

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
 NEARBY BOREHOLE INVESTIGATIONS ENCOUNTERED SHALLOW CLAYS WHICH ARE RECORDED TO GO DOWN AS FAR AS 7.5m. ADDITIONALLY, A SITE WALKOVER UNDERTAKEN BY PWA GEO REVEALS THE POSSIBILITY OF MASS CONTAMINANTS ONSITE, THESE POSSIBLE CONTAMINANTS INCLUDE HYDROCARBONS AND ASBESTOS CONTAINING MATERIALS (ACMs). ON TOP OF SOAKAWAYS BEING UNLIKELY TO SUCCESSFULLY OPERATE IN CLAYS, SOAKAWAYS SHOULD NOT BE INSTALLED IN CONTAMINATED SOILS AS THIS MAY PROMOTE THE MOBILIZATION OF CONTAMINANTS AND GIVE RISE TO CONTAMINATION OF GROUNDWATER. BASED ON THE PRESENCE OF SHALLOW CLAYS AND CONTAMINANTS, WE DO NOT CONSIDER SOAKAWAYS TO BE SUITABLE FOR THIS SITE.

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 BING MAPS SHOWS A WATERCOURSE WITHIN 75m OF THE SITE BOUNDARY. HOWEVER, IN ORDER TO MAKE A CONNECTION TO THIS, WE WOULD HAVE TO CROSS MULTIPLE OWNERSHIP BOUNDARIES AND A DENSE GROVE OF TREES WHICH IS STATIONED BETWEEN THE SITE AND THE WATERCOURSE. ATTEMPTING TO MAKE A CONNECTION TO THE WATERCOURSE WOULD RESULT IN ROOT DAMAGE OF THE ADJACENT LAND OWNERS TREES.
 FOLLOWING THE ABOVE ASSESSMENT, OUTFALL TO A WATERCOURSE HAS BEEN DISCOUNTED AS A METHOD OF DISCHARGE.

SURFACE WATER SEWER
 AS THE CONNECTION TO A SURFACE WATER BODY BEING IS UNAVAILABLE, A CONNECTION TO A SURFACE WATER SEWER, MUST BE EXPLORED.
 UNITED UTILITIES SEWER RECORDS SHOW THERE TO BE NO NEARBY SURFACE WATER SEWER THAT WOULD PROVIDE A PRACTICABLE CONNECTION POINT FOR THE PROPOSED DRAINAGE AND THEREFORE HAS BEEN DISCOUNTED AS A METHOD OF DISCHARGE.

COMBINED SEWER
 THE UNITED UTILITIES SEWER RECORDS SHOW THERE TO BE AN EXISTING COMBINED SEWER LOCATED ON THE SITES SOUTHERN BOUNDARY.
 AS THIS SEWER IS WITHIN PRACTICABLE DISTANCE TO THE DEVELOPMENT AND ALL OTHER DISCHARGE METHODS ARE DISCOUNTED, THE COMBINED SEWER IS TO BE EXPLORED AS AN OUTFALL OPTION.

SURFACE WATER DESIGN
 FURTHER TO THE ASSESSMENT OF THE SURFACE WATER HIERARCHY, THE DESIRED OUTFALL FOR THE SURFACE WATER DRAINAGE IS THE EXISTING COMBINED SEWER ON THE SITES SOUTHERN BOUNDARY.

RUN-OFF RATES
 IN LINE WITH CURRENT NATIONAL GUIDANCE AND SUSTAINABLE DRAINAGE SYSTEMS GUIDANCE - 2022 UPDATE, SECTION 4.2, THE SITE IS BEING TREATED AS ENTIRELY GREENFIELD FOR THE PURPOSE OF THE DRAINAGE DESIGN ONLY.

AN ASSESSMENT OF THE PROPOSED IMPERMEABLE AREAS FOR THE DEVELOPMENT HAS RESULTED IN A TOTAL DRAINED AREA OF 273m² (0.027ha). BASED ON THIS IMPERMEABLE AREA, THE EXISTING QBAR (1 IN 2.33 YEAR RETURN PERIOD) GREENFIELD RATE FOR THE DEVELOPMENT IS 0.20l/s. FOLLOWING HYDRAULIC CALCULATIONS, THE CALCULATED GREENFIELD RATE OF 0.20l/s GIVES AN EXTREMELY SMALL ORIFICE SIZE FOR THE FLOW CONTROL DEVICE (20mm). AN ORIFICE THIS SMALL CAN RESULT IN BLOCKAGES AND SYSTEM FLOODING. AS A SAFETY MEASURE, WE HAVE INCREASED THE FLOW RATE TO PROVIDE AN ORIFICE SIZE OF 50mm. THE DEVELOPMENT MUST SEEK TO RESTRICT THE PROPOSED SURFACE WATER FLOWS FOR A 1 IN 1, 30 AND 100 YEAR RETURN PERIODS WITH AN APPROPRIATE ALLOWANCE FOR CLIMATE CHANGE.

PROPOSED DISCHARGE RATE: 1.5l/s

CLIMATE CHANGE
 IN LINE WITH THE LATEST WHICH GUIDANCE SETS CLIMATE CHANGE ALLOWANCES BASED ON RIVER BASIN MANAGEMENT CATCHMENTS. THE CLIMATE CHANGE ALLOWANCES FOR THE DEVELOPMENT SHOULD BE SET IN LINE WITH THE BELOW:

WHARFE AND LOWER OUSE MANAGEMENT CATCHMENT

2070S EPOCH - CENTRAL ALLOWANCE.

3.3% (1 IN 30 YEAR):	40%
1% (1 IN 100 YEAR):	50%

PROPOSED DRAINAGE SYSTEM
 TO RESTRICT PROPOSED FLOWS TO A RATE OF 1.50 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. A CELLULAR ATTENUATION TANK HAS BEEN INCORPORATE TO MINIMIZE FLOWS, THE TANK HAS BEEN SIZED AS:
 4.0m(W) X 4.0m(L) X 0.8m(d) PROVIDING 12.16m³ OF STORAGE WITH A 95% VOID RATIO.

FOUL WATER DESIGN
 AFTER A REVIEW OF THE UNITED UTILITY SEWER RECORDS, THERE ARE NO SUITABLE FOUL SEWERS WITHIN THE VICINITY OF THE SITE.
 IN RESPONSE TO THIS, WE PROPOSE TO MAKE A COMBINED CONNECTION WITH THE PROPOSED SURFACE WATER SEWER INTO THE EXISTING COMBINED SEWER ON THE SOUTHERN BOUNDARY.

AREA	TOTAL AREA m ² (ha)
PROPOSED IMPERMEABLE	273m ² (0.027ha)
+10% URBAN CREEP	300m ² (0.030ha)
AREA TO FREELY DRAIN	41m ² (0.004ha)

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

GREENFIELD RUNOFF RATES

RETURN PERIOD (YEARS)	FLOW RATE (l/s)
1 IN 1 YEAR	0.20 l/s
1 IN 30 YEAR	0.39 l/s
1 IN 100 YEAR	0.48 l/s
1 IN 2.33 YEAR (QBAR)	0.23 l/s
PROPOSED RATE	1.50 l/s

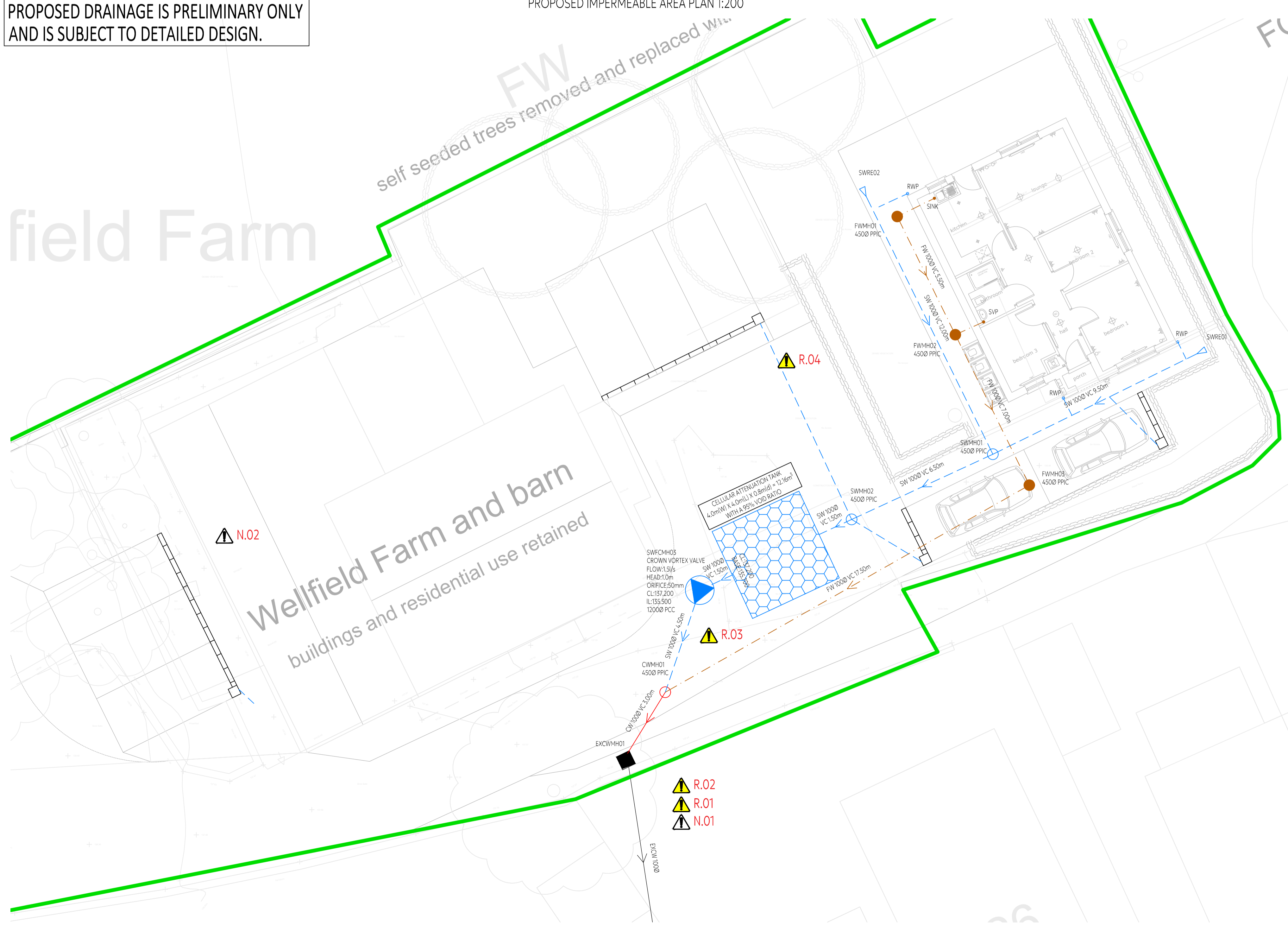
PROPOSED DRAINAGE IS PRELIMINARY ONLY AND IS SUBJECT TO DETAILED DESIGN.

TABLE 1: DESIGNERS RISK ASSESSMENT

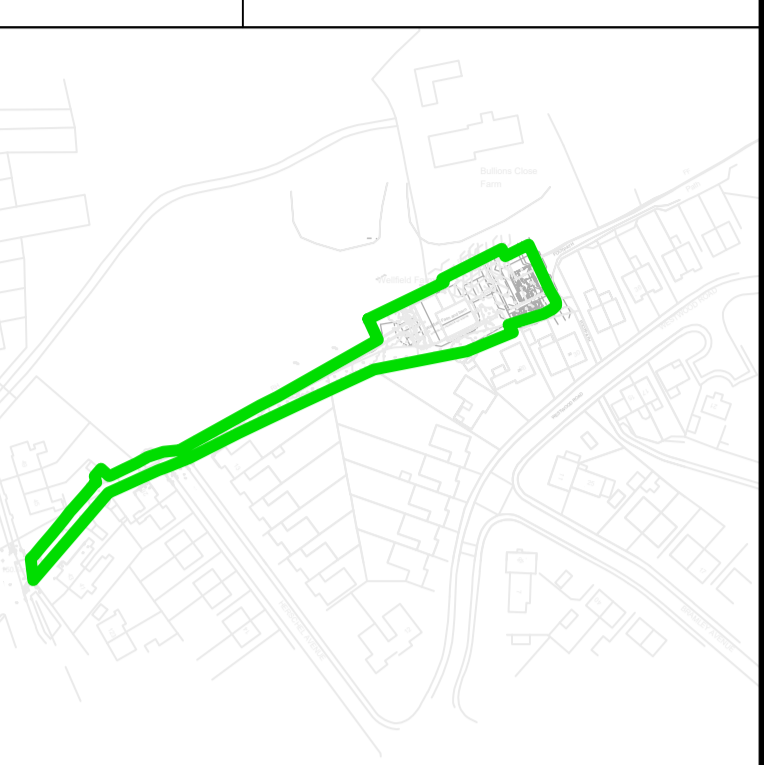
RISK REFERENCE	RISK DESCRIPTION	RISK CONSIDERATION/ MITIGATION
R.01	UNCONFIRMED LOCATION AND DEPTH OF EXISTING COMBINED SEWER.	ONSITE INVESTIGATION IS TO BE UNDERTAKEN TO LOCATE THE EXISTING COMBINED SEWER AND DETERMINE ITS DEPTH.
R.02	POTENTIAL BACK FLOWING OF FOUL WATER INTO SURFACE WATER SEWER.	NON RETURN VALVES TO BE FITTED TO THE THE COMBINED INSPECTION CHAMBER TO PREVENT FOUL WATER BACKING UP INTO THE SURFACE WATER SYSTEM.
R.03	ORIFICES WITH SMALL DIAMETERS COULD BECOME BLOCKED FROM DEBRIS FLOWING THROUGH THE SYSTEM.	LEAF GUARD TO BE INSTALLED UPSTREAM OF FLOW CONTROL TO MINIMIZE DEBRIS THAT ENTERS THE SYSTEM DECREASE BLOCKAGE RISK.
R.04	PWA GEOLOGICAL ENGINEERS FOUND A VAST AMOUNT OF POSSIBLE CONTAMINANTS DURING THEIR SITE WALKOVER.	CLAY PIPES HAVE BEEN PROPOSED AS A PRELIMINARY MEASURE. ADDITIONAL MEASURES CAN BE PUT FORWARD FOLLOWING THE COMPLETION OF A PHASE 2 REPORT.

TABLE 2: NOTE TO DEVELOPER

NOTE REFERENCE	NOTE DESCRIPTION
N.01	S106 APPLICATION WITH UNITED UTILITIES IS TO BE AGREED PRIOR TO THE CONNECTION INTO THE PUBLIC SEWER BEING MADE.
N.02	NEW CAR PARKING AREA FOR THE EXISTING BUILDING IS TO FREELY DRAIN IN TO THE EXISTING SEWERS WHICH CURRENTLY SERVE THE SITE. THESE EXISTING SEWERS ARE TO BE SURVEYED PRIOR TO CONSTRUCTION TO ASSESS THEIR CONDITION AND LOCATION. IF THESE SEWERS ARE IN UNSUITABLE CONDITION, THEY ARE TO BE REPAIRED FOR A CONNECTION TO BE MADE.



SITE LOCATION
 OS X (EASTINGS) 382395
 OS Y (NORTHINGS) 433730
 NAT GRID SDB23337
 POSTCODE BB12 0HR



KEY PLAN - 1:2500

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- KEY**
- EXISTING COMBINED WATER SEWER
 - EXISTING COMBINED WATER MANHOLE
 - PROPOSED SURFACE WATER SEWER
 - PROPOSED SURFACE WATER FLOW CONTROL MANHOLE
 - PROPOSED SURFACE WATER INSPECTION CHAMBER
 - PROPOSED CELLULAR STORAGE
 - PROPOSED CHANNEL
 - PROPOSED FOUL WATER SEWER
 - PROPOSED FOUL WATER INSPECTION CHAMBER
 - PROPOSED COMBINED WATER SEWER
 - PROPOSED COMBINED WATER INSPECTION CHAMBER
 - SITE BOUNDARY

Rev	Date	Remarks	By	CS

PWA / GROUP

CIVIL SUMMIT HOUSE, RIPARIAN WAY, 01535 633350
 STRUCTURAL THE CROSSINGS, CROSSHILLS, info@pwagroup.co.uk
 GEO-ENVIRONMENTAL KEIGHLEY, BD20 7BW www.pwagroup.co.uk



Client
**HERSCHEL AVENUE
 BURNLEY
 LANCASHIRE**

Title
DRAINAGE LAYOUT

Site	Scale	Designed	Checked	Date
A1	A.S	IB	LS	MAR 23

Drawing Status
PRELIMINARY

Job Number	Originator	Zone	Level	Type	Rate	Drawing No.	Rev
24030	PWA	00	XX	DR	C	1000	P01