Drainage Strategy - Surface water

Surface water runoff generated by the development is proposed to discharge to the adjacent waterbody/ watercourse known as 'Big Water' via a proposed outfall manhole (Ref: S57HW). The discharge will be controlled to a restricted rate of 18.1 l/s, which provides a betterment over the calculated pre-development greenfield runoff rate (QBAR) of 29.8 l/s.

Proposed Outfall Manhole:

MH Ref:	S57HW (Proposed)
Cover Level (CL):	34.88 mAOD
Invert Level (IL):	33.68 mAOD
Outgoing Pipe:	300mm Ø

Surface water attenuation for the development will be provided via a combination of attenuation basins. An online attenuation basin is proposed to serve **Phase 3A** of the development, with a second online attenuation basin provided to serve the future **Phase 3B** area.

The surface water pipe network has been designed to cater for the 1:30 year storm event. Attenuation storage, including the attenuation basins, has been designed to accommodate the 1:100 year plus 45% climate change storm event, ensuring controlled discharge to the receiving watercourse without increasing flood risk.

Approval for the proposed discharge to Big Water will be required from the Lead Local Flood Authority (LLFA) prior to detailed design and implementation.

Further drainage investigation works, including a CCTV survey, will be required at the detailed design stage to confirm existing levels, pipe sizes, structural condition, and to validate the proposed outfall connection. The drainage strategy is therefore subject to the findings of these investigations.

Drainage Strategy - Foul water

The development will primarily drain to a proposed foul water pumping station located adjacent to Plots 90–93. The majority of the site will discharge foul flows to this pumping station, with the pumped flows conveyed via a rising main to the proposed foul water gravity network within **Phase 3A**, prior to ultimately discharging via gravity to the existing United Utilities foul sewer network.

In addition, a small area within **Phase 3A** and a limited portion of **Phase 3B** will discharge foul water directly via gravity to the existing United Utilities foul sewer network within Phase1.

Gravity Connection Manholes (Existing – Phase 1):

Phase 3A Connection:

MH Ref:	HGV_FMH27 (Existing)
Cover Level (CL):	43.581 mAOD
Invert Level (IL):	38.993 mAOD
Outgoing Pipe:	225mm Ø

Phase 3B Connection:

MH Ref:	F14.B (Existing)
Cover Level (CL):	46.221 mAOD
Invert Level (IL):	41.615 mAOD
Outgoing Pipe:	150mm Ø

Rising Main Termination Chamber (Proposed):

MH Ref:	F12 (Proposed)
Cover Level (CL):	42.133 mAOD
Invert Level (IL):	39.430 mAOD
Incoming Pipe:	150mm Ø

The foul water network associated with the development is proposed as an entirely new system, with the pumping station and rising main forming a key component of the overall foul drainage strategy. Connection details and levels referenced above are based on **previous design** works undertaken for Phase 1 of the wider development.

Approval to connect into the existing United Utilities foul sewer network will be required and must be confirmed via a United Utilities pre-development enquiry and subsequent Section 106 agreement prior to detailed design and construction.

Further drainage investigation works, including a CCTV survey, will be required at the detailed design stage to confirm existing cover levels, invert levels, pipe diameters, manhole dimensions, and the overall condition of the receiving network. The proposed foul drainage strategy is therefore subject to the findings of these investigations.

Notes

1. Design is produced using the topo survey provided by **Taylor Wimpey** and an architectural planning layout by **File Reference 1474-TWNW hclonenod P3 2026-01-21.**
2. The use of any other flow control devices not associated with the Hydro International Hydro-Brake Optimum references provided may constitute a flood risk.
3. Drainage design and construction is in accordance with Design and Construction Guidance 2020 (DCG) and the requirements of the statutory undertaker.
4. Tolerances in pipe laying to be in accordance with Design and Construction Guidance 2020 (DCG).
5. For pipes 150-450mm dia. all rocker pipes to be in accordance with Design and Construction Guidance 2020 (DCG).
6. Engineering bricks shall not contain frogs or holes.
7. Brickwork to manholes to be English bond.
8. Where pipes are surrounded in concrete, flexibility is to be maintained at pipe joints by the use of a suitable compressible material eg. "FLexcell" or "Fibreboard".
9. All manhole covers and frames must comply with BS EN124. covers in roads to be grade D400 and be 150mm deep. manhole covers in car parking areas and drives to be grade B125, whilst landscaped areas may be grade A15.
10. Clayware pipes to be 65 extra strength quality "Hepseal" or similar approved.
11. Granolithic benching to manholes to be 40mm minimum thickness.
12. Precast concrete chamber rings to be reinforced.
13. The slope of benching in all cases should be 1 in 30.
14. Manholes shall not incorporate double square or double oblique channel junctions in their inverts.
15. All incoming pipes shall be surrounded with 150mm of concrete to the face of the collar of the first flexible joint and the outgoing pipe shall also be surrounded to within 50mm of the first flexible joint and a compressible filler used as a former between the concrete surround and downstream pipe collar.
16. All underground services to be confirmed by contractor prior to commencement on site. any discrepancies to be reported to engineer.
17. Private sewers not located in roads to be class F granular bed and surround as per standard details.
18. Sewers located under adopted roads to be class s granular bed and surround (more than 1.2m cover.)
19. Sewers located under private roads and car parking bays to be class f granular bed and surround as per standard details unless adopted, then provide class s (if more than 1.2m cover).
20. Private sewers with less than 0.6m of cover to be concrete surrounded as class Z on standard details.
21. Adopted sewers with less than 1.2m cover, provide class Z concrete bed and surround. concrete haunching may be suitable for large diameter storage sewers, guidance must be sought from adopting authority prior to use.
22. Road gullies to be pcc and trapped with 150mm ST4 concrete surround.
23. No deep or wide routed trees to be planted within close proximity of the proposed and existing public sewer system.
24. Pipes less than 300mm dia. to be Polypipe UPVC unless otherwise stated.

NOTE:-
ALL CONNECTIONS ON THE ADOPTABLE SEWER WORKS MUST BE SOFFIT TO SOFFIT CONNECTIONS

The adoptable drainage and highway works are subject to technical approval by **United Utilities** and **St.Helens Borough Council** respectively and may therefore change

MANHOLE REFERENCES:-

TYPE 1	UU MANHOLE TYPE 1 (STND/19/001 A)
TYPE 4	UU MANHOLE TYPE 4 (STND/19/003 A)
RH	UU SW SHALLOW MANHOLE (STND/19/004 A)
AMPS	ALTERNATIVE MANHOLE PLATFORM SYSTEM
SPEC	SPECIAL MANHOLE WITH MID SECTION LANDING (FOR MANHOLES +6.0m COVER TO SOFFIT - SEE SPECIFIC DETAILS)
HB	HYDROBRAKE MANOLE (SEE SPECIFIC MANHOLE DETAILS)
HW	HEAD WALL (SEE SPECIFIC DETAILS)
FWPS	FOUL WATER PUMPING STATION (SEE SPECIFIC DETAILS)
PS	FOUL WATER PEN STOCK MANHOLE (SEE SPECIFIC DETAILS)

Phase 3B Proposed Foul Water Connection (F14.B/Existing)

It is proposed that a small portion of **Phase 3B** foul water drainage discharge via gravity to the existing foul water sewer network with in Phase 1 at manhole F14.B.

Cover level: 46.221 mAOD
Invert level: 41.615 mAOD

Proposed Surface Water Outfall (S57HW)

A connection to the existing Surface Water body/system, Big Water is proposed.

Cover level: 34.88 mAOD (From Topo Survey)
Invert level: 33.68 mAOD (From Drainage Survey)

Surface water outfall

Proposed Outfall headwall into Big Water.
Surveyed top water level 33.38 mAOD.
Land drainage consent will be required from the Lead Local Flood Authority.

Proposed Cellular Storage

Storage volume - 108 m³.
3 no. layers of 400mm deep units.

Cells
CL: 95.150 mAOD
IL: 92.972 mAOD

Length x Width x Depth = 15.0m x 6.0m x 1.2m
Cell Unit Size = 1.0m x 0.5m x 0.4m

Maintenance Access

300mm Silt Trap and Air Vent located up and down stream of cells.
See Cellular Storage manufactures details/ requirements.

Flow Control Chamber Manhole - S50 HB

Hydro International HydroBrake Optimum

S50 HB
Cover level: 35.90 mAOD
Invert level: 33.828 mAOD

Unit
Reference = SHE-0184-1810-1425-1810
Design head = 1.425 m
Restricted discharge max. = 18.1 l/sec
Flow control orifice size = 184 mm

Foul Water Pumping Station F42 FWPS

Proposed foul water pumping station to pump flows to the existing foul drainage network.
The connection / discharge point is to be confirmed and agreed with United Utilities prior to detailed design.

Flow Control Chamber Manhole - S45 HB

Hydro International HydroBrake Optimum

S45 HB
Cover level: 35.475 mAOD
Invert level: 33.933 mAOD

Unit
Reference = SHE-0100-5000-1400-5000
Design head = 1.400 m
Restricted discharge max. = 5.0 l/sec
Flow control orifice size = 100 mm

S44HW Headwall

To be constructed inline with the details set out in UU drawing STND//19/011 or STND//19/011.

Invert level and pipe diameter to be confirmed prior to any construction

Foul Water Rising Main

Proposed Foul Water rising main to be routed through site within the proposed footway & carriageway, discharging the proposed foul water gravity network at manhole F12 . this gravity system they discharges to the existing foul water sewer with in Phase 1 at manhole HGV_FMH28.

Rising Main Length: ~388m

S43HW Headwall

To be constructed inline with the details set out in UU drawing STND//19/011 or STND//19/011.

Invert level and pipe diameter to be confirmed prior to any construction

Proposed Online Attenuation Basin

Approximately 12070m³ storage within basin.

Top of bank level:	35.475 mAOD
Top of bank area:	2754.375 m²
Basin bed level:	33.975 mAOD
Basin bed area:	1468.447 m²
Freeboard level:	35.175 mAOD

Embankment gradient: 1:3

Inlet level:	S43 - 34.275 mAOD S64 - 34.49 mAOD
Outlet level:	S44 - 33.975 mAOD

The basin will fill via headwall (S43 & S64 HW) and drain via headwall S44HW.

S33HW Headwall

To be constructed inline with the details set out in UU drawing STND//19/011 or STND//19/011.

Invert level and pipe diameter to be confirmed prior to any construction

Proposed Foul Water Connection (HGV_FMH27/Existing)

It is proposed that the foul water drainage discharge via gravity to the existing foul water sewer with in Phase 1 at manhole HGV_FMH28.

Cover level: 43.581 mAOD
Invert level: 38.993 mAOD

Foul Water Rising Main

Proposed Foul Water rising main to be routed through site within the proposed footway & carriageway, discharging the proposed foul water gravity network at manhole F12 . this gravity system they discharges to the existing foul water sewer with in Phase 1 at manhole HGV_FMH28.

Rising Main Length: ~388m

Phase 3B Proposed Surface Water

In order to attenuate storm water flows generated by **Phase 3B** within a second online storage basin a new length of sewer is required to link **Phase 3A** Drainage Network to **Phase 3B** Attenuation Basin (new length of sewer between MH522 & S23HW).
with this connection made the link to **Phase 3A** basin between manholes S39 & S44HW is to be 'grubbed up'/ removed.
The pipe work between Manhole S22 & S63 is also to be 'grubbed up'/ removed.
A new pipe length between manholes S39 & S40 is to be installed to convey flow from manhole S63 onward to **Phase 3A** Attenuation Basin.

Phase 3B/Future Phase Attenuation Storage & Flow Control

Flow Control Chamber Manhole - S25 HB

Hydro International HydroBrake Optimum

S50 HB
Cover level: 35.90 mAOD
Invert level: 33.828 mAOD

Unit
Reference = SHE-0104-5000-1300-5000
Design head = 1.300 m
Restricted discharge max. = 5.0 l/sec
Flow control orifice size = 104 mm

Phase 3B Headwall

To be constructed inline with the details set out in UU drawing STND//19/011 or STND//19/011.

Invert level and pipe diameter to be confirmed prior to any construction

Phase 3B Proposed Online Attenuation Basin

Approximately 1211m³ storage within basin.

Top of bank level:	37.000 mAOD
Top of bank area:	1595.626 m²
Basin bed level:	35.500 mAOD
Basin bed area:	792.938 m²
Freeboard level:	36.700 mAOD

Embankment gradient: 1:3

Inlet level:	S23 - 35.800 mAOD
Outlet level:	S24 - 35.500 mAOD

The basin will fill via headwall S23 and drain via headwall S24HW.

Mark	Date	Details	By	Chk
D	22.01.26	Drawing updated with various notes		CP
C	21.01.26	Updated with Layout: 1474-TWNW Halsnead P3 2026-01-21 Drainage Design for Phase 3A shown		CP
B	20.08.25	Discharge rate amended to be 29.8l/s		NR
A	20.05.25	Preliminary issue for review		JC

Revision history

Drawing originator:

BETTS HYDRO CONSULTING ENGINEERS
BETTS ASSOCIATES CONSULTING ENGINEERS
BETTS GEO CONSULTING ENGINEERS

Client:

Taylor Wimpey

Project title:

Halsnead Phase 3
Whiston

Drawing title:

Main Drainage Layout

Scale: 1:500 for the original size of A0

Drawn by: JC | Checked by: | Passed by: | Date: 20.05.25

Drawing status:

Planning

Job No:	Drawing No: Project	Origin.	Volume	Level	Type	Discip.	Number	Revision:
TAY132	XX	BET	XX	XX	XX	C	101	D

Do not scale this drawing

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