

## 14 SERVICES AND INFRASTRUCTURE

### 14.1 Introduction

14.1.1 This section identifies the extent of existing drainage provision in proximity to the Application Site and presents realistic options for utilising this service where available / feasible and addresses the requirement for additional infrastructure where necessary.

14.1.2 Foul and surface water drainage requirements are outlined below.

### 14.2 Planning Policy

14.2.1 Early liaison with Dwr Cymru, Welsh Water (DCWW) and the Environment Agency Wales (EAW) ensures realistic options are presented and prevents progression of abortive work.

14.2.2 The EAW, in their letter dated 9<sup>th</sup> March 2009, (see Appendix 14.1), have stipulated a requirement for the inclusion of Sustainable Urban Drainage Systems (SUDS) for adoption in order to deal with the Application Site's surface water discharge. Furthermore, a restriction on discharge to a rate of 21l/s/ha and a minimum storage of 310m<sup>3</sup>/ha of impermeable surface created must also be catered for as outlined in their letter dated 2<sup>nd</sup> July 2009.

### 14.3 Methodology

14.3.1 The surface water drainage will be designed in accordance with the Water Industry's publication 'Sewers for Adoption' 6th Edition with intensity of rainfall established from the Wallingford Procedure Mapping for the Bridgend area. Flows will be simulated through a micro-drainage model thus ensuring a design with adequate storage for the storm return period of 100 years.

14.3.2 The foul water drainage will be designed in accordance with the Water Industry's publication 'Sewers for Adoption' 6th. Edition, BS6465-1: 2006 for Sanitary Installations, Building Regulations 2000: Document H for Drainage and Waste Disposal (2002 Edition) and 'Toilet Facilities at Stadia' by the Sports Council in the absence of information outlining the number of appliances within.

### 14.4 Baseline Data and Assessment

14.4.1 It is proposed that surface water drainage will be discharged, subject to DCWW approval, to the existing 750mm dia. surface water sewer located in the southern verge of the A48. This sewer was installed in 1983/84 to serve the existing science park and future further phase of the science park within the Application Site. It is therefore considered capacity may be available to discharge into this sewer; however confirmation of the available capacity will be determined by the DCWW, on completion of a modelling exercise of the existing network. Should capacity not be available, a requisition sewer will be laid along the A48 corridor to discharge into the River Ogwr, located approximately 450m from the site's western boundary.

14.4.2 It is proposed that foul drainage will be discharged, subject to DCWW approval, to the existing 225mm dia. foul sewer located in the southern verge of the A48. As above, this sewer was installed in 1983/84 to serve the existing science park and the anticipated future further phase of the science park within the Application Site. It is therefore considered that this sewer

should have spare capacity, bearing in mind the peak flows for the Stadia and science park will not occur simultaneously. DCWW will require a modelling exercise to confirm that the Application Site proposals can be accommodated within the existing sewer's capacity. In the event that capacity is not available, a requisitioned sewer will be required, laid within the A48 corridor, to discharge into the 1200mm dia. trunk foul sewer, located approximately 250m from the site's western boundary. DCWW confirmed in 2004 that the 1200mm dia. trunk foul sewer had some spare capacity.

## 14.5 On Site Surface Water Drainage

14.5.1 The EAW confirmed that a SUDS approach should be adopted for the drainage of the Application Site, subject to precautions required to mitigate potential contamination of the major aquifer underlying the site. SUDS solutions can include a variety of surface water flow reduction measures such as lagoons, swales, soakaways, green roofs etc.

14.5.2 Appendix 14.2 shows the principle of the drainage proposal to the Application Site. In effect both surface water from the development areas and highways will be discharged to the existing sewer alongside the A48 via an attenuation lagoon located at the western side of the site. Drainage of the car parking areas will consist of permeable paving discharging to the sub-surface. The overall discharge strategy for site storm water is as follows: -

- Discharge of site roofs, highway and access road drainage to the A48 via pipework and an attenuation pond(s)
- Discharge of A48 and A48 / site access road junction into a dedicated highway drain within the A48, without attenuation.
- Car parking to sub-soil

14.5.3 Topographically the Application Site falls generally from north to south, but the surface water network discharges in the opposite direction. To mitigate the effects of the long drainage path to the outfall, downpipes will be located as far as is practicable on the northern side of all buildings. Large roofs will be drained by siphonic arrangement, thereby minimising the number of downpipes.

14.5.4 Total surface water flows off-site will be mitigated in accordance with the EAW requirements by: -

- introduction of lagoons and water features
- the introduction of green roofs
- providing permeable car parking surfaces.

14.5.5 The EAW were concerned that contamination of the aquifer below the site may occur should soakaways or other large unlined bodies of water be introduced. It is therefore proposed that lagoons and other water bodies be lined to prevent the flow of potential contaminants into the sub-soil. Water passing through the permeable car park construction will be purified by filtration and microbial action as it passes through a geotextile layer, Inbitex or similar. If the

car park design were to be of a conventional impermeable paving type, with gullies and piped drainage, oil / petrol interceptors would be provided to capture and retain hydro carbons for manual removal.

- 14.5.6 Although the EAW and all planning authorities promote the use of SUDS, the EAW, DCWW and Local Authorities (LAs) are, in practice, reluctant to adopt such schemes, due presumably to the current legislation and cost implications. It is understood however that legislation will shortly be forthcoming which will require authorities to adopt SUDS designs. Should this be the case the currently proposed piped network will be modified to lined swales wherever possible. This will promote the principle of a SUDS solution for drainage on the site. Currently swales are unadoptable features as they are, in addition to being development surface water conveyors, deemed to be land drainage for which no authority will claim responsibility
- 14.5.7 The drawing also indicates a means of drainage for the Bridgend Athletic Football Club stand and the football and rugby field to the south of the site. Discharge will be via swales to an area to be classified, environmentally, as a wetland area.

## 14.6 On Site Foul Drainage

- 14.6.1 Appendix 14.3 shows the proposed drainage strategy for the Application Site. It should be noted that the drainage generally falls from south to north, along the access road, serving the indoor tennis facility and the main site access road.
- 14.6.2 Along the route to the A48 it connects with drainage runs from the various sporting facilities and science park development. Ideally the new foul sewer should link with the existing sewer adjacent the A48 / access road junction. However, due to gravity and level considerations, it is proposed to connect to the existing deep DCWW manhole located at the north western corner of the site.
- 14.6.3 The foul sewer serving the stand and changing facilities within the Bridgend Athletic football stand may need to be pumped to the nearest gravity based foul sewer manhole. Careful ground modelling of the Application Site may, however, make gravity discharge practicable at this location.

## 14.7 References

*Sewers for Adoption, 6<sup>th</sup> Edition – a design and construction guide for developers*

*BS6465-1: 2006 – Sanitary Installations*

*Building Regulations 2000: Drainage and Waste Disposal – Section H; 2002 Edition*

*Toilet Facilities at Stadia' by the Sports Council, 1993*