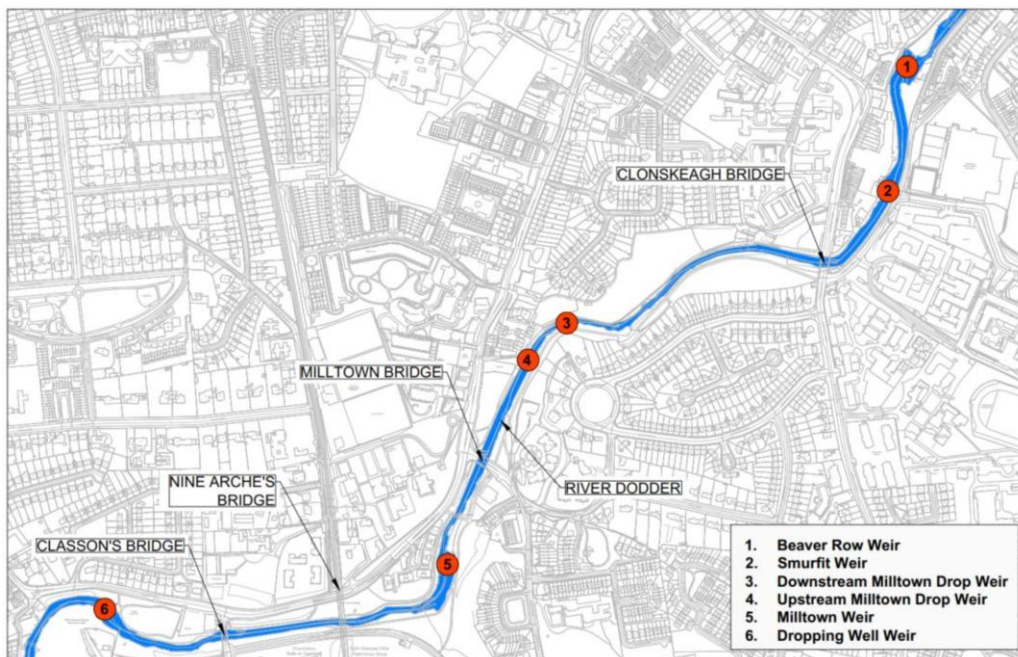


Figure 2-1 Location of weirs in South Dublin (Source: IFI)

2.2 Survey Extents

The Survey extents are demarcated in the areas indicated in the survey drawings, comprising everything within the indicated boundaries shown. When the boundary of the survey appears to be on a fence line or similar demarcation, the boundary feature shall also be surveyed. The survey drawings are included in Appendix A.

It is recommended that the *Surveyor* visits these areas with prior Landowner approval, prior to commencement of the survey to provide visual and verbal confirmation of the work required. If the Landowner is not identified, the *Surveyor* shall carry an *Authorised Person* letter, provided by the *Employer*.

2.3 Survey features

Alongside all specified survey elements listed in Section 3, the *Surveyor* shall record all the following features:

- All natural and manmade features.
- Softscape: Any plant, type, approximate height, diameter and trees' trunks calliper/diameter.
- Culverts (invert level, soffit level)
- Top and bottom of walls, width of walls.
- Headwalls (width and both edges of structure)

Trash screens (details such as bar size, bar spacing and trash screen, plan position and levels of the top and bottom rails of any screens)

- Roads, tracks, footpaths (Street names, curb line or edge of surfacing to carriageways, steps, pedestrian crossings, traffic islands, parking or amenity areas, poorly defined or overgrown bridle path, driveways, footways, footbridges).
- Street furniture (electricity poles, lighting columns, traffic signals, road signs, gullies, manhole covers, etc.).
- Buildings (outline, names or numbers of plots and threshold elevation).
- Boundary features (fences, gates, walls, hedges, etc.).
- Location and line of any overhead electrical utilities.
- Slopes and earthworks (cuttings and embankments, quarries, refuse tips, cliffs, etc.).
- Types and dimensions (internal and external) of each manhole type and invert levels.
- The feature name printed on the ground or on object of any surface feature such as manholes, poles, etc.
- Colours, thicknesses, and gaps (if any) are to be mentioned for all pavement markings for airside and landside.

2.4 Access

The *Surveyor* is to allow for liaison with the relevant landowners and shall allow for distributing a notification letter in the form set out in Appendix B as appropriate to all affected properties as detailed on the drawings. The *Surveyor* must endeavour to foster good relations with all parties throughout the survey period.

When tendering, the *Surveyor* is responsible for assessing site specific access constraints. They shall ensure that such access prioritises the safety of their operatives and users of the site. As part of this, the *Surveyor* shall also satisfy both themselves and the *Employer* that equipment can be used safely and recovered. Where vegetation clearance is required, it is to be agreed with the *Employer*. Consideration should be given to environmental and ecological protections and constraints

2.5 Working Hours

Works shall normally be permitted between 0800-1800, Monday to Friday inclusive. Working days are normally deemed to be Monday to Friday inclusive, excluding public holidays. Should the *Surveyor* wish to deviate from this, it should be brought to the attention of the *Employer* in advance.

The *Surveyor* shall note that due to the existing traffic arrangements, restrictions imposed by Landowners, An Garda Síochána or the various local authorities traffic departments, out of hours (weekend or nighttime working) may be required. Should out of hours working be envisaged, the *Surveyor* shall inform the *Employer* not less than six working days prior to the proposed works being undertaken.

The *Surveyor* shall allow for all costs associated with out of hours working in their tendered rates and prices.

2.6 Survey Programme

The approximate key dates associated with the survey programme are shown below. Programme is of critical importance on this project and the survey must be completed efficiently and expediently. Please refer to Section 3.10.2 where it is requested to outline the proposed survey programme as part of the tender submission.

Tenders to be submitted by: 18th September 2026

Envisaged appointment by: 2nd October 2026

2.7 Health and Safety

The Safety, Health and Welfare at Work Act, 2005 places obligations in regard to health and safety at work on employers and employees.

The attention of Tenderers is drawn to the obligations arising under the relevant clauses of the Safety, Health and Welfare at Work (General) Regulations 2007 (SI No. 299 of 2007) (as amended).

All roadways, bridges etc. will remain live during the inspection; therefore, the *Surveyor* should organise the survey during a suitable weather window. The *Surveyor* should be particularly aware of working in close proximity to water, live traffic lanes and open footpaths or Greenways.

The Tender Price shall include all costs, which may be incurred by the successful Tenderer in complying with its obligations pursuant to the 2005 Act and the relevant safety regulations and codes of practice.

2.8 Confined Spaces

It is possible that a portion of the survey work to be undertaken may fall under the provisions of the Safety, Health and Welfare at Work (Confined Spaces) Regulations 2001 (SI No. 218 of 2001). If so, *Surveyors* undertaking this work must comply with these regulations and be suitably qualified to undertake the work. It is the responsibility of the *Surveyor* to ensure compliance in this regard.

2.9 Use of Drones and Boats

2.10 Where the *Surveyor* proposes to use drones or boats for the completion of the survey work, they shall ensure that all equipment is safe for use and fit for purpose. If utilising either boats or drones, it shall be a requirement that they comply with all relevant regulations that govern their use. Equipment shall only be operated by trained personnel. Safety Statement

Prior to the commencement of survey work, the *Surveyor* shall provide an up-to-date Safety Statement, in accordance with the Safety, Health and Welfare at Work Act, 2005.

2.11 Hazard and Risk Assessment

The *Surveyor* shall carry out hazard and risk identification across all survey areas prior to the commencement of survey works. The *Surveyor* shall also propose and implement measures to remove, reduce or mitigate the risks associated with the identified hazards.

The *Surveyor* shall remain vigilant of hazards and risks while on site during the completion of works, recognising that these may change from what was originally identified, and may require the adoption of additional mitigation measures where appropriate.

2.12 Environmental

The *Surveyor* should note that invasive species have been previously identified in some areas to be surveyed, namely Himalayan Balsam and Japanese Knotweed. It shall be the responsibility of the *Surveyor* to ensure that their proposed method of works minimises the risk of further spread of these species, or any other invasive species encountered. The *Surveyor* shall, at a minimum, ensure that:

- All staff are made aware of the potential presence of invasive species;
- All staff are made aware of how to identify invasive species while undertaking their work;
- Equipment is to be cleaned prior to moving location.

2.13 Photographs

Photographs are to be taken in the locations as specified in this Specification.

Surveyors shall take photographs of the following features, in the following locations:

1. All along the surveyed length of the river:
 - Utility Covers: manholes, drain gullies, and inspection chambers, including close-ups of cover labels.
 - Water Features: The exact edges of streams, rivers, or ponds, including photos of any headwalls, outfalls, or watermarks.
2. Within 100m of weirs:
 - Weirs: wide-angled photographs of the weirs, and close ups of
 - Grade Breaks: Locations where the slope significantly changes (e.g., tops and toes of embankments, edges of ditches, or steep slopes).
 - Trees and Root Systems: Significant trees, especially those requiring a Tree Protection Zone.
 - Access Points: Gates, dropped curbs, and potential entry points for heavy machinery.
3. At each weir:
 - Wide-angled photographs of the weirs, to show the general character of the surroundings.
 - Close-up shots of areas of undercutting caused by degradation of the weir, areas of visible damage, and changes in construction materials.
4. At every cross-section:
 - Site Overview: Wide-angle panoramic shots of the whole site to show the general character and surroundings.

All photographs are to be provided in a digital format (jpeg), must be in focus and must be of adequate quality to fully describe the features of the subject.

All photographs shall be georeferenced to Irish Transverse Mercator (ITM) to match the wider survey deliverables. They should also be labelled to provide details of what section/location they refer to and the direction in which the photograph was taken.

Photographs shall not include identifiable persons unless those persons have given express written permission to be photographed. Where permission is obtained, it is the *Surveyor's* responsibility to comply with all requirements of the EU general Data Protection Regulations.

In public areas, photographs should avoid including members of the public where possible.

3. Scope of Works

The Scope includes, but is not limited to, the detailed survey of the areas indicated on the survey drawings, shown in Appendices A, C, D and E.

The Scope includes:

- Break of Slope survey – bathymetric and topographic
- In channel survey – channel cross sections
- Topographic Survey – Structures
 - Weirs
 - Bridges
 - Miscellaneous
- Topographic Survey - Top of Bank survey
- Topographic Survey – additional areas (including access routes and potential compound areas)

The *Surveyor* shall allow for returning to site on one occasion following completion of the fieldwork to validate levels in the presence of the *Employer's Representative*.

The Scope also includes liaison with the various relevant authorities, landowners and utility service providers with respect to access to lands and temporary traffic management arrangements as required.

The results of this survey will be used as a basis for the detailed design of the River Dodder Barrier Mitigation Project. The survey results produced by the *Surveyor* shall be suitable for use as reliable data for detailed design and construction.

The *Surveyor* shall employ appropriately skilled and experienced personnel and sub-contractors to carry out works of the nature described in this Specification and who are both experienced in and competent to liaise with the relevant local authorities, landowners and utility service providers.

The *Surveyor* shall make adequate resources available to meet the programme deadlines.

The full list of deliverables that form the core requirement of this instruction is outlined in Section 4.

This section provides quantities of the scope deliverables for each survey category. Where items additional to the quantities listed are required during the surveying, they shall be paid for based on pro-rata rates using the listed quantities in this Specification and the sum tendered for each item.

3.1.1 Pilot Weir survey deliverable

The *Surveyor* shall complete the survey at the Dropping Well Weir, process the data, and issue the post-processed data (in line with the deliverables outline in Section 4) to the *Employer* without delay. Surveying of the other weirs can continue while this data is being processed and reviewed. The pilot weir survey shall extend 100m upstream and downstream of the weir. This is to confirm that the survey outputs are complete and comply with this Specification. This review is intended to identify any issues with survey pick-up, feature coding, labelling, drawing presentation or deliverable format while the *Surveyor* remains mobilised on site. The *Surveyor* shall take account of any reasonable comments received when completing the remaining survey works.

3.2 In Channel Survey – Channel cross sections

Cross sections will be recorded generally at 50m intervals, from the first cross section shown in Figure 3-1. Cross sections may be recorded within a range of 40m to 60m distance from each other if otherwise impractical or unsafe, or if they better capture the profile of the river, up to the discretion of the *Surveyors*. The number of cross sections should be between 56no and 62no.



Figure 3-1 First cross section of cross-section based survey

In addition to the cross sections described prior, cross sections are to be recorded 10m upstream of the upstream edge of each weir and bridge, for a total of 14no cross sections (6no weirs and 8no bridges).

The extent of the cross sections based survey is shown in Appendix A.

The survey of the required river channel cross-sections should be undertaken so as to accurately describe the hydraulic characteristics of the channel and out of bank survey points.

- Cross-sections will be surveyed perpendicular to the flow direction (for river channels, this will be perpendicular to the direction of the banks; for floodplains, it will generally be perpendicular to the general direction of the valley).
- Cross sections will extend to 10m beyond the top of the bank on either side of the river.
- All elevations and cross-sections shall be plotted as viewed from upstream to downstream.
- Cross-section offset will increase from left to right looking in the downstream direction. Channel offset is taken from left hand extreme of cross section, therefore all offsets will be positive.
- The hard and soft bed is to be identified where possible and labelled.
- The number of survey points in any cross section must be sufficient to describe changes in the shape of the cross section and include an adequate number of survey points appropriately located across the cross section to permit accurate representation of the channel geometry and hence conveyance within a hydraulic model. Generally, the distance between consecutive points should not exceed 2m. The vertical

difference in level between consecutive points out of channel should not exceed 0.2m. On steep banks, recordings should be made at not greater than 5m intervals, providing the gradient of the slope between the points is constant. At the point where the cross section finishes a note should be included on the drawing to give details of the general description of the land beyond this point (i.e. what happens next).

- The elevations and diameters of pipes / outfalls discharging into the watercourses which are readily visible above or below the waterline should be surveyed, subject to a minimum diameter of 300mm. Where an outfall of any diameter is flapped, it shall be considered to provide a flood defence function, and the pipe diameter, invert level, flap width and flap height shall be recorded, and the pipe identified as such. It is not expected that any underwater inspection is required to locate outfalls.
- The river water level, time and date shall be recorded at the time of survey of each cross section and structure. This is to be labelled on the drawings.
- To assist the modellers in assigning roughness coefficients during the construction of the hydraulic models, the nature of the riverbed material and vegetation should be recorded at each cross section, and labelled accordingly on the drawings (e.g. silt, gravel, concrete, heavy weed, etc). Similarly, the nature of the bank / floodplain ground cover should be recorded and labelled on the drawings (e.g. pasture, arable, scrub, woodland, etc).
- All survey data is provided in the OSM15 geoid.

3.3 In Channel Survey – Additional cross sections downstream

In addition to the cross sections listed in the previous sections, the *Employer* wishes to obtain cross section data for 20 cross sections over a 1.6km length of the river downstream of Anglesey Bridge. The cross-sections will be distanced on average 80m from the next cross-sections.

The cross sections will be taken in the same location as previously surveyed as part of the River Dodder Flood Alleviation Scheme Phase 2. The purpose of these cross sections is to establish a baseline for comparison with post-Project works, and to compare the changes to the riverbed downstream of the Project area arising from the Flood Alleviation Scheme (FAS). For this reason, it is essential that the cross-sections be taken in the same locations as previously surveyed.

- The *Surveyor* will survey 20 cross-sections downstream of the Project area, in the area shown in Figure 3-2 below. The location of the cross-sections will be provided to the Successful Tenderer in a CAD file.
- The *Surveyor* will provide the additional cross-sections in both osgm02 and osgm15 datums.
- The *Surveyor* will provide the additional cross-sections in both Irish Transverse Mercator and Irish National Grid coordinate referencing systems.
- The number of survey points in any cross section must be sufficient to describe changes in the shape of the cross section and include an adequate number of survey points appropriately located across the cross section to permit accurate representation of the channel geometry and hence conveyance within a hydraulic model. Generally, the distance between consecutive points should not exceed 2m. The vertical difference in level between consecutive points out of channel should not exceed 0.2m. On steep banks, recordings should be made at not greater than 5m intervals, providing the gradient of the slope between the points is constant. At the point where the cross section finishes a note should be included on the drawing to give details of the general description of the land beyond this point (i.e. what happens next).
- In addition to the survey points specified above, the *Surveyor* shall record points at specific points provided to the *Surveyor*. These points are from the previous, pre-Flood Alleviation Scheme survey. These consist of approximately 5 points per section (top of bank, bottom of bank, thalweg). An example of the level of detail of the previous survey is shown in Figure 3-3.
- Cross-sections will be surveyed perpendicular to the flow direction (for river channels, this will be perpendicular to the direction of the banks; for floodplains, it will generally be perpendicular to the general direction of the valley).
- All elevations and cross-sections shall be plotted as viewed from upstream to downstream.

- Cross-section offset will increase from left to right looking in the downstream direction. Channel offset is taken from left hand extreme of cross section, therefore all offsets will be positive.
- The hard and soft bed is to be identified where possible and labelled.



Figure 3-2 Additional cross-sections downstream extents

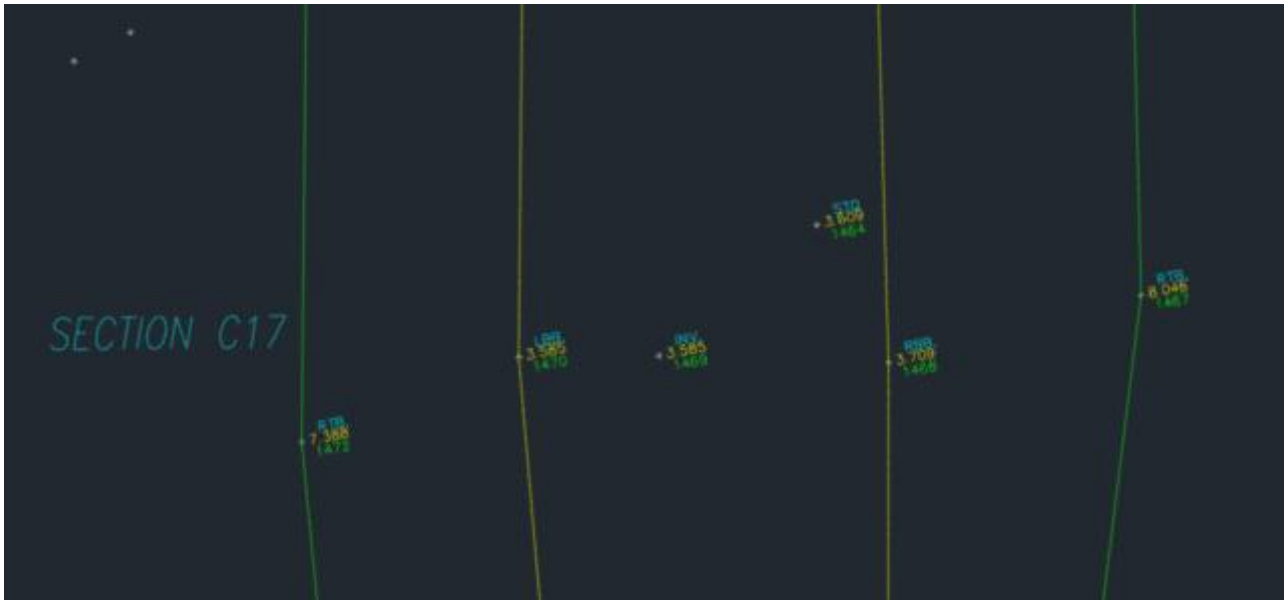


Figure 3-3 Expected level of detail of the additional cross-sections

3.4 Break of Slope survey

A Break of Slope (BoS) survey will be conducted 100m upstream and downstream of each weir. The extent of the Break of Slope survey is shown in Appendix C.

The BoS survey will have a bathymetric component (in-channel) and a topographical component (out of channel). The survey will involve taking points below the water surface, and potentially in some deep water areas, such as deep pools in the riverbed.

See Figure 3-4 for a sketch showing the principle of the Break of Slope survey, for guidance.

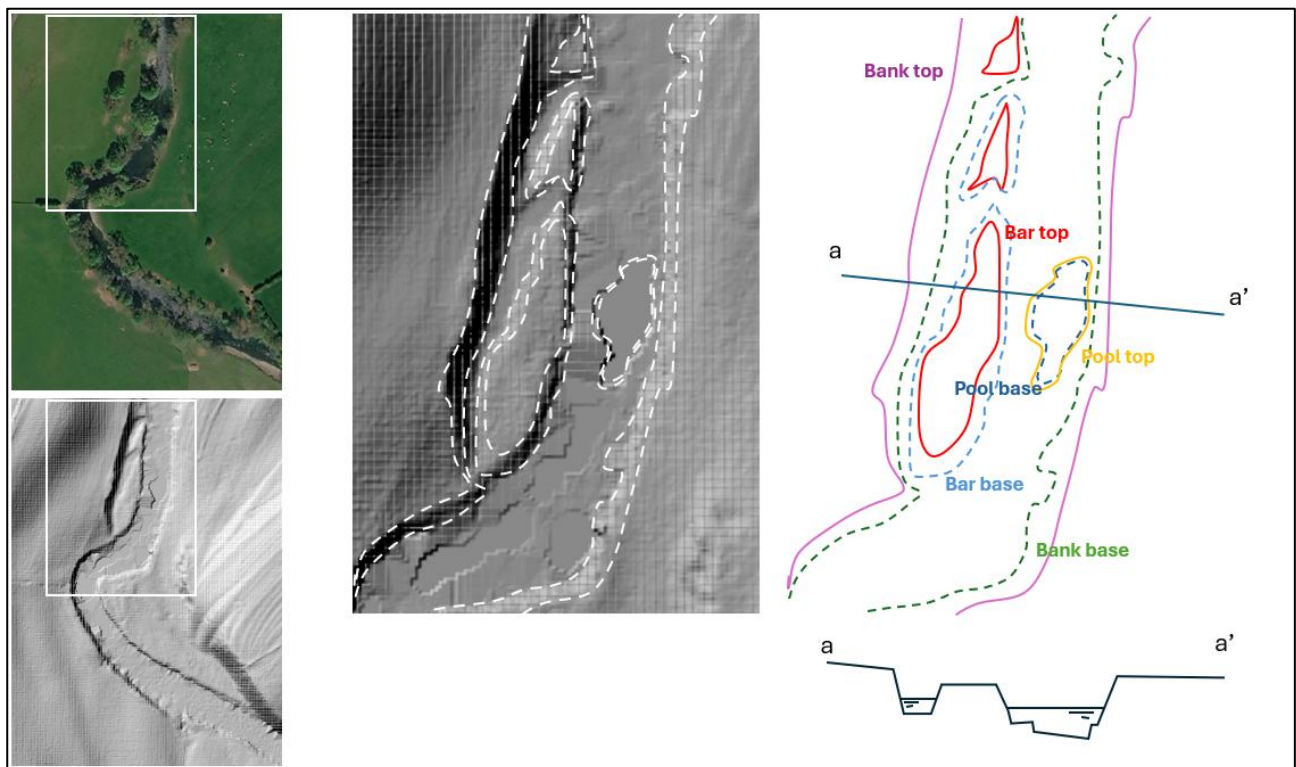


Figure 3-4 - BoS survey sketch

The BoS survey is to be carried out using the following specifications:

- The hard and soft bed is to be identified where possible, and labelled.
- *Surveyors* shall record discrete points at all locations where:
 - Bed slope changes visually or instrumentally
 - Channel transitions occur (e.g., pool top to pool base)
 - Abrupt elevation changes (>0.1–0.3 m depending on scale)
 - Bank toe and top-of-bank are identifiable, including any intermediate changes in slope angle (e.g. berms)
 - Structures or obstructions influence morphology
- Points are to be taken no more than 1-2m apart from each other.
- In areas of complex morphology, such as pools, riffles and confluences, the *Surveyors* shall increase the density of break of slope points and supplement them with spot soundings.
- All points shall be labelled with suitable feature codes.
- The water level shall be recorded at 20m intervals over the 200m length of BoS survey for each weir.
- Spot levels shall be recorded at least at 3m intervals along the top of the bank.
- *Surveyors* will record the following features within 10m away from the top of bank, on the dry side:
 - Location and canopy extent of trees,
 - Extent of vegetation,
 - Top and bottom of walls, width of walls,
 - Any other identifiable key features.

3.5 Topographic survey - Structures

The *Surveyor* shall capture the structures present in channel, including but not limited to 6no weirs, 8no, bridges, the Dodder Rhinoceros statue and culverts, headwalls and trash screens encountered.

The naming convention of the structures will be confirmed and agreed with the *Employer's Representative* in advance of the survey commencement.

The survey of the required online structures should be undertaken so as to accurately describe the hydraulic characteristics of the structures and capture potential overflow or by-pass routes.

The structures should be surveyed across its face, and the skew angle of the structure should be recorded and noted on the cross-section drawing. The skew angle shall be measured as the angle between the structure face and a line perpendicular to the channel.

3.5.1 Weirs

Each of the weirs should be surveyed in detail. The purpose of the survey of the weirs is to accurately measure the weirs in their current state of disrepair.

- The bed level
- The survey shall trace the top and bottom edges of all features present, including but not limited to:
 - The toe of the weir,
 - The crest of the weir,
 - Areas of undercutting caused by degradation of the weir.

- A full record of the variation in levels along the upstream and downstream faces of the weir should be recorded, i.e. irregularities/non-uniform weirs are captured. This is so as to ensure that full details of the slots and gaps in the weir are recorded.
- The type of material is to be recorded and labelled in the drawings. The location of any change in the type of material is to be recorded.
- Long sections of the weir will be recorded, at intervals no more than 1m wide.

A schematic giving an example of features to be recorded is shown in Figure 3-5.



Figure 3-5 - Example of features to record

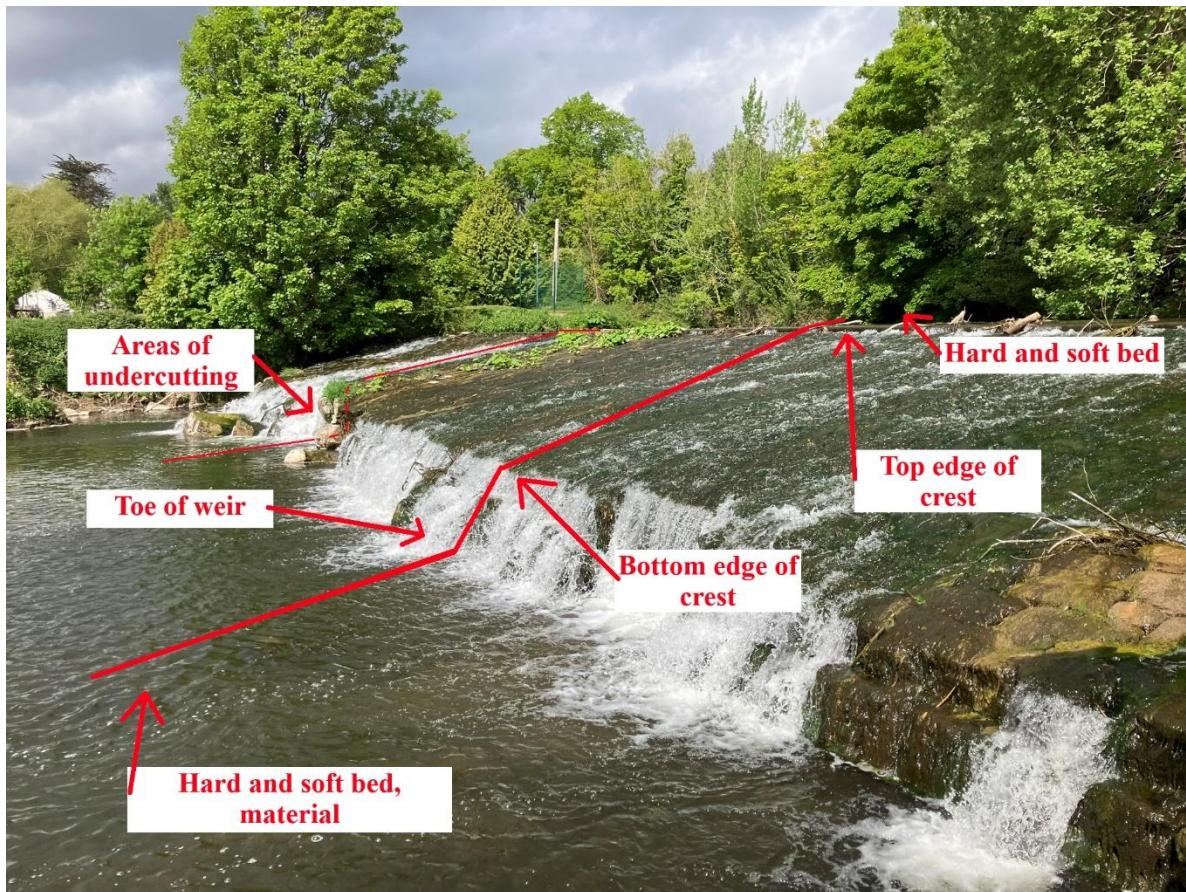


Figure 3-6 - Example of long section to record

3.5.1.1 Beaver Row Weir

In addition to the prior, *Surveyors* are to make sure that the following features are picked up at Beaver Row Weir.

Beaver Row Weir is a masonry weir that has been built on a natural bedrock outcrop. The structure is in disrepair, and the bedrock on which the weir was built is visible in some locations.

The *Surveyors* shall record the transition between man-made material and bedrock.

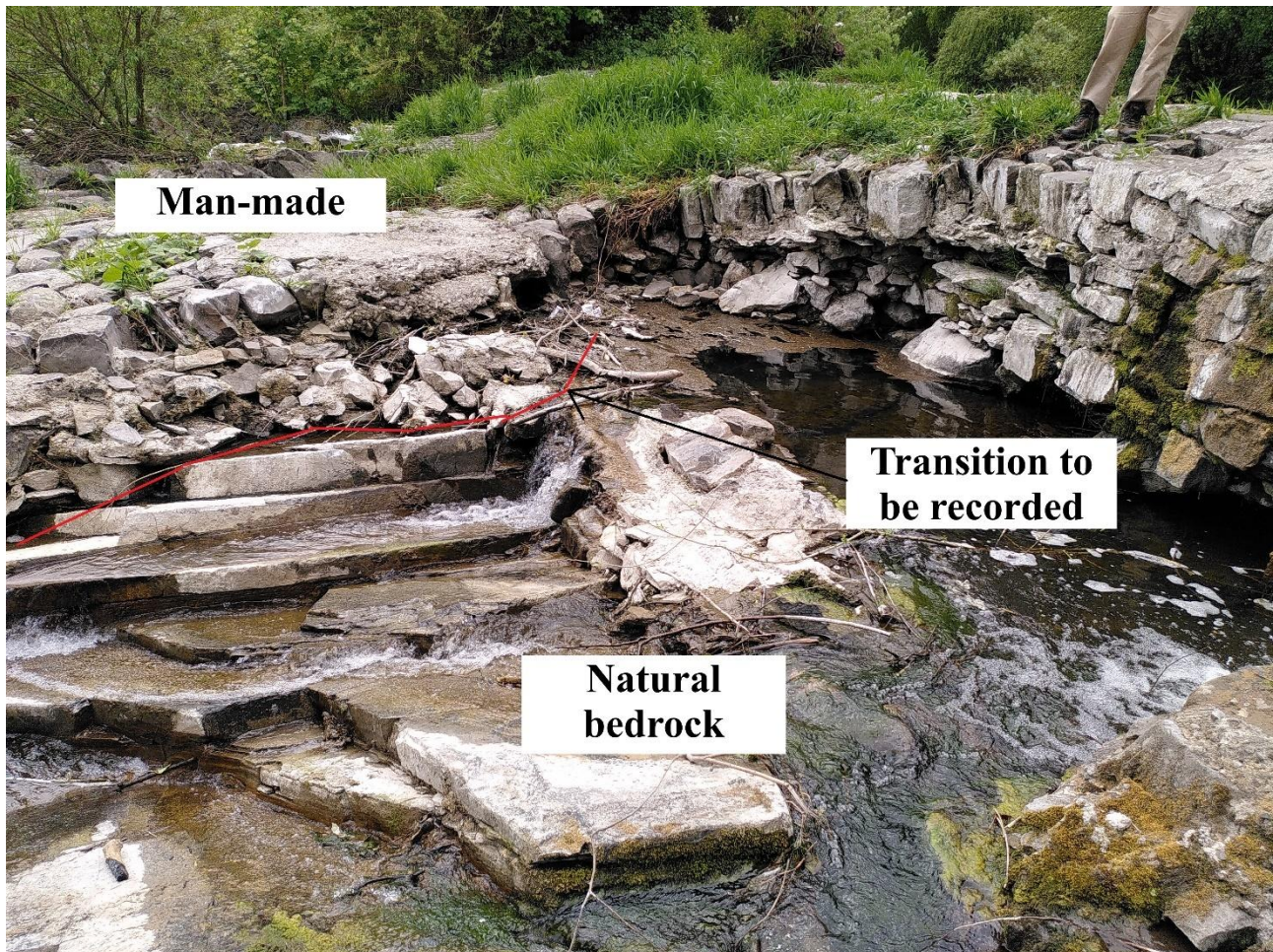


Figure 3-7 - Beaver Row Weir

3.5.2 Bridges

The survey specification for a bridge is as follows:

- One cross-section shall be surveyed at the upstream elevation of the bridge, to include channel bed levels and bridge details. The bridge details shall include the top chord (for example, deck level, approach road and top of embankment levels and parapet) and bottom chord (for example, pier and arch dimensions, widths, springing levels and soffit levels). Survey points of the bottom chord should be provided with a corresponding channel bed and bank survey point i.e. at the same offset value. However, the requirements in relation to the spacing of the cross-section survey points across the section should still be observed. At bridges with flood relief culverts the cross section should extend across the floodplain so that the flood relief culverts are surveyed.
- One cross-section shall be surveyed at the downstream elevation of the bridge. At bridges with flood relief culverts the cross section should extend across the floodplain so that the flood relief culverts are surveyed.
- If the d/s is not surveyed, the downstream soffit and invert levels should be indicated on either the cross section or long section.
- The survey should record the levels and dimensions of any pipes in the opening of the bridges.
- The length of the bridge shall be measured parallel to the watercourse and indicated on the appropriate drawings. The length of the bridge tunnel is the channel length through the bridge parallel to the watercourse.
- For clarity, the skew angle of all bridges should be shown on the cross-section plot, even where it seems the bridge is perpendicular to the watercourse.

3.5.3 Dodder Rhinoceros statue

The following features of the Rhinoceros statue of the Dodder shall be recorded:

- Top and bottom of plinth,
- Contour of plinth
- Length and height of the Rhinoceros,
- Width of the Rhinoceros along the shoulders and the legs,
- Soffit and deck level of the Rhinoceros,
- 6-point contour of the Rhinoceros: legs, horn and tail.

3.6 Topographic Survey - Top of Bank survey

A topographic survey will be required to complement areas not captured by the Break of Slope survey. The topographic survey will run along the banks of the river (in the sections not recorded by the BoS survey), recording Top of Bank and Bottom of Bank. See Appendix A for figures of the required extents. The survey will generally extend 10m away from the top of the bank towards the dry side, except where there are constraints relating to private land (ie. gardens of private properties) and roads. Some areas which should not be included within the Top of Bank survey are specified in Appendix D, and the *Employer's Representative* will inform the *Surveyor* of any more areas are identified.

- Spot levels should be taken at 5m intervals along the bank crest.
- A top-of-bank survey line is to be taken along the bank top to define the bank top between surveyed river cross sections.
- Spot levels should define any notable changes in crest elevation. This will include low points or gaps, and confluences with tributaries and drains.
- Where there are steep changes along a crest, points immediately adjacent to the step should be surveyed, to correspond with both elevations at this location
- The *Surveyors* will capture cycleways, tracks and footpaths, and all general survey features listed in Section 2.3.

3.7 Topographic Survey – additional areas

As well as the topographic survey running along the river, additional areas will require a topographic survey. These areas are shown in Appendix E. Where there are no features listed below, *Surveyors* shall take spot levels in a 2.5m grid.

In the additional areas, key features are to be recorded, including but not limited to the following and the general survey features listed in Section 2.3:

- Location of trees and extent of canopies,
- Extent of vegetation,
- Top and bottom of walls, width of walls,
- Street / outdoor furniture, including but not limited to:
 - Outfall invert levels on river side of quay walls.
 - Call boxes.
 - Pillar boxes.
 - Bollards.

- Bus stops.
- Lamp Posts.
- Telecom Poles.
- Electricity Poles.
- Vent pipes.
- Road signs.
- Traffic signals and control boxes.
- Vehicle detector pads.
- Drains or gullies.
- Fire hydrants and valves.
- Manhole - cover levels, invert level, direction of flow and pipe sizes.
- Inspection chambers - cover level and invert level and type.
- Weighbridge.

3.7.1 Dropping Well Weir manhole cover

Within the additional survey areas, there is an existing sewer main under Dropping Well Weir.

The *Surveyor* will record the cover level and the invert level of the manholes on the left and right bank of the Dodder, as shown in Figure 3-8. The manhole cover on the left bank is located within heavily vegetated shrub, and the vegetation may have to be cleared in order to access the manhole cover (when the nature of the vegetation is confirmed, due process shall be followed with respect to its clearance). The location of the manhole cover is shown within the red circle in Figure 3-9.

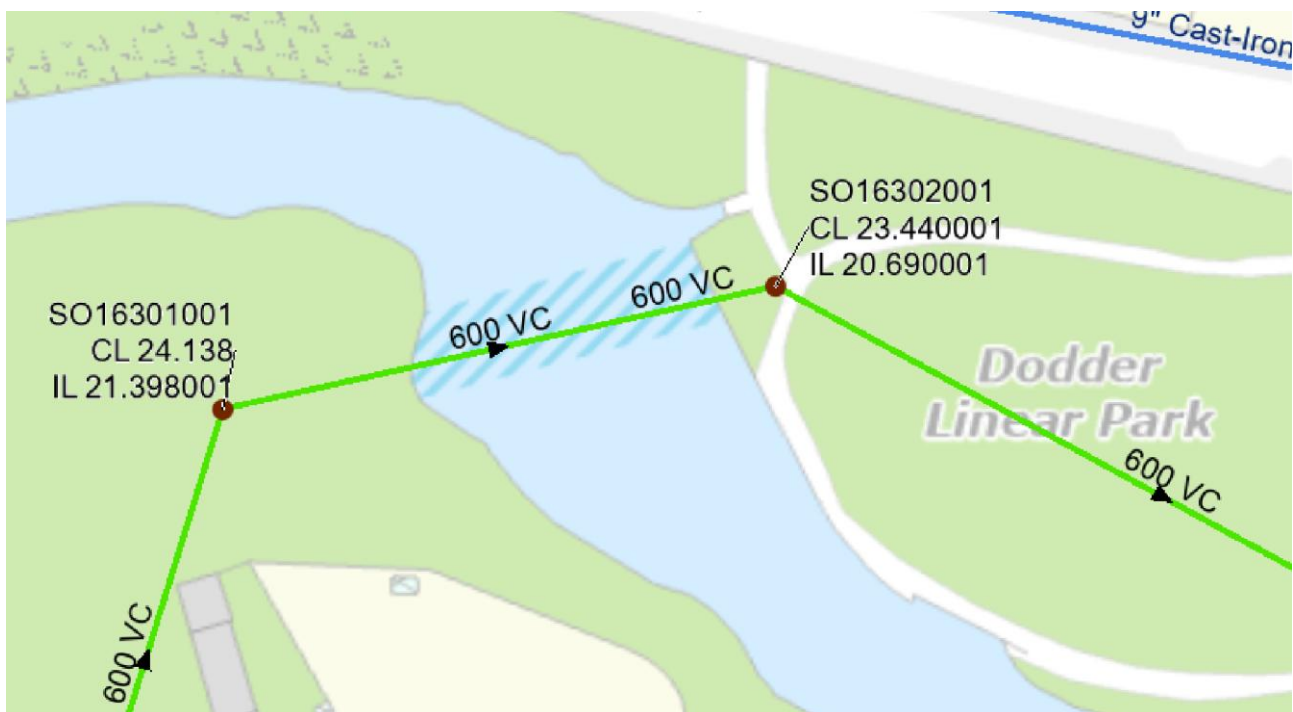


Figure 3-8 Plan of sewer crossing the Dropping Well Weir (Dún Laoghaire-Rathdown County Council)



Figure 3-9 Approximate expected location of sewer manhole on left bank of river

3.8 Survey Control

3.8.1 Units of Measurement

Metric units shall be used for all linear dimensions and measurement; base units to be in metres. Angular measurements and geodetic coordinates shall be degrees, minutes and seconds. All Cartesian co-ordinates shall be reported to the nearest millimetre. All geodetic co-ordinates shall be reported to the nearest one thousandth of a second.

3.8.2 Plan Control

Plan control shall be based on ETRS89 coordinate system with computed coordinates projected into Irish Transverse Mercator (ITM). Ellipsoidal heights shall be transformed into orthometric height to Malin Head Datum using the Ordnance Survey Geoid Model.

Secondary control points shall be connected by a closed net, which shall be tied to at least two control points positioned using GPS (Global Positioning System) referencing the Active GPS Network.

The maximum closing error for all distances between points used to determine the location of secondary control points when checked by precise measurement shall not exceed 1/100,000, or between adjacent site survey control points ± 5 mm.

The *Surveyor* shall provide survey results data in both OSGM15. This requirement shall be considered by the *Surveyor* in their tendered price.

3.8.3 Referencing of Control Points

All Ground Control Points, Permanent Ground Markers and Permanent Benchmarks established for the works shall be included and referenced.

- Ordnance Survey Trigonometrical Stations
- Ground control points
- Setting out control points
- Ordnance survey benchmarks

3.8.4 Site Benchmarks

All permanent control stations will act as site benchmarks.

At least one permanent control survey station will be located in public land on an object that is unlikely to be altered in the foreseeable future to allow continuity for future or infill survey work; to be proposed by the *Surveyor* as part of the Method Statement.

3.9 Survey Accuracy

All survey is to be undertaken in accordance with the survey accuracy prescribed in RICS ‘Measured surveys of land, buildings and utilities’, 3rd Edition.

Plan and height accuracy shall be to Band C.

3.10 Method Statement

The *Surveyor* shall submit a Method Statement to the *Employer* for approval in advance of commencing work. The Method Statement shall provide details to illustrate the form, sequencing and programming of all key investigation work elements including constraints.

The programme shall be clearly organised and shall include the start and completion dates for each key activity. This shall contain sufficient detail to assure the *Employer* of the feasibility of the plan and approach proposed by the *Surveyor*. The *Surveyor* shall include any allowances for public holidays, weekends and stoppages due to weather or any other influences that may affect the progression of the survey. The Programme must identify the Delivery Date for each key element of the works.

The Method Statement should also detail the proposed investigation sequencing and methods, access requirements and traffic management considerations. Any specific environmental considerations, and health and safety issues, should also be identified.

The submission should be structured to demonstrate the *Surveyor*’s ability to overcome any restrictions / deficiencies associated with any of the proposed methods.

The methodology shall comply with relevant safety standards and construction and good practice guidelines.

3.10.1 Additional Information

The *Surveyor* shall include the following as part of their Method Statement:

- Experience/company profile: The *Surveyor* shall provide a company profile including information on previous relevant projects within the last five years, key staff CVs, plant specifications quality assurance systems and any other information the *Surveyor* wishes to include in support of the application.
- Risk assessment: The *Surveyor* shall provide an assessment outlining all known and possible risks associated with the works and measure of prevention and/or mitigation of those risks. The risk assessment should also outline general safety procedures and any quality assurance criteria employed by the *Surveyor*.
- Details of equipment: The *Surveyor* shall detail any relevant equipment and standards to which their equipment have been provided/prepared.

- Survey accuracy: Should the *Surveyor*'s proposed method of survey not be able to reach the specified vertical and horizontal accuracy, please specify the best possible accuracy that can be achieved.
- Sub-contractors: The *Surveyor* shall provide details of any work to be subcontracted and a list of proposed sub-contractors together with evidence of their competence.
- Insurances: The *Surveyor* shall provide details of the following insurances: Employer's Liability, Public Liability, Professional Indemnity and any other Insurances required to carry out the survey works proposed in this Specification.

The following Indemnity Limits shall apply to the insurances:

Employers Liability - €13 million employer's liability limit for any one claim or series of claims arising out of a single occurrence.

Public Liability - €6.5 million public liability limit for any one claim or series of claims arising from one single occurrence.

Professional Indemnity - €1,250,000 cover on each and every claim basis, €1,500,000 in the aggregate per insurance year.

3.10.2 Proposed Programme

The *Surveyor* shall submit their proposed programme for the tendered works. This shall include, but is not limited to:

- Mobilisation date
- Delivery of Pilot Weir survey data
- Completion of full survey on site
- Completion of post-processing
- Draft issuance of survey data and associated survey report
- Final issuance of survey data and associated survey report

3.11 Traffic Management

The *Surveyor* should note that the survey is adjacent to, and located on, heavily trafficked, narrow and busy roads. Traffic management and liaison by the *Surveyor* with all relevant stakeholders (e.g. Dublin City Council, Dún Laoghaire Rathdown County Council, Bus Éireann, An Garda Síochána, and Dublin Emergency Services) will form an integral component of this contract.

The *Surveyor* shall be responsible for the design, construction and maintenance of Temporary Traffic Management Schemes and all associated works, complying with the requirements and advice in the following publications:

- (i) "Irish Road Acts 1993 – 2007" and "Road Traffic Acts 1961 – 2007"
- (ii) The Design Manual for Roads and Bridges (DMRB) as published by the NRA.
- (iii) Irish Traffic Signs Manual (Chapter 8).

The *Surveyor* shall appoint a Traffic Safety and Control Officer and as defined below.

The *Surveyor* shall liaise with any other contractors who may significantly affect traffic flows in the vicinity of the sites and with public transport operators where public transport services are directly affected by the Temporary Traffic Management Schemes.

The *Surveyor* shall ensure that all staff, sub-contractors, and any other personnel who from time to time may visit the Site, are aware of the requirements of this Specification. The *Surveyor* shall ensure that the provisions of this Specification are strictly complied with at all times by the *Surveyor*'s workers or subcontractors.

The *Surveyor* shall be responsible for the preparation and agreement of all necessary documentation required by the Local Authority and/or relevant authority and for the payment of all charges arising from the advertising of traffic orders.

It is the *Surveyor*'s responsibility to ensure that any existing traffic signalling and monitoring equipment is not affected by any Works. This includes all elements of communications including fibre optic, copper cables, wireless communications and telecom cabling.

3.11.1 Definitions

The word "should" where used in the Irish Traffic Signs Manual Chapter 8 shall be regarded as a requirement under the Contract.

Temporary Traffic Management Schemes (TTMS) are the arrangements implemented by the *Surveyor* to direct traffic through or around the site to facilitate construction of the Works. Any alteration to these arrangements such as changes to lane provision, width, location or type shall be deemed to be a new and separate TTMS.

Traffic Management Operation: A Traffic Management Operation consists of those activities necessary to assemble, maintain, alter and remove a Temporary Traffic Management Scheme.

Traffic Management Equipment: Traffic Management Equipment consists of all signs and their covers, cones, cylinders, studs, barriers, road markings, lights and traffic signals including their supports and fixings and any cabling, piping, joints, connectors, electricity supply, weighting down and any other item required for any Temporary Traffic Management Scheme.

Traffic Safety and Control Officer: Traffic Safety and Control Officer is a senior person nominated by the *Surveyor* who is responsible for Temporary Traffic Management Schemes and is as defined in the Agreement.

4. Survey Deliverables

This section details what survey deliverables are required for the survey types outlined in Section 3.1.

The following deliverables form the core requirement of this instruction and therefore full payment from the Client is contingent on receiving all such items and adherence to the requirements outlined in this specification:

1. Cross section and topographic/bathymetric survey data to be provided as AutoCAD/Civil 3D .dwg file with plot/cadastral parcel lines, contours, survey points, survey notes, and any other 3D surveyed data as identified in the Scope of Works.
2. Cross section and topographic/bathymetric survey data to be provided as AutoCAD Civil 3D .dwg file with a 3D surface of existing surface, contours, survey points, survey notes and any other surveyed data.
3. CAD files to be provided in accordance with the output requirements outlined in Section 3. Work in progress CAD files may be provided in advance of the final CAD file(s).
4. Break-of-Slope survey data in XYZ text file and GeoTIFF format to be provided
5. GIS data provided to be ESRI compatible.
6. DTM survey data to be provided. DTM to be in either LandXML or DWG at a useable file size
7. Photographs provided in .jpeg format, georeferenced to ITM.
8. 1:500 PDF file(s) of final survey with *Surveyor*'s information and stamp.

9. Report on survey findings.

10. All survey Deliverables shall include the following:

- a. Legend and Abbreviations table.
- b. Date of survey.
- c. Datums and Coordinate Systems.
- d. Monuments and Control Points (project into ITM and latitude and longitude of control points).
- e. Description of title report or maps used for boundary

All work shall be delivered in English.

Appendix A – Cross Sections based survey location



Figure 4-1 Cross section based survey, from Dropping Well Weir to Milltown Weir

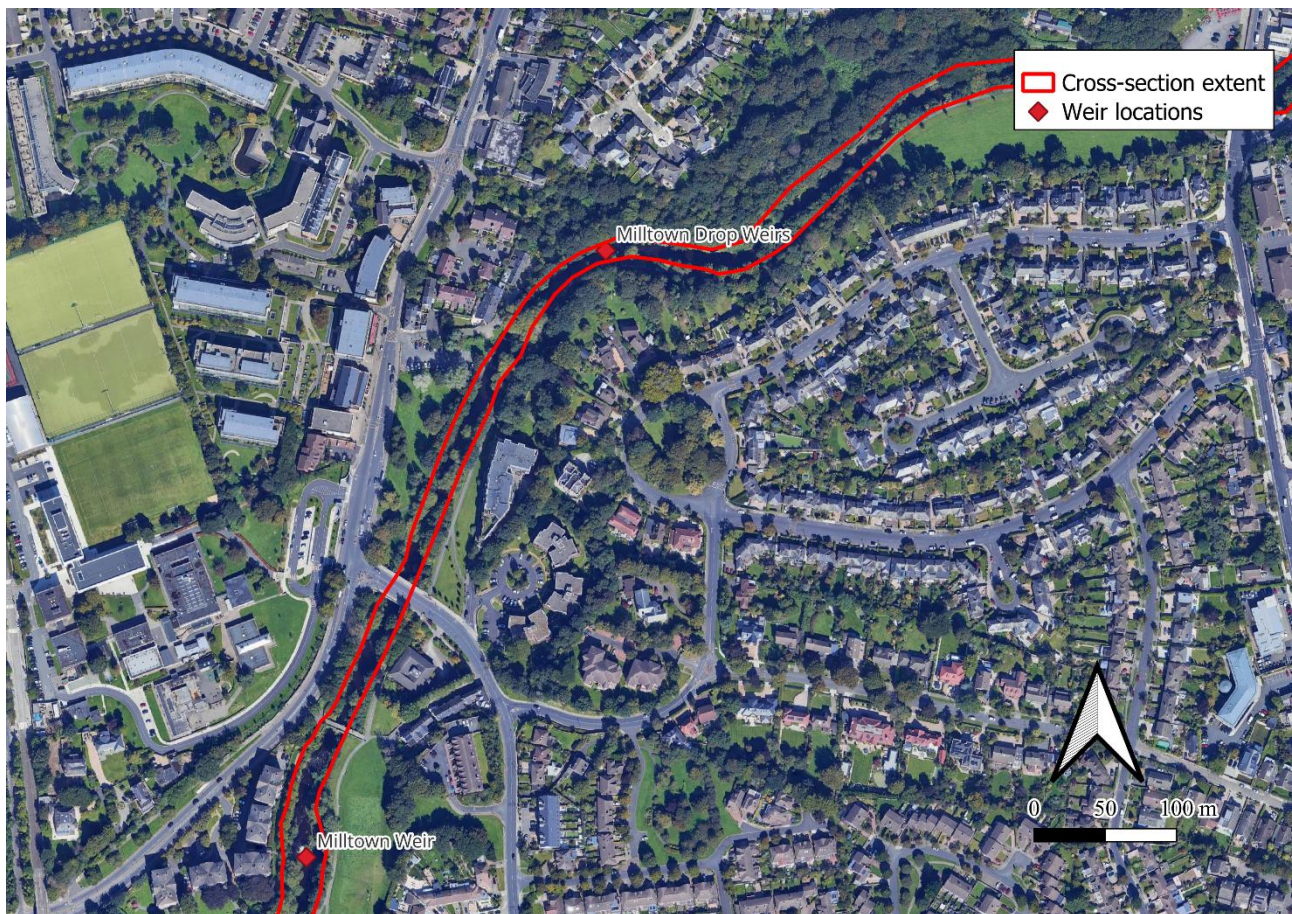


Figure 4-2 Cross section based survey, from Milltown Weir to Milltown Drop Weirs

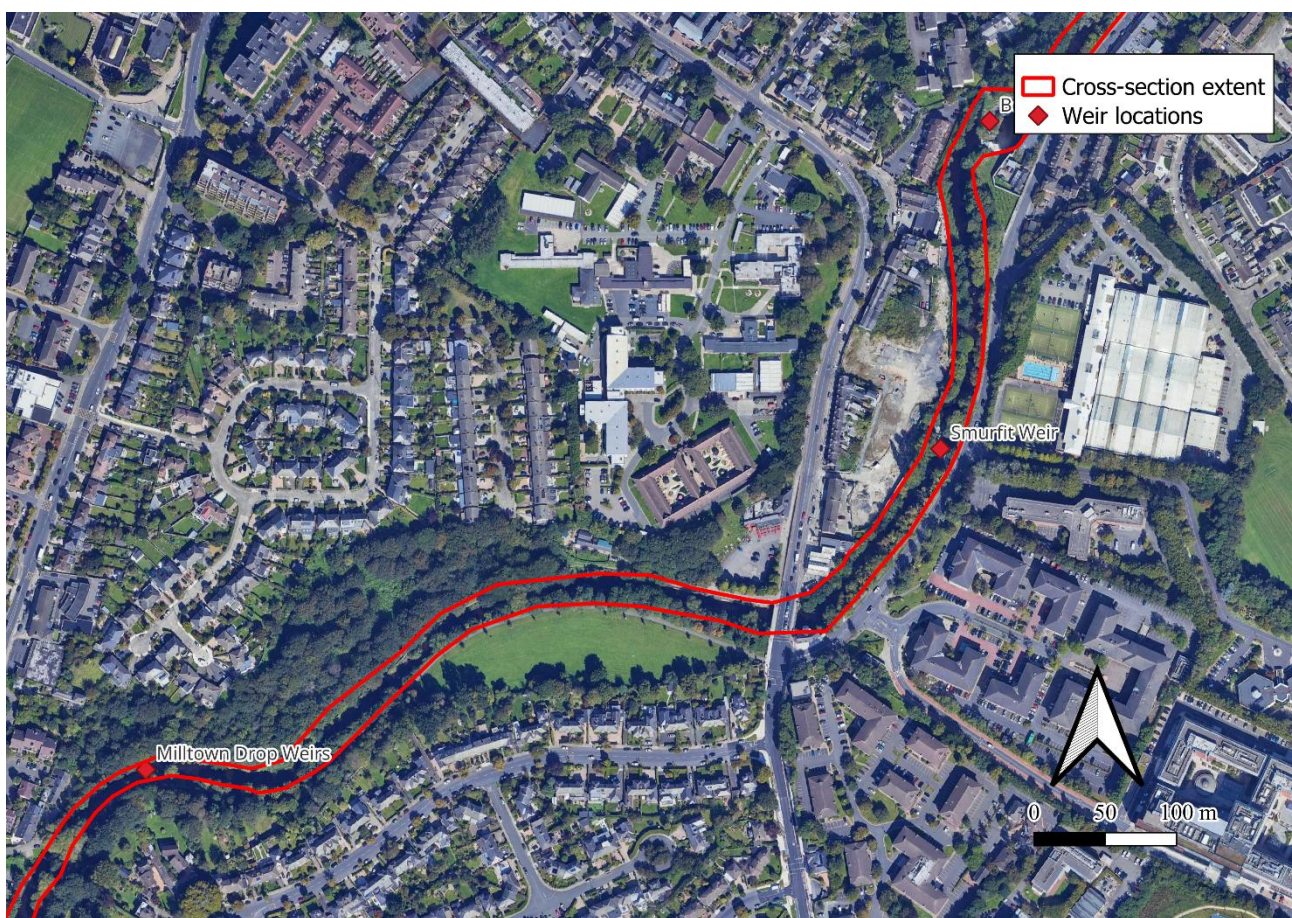


Figure 4-3 Cross section based survey, from Milltown Drop Weirs To Smurfit Weir

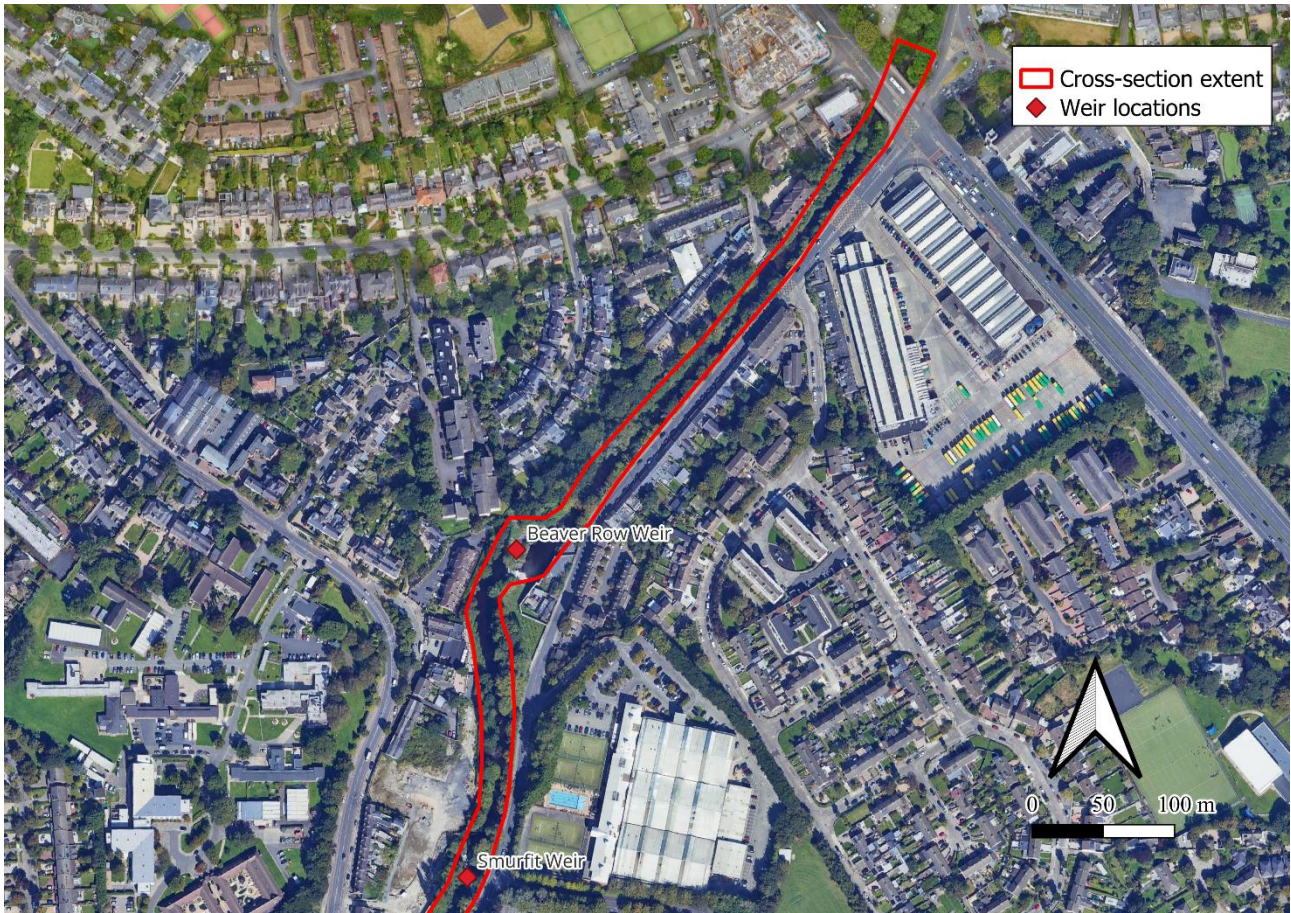


Figure 4-4 Cross section based survey, from Smurfit Wier to Beaver Row Weir

Appendix B – Notification letter for Access

(SURVEYING COMPANY ADDRESS)

Dear Sir/Madam

River Dodder Barrier Mitigation Project – Topographic and Bathymetric Survey

Notice of Topographic Survey to be undertaken

On behalf of our client, Inland Fisheries Ireland, we propose to undertake survey work in your area. This survey work is required in relation to the River Dodder Barrier Mitigation Project.

We will require access to the external grounds in the curtilage of your property from **(DATE)** to **(DATE)**. The survey work will involve taking several spot levels on and around your grounds.

If you wish to discuss the above in more detail, we can be contacted at **(SURVEYING COMPANY CONTACT DETAILS)**.

We thank you for your co-operation.

Yours faithfully

On behalf of

(SURVEYING COMPANY)

Appendix C – Break-of-Slope survey location

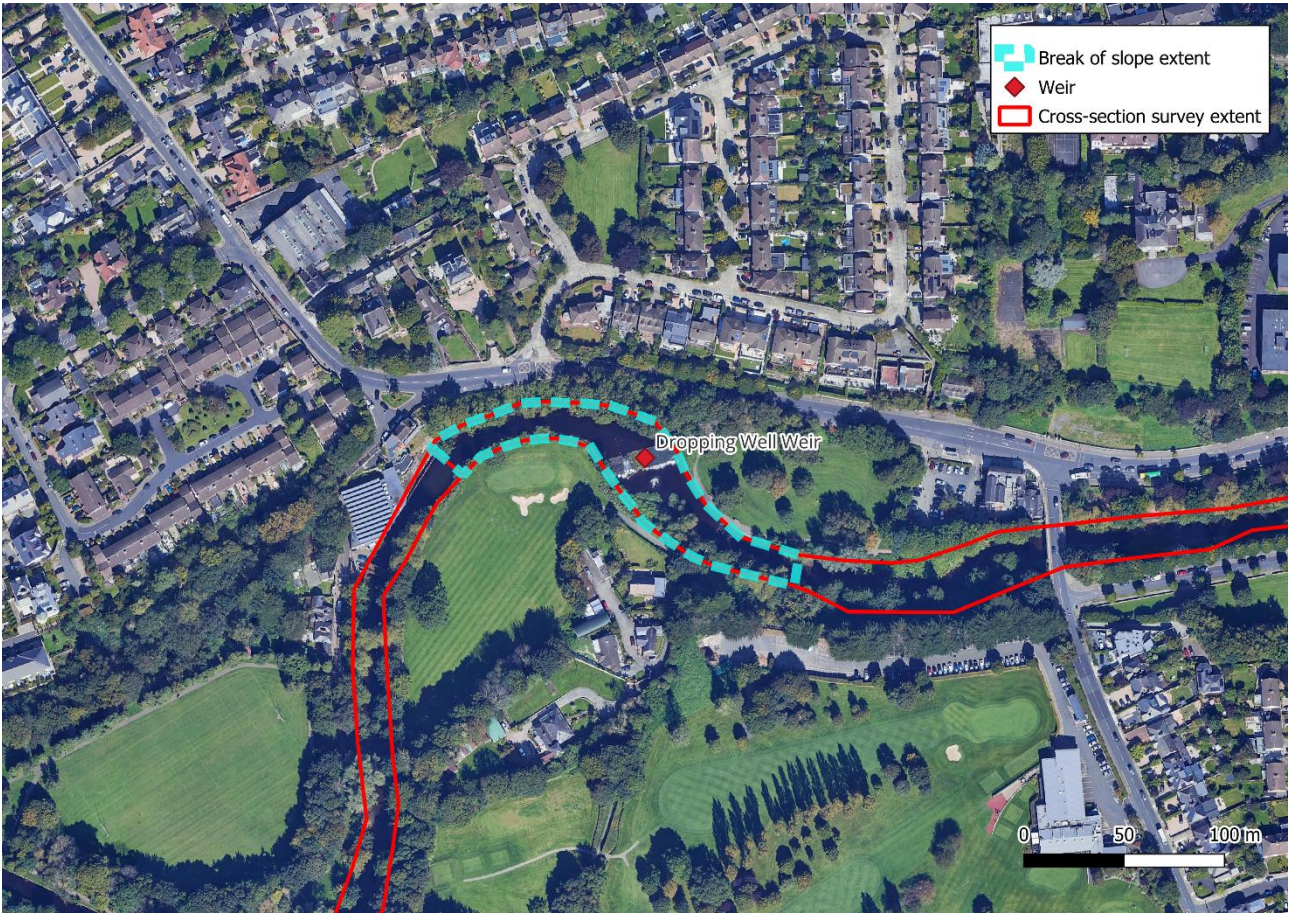


Figure 4-5 Further detail of Break-of-Slope survey extent near the Dropping Well Weir

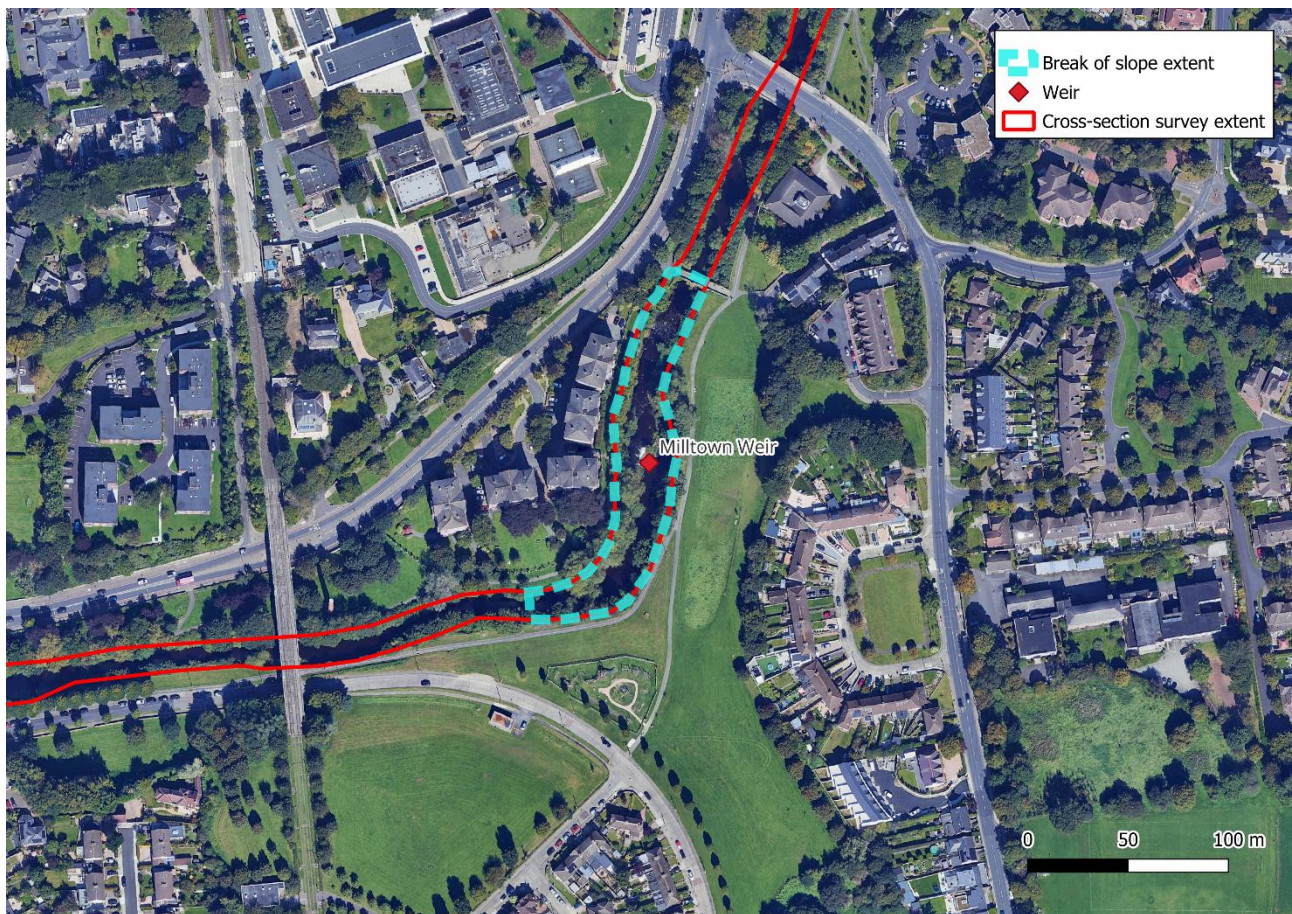


Figure 4-6 Further detail of Break-of-Slope survey extent near Milltown Weir

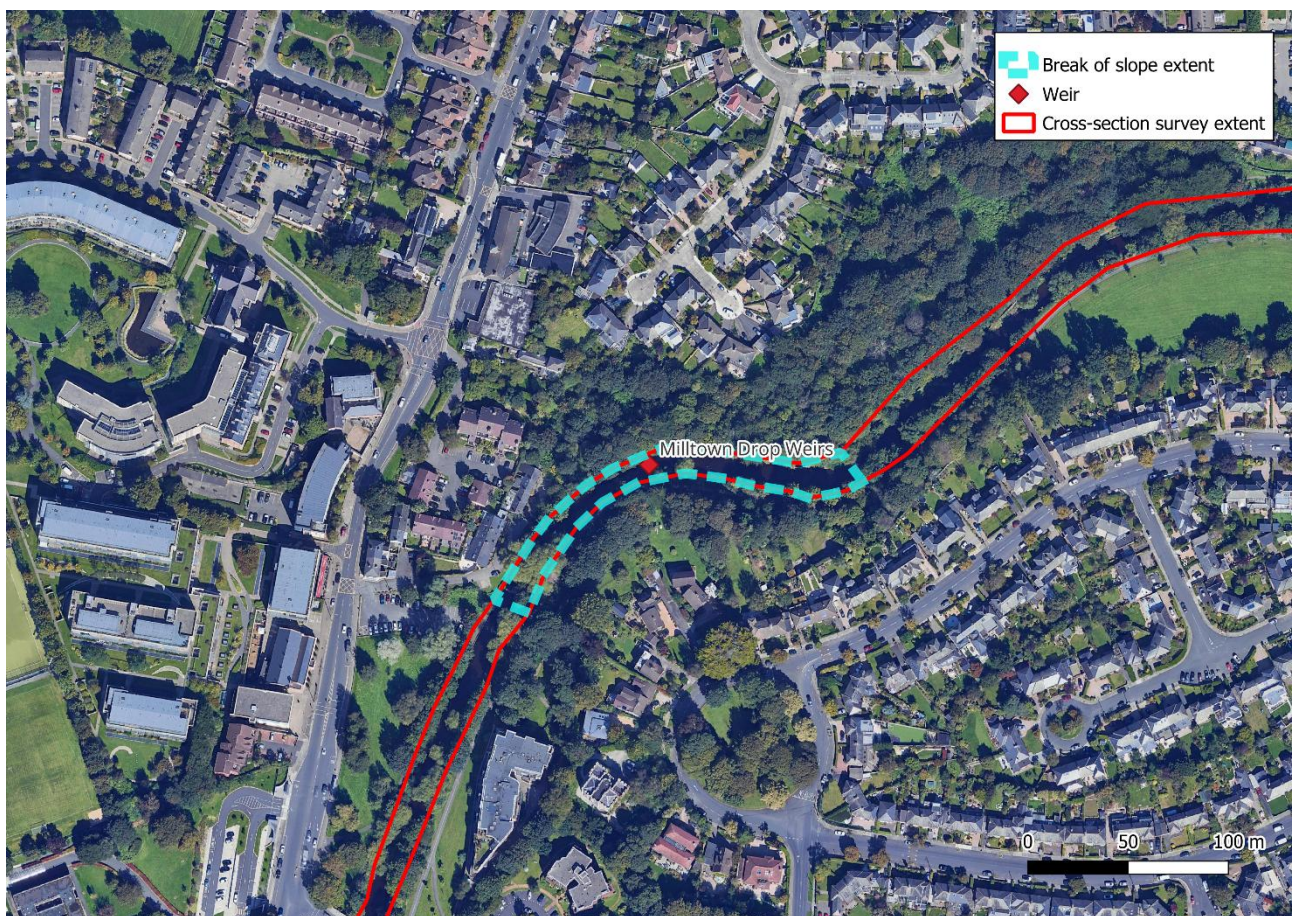


Figure 4-7 Further detail of Break-of-Slope survey extent near the Milltown Drop Weirs

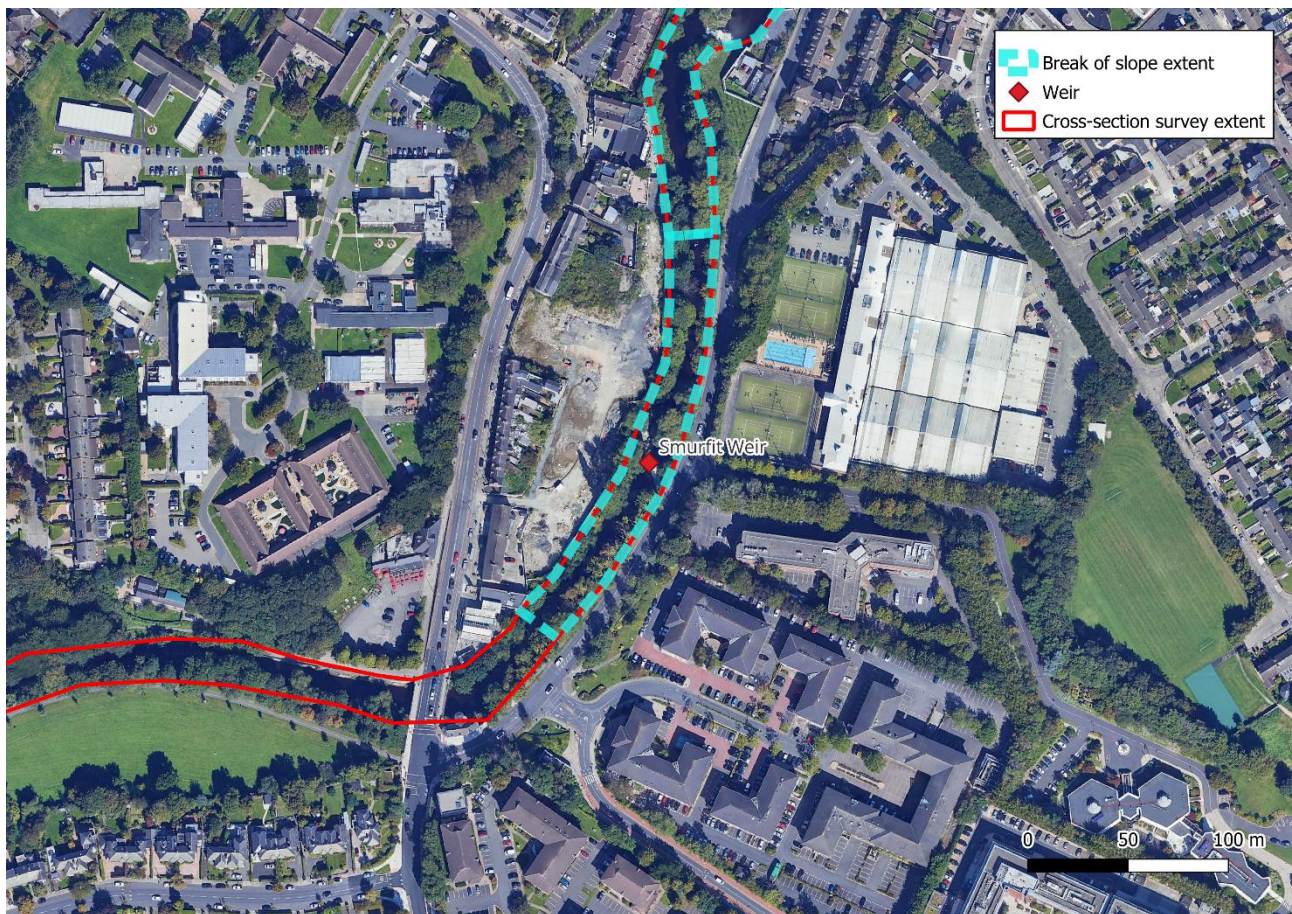


Figure 4-8 Further detail of Break-of-Slope survey extent near the Smurfit Weir

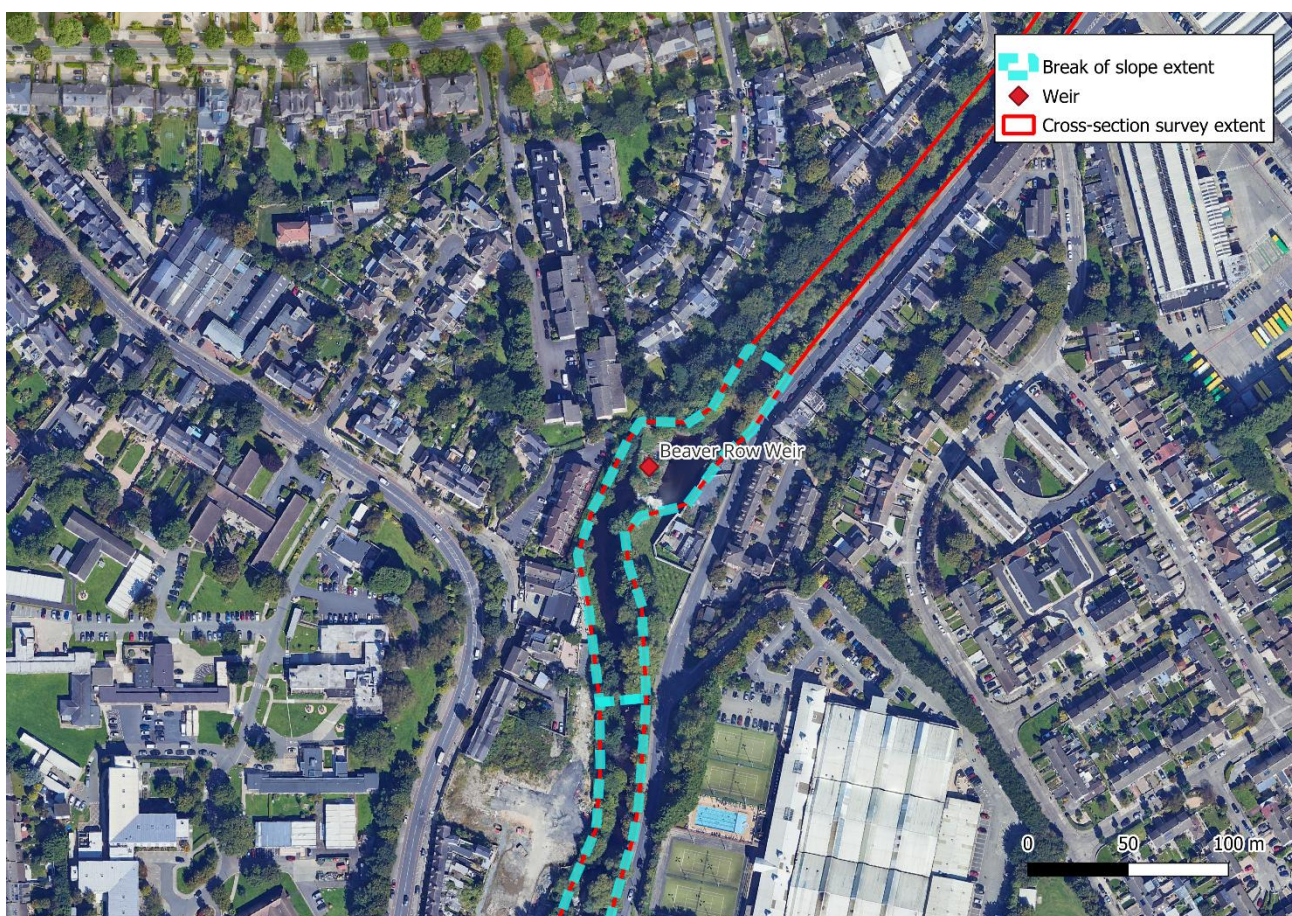


Figure 4-9 Further detail of Break-of-Slope survey extent near the Beaver Row Weir

Appendix D – Top of Bank survey – areas not included



Figure 4-10 Areas not included: road at Beaver Row

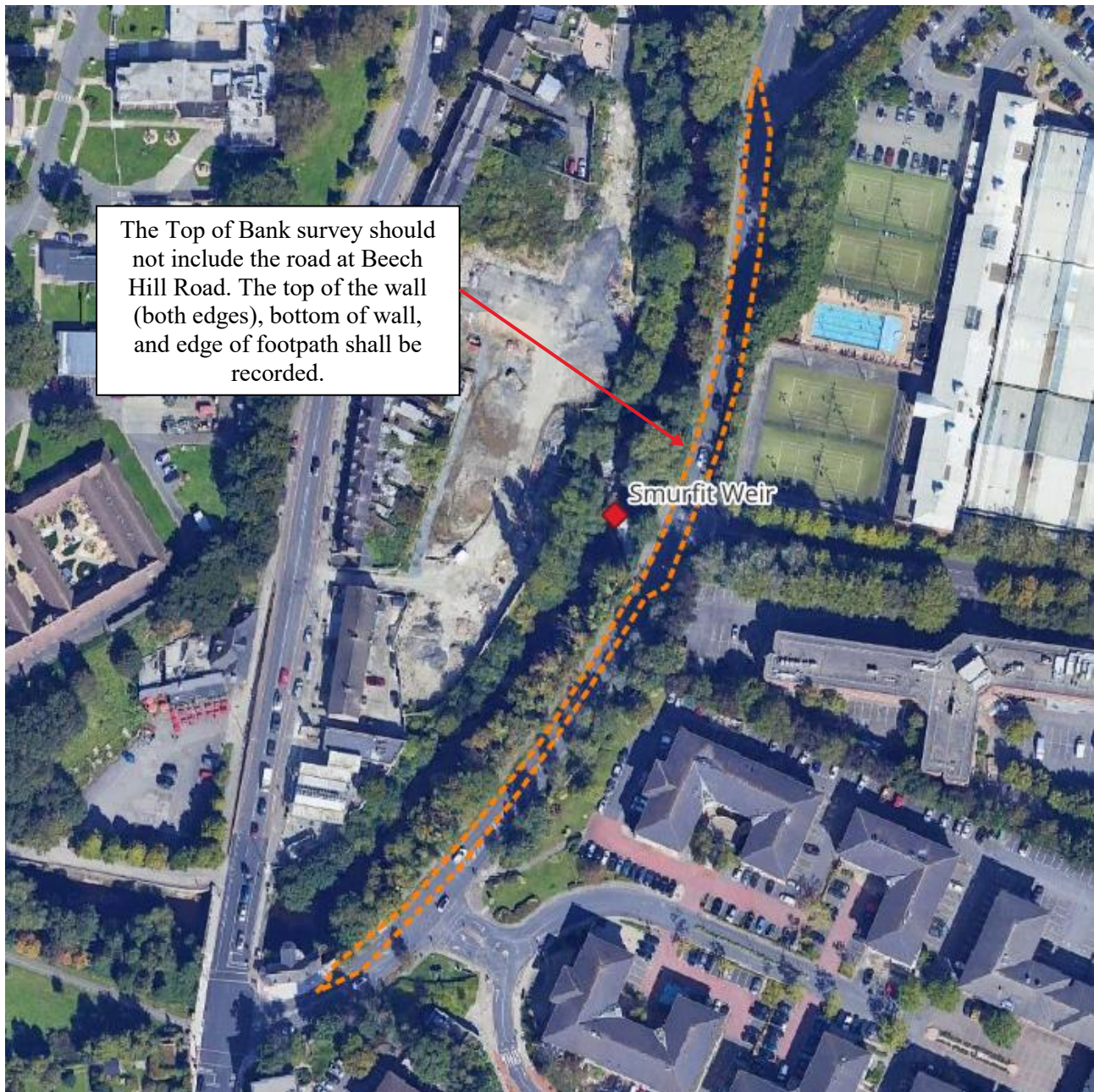


Figure 4-11 Areas not included: Beech Hill Road

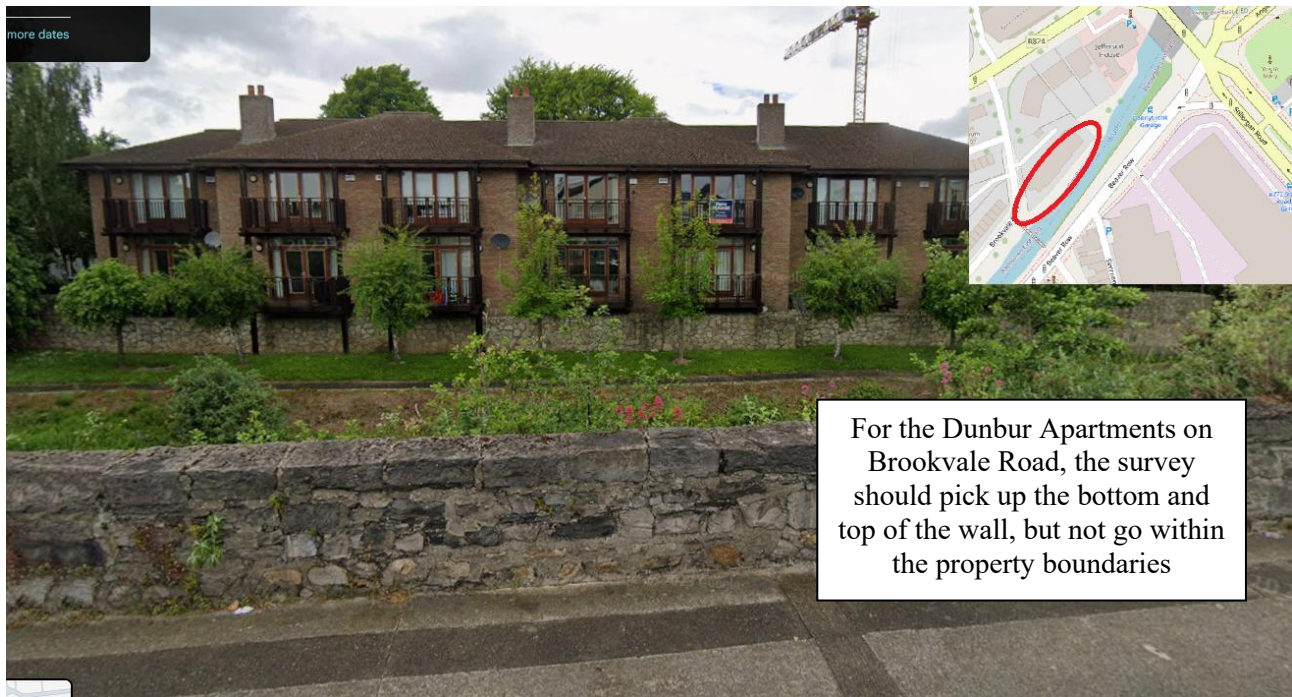


Figure 4-12 Areas not included: within property boundaries at Dunbur apartments

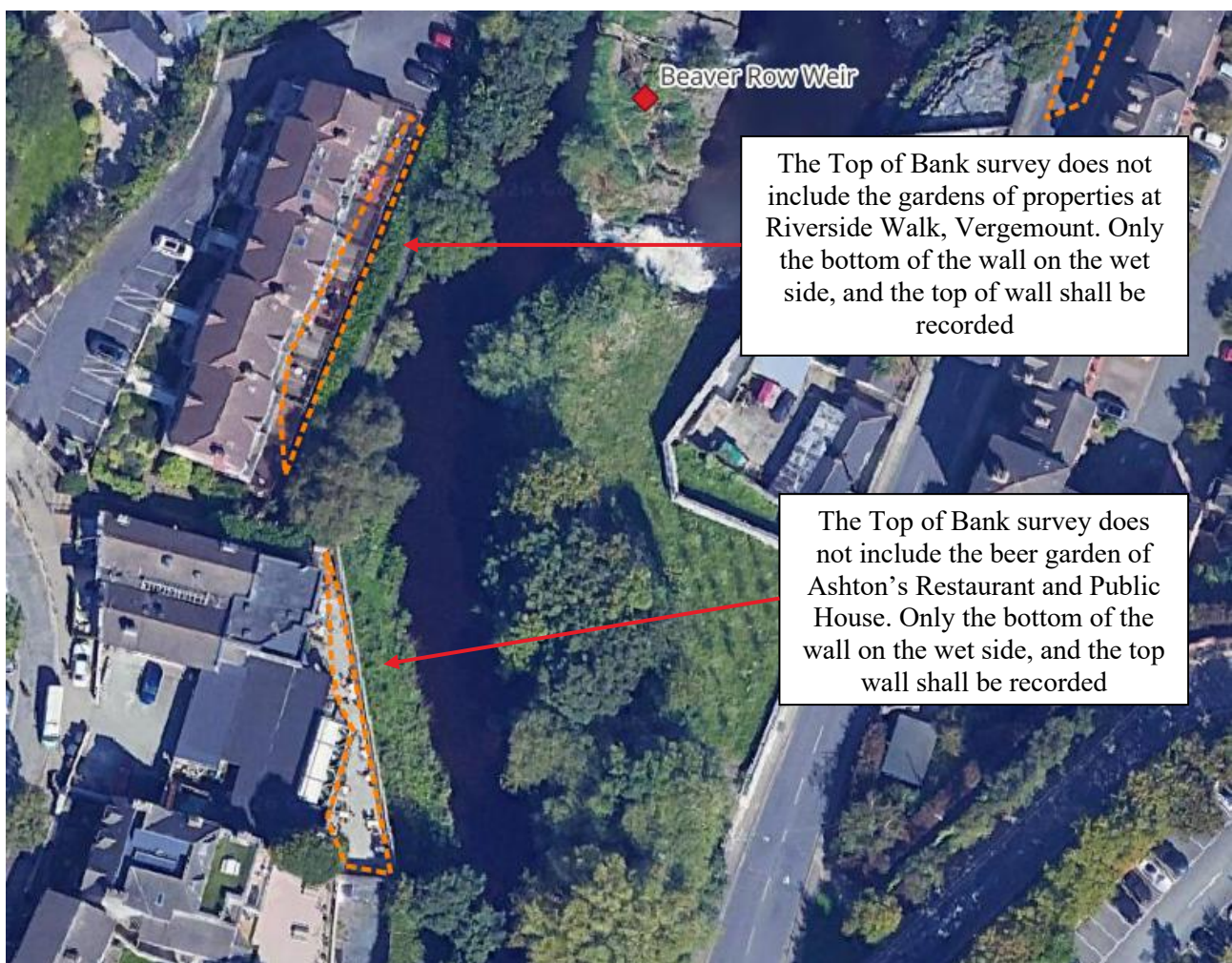


Figure 4-13 Areas not included: Riverside Walk and Ashton's Restaurant and Public House

Appendix E - Additional areas for topographic survey



Figure 4-14 Area of additional topographic survey near the Dropping Well Weir



Figure 4-15 Area of additional Topographic survey near Milltown Weir

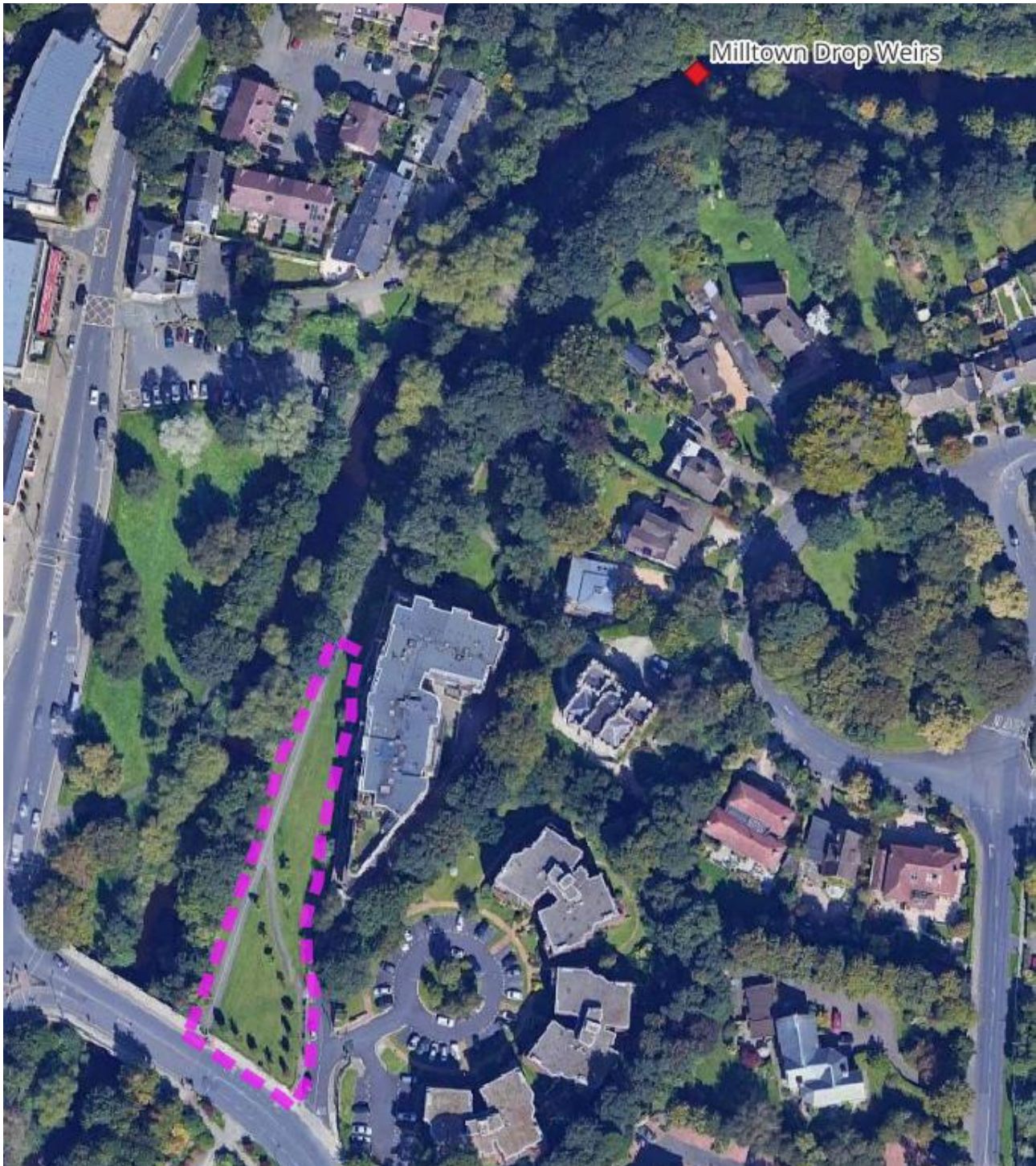


Figure 4-16 Area of additional Topographic survey near Milltown Drop Weirs

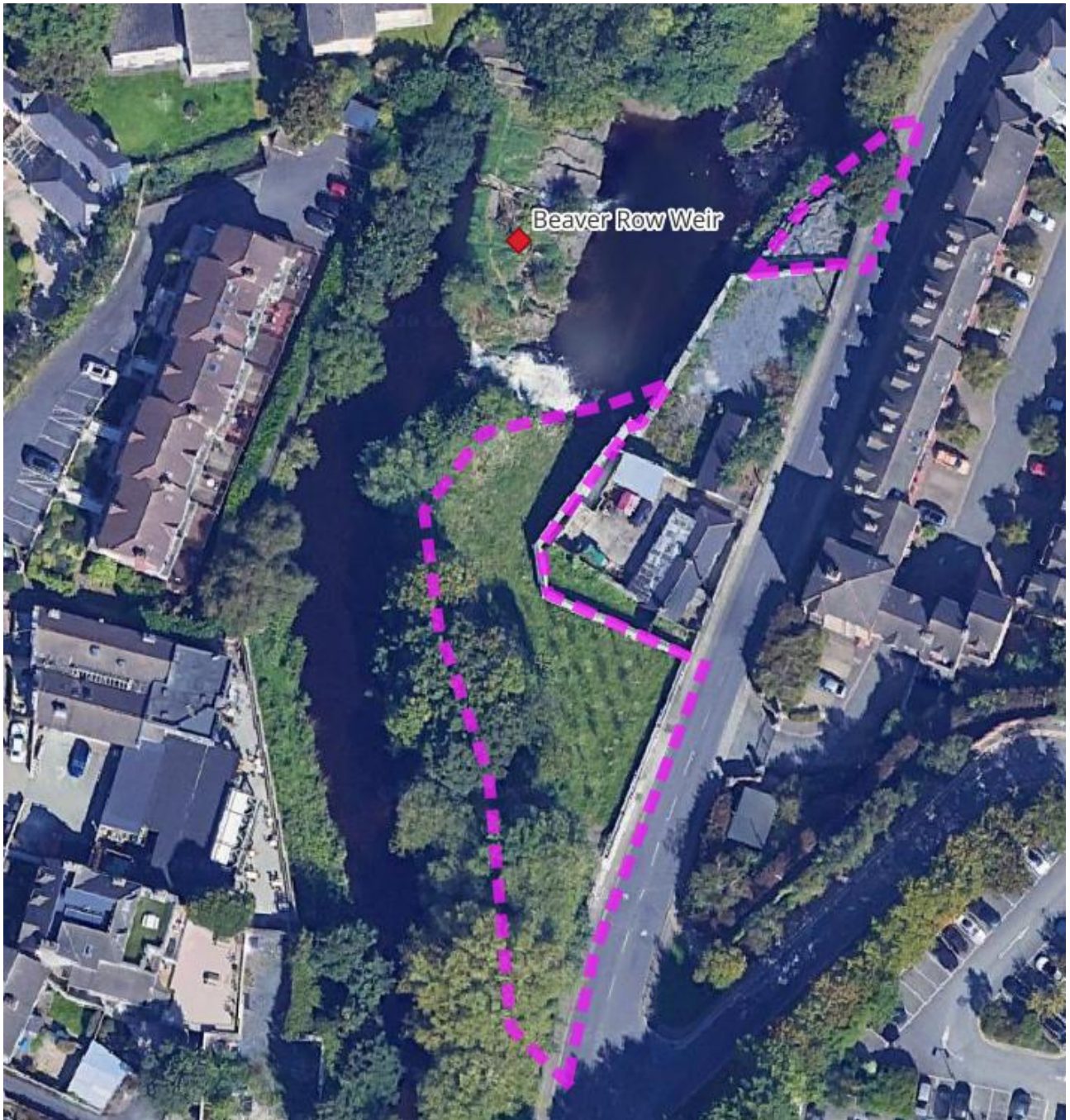


Figure 4-17 Area of additional Topographic survey near Beaver Row Weir