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.

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 !!!

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 ARE AS FOLLOWS:
1 YEAR RP = 25.8L./SEC.
30 YEAR RP = 57.3 L./SEC.
100 YEAR + 45% CC = 75.2 L./SEC.
THIS IS TO BE SPLIT OVER FOUR SEPARATE OUTFALL LOCATIONS BY WAY OF HYDROBRAKE FLOW CONTROL DEVICES.

SW NETWORK 3

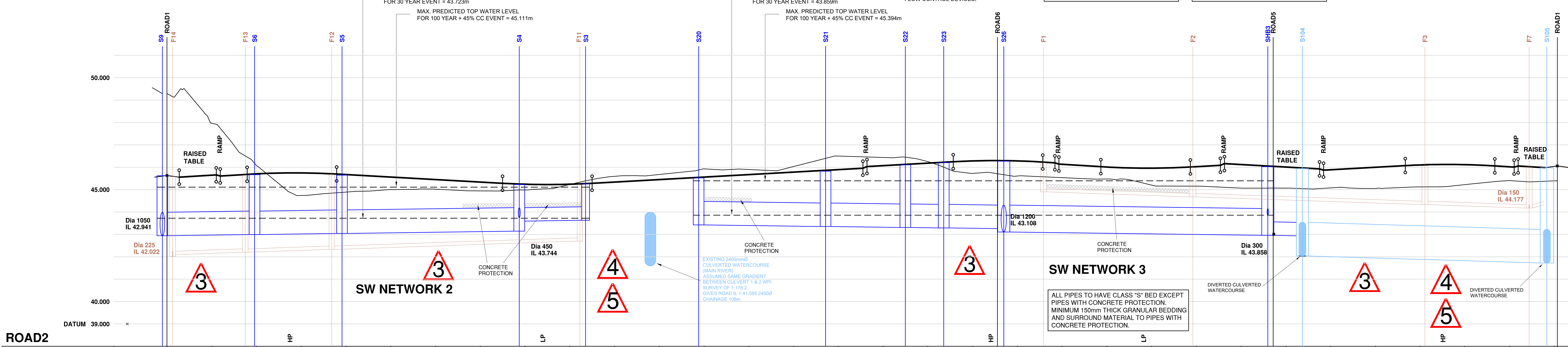
HYDROBRAKE DETAILS

MH. No.	SHB3	
TYPE	SHE-0140-8600-0700-8600	
DESIGN HEAD (m)	0.7	
MAX. FLOW (litres/sec)	8.6	IL 42.958
ORIFICE DIA. (mm)	140	
SURCHARGED OUTFALL PIPE	YES	

HYDROBRAKE DETAILS

MH. No.	SHB3	
TYPE	SHE-0129-8500-1450-8500	
DESIGN HEAD (m)	1.45	
MAX. FLOW (litres/sec)	8.5	IL 43.550
ORIFICE DIA. (mm)	140	
SURCHARGED OUTFALL PIPE	YES	

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



ROAD2

EXISTING GROUND LEVEL	49.297, 47.998, 46.080, 44.737, 44.892, 44.999, 45.021, 44.945, 44.986, 45.229, 45.601, 45.676, 45.927, 45.898, 46.032, 46.500, 46.439, 46.256, 45.728, 45.609, 45.538, 45.475, 45.204, 45.157, 45.067, 45.068, 45.078, 45.050, 45.123, 45.223, 45.401, 45.394, 45.398
ALIGNMENT LEVEL	45.557, 45.647, 45.660, 45.608, 45.683, 45.706, 45.742, 45.749, 45.747, 45.724, 45.696, 45.673, 45.562, 45.451, 45.340, 45.284, 45.285, 45.243, 45.229, 45.243, 45.285, 45.340, 45.451, 45.563, 45.674, 45.785, 45.896, 45.957, 46.031, 46.071, 46.183, 46.246, 46.283, 46.298, 46.298, 46.284, 46.240, 46.232, 46.198, 46.143, 46.135, 46.026, 46.011, 45.971, 45.960, 45.960, 45.980, 46.012, 46.027, 46.087, 46.161, 46.120, 46.009, 45.925, 45.871, 45.888, 45.999, 46.074, 46.104, 46.125, 46.126, 46.117, 46.079, 46.060, 46.019, 46.006, 46.058, 45.983
VERTICAL ALIGNMENT	G= 1.250% 1: 80.0; G= -5.805% 1: -17.2; G= 1.250% 1: 80.0; L= 20.000 KF= -8.47099; G= -1.111% 1: -90.0; KF= 9.00090 L= 20.000; G= 1.111% 1: 90.0; G= 8.300% 1: 12.0; G= 1.111% 1: 90.0; L= 20.000 KF= -8.47099; G= -1.250% 1: -80.0; G= -6.078% 1: -16.5; G= -1.250% 1: -80.0; KF= 8.47099 L= 20.000; G= 1.111% 1: 90.0; G= 8.300% 1: 12.0; G= -1.111% 1: -90.0; G= -6.078% 1: -16.5; G= 1.111% 1: 90.0; L= 20.000 KF= -8.47099; G= -1.250% 1: -80.0; G= 5.779% 1: 17.3; G= -1.250% 1: -80.0
HORIZONTAL ALIGNMENT	R= 49.977; R= 8.750; R= 8.750
STORMWATER DETAILS	CL 45.620; IL 42.941 Pipe 1.004 Dia 1050 Circular CONC 1 in 393 20.825 CL 45.667 IL 42.994; IL 42.994 Pipe 1.003 Dia 1050 Circular CONC 1 in 398 19.914 CL 45.645 IL 43.044; IL 43.044 Pipe 1.002 Dia 1050 Circular CONC 1 in 396 39.612 CL 45.226 IL 43.144; IL 43.594 Pipe 2.000 Dia 600 Circular CONC 1 in 395 14.620 CL 45.258 IL 43.631; CL 45.525 IL 43.426 Pipe 1.000 Dia 1050 Circular CONC 1 in 394 28.368 CL 45.825 IL 43.354; IL 43.354 Pipe 1.001 Dia 1050 Circular CONC 1 in 398 17.516 CL 46.106 IL 43.310; IL 43.310 1.002 1050 CONC 1:400 7.592 IL 43.291; IL 43.291 CL 46.204 1.003 Dia 1050 CONC 1 in 400 13.232 CL 46.272 IL 43.258; IL 43.108 Pipe 1.004 Dia 1200 Circular CONC 1 in 393 58.992 CL 46.028 IL 42.958; IL 42.958; CL 45.941 IL 42.938; IL 42.038 Pipe 1.005 Dia 600 Circular CONC 1 in 387 7.736
FOULWATER DETAILS	CL 45.578 IL 42.097 Pipe 3.002 Dia 150 Circular UPVC 1 in 150 16.006 CL 45.647 IL 42.204; IL 42.204 Pipe 3.001 Dia 150 Circular UPVC 1 in 150 18.756 CL 45.678 IL 42.329; IL 42.329 Pipe 3.000 Dia 150 Circular UPVC 1 in 150 55.625 CL 45.224 IL 42.700; CL 46.196 IL 44.900 Pipe 1.000 Dia 150 Circular UPVC 1 in 150 33.367 CL 45.985 IL 44.678; IL 44.678 Pipe 1.001 Dia 150 Circular UPVC 1 in 150 51.863 CL 46.067 IL 44.332; IL 44.332 Pipe 1.002 Dia 150 Circular UPVC 1 in 150 23.292 CL 46.020 IL 44.177
CHAINAGE	0.000, 2.750, 8.219, 10.000, 11.016, 11.916, 17.913, 20.000, 25.000, 28.501, 30.000, 35.000, 37.913, 38.791, 40.000, 50.000, 60.000, 70.000, 74.984, 75.000, 80.000, 84.984, 85.000, 90.000, 90.669, 94.984, 100.000, 104.413, 110.000, 120.000, 130.000, 140.000, 150.000, 155.506, 156.403, 160.000, 161.957, 170.000, 175.689, 175.701, 180.000, 185.000, 185.100, 185.559, 190.000, 195.000, 195.689, 198.403, 199.303, 200.000, 208.662, 210.000, 215.000, 219.251, 220.000, 225.000, 228.662, 230.000, 235.387, 236.285, 240.000, 247.165, 250.000, 257.533, 258.432, 260.000, 270.000, 276.703, 280.000, 285.000, 286.114, 290.000, 295.000, 296.703, 300.000, 301.014, 301.916, 310.665

ALL PIPES TO HAVE CLASS "S" BED EXCEPT PIPES WITH CONCRETE PROTECTION. MINIMUM 150mm THICK GRANULAR BEDDING AND SURROUND MATERIAL TO PIPES WITH CONCRETE PROTECTION.

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

THE S38/S278 AGREEMENT FOR THIS SCHEME IS ALSO ASSOCIATED WITH THE LATEST APPROVED REVISION OF THE FOLLOWING PLANS:–
ROAD AND DRAINAGE LAYOUT – DRGS: 22122/100/1, 22122/100/2
LONGITUDINAL SECTIONS – DRGS: 22122/100/3, 22122/100/4, 22122/100/5, 22122/100/6, 22122/100/7
ROAD LEVELS & CONTOURS – DRGS: 22122/101/1
TYPICAL ROAD CONSTRUCTION DETAILS – DRGS: 22122/113/1, 22122/113/2
KERBING & SURFACING – DRGS: 22122/116/1, 22122/116/2

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 ASSSESED 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	TWL'S & HB'S REVISED FOLLOWING SW RECALCULATIONS	RW	13.07.23
E	CONCRETE PROTECTION NOTE ADDED AS PER S104 COMMENTS	RF	24.05.23
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 FW REVISIONS BETWEEN F17-F21 F18 REMOVED	RF	30.11.22

smas worksafe designer www.smasltd.com — as recognised by 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 2

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CONSULTING ENGINEERS
CIVIL • STRUCTURAL
GEOTECHNICAL • ENVIRONMENTAL

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

DRAWING No 22122/100/4 Rev F

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A1 SHEET