SURFACE WATER PRINCIPLES

NPPG HIERARCHY OF SURFACE WATER DRAINAGE

THE NATIONAL PLANNING PRACTICE GUIDANCE SETS OUT THE HIERARCHY OF DRAINAGE TO PROMOTE THE USE OF SUSTAINABLE DRAINAGE SYSTEMS, BY ALIGNING MODERN DRAINAGE SYSTEMS WITH NATURAL WATER PROCESSES. THE AIM OF HIERARCHY OF DRAINAGE IS TO DRAIN SURFACE WATER RUN-OFF AS SUSTAINABLE, AS HEIGHBOURLY PRACTICABLE.

AS STATED IN THE NATIONAL PLANNING PRACTICE GUIDANCE, THE AIM SHOULD BE TO DISCHARGE SURFACE WATER RUN-OFF AS HIGH UP THE DRAINAGE HIERARCHY, AS REASONABLY PRACTICABLE:

- INTO THE GROUND (INFILTRATION).
- TO A SURFACE WATER BODY.
- TO A SURFACE WATER SEWER, HIGHWAY DRAIN, OR ANOTHER DRAINAGE SYSTEM.
- TO A COMBINED SEWER.

INFILTRATION

A PHASE 1 GEO-ENVIRONMENTAL ASSESSMENT UNDERTAKEN BY PWA GEO-ENVIRONMENTAL (REF: 21307-PWAG-00-XX-R-G-1000/R1, DATED 2021), REVIEWED BGS GEOLOGICAL MAPPING WHICH INDICATES SUPERFICIAL GEOLOGY TO COMPRISE GLACIAL TILL FROM THE VALE OF YORK FORMATION. SOAKAWAY TESTING HAS BEEN UNDERTAKEN FOR THE SITE, REFER TO SOIL INFILTRATION TESTING. THIS GAVE AN INFILTRATION RATE OF 7.00X10^{-6} M/S, AND THE OTHER 2 PITS FAILED. IT HAS BEEN ADVISED BY THE UNDERTAKERS THAT SOAKAWAY IT UNLIKELY TO BE SUITABLE FOR THE SITE, WITH THE ABOVE, INFILTRATION HAS BEEN DISCOUNTED FOR THE DISPOSAL OF SURFACE WATER FLOWS DUE TO THE INSUFFICIENT INFILTRATION RATES.

WATERCOURSE

IF INFILTRATION HAS BEEN DISCOUNTED AS A VIABLE SOLUTION, THE NEXT METHOD IN PRIORITY SHOULD BE TO DISCHARGE TO A WATERCOURSE OR SURFACE WATER BODY.

AN ASSESSMENT OF THE UK RIVER MAPS HAS IDENTIFIED AN UNNAMED WATERCOURSE/DURANCE WATER FEATURE APPROXIMATELY 65M TO THE SOUTH-EAST OF THE PROPOSED DEVELOPMENT SITE, HOWEVER, DUE TO LOCATION OF THIS WATERCOURSE, IT WOULD NOT BE REASONABLY PRACTICABLE TO ACHIEVE AN OUTFALL BECAUSE OF THE EXISTING DWELLINGS OFF FINKLE STREET.

SURFACE WATER SEWER

DUE TO DISCHARGE OF SURFACE WATER FLOWS TO A WATERCOURSE OR SURFACE WATER BODY HAS BEEN DISCOUNTED, DISCHARGE TO A SURFACE WATER SEWER SHOULD BE EXPLORED.

YORKSHIRE WATER SEWER RECORDS HAVE IDENTIFIED AN EXISTING PUBLIC SURFACE WATER SEWER WITHIN FINKLE STREET. THE DEVELOPMENT SHOULD SEEK APPROVAL FROM YORKSHIRE WATER UNDER A SECTION 106 AGREEMENT TO DISCHARGE THE PROPOSED FLOWS FROM SITE.

SURFACE WATER DESIGN

RUN-OFF RATES

A REVIEW OF THE EXISTING SITE TOPOGRAPHICAL SURVEY HAS IDENTIFIED THE PRESENCE OF A POSITIVELY DRAINED EXISTING BUILDING AND ASSOCIATED EXTERNAL AREAS, IN LINE WITH CITY OF YORK COUNCIL SUSTAINABLE DRAINAGE SYSTEMS GUIDANCE FOR DEVELOPERS (CYC SUDS), THIS SITE IS TO BE TREATED AS BROWNFIELD. BROWNFIELD SITES ARE TO LIMIT THE DISCHARGE OF SURFACE WATER OFF SITE BASED ON 140 L/S/HA OF PROVEN CONNECTED IMPERMEABLE AREAS FOR THE 1 IN 1 YEAR STORM OR BETTER, BASED ON THE EXISTING IMPERMEABLE AREAS* THE EXISTING BROWNFIELD RUN-OFF RATE FOR THE SITE IS CALCULATED AT 3.8 L/S, IN LINE WITH THE CYC SUDS GUIDANCE A REDUCTION OF 30% IS TO BE APPLIED TO ANY BROWNFIELD RUNOFF RATES FOR NEW DEVELOPMENTS. THIS HAS BEEN CALCULATED AT 2.6 L/S. **

* REFER TO PWA DRAWING 21307-00-XX-DR-C-1000 FOR EXISTING IMPERMEABLE AREA PLAN.

** REFER TO PWA CALCULATIONS 21307-00-XX-CA-C-1000 FOR BROWNFIELD RUNOFF ANALYSIS.

PROPOSED DRAINAGE SYSTEM

TO RESTRICT PROPOSED FLOWS TO A RATE OF 2.6 L/S, THE PROPOSED DRAINAGE SYSTEM SHOULD SEEK TO IMPLEMENT SOURCE CONTROL SUDS METHODS WHERE POSSIBLE AND AN ATTENUATION SYSTEM TO STORE THE RESTRICTED FLOWS.

THE CYC SUDS GUIDANCE STATES THAT AN URBAN CREEP ALLOWANCE IS TO BE APPLIED TO ANY DEVELOPMENT WHERE THERE IS FUTURE POTENTIAL TO EXPAND IMPERMEABLE AREAS WITHIN THE DEVELOPMENT. THIS ALLOWANCE IS TO BE TAKEN AS A 10% INCREASE OF ALL IMPERMEABLE AREAS FOR DESIGN PURPOSES. *

BASED ON THE PROPOSED IMPERMEABLE AREAS WITH A 30% URBAN CREEP ALLOWANCE, THE REQUIRED ATTENUATION FOR A 1 IN 100-YEAR STORM EVENT + 30% CLIMATE CHANGE IS CALCULATED AT 70.0M^3 **

* REFER TO PWA DRAWING 21307-00-XX-DR-C-1001 FOR PROPOSED IMPERMEABLE AREA PLAN.

** REFER TO PWA CALCULATIONS 21307-00-XX-CA-C-1001 FOR ATTENUATION VOLUME ESTIMATE

PRELIMINARY ATTENUATION DESIGNS ARE BELOW.

MANHOLES

2.4m Ø MANHOLE = 4.524m^2/m DEPTH.

3 NO. 2.4m Ø MANHOLES AT 2.0m DEPTH = 27.14m^3

PIPEWORK

1.20m Ø PIPEWORK = 1.131m^2/M LENGTH.

1.131 m^2/m X 41.5m = 46.955m^3

27.14m^3 (MANHOLES) + 46.955m^3 (PIPEWORK) = 74.075m^3 OF ATTENUATION.

FOUL WATER DESIGN

FOUL WATER STRATEGY

THE PROPOSED FOUL WATER FROM THE DEVELOPMENT WILL BE DRAINED VIA GRAVITY AND DISCHARGED UNRESTRICTED TO THE EXISTING PUBLIC FOUL SEWER WITHIN FINKLE STREET.

EXISTING DRAINAGE HAS BEEN IDENTIFIED ON SITE THAT DISCHARGES INTO FINKLE STREET. IF THIS CAN BE CONFIRMED TO CONNECT INTO THE PUBLIC FOUL SEWER THEN THE EXISTING CONNECTION COULD BE UTILISED.

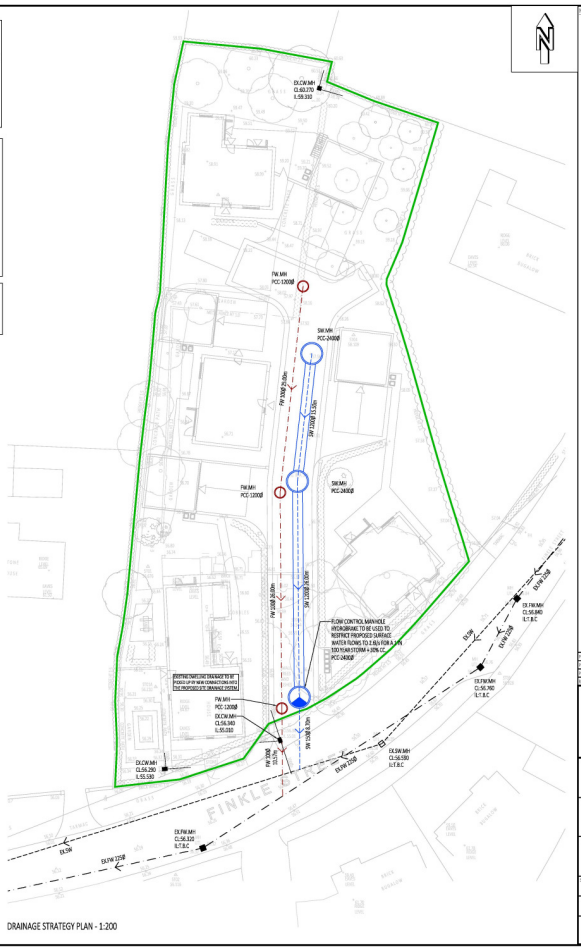
ALL PROPOSED CONNECTION WORKS, DIRECT OR INDIRECT, IS SUBJECT TO A SECTION 106 AGREEMENT WIT YORKSHIRE WATER PRIOR TO COMMENCEMENT OF CONNECTION WORKS.

ALL PROPOSED DRAINAGE IS SUBJECT TO DETAILED DESIGN. DETAILED DESIGN TO BE IN LINE WITH YORK GUIDANCE: "STORAGE VOLUME SHOULD ACCOMMODATE A 1:30 YEAR EVENT WITH NO SURFACE FLOODING AND NO OVERLAND DISCHARGE OFF THE SITE IN A 1:100 YEAR EVENT. A 30% ALLOWANCE FOR CLIMATE CHANGE SHOULD BE INCLUDED IN ALL CALCULATIONS. A RANGE OF DURATIONS SHOULD BE USED TO ESTABLISH THE WORST-CASE SCENARIO.

ALL PROPOSED CONNECTION TO THE EXISTING PUBLIC SEWER NETWORK IS SUBJECT TO THE APPROVAL OF YORKSHIRE WATER UNDER A SECTION 106 AGREEMENT.

EXISTING IMPERMEABLE AREA - 1:500

PROPOSED IMPERMEABLE AREA - 1:500



DRAINAGE STRATEGY PLAN - 1:200

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AREA	IMPERMEABLE CATCHMENT AREA m^2 (ha)
EXISTING IMPERMEABLE	2076m^2 (0.0276ha)

*TOTALS FOR HECTARES (ha) AND METERS SQUARED (m²) DIFFER SLIGHTLY DUE TO ROUNDING AND ACCUMULATION OF INDIVIDUAL AREAS.

BROWNFIELD RUNOFF RATES

EDWM EVENT	DISCHARGE RATE
EXISTING	3.8l/s
EXISTING - 30%	2.6l/s
PROPOSED	2.6l/s

AREA	IMPERMEABLE CATCHMENT AREA m^2 (ha)
PROPOSED IMPERMEABLE	1,470m^2 (0.147ha)
10% URBAN CREEP APPLIED	1,617m^2 (0.162ha)

*TOTALS FOR HECTARES (ha) AND METERS SQUARED (m²) DIFFER SLIGHTLY DUE TO ROUNDING AND ACCUMULATION OF INDIVIDUAL AREAS.

STORAGE REQUIREMENTS

EDWM EVENT	STORAGE VOLUME
1 IN 100 YEAR	70.0m^3
1 IN 100 YEAR + CC	70.0m^3

THE PRELIMINARY ATTENUATION DESIGNS ARE BELOW:

MANHOLES

2.4m Ø MANHOLE = 4.524m^2/m DEPTH.

3 NO. 2.4m Ø MANHOLES AT 2.0m DEPTH = 27.14m^3

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KEY

- EXISTING PUBLIC FOUL WATER SEWER
- EXISTING PUBLIC FOUL WATER MANHOLE
- EXISTING PUBLIC SURFACE WATER SEWER
- EXISTING PUBLIC SURFACE WATER MANHOLE
- EXISTING PRIVATE COMBINED WATER SEWER
- EXISTING PRIVATE COMBINED WATER MANHOLE
- PROPOSED PRIVATE FOUL WATER SEWER
- PROPOSED PRIVATE FOUL WATER MANHOLE
- PROPOSED PRIVATE SURFACE WATER SEWER
- PROPOSED PRIVATE SURFACE WATER STORAGE PIPE
- PROPOSED PRIVATE SURFACE WATER MANHOLE
- PROPOSED PRIVATE SURFACE WATER FLOW CONTROL MANHOLE
- SITE BOUNDARY

Rev	Date	Details	Drawn	Check
P03	13/05/22	REPORT TO SUIT SUMMARY TO PWA ON COMMENTS	LS	MW
P02	30/03/2022	FLOW MAKE AMENDED	LS	LS
P01	11/03/2022	FIRST ISSUE	LS	LS

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LAND OFF FINKLE STREET
SHERRIF HUTTON, YORK

Title: PROPOSED DRAINAGE LAYOUT

Size	Scale	Designed	Checked	Date
A1	1:200	LS	LS	APR 22

Drawing Status: PRELIMINARY

Job Number	Originator	Zone	Level	Type	Role	Drawing No	Rev
21307	PWA	00	XX	DR	C	1002	P03