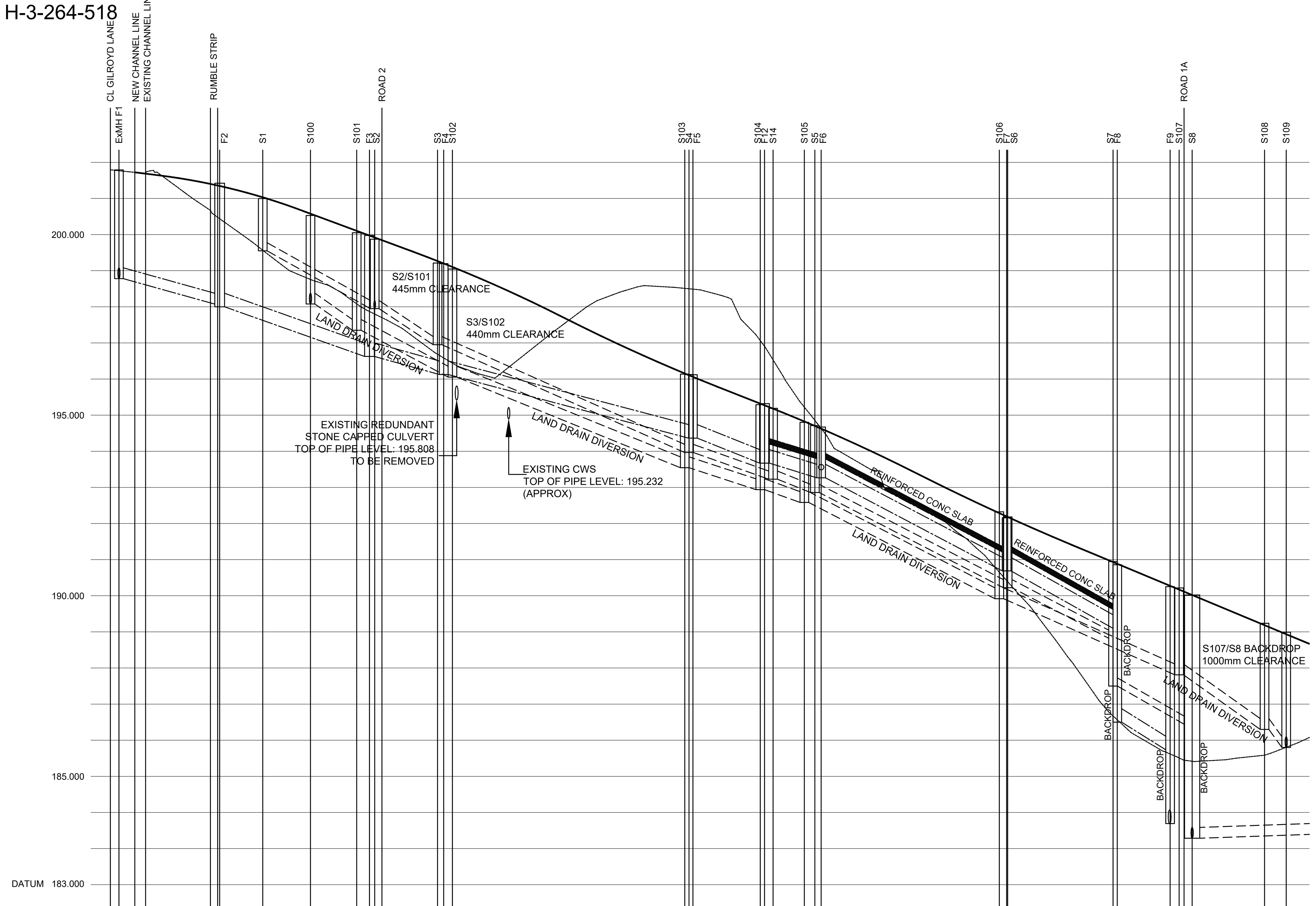
YW REF: R-3-222-045
YW REF: H-3-264-518



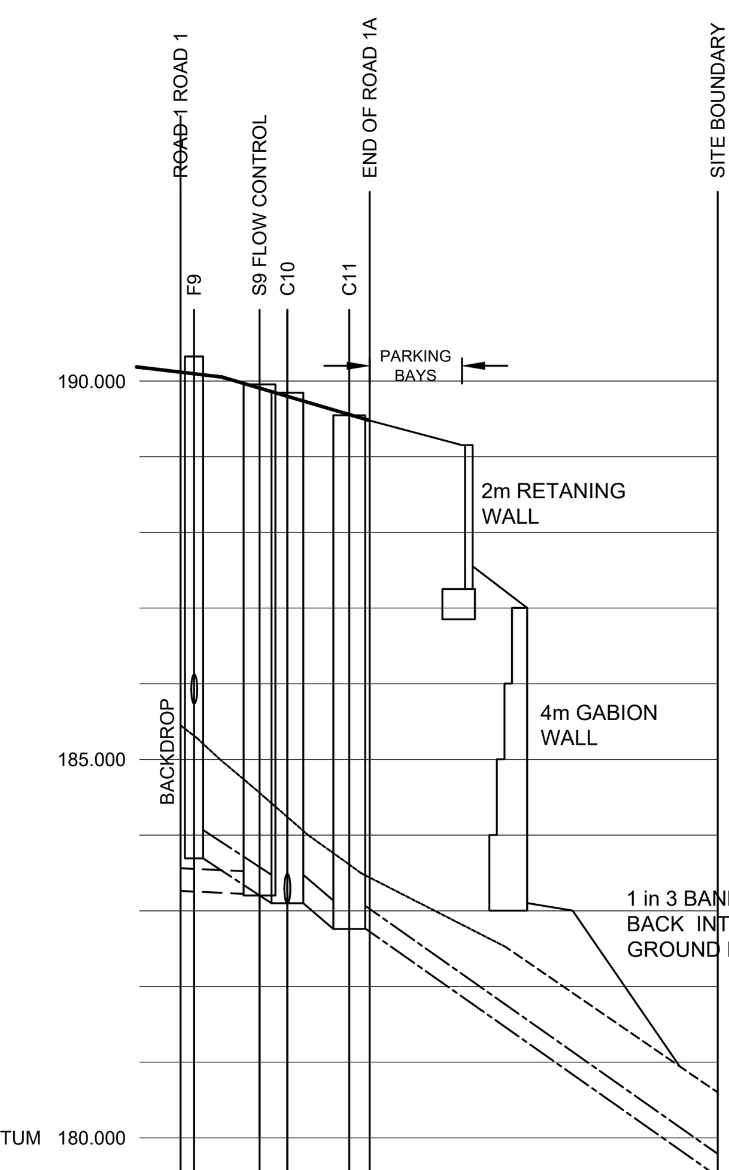
ROAD 1

Row	Values
CHAINAGE	-3.385, -2.195, -0.000, 1.495, 3.363, 5.000, 10.000, 10.500, 11.500, 11.751, 15.000, 16.351, 17.716, 20.000, 22.990, 23.363, 25.248, 30.000, 32.492, 33.214, 34.225, 38.615, 40.000, 41.918, 42.768, 45.000, 47.868, 50.000, 55.000, 58.615, 60.000, 60.615, 65.000, 70.000, 70.648, 75.000, 76.735, 77.279, 80.000, 80.615, 87.615, 88.374, 90.000, 94.161, 95.000, 97.466, 100.000, 105.000, 107.615, 109.615, 110.000, 115.000, 120.000, 120.415, 125.000, 129.615, 130.000, 135.448, 136.031, 140.000, 143.348, 145.278, 146.402, 150.000, 151.086, 160.000, 162.634
EXISTING GROUND LEVEL	201.791, 201.724, 200.733, 199.214, 198.199, 196.958, 196.046, 197.613, 198.568, 198.395, 195.997, 193.716, 192.415, 190.583, 188.087, 185.931, 185.432, 185.848, 186.076
ALIGNMENT LEVEL	201.724, 201.640, 201.595, 201.420, 201.183, 200.884, 200.649, 200.157, 199.519, 199.415, 199.020, 198.592, 198.131, 197.778, 197.640, 197.578, 197.150, 196.687, 196.250, 195.840, 195.791, 195.240, 195.049, 194.629, 194.183, 193.710, 193.452, 193.252, 193.214, 192.726, 192.259, 191.813, 191.419, 191.387, 190.554, 189.720, 188.887, 188.668
VERTICAL ALIGNMENT	G= -2.500% 1: -40.0; L= 20.000 KF= -4.07547; G= -7.407% 1: -13.5; L= 20.000 KF= -7.71428; G= -10.000% 1: -10.0; KF= 9.40741 L= 20.000; G= -7.874% 1: -12.7; L= 20.000 KF= -9.40741; G= -10.000% 1: -10.0; KF= 12.0 L= 20.000; G= -8.333% 1: -12.0
HORIZONTAL ALIGNMENT	R= 20.000; R= 11.750; R= 15.950; R= 18.750
STORMWATER COVER LEVEL	200.996, 199.871, 199.212, 196.126, 195.189, 194.712, 192.182, 190.948, 190.020
STORMWATER INVERT	199.550, 197.950, 197.950, 196.950, 196.950, 193.966, 193.966, 193.227, 193.227, 192.859, 192.859, 190.223, 190.223, 188.823, 187.500, 186.436, 183.286
STORMWATER DETAILS	Pipe 1.000 Dia 225 Circular CLAY 1 in 10 HIGHWAY SEWER; Pipe 1.001 Dia 225 Circular CLAY 1 in 10 HIGHWAY SEWER; Pipe 1.002 Dia 225 Circular CLAY 1 in 12; Pipe 1.003 Dia 225 Circular CLAY 1 in 16; Pipe 1.004 Dia 225 Circular CLAY 1 in 16; Pipe 1.005 Dia 225 Circular CLAY 1 in 10; Pipe 1.006 Dia 225 Circular CLAY 1 in 10; Pipe 1.007 Dia 225 Circular CLAY 1 in 10; Pipe 3.001 Dia 300 Circular CLAY 1 in 152
STORMWATER LENGTHS	16.000, 10.000, 35.804, 11.822, 5.898, 26.756, 14.000, 10.642, 26.788
FOULWATER COVER LEVEL	201.790, 201.422, 199.976, 199.195, 196.120, 195.319, 194.672, 192.158, 190.859, 190.252
FOULWATER INVERT	198.780, 198.065, 197.990, 196.626, 196.626, 196.126, 196.126, 194.364, 194.364, 193.672, 193.672, 193.265, 193.265, 190.688, 190.688, 189.099, 186.500, 185.735
FOULWATER DETAILS	Pipe 1.000 Dia 300 Circular CLAY 1 in 20; Pipe 1.001 Dia 375 Circular CONC 1 in 14; Pipe 1.002 Dia 375 Circular CONC 1 in 19; Pipe 1.003 Dia 375 Circular CONC 1 in 20; Pipe 1.004 Dia 375 Circular CONC 1 in 16; Pipe 1.005 Dia 375 Circular CONC 1 in 21; Pipe 1.006 Dia 375 Circular CONC 1 in 10; Pipe 1.007 Dia 375 Circular CONC 1 in 10; Pipe 1.008 Dia 375 Circular CONC 1 in 10
FOULWATER LENGTHS	14.595, 19.568, 9.593, 35.241, 11.069, 8.644, 25.972, 15.887, 7.652
LAND DRAIN COVER LEVEL	200.528, 200.050, 199.045, 196.137, 195.291, 194.802, 192.325, 190.216, 189.237, 189.085
LAND DRAIN INVERT	98.120, 197.350, 197.350, 196.050, 196.050, 193.544, 193.544, 192.938, 192.938, 192.583, 192.583, 189.918, 189.918, 187.810, 187.810, 186.299, 185.800
LAND DRAIN DETAILS	Pipe 1.000 Dia 300 Circular CLAY 1 in 9; Pipe 1.001 Dia 300 Circular CLAY 1 in 12; Pipe 1.002 Dia 300 Circular CLAY 1 in 13; Pipe 1.003 Dia 300 Circular CLAY 1 in 16; Pipe 1.004 Dia 300 Circular CLAY 1 in 16; Pipe 1.005 Dia 300 Circular CLAY 1 in 10; Pipe 1.006 Dia 300 Circular CLAY 1 in 10; Pipe 1.007 Dia 300 Circular CLAY 1 in 7; Pipe 1.008 Dia 300 Circular CLAY 1 in 8
LAND DRAIN LENGTHS	6.824, 14.964, 32.516, 9.698, 5.678, 26.654, 21.077, 11.108, 3.985

YW DIVERSION REFERENCE NO: R-3-222-045

RISK ASSESSMENT: SIGNIFICANT RISKS THAT CANNOT BE DESIGNED OUT		
RISK	LEVEL OF RISK (H/M)	SUGGESTED ACTION
DEEP EXCAVATIONS ASSOCIATED WITH NEW DRAINAGE WORKS	HIGH	ENSURE ALL EXCAVATIONS HAVE ADEQUATE TRENCH SUPPORTS
HANDLING LARGE DIAMETER MANHOLE RINGS AND CIRCULAR PIPES	HIGH	USE CORRECT LIFTING EQUIPMENT AND ENSURE OPERATIVES WEAR APPROPRIATE PROTECTIVE CLOTHING/HARD HATS/CORRECT PPE.
CONTACT WITH SEWAGE	MED	OPERATIVES TO USE CORRECT BREATHING EQUIPMENT/CORRECT PPE
NOISE	MED	OPERATIVES TO USE CORRECT EAR PROTECTION/CORRECT PPE
DRAINAGE EXCAVATIONS ADJACENT EXISTING BOUNDARY STRUCTURES	HIGH	ENSURE CORRECT SUPPORTS ARE PROVIDED TO TRENCHES AND BUILDINGS WHERE REQUIRED
DRAINAGE EXCAVATION IN PUBLIC HIGHWAY	HIGH	ENSURE CORRECT USE OF TRENCH SUPPORTS IN EXCAVATION AND SCREEN BARRIERS TO PROTECT MEMBERS OF THE PUBLIC
MAINTAIN ACCESS TO ADJACENT PROPERTIES AND OCCUPIERS	HIGH	ENSURE WORKS ARE PROTECTED WITH BARRIERS AND SIGNS TO GUIDE THE PUBLIC AWAY FROM THE WORKS
DRAINAGE EXCAVATIONS NEAR TO EXISTING SERVICES	HIGH	ENSURE WORKS ARE PROTECTED WITH BARRIERS AND SIGNS TO GUIDE MEMBERS OF THE PUBLIC AWAY FROM THE AREA
WORKING IN CONFINED SPACES. WORKING IN DRAINS AND MANHOLES	HIGH	CONFINED SPACES WORKING TRAINED PERSONNEL ONLY TO CARRY OUT WORKS UNDER A PERMIT TO WORK SCHEME IMPLEMENTED BY CONTRACTOR. GAS TESTING TO TAKE PLACE BEFORE ALL ENTRIES TO CONFINED SPACES.
WORKING IN HIGHWAYS / RISKS FROM VEHICLE AND PLANT	HIGH	ALL WORKS TO BE SIGNED AND FENCED FROM NORMAL VEHICULAR TRAFFIC. ALL WORKERS TO WEAR HIGH VISIBILITY CLOTHING. ALL PLANT TO HAVE VISUAL AND AUDIBLE WARNING SYSTEMS.
ROAD AND DRAINAGE CONSTRUCTION	HIGH	ALL EXCAVATIONS TO BE ADEQUATELY FENCED OFF AND SUPPORTED DURING CONSTRUCTION. ALL OPERATIVES TO BE TRAINED IN CORRECT METHODS OF LIFTING AND WORK IN ACCORDANCE WITH LOLER REGS
IT IS ASSUMED THAT WORKS ASSOCIATED WITH THIS DESIGN WILL BE UNDERTAKEN BY A PERSON OR PERSONS WHO ARE COMPETANT AND HAVE THE REQUIRED LEVEL OF EXPERIENCE AND EXPERTISE		

1. ALL ADOPTABLE SEWER WORKS AND MATERIAL TO BE IN ACCORDANCE WITH "CODES FOR ADOPTION",THE RELEVANT BRITISH/EUROPEAN AND YORKSHIRE WATER'S STANDARDS/REQUIREMENTS/ADDENDUM TO THE MECHANICAL AND ELECTRICAL SPECIFICATION AND KITEMARKED.
2. MANHOLE COVERS SHALL/MUST HAVE A CLEAR OPENING OF 600mm AND SHALL BE CLASS D400 TO BS EN 124 WITH 150mm DEEP FRAMES IN HIGHWAYS.
3. FILLED GROUND MUST BE FILLED AND CONSOLIDATED UNDER THE SUPERVISION AND TO THE SATISFACTION OF YORKSHIRE WATER BEFORE ANY SEWER WORKS ARE CARRIED OUT.
4. YORKSHIRE WATER IS **NOT** OBLIGED TO ACCEPT FILTER DRAIN/LAND DRAINAGE RUNOFF INTO THE PUBLIC SEWER NETWORK OR ADOPTABLE DRAINAGE SYSTEM (DIRECTLY OR INDIRECTLY). AN ALTERNATIVE METHOD OF DISPOSAL OF THE LAND DRAINAGE RUNOFF WILL THEREFORE BE REQUIRED AND YOU WILL HAVE TO LIAISE WITH THE LOCAL AUTHORITY, LAND DRAINAGE SECTION WITH REGARD TO THE DISPOSAL OF THE FILTER DRAIN/LAND DRAINAGE RUNOFF.
5. COVER SLABS MUST CARRY THE BSI KITEMARK OR WILL BE REJECTED BY YORKSHIRE WATER INSPECTOR. WHERE THE CLEAR OPENING OF THE KITEMARKED PRODUCT IS DIFFERENT TO THAT OF THE COVER AND FRAME, A LOADING BEARING SLAB SHOULD BE FITTED ABOVE THE COVER SLAB TO BRING THE SIZE DOWN TO 600x600mm FOR THE YORKSHIRE WATER SPECIFIED COVER SIZE. PLEASE REFER TO CONCRETE PIPE SYSTEMS ASSOCIATION (CPSA), 'TECHNICAL BULLETIN' ISSUED AUTUMN 2004 FOR KITEMARKED COVER SLAB OPENING SIZES.
6. SULPHATE RESISTANT CEMENT (C20-DC2) AND PRECAST CONCRETE PRODUCTS MUST BE USED OR A LABORATORY REPORT PROVIDED PROVING THAT SUCH PRECAUTIONS ARE NOT NECESSARY.
7. THE ADOPTABLE SEWERS SHOULD BE A MINIMUM OF 1m AND MANHOLES 0.5m FROM KERB FACES.
8. SEWERS MUST HAVE 5m CLEARANCE FROM TREES AND HEDGES
9. SEWERS TO BE LAID IN CLASS "S" BEDDING (150mm GRANULAR BED AND SURROUND). WHERE DEPTH OF COVER TO TOP OF THE SEWER IS LESS THAN 1.2m IN HIGHWAYS AND VERGES (OR LESS THAN 900mm IN NONE VEHICULAR ACCESS AREAS) THEN A 175mm CONCRETE SLAB OVER SEWER SHALL BE PROVIDED.
10. ALL PIPEWORK 300mm DIAM. OR LESS TO BE VITRIFIED CLAY CONFORMING WITH BS 65. MINIMUM CRUSHING STRENGTHS TO BE AS FOLLOWS: 100mm DIA. 40kN/m, 150mm DIA 40kN/m, 225mm DIA 45kN/m, 300mm DIA 72kN/m.
11. ALL PIPEWORK 375mm DIAM. OR GREATER TO BE CONCRETE CLASS 120 TO EN 1916/ BS 5911-1: 2002,
12. THE CHAMBER SIZE OF MANHOLES WITH MORE THAN ONE CONNECTION IN THEM MAY NEED TO BE INCREASED AN INCREMENT TO ACCOMMODATE THE CONNECTIONS AND BENDS.
13.YORKSHIRE WATER POLICY IS NOT TO ACCEPT TYPE "C" BRICK MANHOLES AND 1050mm DIAM. MANHOLE RINGS. INSTEAD IT IS PREFERRED THAT YOU USE A TYPE "B" MANHOLE WITH 1200mm DIAM. OR 1500mm DIAM. RINGS, WITH THE OPENING SIGHTED OVER THE CHANNEL WHERE DEPTH OF COVER TO PIPE SOFFIT IS 1-1.5m.
14. ALL HIGHWAY WORKS AND MATERIAL TO CONFORM WITH KIRKLEES COUNCIL SPECIFICATION.
15. GULLY COVER AND FRAMES SHALL BE D400 DUCTILE IRON AND COMPLY WITH EUROPEAN STANDARD BS EN 124. THOSE SIGHTED IN ACCESSWAYS AND MEWS COURTS MUST BE SUITABLE FOR USE IN PEDESTRIAN AREAS.
16. BEDDING AND BACKFILL MATERIAL TO CONFORM TO THE REQUIREMENT OF WATER INDUSTRY SPECIFICATION 4-08--2 (TABLE A2).
17. PLASTIC CHANNEL SECTIONS IN MANHOLES ARE NOT ACCEPTABLE AND YORKSHIRE WATER WOULD PREFER CLAYWARE CHANNELS IN MANHOLES. YORKSHIRE WATER HAVE FOUND THAT PLASTIC CHANNELS ARE DIFFICULT TO SET IN CONCRETE AS THEY FLOAT AND A SATISFACTORY FINISH CANNOT BE OBTAINED ON BENCHING.
18. WHERE A B125 COVER AND FRAME HAS BEEN APPROVED, THIS **MUST NOT** BE COATED IN PLASTIC AND MUST HAVE LIFTING EYES SUITABLY SIZED TO ACCOMMODATE STANDARD LIFTING KEYS. SCREW DOWN COVERS ARE **NOT** ACCEPTABLE.
19. THERE SHOULD BE ENOUGH CLEARANCE TO ACCOMMODATE THE BEDDING FOR BOTH PIPES, APPROX 300mm : IF CROSSOVER IS NEAR THE ROCKER THEN THE CLEARANCE NEEDED MAY BE INCREASED.



PROPOSED SEWER DIVERSION TO CONNECT BACK INTO EXISTING 300Ø COMBINED SEWER AT MANHOLE C11.

RIGHTS OF PERPETUITY TO BE GIVEN TO YW TO ACCESS COMBINED SEWER BEYOND ADOPTABLE HIGHWAY INCLUDING 24/7 ACCESS TO MANHOLE C11 FOR FUTURE MAINTENANCE.

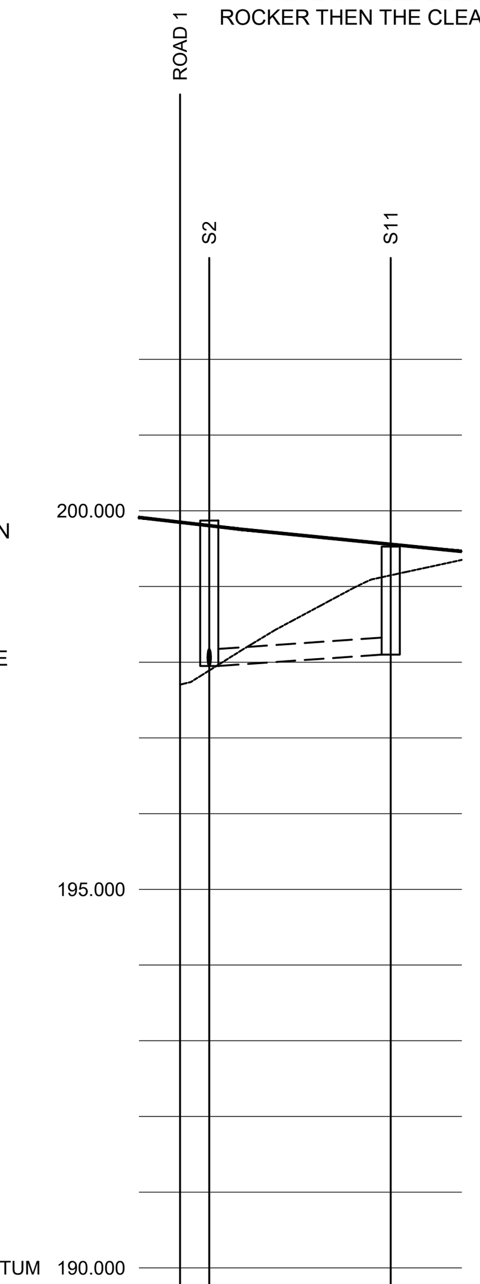
REFER TO DRWG NO. E16/6781/100 FOR DETAILS OF SEWER CONSTRUCTION BENEATH PROPOSED RETAINING STRUCTURE.

1 in 3 BANKING TO REGRADE BACK INTO EXISTING GROUND LEVELS

ROAD 1A

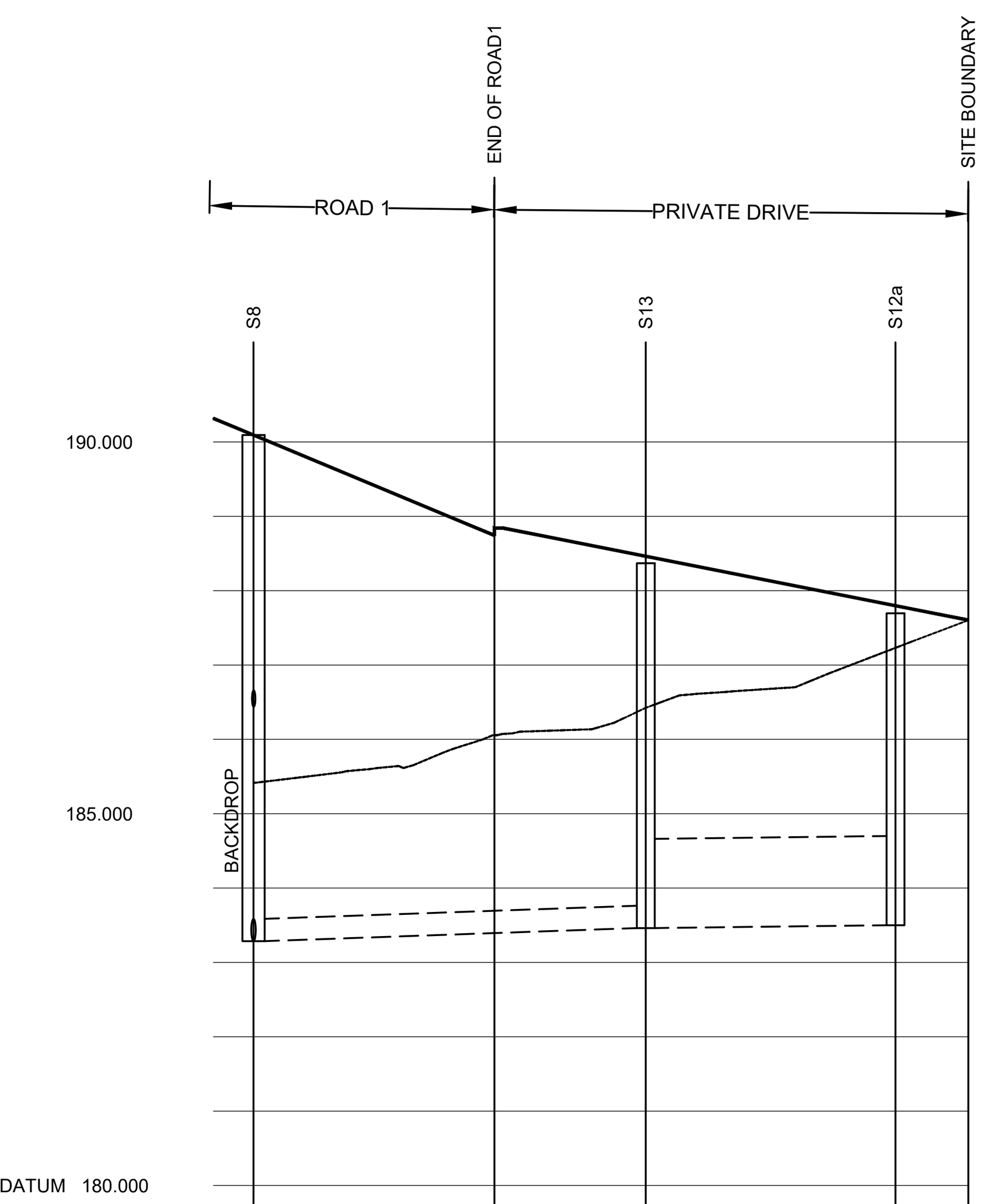
Row	Values
CHAINAGE	-2.750, -1.658, 0.001, 2.171, 4.009, 8.360, 9.736
EXISTING GROUND LEVEL	185.429, 184.976, 183.434
ALIGNMENT LEVEL	190.052, 189.478
VERTICAL ALIGNMENT	G= -5.897% 1: -17.0
HORIZONTAL ALIGNMENT	
STORMWATER COVER LEVEL	189.645, 189.598
STORMWATER INVERT	183.252, 183.200, 183.179
STORMWATER DETAILS	Pipe 1.008 Dia 300 Circular CLAY 1 in 147; Pipe 1.009 Dia 300 Circular CLAY 1 in 150
STORMWATER LENGTHS	5.003, 3.086
FOULWATER COVER LEVEL	190.252, 189.598, 189.362
FOULWATER INVERT	183.693, 183.104, 183.179, 183.104, 182.760
FOULWATER DETAILS	Pipe 1.009 Dia 375 Circular CONC 1 in 10; Pipe 1.010 Dia 375 Circular CONC 1 in 12; Dia 300 Circular CLAY 1 in 7 EXISTING
FOULWATER LENGTHS	5.888, 4.353

YW DIVERSION REFERENCE NO: R-3-222-045



ROAD 2

Row	Values
CHAINAGE	-3.820, -1.895, 0.004, 10.000, 10.088, 14.767
EXISTING GROUND LEVEL	197.704, 198.128, 199.145, 199.351
ALIGNMENT LEVEL	199.760, 199.559, 199.463
VERTICAL ALIGNMENT	G= -2.008% 1: -49.8
HORIZONTAL ALIGNMENT	
STORMWATER COVER LEVEL	199.871, 199.527
STORMWATER INVERT	197.950, 198.100
STORMWATER DETAILS	Pipe 2.000 Dia 225 Circular CLAY 1 in 80 HIGHWAY SEWER
STORMWATER LENGTHS	11.984



S12a-S8

Row	Values
GROUND LEVEL	185.413, 185.630, 186.116, 186.615, 186.985
STORMWATER COVER LEVEL	190.020, 188.400, 187.600
STORMWATER INVERT	186.436, 183.286, 183.462, 183.462, 183.500
STORMWATER DETAILS	Pipe 3.001 Dia 300 Circular CLAY 1 in 150; Pipe 3.000 16.8x10.825x1.2m (ID) Storage Tank 1 in 442
STORMWATER LENGTHS	26.389, 16.800

ALL PIPEWORK 300mm DIAM OR LESS TO BE VITRIFIED CLAY CONFORMING WITH BS 65. MINIMUM CRUSHING STRENGTHS TO BE AS FOLLOWS: 100mm DIA 40kN/m, 150mm DIA 40kN/m, 225mm DIA 45kN/m and 300mm DIA 72kN/m.
ALL PIPEWORK 375mm DIAM OR GREATER TO BE CONCRETE CLASS 120, TO EN 1916 / BS 5911-1:2002.
ADOPTABLE SEWERS TO BE LAID IN CLASS 'S' GRANULAR BED & SURROUND.

Rev E	S108-S109 added.	22.11.21 HH
Rev D	F1-F4 & S100-S107 amended to suit clients instruction.	28.10.21 HH
Rev C	Site entrance amended to suit highway comments.	26.08.21 HH
Rev C	Site entrance amended to suit highway comments. Ramp removed from Road 1. Proposed fw & sw design amended suit new land drainage design along Road 1.	26.08.21 HH
Rev B	S9-C11 amended to suit latest fws diversion design. Notes added to suit YW comments.	07.04.21 HH
Rev A	Storage tank updated to suit manufacturers design S9-C11 updated to suit S185 design.	25.02.21 HH

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Client
SB HOMES

Project
GILLROYD LANE, LINTHWAITE

Detail
SECTION 104 - SWS LONG SECTIONS

Dwn	Chkd	Date	Scale	Dwg No.
HH		Aug-20	1:500 HOR 1:100 VER @A1	E16/6781/005E