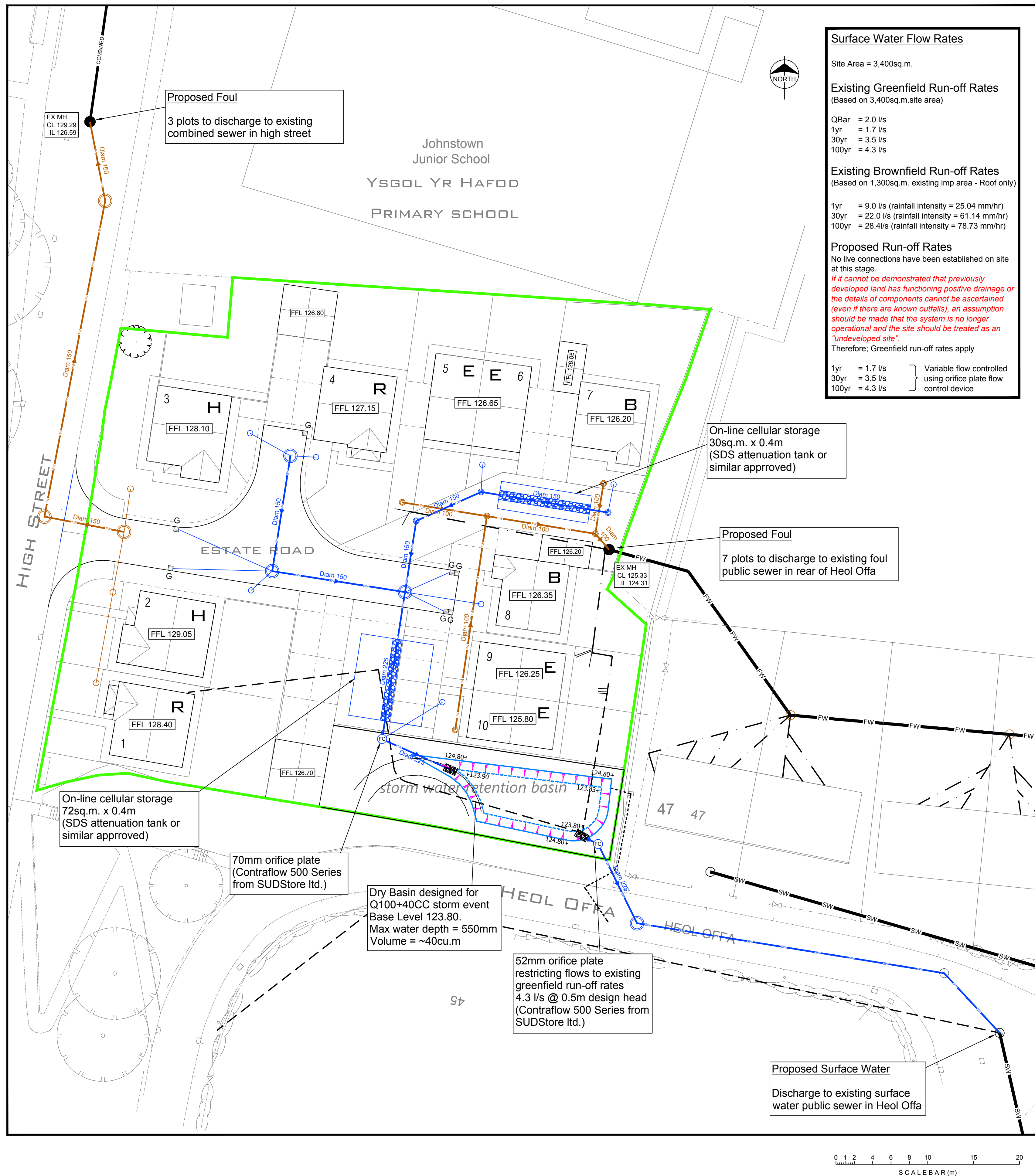


**Surface Water Flow Rates**

Site Area = 3,400sq.m.

**Existing Greenfield Run-off Rates**  
(Based on 3,400sq.m site area)QBar = 2.0 l/s  
1yr = 1.7 l/s  
30yr = 3.5 l/s  
100yr = 4.3 l/s**Existing Brownfield Run-off Rates**  
(Based on 1,300sq.m. existing imp area - Roof only)1yr = 9.0 l/s (rainfall intensity = 25.04 mm/hr)  
30yr = 22.0 l/s (rainfall intensity = 61.14 mm/hr)  
100yr = 28.4 l/s (rainfall intensity = 78.73 mm/hr)**Proposed Run-off Rates**

No live connections have been established on site at this stage.

*If it cannot be demonstrated that previously developed land has functioning positive drainage or the details of components cannot be ascertained (even if there are known outfalls), an assumption should be made that the system is no longer operational and the site should be treated as an "undeveloped site".*

Therefore, Greenfield run-off rates apply

1yr = 1.7 l/s  
30yr = 3.5 l/s  
100yr = 4.3 l/s } Variable flow controlled using orifice plate flow control device

On-line cellular storage  
30sq.m. x 0.4m  
(SDS attenuation tank or similar approved)

Proposed Foul  
7 plots to discharge to existing foul public sewer in rear of Heol Offa

On-line cellular storage  
72sq.m. x 0.4m  
(SDS attenuation tank or similar approved)

70mm orifice plate  
(Contraflow 500 Series from SUDStore Ltd.)

Dry Basin designed for Q100+40CC storm event  
Base Level 123.80.  
Max water depth = 550mm  
Volume = ~40cu.m

52mm orifice plate restricting flows to existing greenfield run-off rates  
4.3 l/s @ 0.5m design head  
(Contraflow 500 Series from SUDStore Ltd.)

Proposed Surface Water  
Discharge to existing surface water public sewer in Heol Offa

**Drainage Strategy****Surface Water****1. Collected for re-use**

The developer is not considering any rainwater harvesting systems for use within the dwellings. However, water butts will be installed to rear RWPs for re-use in the garden.

**2. Infiltration**

No intrusive site investigation has currently been undertaken. However a review of geological mapping indicates the potential for infiltration for disposal of surface water flows from the proposed development is low. Further review required during site investigation (by others). Consider other options.

**2. Watercourse**

No open or culverted watercourses are present within the vicinity of the site.

**4. Surface Water Sewer**

A existing surface water spur from the site appears to discharge into drain to the west of No. 47 Heol Offa. Connectivity upstream and downstream is currently unknown but CCTV indicates this drains to a network to the south of Heol Offa which then discharges into the surface water public sewer further downstream. These sewers may have transferred to public ownership and should to be confirmed by Welsh Water.

Proposed surface water flows from the development will be restricted to greenfield run-off rates and discharge into the existing surface water public sewer network in Heol Offa at a point to be agreed with Welsh Water.

Attenuation will be provided in a dry basin with a maximum water depth of 700mm during a 100year storm event + 40% climate change allowance.

**Proposed Foul**

Discharge to existing foul public sewer in rear of Heol Offa. Existing lateral to be reconstructed /re-routed to suit proposed development layout subject to third party / Welsh Water approval.

**Water Quality****Roof**

Generally run-off from roof can be considered clean run-off and will not require any treatment

**Highway**

All gullies to be trapped to reduce the risk of any silt / oils spills being passed forward to the downstream network

**Driveways**

Tanked permeable paving could assist with removal of suspended solids and hydrocarbons so that the water draining into the next stage of the SUDS management train is significantly higher than if using an impermeable surface material. This will be considered further at detailed design as final site levels and service routes will influence its use.

Further levels of treatment will be provided further down the SUDS management train within the shallow SUDS basin prior to flows leaving the site at a restricted flow via a flow control device.

**5mm Interception**

Rainfall run-off from paved surfaces, such as car parks and roads, contains a range of pollutants; many of these are from vehicle emissions. The highest concentration of these pollutants tends to be found in run-off from the earliest part of a rain storm. Intercepting just 5 mm of every rain storm - large or small, infrequent or frequent, has positive implications for water quality and quantity. Over 50 per cent of rain events produce less than 5 mm of rainfall, so intercepting just 5 mm from each storm means the majority create no rainfall run-off at all.

Interception can be provided on this development by using water butts in rear gardens, permeable paving and setting the outlet pipe from the basin slightly higher than the base level to prevent the first 5mm rainfall leaving the site.

**Maintenance / Responsibilities**

Adoption and maintenance of all surface water components serving 2 or more properties subject to SAB approval.

A 'Private Management Company' should be set-up to maintain the SAB approved surface water network in the future.

WCBC SABS will require details of the Management Company. Maintenance requirements will be considered further at detailed design stage and a SUDS Management Plan will be produced to address the frequency and type of maintenance activities. Residents will be required to pay an annual fee to the Management Company. Details /costs to be determined for Full SABS Application.

**Pipes and manholes:**

All piped networks to have CCTV survey at end of construction activities. Any debris to be removed. Future maintenance to involve inspections to ensure no silt build ups within network. SUDS Management Plan to be produced to address frequency and type of maintenance activities

**Flow Control:**

To be maintained by private 'Management Company' SUDS Management Plan to be produced to address frequency and type of maintenance activities.

**Road Gullies:**

To be maintained by private 'Management Company' SUDS Management Plan to be produced to address frequency and type of maintenance activities.

**Shallow Dry Attenuation Basin :**

To be maintained by private 'Management Company' SUDS Management Plan to be produced to address frequency and type of maintenance activities.

**Note**

- This is a preliminary design demonstrating a drainage solution is achievable to discharge flows from the proposed development. A topographical survey, full site investigation and drainage survey work is required prior to undertaking full design, however, it should be noted the site does currently drain at unrestricted flow rates with no known flooding issues and the proposed scheme will provide a betterment on the existing situation.
- The specification in all respects shall be in accordance with the current Wrexham CBC Specification and Construction publication in force in the county at the time of construction.

**PRELIMINARY**

|      |          |                                         |    |       |
|------|----------|-----------------------------------------|----|-------|
| A    | 18.12.20 | Updated to suit revised planning layout | PW | AJ    |
| Rev. | Date     | Revision                                | By | Appd. |

**coopers**  
chartered consulting engineers

Tel: 01244 684910  
Fax: 01244 684911  
Email: admin@coopers.co.uk  
Web: http://coopers.co.uk

Park House  
Sandpiper Court  
Chester Business Park  
Chester  
CH4 9QU

|         |                                   |  |  |  |
|---------|-----------------------------------|--|--|--|
| Client  | GOWER HOMES                       |  |  |  |
| Project | RUABON ROAD<br>JOHNSTOWN, WREXHAM |  |  |  |
| Title   | Drainage Strategy                 |  |  |  |

|                |             |             |       |      |          |          |   |
|----------------|-------------|-------------|-------|------|----------|----------|---|
| DRAWING NUMBER | 7500 / SK03 | SCALE at A1 | 1:250 | DATE | April 20 | REVISION | A |
| CHECKED        | AJ          |             |       |      |          |          |   |