SURFACE WATER PRINCIPLES

NPPG HIERARCHY OF SURFACE WATER DRAINAGE

THE NATIONAL PLANNING PRACTICE GUIDANCE ANY NYCC SUSTAINABLE DRAINAGE SYSTEMS GUIDANCE - 2022 UPDATE, 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 REASONABLY 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

PWA GEO ENVIRONMENTAL UNDERTOOK INFILTRATION TESTS TO DETERMINE WHETHER SOAKAWAYS ARE A VIABLE DISCHARGE OPTION. THE TESTING REVEALED THE SOAKAWAYS TO FAIL AS THE PITS WOULDN'T DRAIN AT THE SATISFACTORY SPEED REQUIRED TO USE INFILTRATION AS A METHOD OF DISCHARGE.
DUE TO THE ABOVE, INFILTRATION HAS BEEN DISCOUNTED AS A METHOD OF DISCHARGE.

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.

FOLLOWING AN ONSITE DRAINAGE SURVEY, A CULVERTED WATERCOURSE WAS DISCOVERED TO RUN THROUGH THE DEVELOPMENT SITE. THE CULVERT IS THOUGH TO OUTFALL INTO THE RIVER HODDER. THE DRAINAGE SURVEY ALSO REVEALED THAT SURFACE WATER PICKED UP FROM THE EXISTING DEVELOPMENT OUTFALLS INTO THE CULVERT.

FOLLOWING THE ABOVE ASSESSMENT, IT HAS BEEN DETERMINED THAT PROPOSED SURFACE WATER FLOWS WILL OUTFALL INTO THE CULVERT VIA AN EXISTING CONNECTION.

SURFACE WATER SEWER/HIGHWAY DRAIN/COMBINED SEWER.

DUE TO A CONNECTION TO A SURFACE WATER BODY BEING VIABLE, A CONNECTION TO A SURFACE WATER SEWER, HIGHWAY DRAIN OR COMBINED SEWER HAS NOT BEEN EXPLORED.

SURFACE WATER DESIGN

FURTHER TO THE ASSESSMENT OF THE SURFACE WATER HIERARCHY, THE DESIRED SURFACE WATER OUTFALL FOR ALL AREAS OF THE DEVELOPMENT IS THE EXISTING CULVERT ON SITE WHICH ULTIMATELY DISCHARGES TO THE RIVER HODDER TO THE EAST OF SITE.

RUN-OFF RATES

AN ASSESSMENT OF THE EXTENSIONS PROPOSED IMPERMEABLE AREA AGAINST THE EXISTING BUILDING REVEALS AN AREA INCREASE OF 45m². THE BROWNFIELD RATE FOR THIS AREA IS APPROXIMATELY 0.6l/s WHICH IS A NEGLIGIBLE INCREASE IN FLOWS TO THE EXISTING OUTFALL. THEREFORE, WE PROPOSE THAT SURFACE WATER FLOWS FROM THE EXTENSION ARE TO FREELY DISCHARGE.
HOWEVER THE NEW DRIVEWAY AND PARKING SPACES HAVE AN IMPERMEABLE AREA OF 160M², SO WE HAVE CHOSE TO RESTRICT THE RUN-OFF FROM THIS TO 2.0L/S WHICH IS A MINIMUM FLOW RATE THAT CAN BE SAFELY RESTRICTED WITH A VORTEX FLOW CONTROL. INFORMATION REGARDING FLOWS RATES WAS TAKEN FROM PAGE 15 IN THE 'LANCASHIRE SUSTAINABLE DRAINAGE SYSTEMS (SUDS) PRO-FORMA'

PROPOSED DRAINAGE SYSTEM

TO RESTRICT PROPOSED FLOWS TO A RATE OF 1.20 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 SYSTEM IS TO USE 60m² OF PERMEABLE PAVING TO ATTENUATE FLOWS BEFORE THEY OUTFALL INTO THE CULVERT. APPROXIMATE ATTENUATION CALCULATIONS AS BELOW:

60m² (AREA) X 0.3 (POROSITY) X 0.6m (DEPTH BELOW MEMBRANE) =10.8m³

FOUL WATER DESIGN

BARN CONVERSION

PROPOSED FOUL WATER FLOWS FROM THE BARN CONVERSION ARE TO BE TREATED USING A TREATMENT PLANT BEFORE OUTFALLING INTO THE CULVERT USING AN EXISTING CONNECTION.

HOUSE EXTENSION

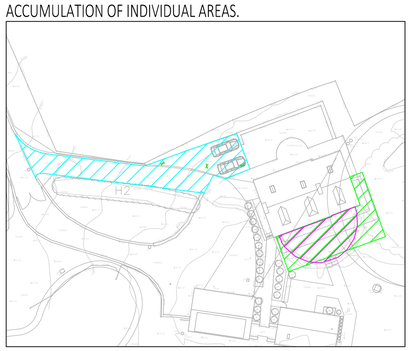
AS THE EXTENSIONS ONLY ADDITIONAL FOUL WATER OUTPUT IS A SINK, FLOWS CAN BE DIRECTED INTO THE EXISTING FOUL WATER SYSTEM ONSITE BEFORE ENTERING THE EXISTING TREATMENT PLANT. THE TREATED FOUL IS THOUGHT TO OUTFALL INTO THE RIVER HODDER.

BROWNFIELD RUNOFF RATES	
IMPERMEABLE AREA	FLOW RATE (l/s)
45m²	0.6 l/s
PROPOSED RATES	
IMPERMEABLE AREA	FLOW RATE (l/s)
160m²	1.2 (l/s)

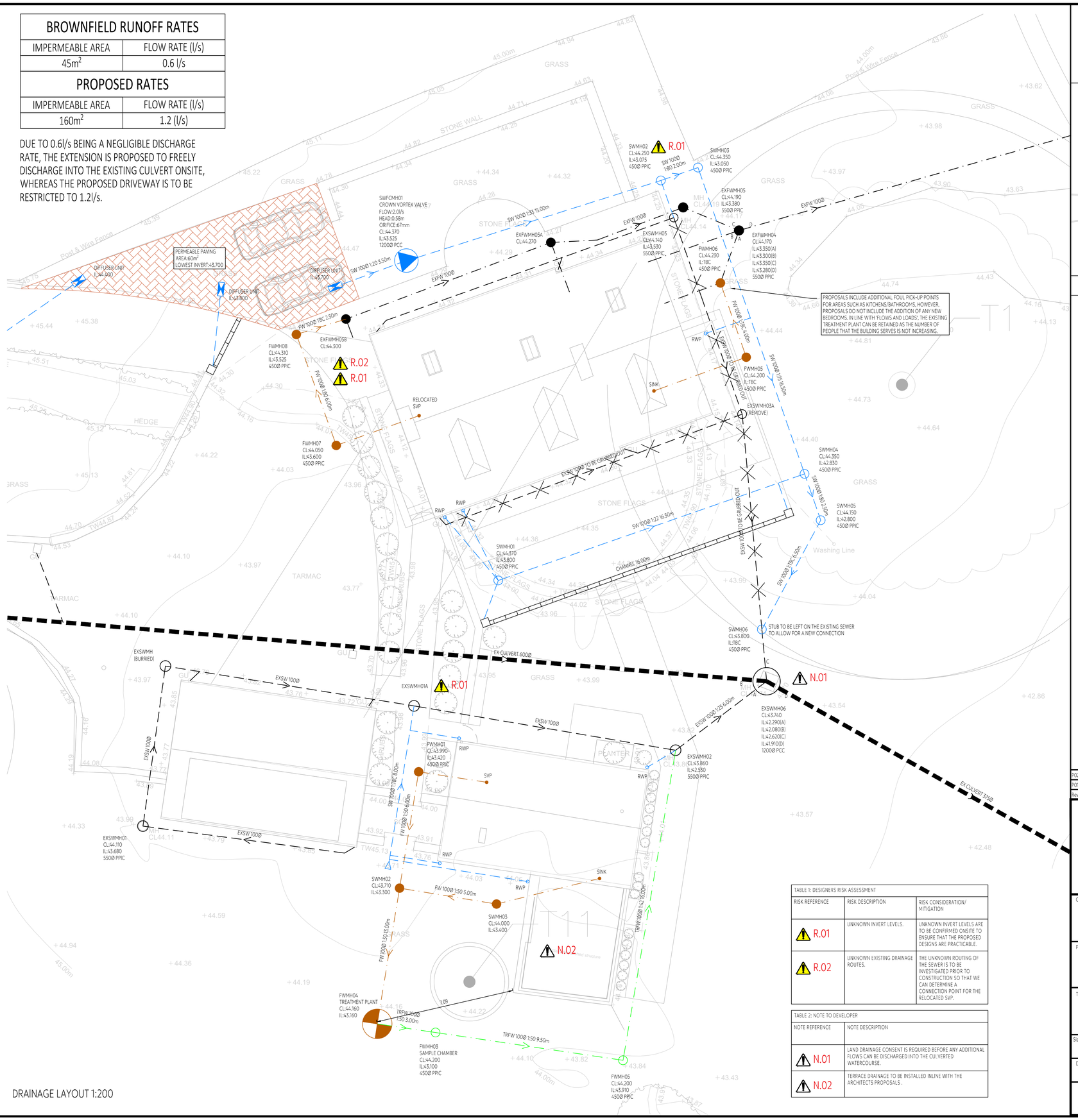
DUE TO 0.6l/s BEING A NEGLIGIBLE DISCHARGE RATE, THE EXTENSION IS PROPOSED TO FREELY DISCHARGE INTO THE EXISTING CULVERT ONSITE, WHEREAS THE PROPOSED DRIVEWAY IS TO BE RESTRICTED TO 1.2l/s.

AREA	TOTAL AREA m² (ha)
EXISTING IMPERMEABLE	69m² (0.007ha)
EXTENSION IMPERMEABLE	114m² (0.011ha)
AREA DIFFERENCE	45m² (0.005ha)
ATTENUATED AREA	160m² (0.016ha)

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



IMPERMEABLE AREA PLAN 1:500



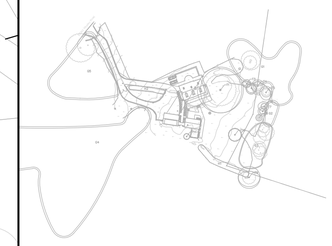
DRAINAGE LAYOUT 1:200

TABLE 1: DESIGNERS RISK ASSESSMENT		
RISK REFERENCE	RISK DESCRIPTION	RISK CONSIDERATION/ MITIGATION
R.01	UNKNOWN INVERT LEVELS.	UNKNOWN INVERT LEVELS ARE TO BE CONFIRMED ONSITE TO ENSURE THAT THE PROPOSED DESIGNS ARE PRACTICABLE.
R.02	UNKNOWN EXISTING DRAINAGE ROUTES.	THE UNKNOWN ROUTING OF THE SEWER IS TO BE INVESTIGATED PRIOR TO CONSTRUCTION SO THAT WE CAN DETERMINE A CONNECTION POINT FOR THE RELOCATED SVP.

TABLE 2: NOTE TO DEVELOPER	
NOTE REFERENCE	NOTE DESCRIPTION
N.01	LAND DRAINAGE CONSENT IS REQUIRED BEFORE ANY ADDITIONAL FLOWS CAN BE DISCHARGED INTO THE CULVERTED WATERCOURSE.
N.02	TERRACE DRAINAGE TO BE INSTALLED INLINE WITH THE ARCHITECTS PROPOSALS .

SITE LOCATION

OS X (EASTINGS)	370302
OS Y (NORTHINGS)	439108
NAT GRID	SD703391
POSTCODE	BB7 9PW



KEY PLAN - 1:2000

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KEY

- EXISTING SURFACE WATER SEWER
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER SEWER
- EXISTING FOUL WATER MANHOLE
- EXISTING CULVERTED WATERCOURSE
- PROPOSED PERMEABLE PAVING
- PROPOSED SURFACE WATER SEWER
- PROPOSED SURFACE WATER INSPECTION CHAMBER
- PROPOSED RODDING EYE
- PROPOSED SURFACE WATER DIFFUSER UNIT
- PROPOSED CHANNEL
- PROPOSED FOUL WATER SEWER
- PROPOSED FOUL WATER TREATMENT PLANT
- PROPOSED FOUL WATER INSPECTION CHAMBER
- PROPOSED TREATED FOUL SEWER
- PROPOSED TREATED FOUL INSPECTION CHAMBER
- SEWER SET TO BE ABANDONED/GRUBBED OUT

Rev.	Date	Remarks	Drawn	Chk'd
P02	20/06/24	DRAINAGE NOTATION REVISED.	IB	IB
P01	14/06/2024	FIRST ISSUE.	IB	LS

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Title: DRAINAGE LAYOUT

Size	Scale	Designed	Checked	Date
A1	A.S.	IB	LS	JUN 24

Drawing Status: PRELIMINARY

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23269	PWA	00	XX	DR	C	1000	P02