SCALE IN METRES 0 5 10 20 50

BENCH MARK INFORMATION

All levels relate to O.S (Newlyn) Datum, Established using network RTK. Survey plotted on a plane local grid, orientated to National Grid.

PROPOSED SURFACE WATER SYSTEM DESIGNED TO CATER FOR EVENTS UP TO AND INCLUDING THE 1%AEP + 45%CC WITH NO PREDICTED SURFACE FLOODING.
TOTAL AGREED SURFACE WATER DISCHARGE RATE FOR FULL DEVELOPMENT IS TO BE RESTRICTED TO 75.0 L/SEC, THIS IS TO BE SPLIT OVER FOUR SEPARATE OUTFALL LOCATION BY WAY OF HYDROBRAKE FLOW CONTROL DEVICE.

EXISTING SERVICES CROSSING THE SITE - REFER TO UTILITIES SURVEY FOR TYPE AND POSITIONS

IF THE CLIENT OR CONTRACTOR IDENTIFIES ANY DISCREPANCIES BETWEEN THE DRAWINGS PRODUCED BY REFA FOR THIS PROJECT THEN THEY SHOULD CONTACT REFA IMMEDIATELY AND BEFORE ANY WORKS COMMENCE OR PROCEED IF IN DOUBT ASK !!!

THE OFF SITE SEWER CONNECTION(S) HAVE BEEN DESIGNED TO TIE IN WITH THE EXISTING SEWERS AND WHILST IT IS ANTICIPATED NO CLASHES WITH EXISTING SERVICES WILL OCCUR, DUE TO THE INHERENT INACCURACIES IN DEPTHS OF EXISTING SERVICES THIS CANNOT BE GUARANTEED

REFA WOULD ADVISE THE CLIENT TO EMPLOY A SUITABLY EXPERIENCED COMPANY TO UNDERTAKE A SURVEY ALONG THE ROUTE OF THE CONNECTIONS TO ASCERTAIN THE EXISTENCE AND PROXIMITY OF ANY SERVICES AND ADVISE REFA OF ANY POTENTIAL CLASHES TO ASCERTAIN IF DESIGN CHANGES NEED BE MADE.

DUE TO THE NEED FOR OFF SITE SEWER WORKS IT IS STRONGLY ADVISED THAT THESE INVESTIGATIONS ARE UNDERTAKEN PRIOR TO ANY CONSTRUCTION ON SITE TO ALLOW DESIGN CHANGES TO BE MADE.

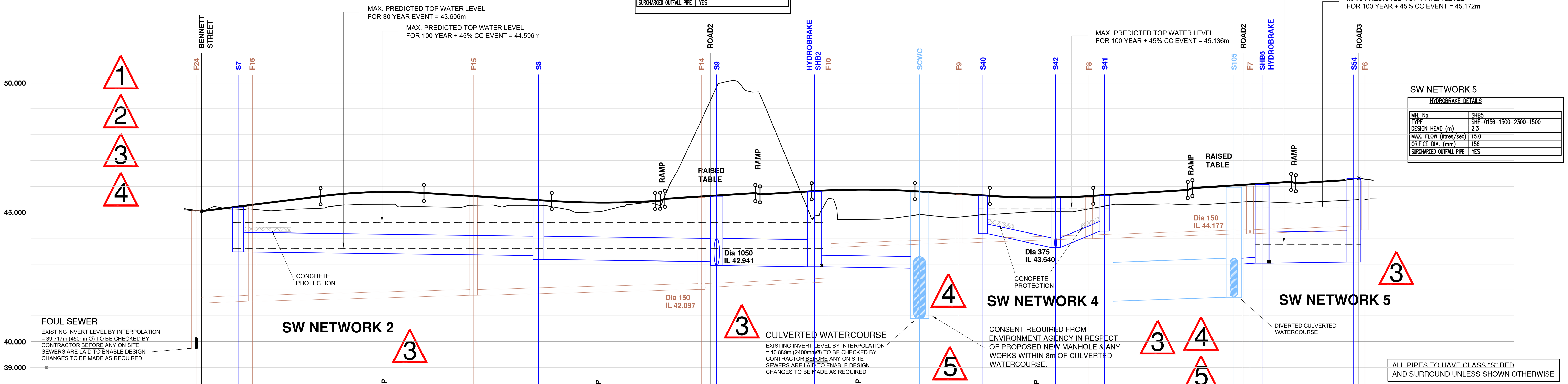
REFA WILL NOT BE HELD RESPONSIBLE FOR ANY ABORTIVE WORKS IF THIS PROCEDURE IS NOT FOLLOWED

SW NETWORK 2
HYDROBRAKE DETAILS

MH. No.	SHB2
TYPE	SHE-0177-2000-2500-2000
DESIGN HEAD (m)	2.5
MAX. FLOW (litres/sec)	20.0
ORIFICE DIA. (mm)	177
SURCHARGED OUTFALL PIPE	YES

SW NETWORK 5
HYDROBRAKE DETAILS

MH. No.	SHB5
TYPE	SHE-0156-1500-2300-1500
DESIGN HEAD (m)	2.3
MAX. FLOW (litres/sec)	15.0
ORIFICE DIA. (mm)	156
SURCHARGED OUTFALL PIPE	YES



ALL PIPES TO HAVE CLASS "S" BED AND SURROUND UNLESS SHOWN OTHERWISE

ROAD1

EXISTING GROUND LEVEL: 45.045, 45.118, 45.135, 45.294, 45.218, 45.194, 45.267, 45.139, 45.165, 45.790, 49.981, 48.623, 45.102, 44.731, 44.898, 44.886, 45.010, 45.073, 45.304, 45.297, 45.378, 45.367, 45.449, 45.494

ALIGNMENT LEVEL: 45.045, 45.295, 45.545, 45.621, 45.666, 45.749, 45.785, 45.787, 45.775, 45.746, 45.659, 45.534, 45.437, 45.412, 45.379, 45.374, 45.377, 45.407, 45.437, 45.449, 45.524, 45.528, 45.653, 45.742, 45.690, 45.715, 45.815, 45.837, 45.872, 45.877, 45.875, 45.847, 45.815, 45.790, 45.665, 45.634, 45.607, 45.575, 45.572, 45.575, 45.607, 45.634, 45.728, 45.853, 45.863, 45.937, 46.041, 46.166, 46.176, 46.124, 46.228, 46.242

VERTICAL ALIGNMENT: G= 2.500% 1: 40.0; L= 20.000 KF= -5.33333; G= -1.250% 1: -80.0; KF= 8.0 L= 20.000; G= 1.250% 1: 80.0; G= 8.300% 1: 12.0; G= 1.250% 1: 80.0; G= -5.800% 1: -17.2; G= 1.250% 1: 80.0; L= 20.000 KF= -8.0; G= -1.250% 1: -80.0; KF= 8.0 L= 20.000; G= 1.250% 1: 80.0; G= 8.300% 1: 12.0; G= 1.250% 1: 80.0; G= -5.800% 1: -17.2; G= 1.250% 1: 80.0

HORIZONTAL ALIGNMENT: R= 40.000; Pipe 1.003 Dia 225 Circular UPVC 1 in 165 6.407

STORMWATER DETAILS: CL 45.198 IL 43.475; Pipe 3.000 Dia 750 Circular CONC 1 in 395 58.092; CL 45.438 IL 43.328; IL 43.178; Pipe 3.001 Dia 900 Circular CONC 1 in 396 34.467; CL 45.620 IL 43.091; IL 42.941; Pipe 1.005 Dia 1050 Circular CONC 1 in 394 18.894; CL 45.808 IL 42.893; IL 42.893; Pipe 1.006 Dia 450 Circular CONC 1 in 380 20.350; CL 45.782 IL 42.839; CL 45.631 IL 44.175; 1.000 Dia 375 CONC 1 in 26 14.043; CL 45.560 IL 43.640; IL 43.640; 2.000 Dia 375 CONC 1 in 15 9.566; IL 44.275 CL 45.641; CL 45.973 IL 41.722 IL 42.997; CL 46.077 IL 43.036; Pipe 1.002 Dia 1200 Circular CONC 1 in 394 17.752; CL 46.306 IL 43.081

FOULWATER DETAILS: CL 45.064 IL 41.493; 1.009 Dia 225 UPVC 1 in 150 10.845; IL 41.565 IL 41.565 CL 45.252; Pipe 1.008 Dia 225 Circular UPVC 1 in 190 42.816; CL 45.595 IL 41.790; IL 41.790; Pipe 1.007 Dia 225 Circular UPVC 1 in 190 44.072; CL 45.578 IL 42.022; IL 42.097; Pipe 1.006 Dia 150 Circular UPVC 1 in 121 24.510; CL 45.817 IL 42.300; IL 43.646; Pipe 1.005 Dia 150 Circular UPVC 1 in 150 25.264; CL 45.685 IL 43.814; IL 43.814; Pipe 1.004 Dia 150 Circular UPVC 1 in 150 25.058; CL 45.580 IL 43.981; IL 43.981; Pipe 1.003 Dia 150 Circular UPVC 1 in 150 29.335; CL 46.020 IL 44.177; IL 44.177; Pipe 2.002 Dia 150 Circular UPVC 1 in 150 22.212; IL 44.325

CHAINAGE: 0.000, 10.000, 20.000, 23.037, 25.000, 30.000, 35.000, 36.371, 40.000, 43.037, 50.000, 60.000, 67.760, 70.000, 75.000, 77.760, 80.000, 85.000, 87.760, 88.745, 89.644, 90.000, 98.394, 100.000, 107.146, 108.045, 110.000, 118.032, 120.000, 125.000, 128.032, 130.000, 135.000, 138.032, 140.000, 150.000, 152.507, 155.000, 160.000, 162.507, 165.000, 168.749, 170.000, 172.507, 180.000, 190.000, 190.790, 191.690, 193.217, 200.000, 201.475, 210.000, 210.791, 211.691, 220.000, 223.891

ALL PIPES TO HAVE CLASS "S" BED AND SURROUND UNLESS SHOWN OTHERWISE

ALL PIPES TO HAVE CLASS "S" BED AND SURROUND UNLESS SHOWN OTHERWISE
ALL CONCRETE PIPES TO BE CLASS 120
ALL CLAY PIPES TO BE EXTRA STRENGTH VITRIFIED CLAY
ALL UPVC PIPES TO COMPLY WITH BS 4660:2000 & BS EN 1401-1
STRUCTURED WALL UPVC PIPES TO COMPLY WITH WIS 4-35-01
MAX. PIPE LENGTH TO BE 3.0m

FOUNDATIONS TO BE DESIGNED / CONSTRUCTED TO TAKE INTO ACCOUNT THE PROXIMITY AND DEPTH OF ADJACENT SEWERS AND DRAINS IN ACCORDANCE WITH SFA 7TH EDITION PART B

CONTRACTOR TO BE AWARE OF AND TAKE APPROPRIATE ACTION TO ENSURE DE-STABILISATION OF ANY EXISTING STRUCTURES, TREES, EMBANKMENTS OR OTHER FEATURES DOES NOT OCCUR AS A RESULT OF ANY EXCAVATIONS WORKS UNDERTAKEN IN ACCORDANCE WITH THE DESIGNS SHOWN ON THIS DRAWING IF CONTRACTOR IS UNSURE ABOUT ANY ASPECT OF THE ABOVE HE SHOULD SEEK ADVICE BEFORE COMMENCING EXCAVATION WORK.

CONTRACTOR/CLIENT SHOULD NOTE THE EXISTENCE OF EXISTING BURIED PLANT AND OR OVERHEAD POWER CABLE(S) BEFORE WORK COMMENCES CONTRACTOR MUST UNDERTAKE RISK ASSESSMENT AND PROVIDE METHOD STATEMENT FOR WORKING IN THIS AREA IN ACCORDANCE WITH HSE AND POWER SUPPLIERS GUIDELINES TO SATISFACTION OF THE PRINCIPLE DESIGNER

TO CATER FOR ANY DEVIATIONS IN THE AS CONSTRUCTED ROAD / FOOTPATH LEVELS IN RELATION TO THE DESIGN LEVELS, THE PROPOSED FLOOR LEVELS SHOWN MUST BE CHECKED ON SITE BY THE SITE AGENT OR ENGINEER IN RELATION TO AS BUILT ROAD LEVELS TO ENSURE COMPLIANCE WITH PART M OF THE BUILDING REGULATIONS

ALL EXISTING SERVICES TO BE LOCATED AT COMMENCEMENT IN ACCORDANCE WITH UNDERTAKERS REQUIREMENTS AND PROTECTED ACCORDINGLY DURING THE WORKS

ALL EXISTING MANHOLE INVERT LEVELS ARE TO LOCATED AND SURVEYED PRIOR TO START ON SITE TO ENSURE THAT THEY ARE CORRECT AND ALSO TO ENSURE THAT LEVEL CLASHES ARE AVOIDED AND THAT INTERPOLATED INVERT LEVELS ARE CORRECT. ANY DISCREPANCY TO BE REPORTED TO REFA PRIOR TO START TO ENABLE ANY CHANGES TO BE MADE TO DESIGN THAT PROVE NECESSARY

ALL DRAGOUT CONNECTIONS FROM MAIN SEWER MANHOLES TO FIRST INSPECTION CHAMBER TO BE 150mm Ø UNLESS INDICATED OTHERWISE

ALL ROAD GULLY CONNECTIONS TO BE 150mm Ø

ALL STORAGE MANHOLES ON THE TANK SEWER WILL NEED TO BE CONCRETE SURROUNDED AS THEY ARE WATER RETAINING.

OUTSIDE OF NEW SEWERS TO BE LOCATED 1.0m MINIMUM FROM KERBLINES OUTSIDE OF MANHOLE CHAMBERS TO BE LOCATED 0.5m MINIMUM FROM KERBLINES

CIVILS DESIGN RISK MANAGEMENT

Abnormal or unusual residual risks associated with the design outcomes shown on this drawing are:-

1. EXISTING SERVICES EXISTING ELECTRIC MAIN
2. WORKING ON EXISTING HIGHWAY AND IN AREAS WHERE MEMBERS OF PUBLIC MAY HAVE ACCESS
3. DANGER OF COLLAPSE TO ALL EXCAVATIONS - RISK TO BE ASSESSED AND MANAGED BY CONTRACTOR IN ACCORDANCE WITH HSE GUIDANCE
4. WORKING ADJACENT TO EXISTING CULVERTED WATERCOURSE OR LIVE FOUL SEWER (WEIL'S DISEASE)
5. WORKING CLOSE TO EXISTING CULVERT
6. WORKING CLOSE TO EXISTING RAILWAY LINE

REFA Ltd has followed its Design Risk Management process for Hazard Elimination and Risk reduction in developing the designs shown on this drawing. Abnormal or unusual residual risks may be shown above where it is considered that such risk may not normally be expected by competent persons engaged on work of this nature or type

PLEASE NOTE THAT THIS DRAWING IS ISSUED FOR INFORMATION/TENDER PURPOSES ONLY UNTIL TECHNICAL APPROVAL HAS BEEN GRANTED.
ANY WORK UNDERTAKEN PRIOR TO TECHNICAL APPROVAL BEING GRANTED IS AT THE CLIENTS RISK.

GENERAL

1. All adoptable sewers and associated works are to comply fully with "Design and Construction Guidance" & Local Practices
2. All highway works to be to adoptable standards and to to comply fully with the Local Authority specification.
3. All private drainage works are to comply fully with part H of the Building Regulations
4. All existing invert levels to be checked by the Contractor at the start of works and any discrepancies notified to REFA. All levels are based on topographical survey information provided by others.
5. All materials to bear the relevant B.S.Kitemark and comply fully with the specifications. All concrete & concrete products must use Sulphate resistant cement (unless the site investigation report proves that sulphate attack from soils and groundwater will not occur)
6. All opening notices etc. as required under highways acts etc. are to be obtained prior to commencement of works. All works are to be inspected by L.A., NHBC or Relevant Water Authority as applicable.

C.D.M. REGULATIONS 2015

In line with the above regulations we are obliged to inform the Client of their responsibilities under section CDM 15/1, and residual risks that may be encountered in the construction of these works. All design work has been carried out with Health and Safety aspects given full consideration. Wherever possible risks have been eliminated from the design, however due to the very nature of this type of work it is not possible to remove all the risks from the design. We would also respectfully remind the Client of his obligations to take all reasonable steps in ensuring that only competent Contractors who have a valid safety policy are employed. They should also provide satisfactory responses at tender stage as to the manner in which they will deal with the elements of risk involved in this type of work and in particular those highlighted by REFA below:-

1. Support / treatment for ALL excavation work.
2. Guarding to edges of excavations to prevent people,materials and vehicles falling into excavation.
3. Guarding of excavations outside working hours to prevent unauthorised access.
4. Undermining to adjacent roads or structures.
5. Confined space operations.
6. Dealing with existing services.
7. Traffic management on existing highways.
8. Procedure to be followed in event of accident or emergency.
9. Method of working where contaminated ground is present on site.
10. Confirmation will be required that all operatives are adequately trained, copies of relevant training certificates to be supplied.

The above list is by no means exhaustive but it does highlight operations that present a risk to contractors and the general public. For clarification on any item please contact REFA.

rev	Revision details	Rev.By	Date
F	CONCRETE PROTECTION NOTE ADDED AS PER S104 COMMENTS	RF	24.05.23
E	FW REFERNCE NUMBERS CORRECTED	RF	04.05.23
D	SEWER REDESIGN FOLLOWING UPDATED EXISTING SEWER INFORMATION	RF	06.04.23
C	REVISED FOLLOWING LLFA COMMENTS	AS	23.02.23
B	CULVERT DIVERSION & NETWORK 4 REVISED ROADS 4, 5 & RAMPS REVISED	RF	20.01.23
A	MINOR SEWER REVISIONS TO NETWORK 5 & FW FROM F11-F12	RF	30.11.22

smas worksafe designer www.smasltd.com — SSIP SAFETY SCHEMES IN PROCUREMENT

Drawing Stage		Drawing Status	
Draft		Comments	● Tender
● Issued		Information	Construction
		● Approval	As Built

Client
KELLEN HOMES LIMITED

Job title
BENNETT STREET MANCHESTER

Drawing title
LONGITUDINAL SECTIONS 1

REFA
45 Bridgeman Terrace
Wigan, Lancs
WN1 1TT
Tel:-(01942) 826020
Fax:-(01942) 230816
CONSULTING ENGINEERS
CIVIL • STRUCTURAL
GEOTECHNICAL • ENVIRONMENTAL

Date	Scale	Drawn
17.11.22	1:500 H ; 1:100 V	RF

DRAWING No 22122/100/3 Rev F

© This drawing is the property of REFA and should not be copied, used or its contents divulged without prior written consent.

A1 SHEET