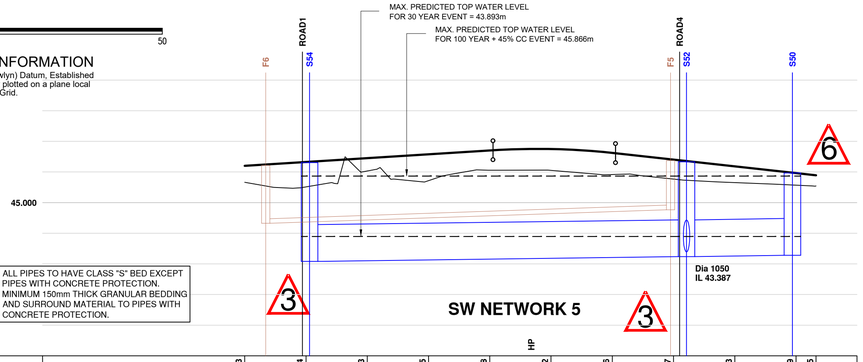
SCALE IN METRES
0 5 10 20 50

BENCH MARK INFORMATION

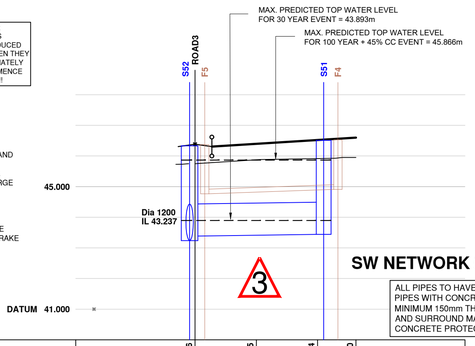
All levels relate to O.S (Newlyn) Datum, Established using network RTK. Survey plotted on a plane local grid, orientated to National Grid.



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.

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.



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.

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

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

ROAD3

EXISTING GROUND LEVEL	45.663	45.514	46.033	45.715	46.058	46.032	45.916	45.767	45.653	45.569	45.545	
ALIGNMENT LEVEL	46.201	46.326	46.451	46.576	46.701	46.707 / 46.746 / 46.753 / 46.748	46.708	46.624	46.612	46.404	46.184	45.964	45.892
VERTICAL ALIGNMENT		G= 1.250% 1: 80.0				L= 20.000 KF= -5.79710				G= -2.200% 1: -45.5			
HORIZONTAL ALIGNMENT													
STORMWATER COVER LEVEL		CL 46.306 IL 43.081	Pipe 1.001 Dia 1200 Circular CONC 1 in 394 61.541						CL 46.333 IL 43.237	IL 43.237	Pipe 1.000 Dia 1200 Circular CONC 1 in 393 17.288	CL 45.966 IL 43.281
FOULWATER COVER LEVEL	CL 46.212 IL 44.325	Pipe 2.001 Dia 150 Circular UPVC 1 in 150 66.089							CL 46.371 IL 44.766			
CHAINAGE	0.000	9.415	10.000	20.000	30.000	40.000	40.536	45.000	47.782	50.000	55.000	60.000	60.536	70.000	70.987	80.000	90.000	93.265

ROAD4

EXISTING GROUND LEVEL	45.746	45.875	45.914	45.930	
ALIGNMENT LEVEL	46.306	46.397	46.522	46.600	
VERTICAL ALIGNMENT		G= 1.250% 1: 80.0			
HORIZONTAL ALIGNMENT					
STORMWATER DETAILS	CL 46.333 IL 43.387	Pipe 2.000 Dia 1050 Circular CONC 1 in 398 21.885	CL 46.511 IL 43.442		
FOULWATER DETAILS	CL 46.371 IL 44.766	Pipe 2.000 Dia 150 Circular UPVC 1 in 150 21.743	CL 46.377 IL 44.811		
CHAINAGE	0.000	2.750	10.000	20.000	26.271

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

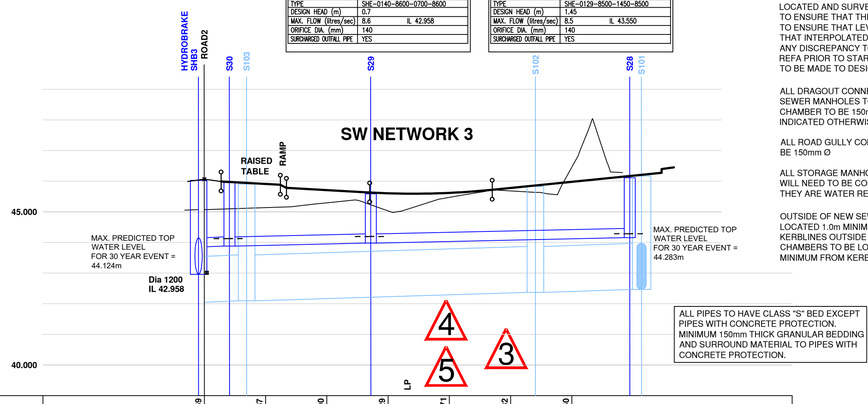
SW NETWORK 3

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



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.

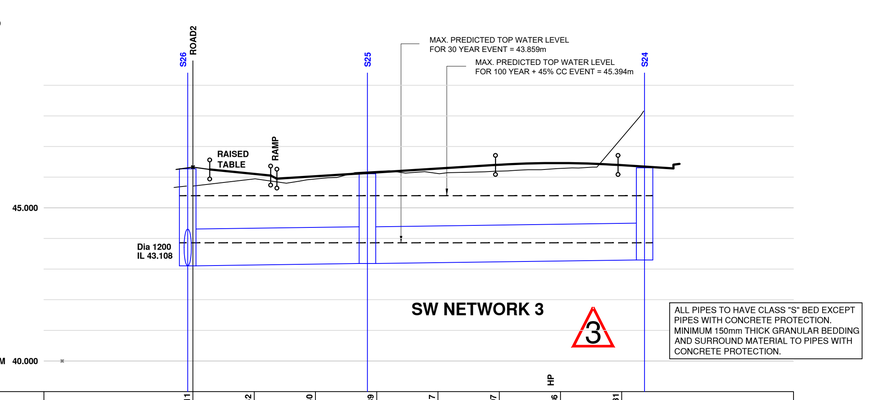
ALL EXISTING MANHOLE INVERT LEVELS ARE TO LOCATED AND SURVEYED PRIOR TO START ON SITE TO ENSURE THAT THEY ARE CORRECT AND ALSO TO ENSURE THAT LEVEL CLASHES ARE AVOIDED AND THAT INTERPOLATED INVERT LEVELS ARE CORRECT. ANY DISCREPANCY TO BE REPORTED TO REFA PRIOR TO START TO ENABLE ANY CHANGES TO BE MADE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



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.

ROAD5

EXISTING GROUND LEVEL	45.069	45.137	45.290	45.029	45.471	45.682	46.460																	
ALIGNMENT LEVEL	45.898	45.908	45.681	45.761	45.708	45.630	45.604	45.591	45.591	45.617	45.682	45.719	45.779	45.979	46.179	46.272								
VERTICAL ALIGNMENT		G= -1.111% 1: -90.0		G= -10.000% 1: -10.0		G= -1.111% 1: -90.0		KF= 6.42880 L= 20.000				G= 2.000% 1: 50.0												
HORIZONTAL ALIGNMENT																								
STORMWATER DETAILS	Pipe 3.002 Dia 300 Circular UPVC 1 in 230 5.068	CL 46.052 IL 43.958	CL 45.964 IL 43.880	IL 43.880	Pipe 3.001 Dia 300 Circular UPVC 1 in 235 23.076		CL 45.587 IL 43.978	IL 43.978	Pipe 3.000 Dia 300 Circular UPVC 1 in 235 42.277					CL 46.113 IL 44.158									
CHAINAGE	0.000	2.750	10.000	12.411	13.411	20.000	26.995	30.000	34.137	35.000	40.000	45.000	46.995	50.000	60.000	70.000	74.852							

ROAD6

EXISTING GROUND LEVEL	45.711	45.942	45.940	46.188	46.117	46.197	46.286	47.281																
ALIGNMENT LEVEL	46.250	46.105	46.051	45.951	46.030	46.155	46.280	46.398	46.405	46.448	46.460	46.460	46.441	46.398	46.390	46.285								
VERTICAL ALIGNMENT		G= -1.999% 1: -50.0		G= -10.000% 1: -10.0		G= 1.250% 1: 80.0					L= 20.000 KF= -8.0			G= -1.250% 1: -80.0										
HORIZONTAL ALIGNMENT																								
STORMWATER DETAILS	CL 46.302 IL 43.109	Pipe 2.001 Dia 1200 Circular CONC 1 in 397 29.343			CL 46.110 IL 43.182	IL 43.182	Pipe 2.000 Dia 1200 Circular CONC 1 in 393 45.238								CL 46.308 IL 43.297									
CHAINAGE	0.000	2.750	10.000	12.699	13.699	20.000	30.000	40.000	49.397	50.000	55.000	59.397	60.000	65.000	69.397	70.000	78.437							

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
G	REVISED FOLLOWING S38 COMMENTS	RW	22.09.23
F	TWL'S & HB'S REVISED FOLLOWING SW RECALCULATIONS	RW	13.07.23
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 SW & FW SEWERS IN ROADS 3,& 4 , F10 & S53 REMOVED	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 3

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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 22122/100/5 Rev G

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A1 SHEET