Taylor Wimpey (South Wales) Ltd

BBC Llandaff, Cardiff

Surface Water and Silt Management Plan

314688 R01 (01)

NOVEMBER 2021

RSK GEOSCIENCES

RSK GENERAL NOTES

Project No.: 314688 R01 (01)

Title: Surface Water and Silt Management Plan – BBC Llandaff, Cardiff

Client: Taylor Wimpey (South Wales) Ltd

Date: November 2021

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Date:	November 2021	Date:	November 2021

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1 INTRODUCTION

RSK Environment Limited (RSK) was commissioned by Taylor Wimpey (South Wales) Ltd (the client) to produce a Surface Water and Silt Management Plan (SWSMP) for the proposed development of the land at the former BBC Broadcasting House Studios, Llandaff, Cardiff, CF5 2YQ (nearest postcode). A site location plan is presented as **Figure 1**.

This site-specific SWSMP has been developed to outline the mitigation measures and water/silt management strategies that will be applied during the development of the Site.

This document must be considered by the Principal Contractor as a 'living' document and must be regularly reviewed and amended as necessary to reflect the site-specific changes as the build phase progresses or should conditions be encountered during the development work.

The site is currently undergoing demolition of existing structures and re-grading of ground levels with this activity anticipated to have been completed by early February 2022. Until re-grading is finalised, there is limited opportunity in the implementation of large scale silt mitigation measures given the high dynamic changes to ground levels and the site as a whole.

The SWSMP must be reviewed as a minimum on a quarterly basis, as new phases of development are commenced or should another significant milestone be reached. The next review should be undertaken post re-grading in early February 2022.

The document has not been prepared for specific discharge of planning conditions.

This report is subject to the RSK service constraints given in **Appendix A**.

1.1 Site Details

The site is located within Llandaff, northwest of Cardiff city centre. The site consists of previously developed land. The site is located at National Grid reference ST 14883 78333.

The site consists of the former BBC Broadcasting House in Llandaff, Cardiff, located off Llantrisant Road, A4119. The site is split into two parcels of land that are divided by Llantrisant Road with the main area located within the northern development parcel (4.3Ha in area), that formerly housed the main BBC building with ancillary offices and vehicle parking. This parcel of land was undergoing demolition during RSK most recent site visit in late October 2021. This northern parcel of land was bounded to the west by residential properties. Bridge Road forms the northern boundary and is located approximately 2m lower than the site. An area of wooded ground and the River Taff are located 40m beyond the boundary, with the River Taff forming the primary surface water receptor. A rowing club is located to the north-east of the northern part of the site.

The southern parcel of site is approximately 2.5Ha in area and housed several buildings. The site was terraced and sloped steeply down towards the north and Llantrisant Road. Demolition of the buildings had not commenced during RSK October 2021 visit.

The southern part of the site is bounded to the west by school grounds with a hospital to the south and university campus to the east. Access to an adjoining university campus to the east of the Taylor Wimpey land was provided through the southern parcel and must be retained.

Access to both the northern and southern developments is gained off the Llantrisant Road (A4119).

A site walkover was undertaken by RSK on the 9th September 2021 and again on 26th October 2021.

The northern parcel of land had numerous changes in topography however, broadly speaking the site sloped down towards the north and north-east. However the changes in topography resulted in at least four distinct watersheds across the northern parcel that would require separate silt mitigation. As discussed, the site is undergoing demolition and a cut and fill exercise to create a level development platform. It is anticipated that following re-grading work, that ground levels will continue to slope down towards the north-east.

The southern parcel of land was terraced and sloped towards the north. This site will also be subject to demolition and re-grading, although it is anticipated that ground levels will continue to slope down to the north.

The nearest surface water course is the River Taff located some 40m north of the site. Both parcels of land are drained of surface waters via a storm drain that connects directly to the River Taff at two locations, north-west and north-east of the site. The storm drain system is being re-located to facilitate the development layout. It is unknown when the diversion will occur however, it is vital that the outfalls are protected for the management of surface waters across the development programme.

Table 1 describes the site surroundings. A photographic record of the site visit is included in **Appendix B**.

Table 1: Site setting – Northern Development Parcel

	Boundary feature	Surrounding land use
To the north:	Dense vegetation including mature trees followed by a metal fence adjacent to Bridge Road	Housing development in northwest, Bridge Road adjacent to site boundary followed by the River Taff some 40m north of the boundary
To the east:	Brick wall and sparce vegetation	Residential dwellings associated with Bridge Road and Bridge Street
To the south	Stone wall and fencing	Llantrisant Road followed by southern development parcel

	Boundary feature	Surrounding land use
To the west:	Mature trees and a brick wall	Residential dwellings associated with Gillian Road

Table 2: Site setting – Southern Development Parcel

	Boundary feature	Surrounding land use
To the north:	Access road to Acorn's nursery and university halls of residence	Llantrisant Road followed by northern development parcel
To the east:	Wire fencing	Acorn's nursery and university halls of residence
To the south	Brick wall, wooden fencing and dense vegetation including mature trees	Residential dwellings associated with Llandaff Chase, Head Injury Clinic/hospital and commercial premises
To the west:	Mature trees and a brick wall	Grounds associated with Bishop of Llandaff High School

The site does not lie in a 'Designated Environmentally Sensitive Area' considered appropriate to the scope of this report.

Published British Geological Survey (BGS) geological records indicate that the site is underlain by superficial glacial till deposits. The superficial deposits are underlain by the Mercia Mudstone Formation across the site. The near surface bedrock is likely to be weathered to a clay. It is therefore anticipated that infiltration to ground is minimal and the use of soakaway pits to assist surface water management during the construction phase is unlikely.

Given the brownfield setting, the site is also covered in a veneer of made ground. The cut and fill exercise to re-grade the site will result in thicknesses of made ground, predominantly granular crush, especially in areas of fill. The fill and made ground will be of benefit as it allows for infiltration to ground and is less likely to release fine suspended solids to surface water. Areas subject to cut are predominantly located in the central and eastern parts of the northern parcel and the north-eastern corner on the southern parcel. Areas subject to cutting may be lowered by up to 2.5m in height and therefore natural soils may be encountered and left exposed. These areas will be of higher risk for the remobilisation of suspended solids to surface waters, especially if tracking over them.

The natural superficial deposits and weathered bedrock are likely to contain a significant proportion of clay with a particle size of <0.002mm and silt (0.002-0.06mm size). These particle sizes readily mobilise to surface water when disturbed and remain suspended within the water column for long durations. Suspended clay/silt can therefore migrate significant distances on these types of ground conditions and are difficult to settle from

the water column. Consideration to minimising soil disturbance must be taken into account when planning work.

The superficial deposits are classified as Secondary (undifferentiated) aquifer. The bedrock deposits are classified as a secondary B aquifer. The site does not fall within a designated groundwater source protection zone (SPZ). Given the geology, infiltration is unlikely. The hydrogeological setting is considered to be less sensitive than the hydrology (surface water receptors) regime.

No geoenvironmental data has been provided for review however, it is RSK's understanding that no obvious sources of contamination have been encountered by the client on site. The site is considered brownfield due to past use as the BBC studios, however, the former land use is not expected to have resulted in significant contamination. The potential for unexpected soil contamination to be encountered during construction work cannot be fully discounted. Based on our current understanding, this SWSMP does not further consider mitigation to address contamination.

1.2 Proposed Development & Drainage System

The site is proposed to be developed principally for residential land use, to comprise traditional residential units including apartments along with associated infrastructure, hardstanding and areas of soft landscaping. The proposed development plan is included within in **Figure 2**.

It is understood that the surface water drainage system will comprise standard highway surface water gullies across the site. These will discharge storm water to two existing storm drain outfalls on the north-western and north-eastern site boundaries, respectively.

The storm drain, currently located along the western boundary of the southern and northern parcels, is to be re-routed to accommodate the new development layout. It is understood that Welsh Water will undertake these works, as principal contractor and be responsible for the working areas, commencing early December 2021. It is anticipated that this work will be completed by March 2022. Welsh Water will be responsible for the surface water discharge and quality for this duration.

1.3 Sensitive Receptors to Silt

On-site sensitive receptors to surface water and silt are identified as follows:

- Residents in completed phases (upon completion and occupation).
- Highway gullies & storm drain system on site (once constructed and completed), including existing outfalls.

Off-site sensitive receptors to surface water and silt are as follows:

- The River Taff, 40m from the site
- Adjacent University and Hospital within southern development parcel.

- Llantrisant Road (A4119) that splits the northern and southern parcels and Bridge Road adjacent to the north northern development boundary
- Residential dwellings to the east, west and south (southern parcel only) of the site.

2 PROTECTION MEASURES DURING DEMOLITION PHASE (NOVEMBER 2021 TO FEBRUARY 2022)

The most significant generation of silt and silt-contaminated surface water will occur post demolition phase. The following protection measures should be implemented during the demolition phase (please refer to attached **Figure 3**). Thereafter silt mitigation must be reviewed.

2.1 Environmental permit application for the discharge of surface waters during the construction phase

It is likely that the development will require an environmental permit to discharge surface water during the construction phase. It is an offence to discharge contaminated water (including those affected by silt) to surface waters. All surface water discharge must be clean and free of contaminants. However, NRW have recently been applying Regulation 38 of the Environmental Permitting (England and Wales) Regulations, 2016, to require all surface water discharge on an active construction site, including surface water flow and rainfall, to be discharged under an environmental permit.

RSK will be applying for a permit on behalf of Taylor Wimpey to cover the construction phase.

2.2 Demolition phase mitigation

The following measures should be implemented as a minimum as shown on **Figure 3**:

Northern parcel:

- An existing reptile fence on the northern boundary must be retained. The fence is constructed of polythene (waterproof), secured into the ground. The fence is approximately 300mm in height and runs the entire length of the boundary. The fence will provide a good silt barrier if needed. The fence should be repaired, where necessary and maintained throughout the demolition phase. The fence should, where feasible, also be maintained for the subsequent construction phase. The fence is marked on **Figure 3**.
- A silt fence should be installed along the western perimeter of the site as shown in **Figure 3**. The purpose of the fence is to prevent runoff impacting upon the off site residential properties, which are located topographically lower than the site. The position of the fence should take into account the proposed storm water drainage diversion to be undertaken starting in December 2021, to avoid becoming damaged.
- The main site entrances to the northern parcel should have sand bags or a ramp fitted to divert water way from the main highway (Llantrisant Road) as shown on **Figure 3**. If plant or haulier movements are anticipated onto the highway, then a rumble strip close to the entrance is advised to reduce sediment drag onto the highway.

- A small pedestrian access point is located in the north-east of the site. Given the current topographic gradient, the access point may allow surface waters to escape the site boundary. The access point is redundant and therefore a silt fence should be installed across it. Given the presence of hardstanding, the base of the fence should be weighed down using sand bags, as shown on Figure 3.

Southern parcel:

- Installation of a silt fence along the western boundary as shown on **Figure 3** to protect the off site properties.
- The installation of sand bags or a ramp angled across the site entrance, to divert runoff from the hardstanding into an area of soft cover to the west. This will avoid runoff impacting upon the highway.

General measures:

- Provision of a road sweeper on the surrounding public highway realm if necessary. This to be continually assessed by site management and the frequency increased during periods of inclement weather and on/off site plant movement. Tipping of road sweeper wastes **must not** be allowed on site.
- Cut and fill will occur with the potential for stockpiling of loose material following the demolition phase for future use. The placement of any such stockpiled materials should be within a designated area as far as practicably possible away from drainage infrastructure and site boundaries. If required, the placement of silt fencing at the base of the stockpile(s) to control run-off should be implemented.
- Retain additional spare silt fencing and silt mat materials on site to enable deployment at short notice and to facilitate on-going maintenance of installations.

2.3 Construction Phase

Silt and surface water management for the construction phase is to be reviewed in early February 2022 post demolition and re-grading of the site.

2.4 Site Personnel and Documentation

The following measures are to be implemented to increase awareness and bring existing site documentation up to date:

- Include a detailed section relating to surface water and silt protection within the site induction folder for all phases of the wok, including demolition phase.
- Continued documented review by the site management team of the existing site conditions in relation to this SWSMP and update the requirements on an as necessary basis.
- Undertake documented weekly site inspections and obtain support from the appointed Environmental Consultant if/when required.
- Conduct a site pre-start meeting with all relevant parties to agree methods of working to control surface water and silt management.

- Undertake additional detailed site-based awareness training (Site Briefing / Tool-Box Talk) on surface water and silt management and protection for all pertinent site staff including groundworkers. Clear guidance should be given to groundworkers on the mitigation measures discussed.

Actions reported for project personnel include:

Technical team:

- Ensure this SWSMP is communicated to the site management team and updated as necessary with any required discharge consents applied for.

Site managers:

- Ensure the measures presented within this SWSMP are implemented by the site construction contractors.
- Brief sub-contractors and site operatives on effective water management and their responsibilities.
- Undertake regular documented inspections and checks to ensure the effectiveness of the pollution prevention measures, especially before, during and after heavy rainfall events, adverse weather and during the wetter seasons (winter).
- Notify Taylor Wimpey Ltd safety / environmental managers should the site be contacted by any enforcing authority and/or members of the public raising concerns over the quality of water leaving the site.
- Report any environmental incident (such as silt ingress to the unnamed surface watercourse) to an appointed environmental advisor.

Contractors:

- Ensure that this SWSMP is communicated to all relevant site teams and groundworkers.

2.5 Dewatering of excavations

Dewatering of demolition excavations during the removal of in-ground obstructions without appropriate water treatment can result in significant pollution of controlled waters. Dewatered silt contaminated surface water should not be discharged into the existing surface water drainage system or directly to surface waters. The NRW Regulatory Position Statement (RPS) “Temporary dewatering of excavations to surface waters”, April 2021 requires discharged water to:

- be clean water, for example clear rainwater or infiltrated groundwater which has collected in the bottom of temporary excavations.
- not result in water containing fine or coarse suspended solids (silty water) entering surface water.
- not last more than 3 consecutive months (the activity may stop and restart but the clock does not restart) – if the activity is likely to go over 3 consecutive months then a permit must be applied for.

- be made to surface water, such as a river, stream or the sea.
- have a method statement that minimises the risk of pollution.

The discharge must not:

- pollute surface water.
- contain any chemical dosing agents, flocculants or coagulants.
- be from a site which is contaminated by oil, metals, hydrocarbons, solvents or pesticides or other polluting substances.
- result in the spread of non-native invasive species, parasites or disease.
- cause flooding from surface water.
- cause erosion of the banks or bed of the receiving watercourse.
- contain concrete wash water even if it has been treated.
- contain site drainage from surface areas such as haul roads, storage or working areas.
- be from a site with naturally elevated concentrations of substances which exceed environmental quality standards.

If active pumping of water from foundation trenches is considered, care needs to be taken that water will not be discharged direct to surface water drains without prior treatment to remove silt to <25mg/L. If required, consideration to dispose of silt-contaminated water into the foul water system, which may allow up to 1,000mg/L of suspended soil should be sought. This would require approval from the local water board and there is typically up to 6 months of lead in time to obtain appropriate licences. Where dewatering of significant volumes of water is anticipated, early advice from an appointed environmental advisor should be sought.

Importantly, following three months, an environmental permit would be required for continued pumping and discharge. The statutory appraisal time for permit applications may be up to 4 months, therefore early consideration for permit application is paramount.

3 SITE MONITORING PROCEDURES AND RECORDS

The following monitoring procedures should be carried out on a regular basis by the site management team to enable continuous review of the measures listed above. Examples of monitoring sheets are included in **Appendix D**. A comprehensive record of the effectiveness of the system should then be maintained to enable further review by any parties attending site:

- Monitoring of on site for surface water and silt run-off at boundaries, main site entrances and the adjacent public highway realm.
- Given the existing storm drainage scheme and the absence of clear outfalls on the River Taff, it is not possible to directly monitor the surface water discharge quality. This therefore increases the risk that contaminated waters may be leaving the site undetected via the storm drain system.
- Regular inspection of all gullies and conditions of the public highway at site entrances.
- All records should be reviewed on a regular basis, but advice can be obtained by the site management team at any time from an appointed Environment Consultant.
- Calls to the appointed Environmental Consultant should be made in the event of heavy rainfall breaching protective measures or silt pollution incidents being recorded.
- To enable a prompt response to changing site conditions, it is advisable to ensure a supply of straw bales, silt fencing and silt matting is readily available to implement emergency measures.

This SWSMP is intended to be a live working document to be regularly reviewed and updated as required.

FIGURES

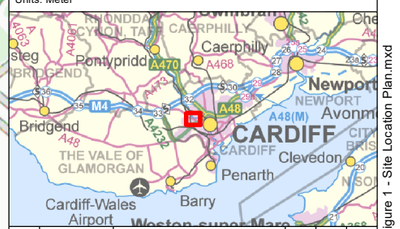
314000 315000 316000

179000 178000

Legend:

Site Boundary

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



Rev	Date	Description	Drn	Chk	App
00	30/09/2021	First Draft	DR	CL	CL

Taylor Wimpey
BBC Llandaff, Cardiff

RSK

TITLE:
Figure 1:
Site Location Plan

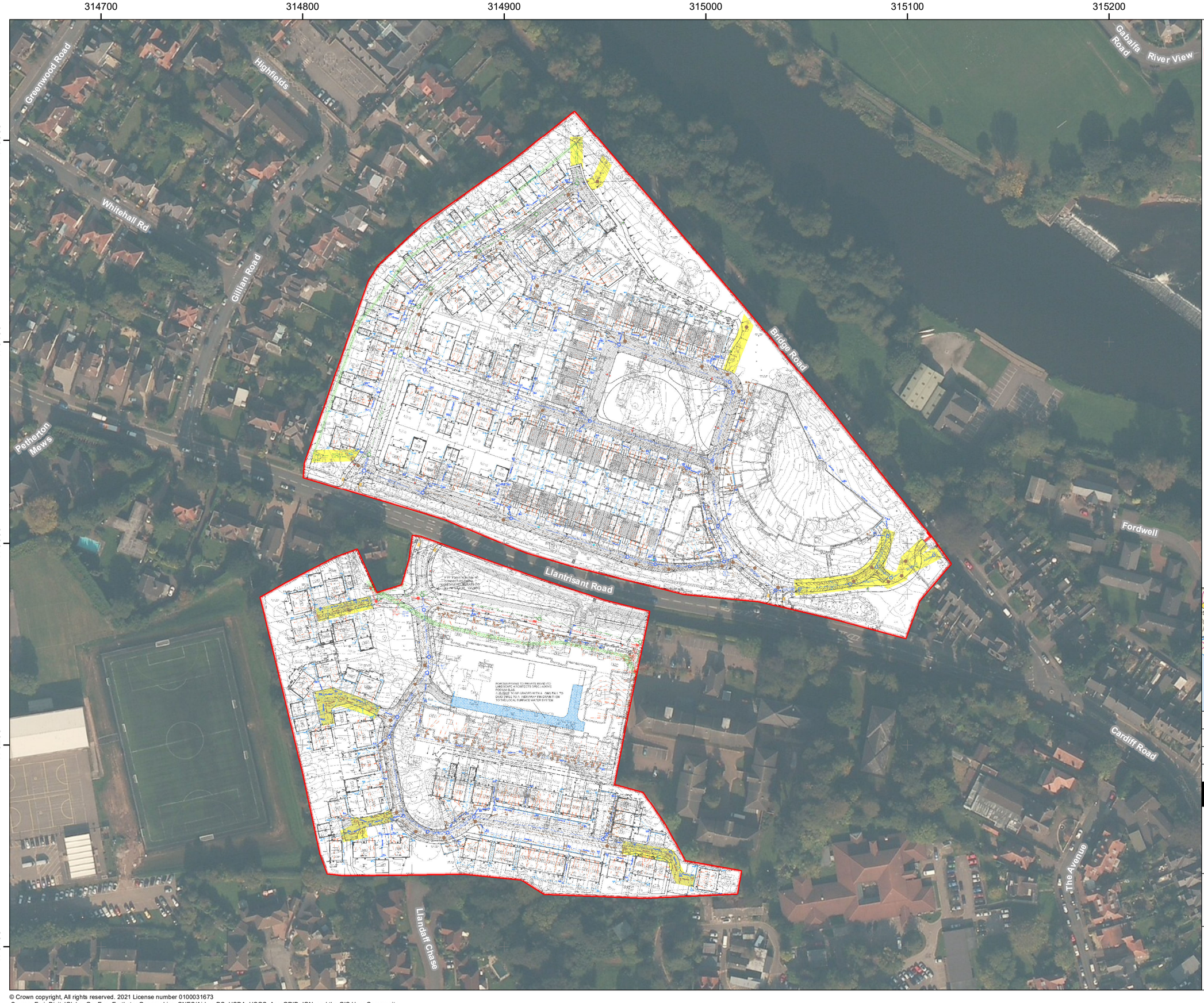
0 50 100
Metres

SCALE: 1:7,000 @ A3

N W E S

REV 00

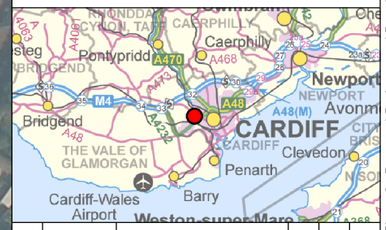
Document Path: P:\Geoscience\314600 - 314699\314688 - BBC Llandaff\01 - GIS\Figure 1 - Site Location Plan.mxd



Legend:

Site Boundary

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



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00	30/09/2021	First Draft	DR	CL	CL

Taylor Wimpey
BBC Llandaff, Cardiff

RSK

TITLE:
Figure 2:
Proposed Drainage and Development Plan

0 20 40
Metres
SCALE: 1:1,750 @ A3

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W E
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Install new silt fence
along western perimeter

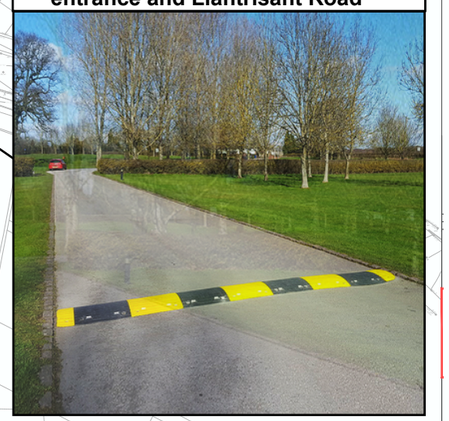
Retain, repair and maintain
existing reptile fence.

Install sand bags or ramp (tarmac)
to divert runoff away from the site
entrance and Llantrisant Road

Install new silt fence across
redundant pedestrian entrance and
weigh down at ground level with sand
bags.

Install new silt fence
along western perimeter

Install sand bags or ramp (tarmac)
to divert runoff away from the site
entrance and Llantrisant Road



BBC Cymru Wales

University College Cardiff
Plas Gwyn

BRIDGE ROAD

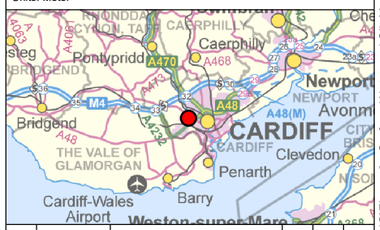
LLANTRISANT ROAD

LLANDAFF / LLANDA?F

Legend:

Silt Fence

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



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00	16/11/2021	First Draft	DR	CL	CL

Taylor Wimpey
BBC Llandaff, Cardiff

RSK

TITLE: Figure 3:
Surface Water and Silt
Management Plan (prevention and
mitigation features)

NOT TO SCALE

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W E
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Document Path: C:\Users\droberts\Desktop\Workings\314688 - BBC Llandaff\01 - GIS\Figure 3 - Surface Water and Silt Management Plan (prevention and mitigation features) Template.mxd