SECTION 104 & 38 NOTES

1. All adoptable drainage works have been designed and are to be constructed in accordance with "Design and Construction Guidance" & Local Practices
2. All clay pipe work shall be Extra Strength Clayware to B.S. EN 295:1991 Part 1
3. All precast concrete pipework shall be to the class stated on the drawings in accordance with BE EN 1916:2002. All manholes and chambers shall be to BS EN 1917:2002
4. All plastic pipes being offered for adoption under S104 must be structural wall and must comply with BS EN 13476-1 and WIS 4-35-01 MAX. PIPE LENGTH TO BE 3.0m
5. All levels relate to an Ordnance Datum.
6. This drawing is to be read in conjunction with all other relevant drawings.
7. House drainage connections to sewers must be 150mm ø and unless otherwise stated laid to the dragout invert level shown.
8. Levels given on drag out chambers are incoming pipe levels.
9. House drainage runs to be kept within the curtilage of the plot they serve wherever possible.
10. The Contractor shall be responsible for ensuring that any existing invert levels indicated on drawings are correct before work commences.
11. The Contractor should satisfy himself as to the position and depth of any existing Statutory Undertakers plant which could effect the works before the works are commenced.
12. Flood gully connections are to be 150mm ø connecting either directly to manholes shown, or to sewer runs using pre-formed junctions.
13. All connections to adoptable sewers shall be by manufactured junction pipes. Saddle connections will not be permitted.
14. All sewers for adoption with greater than 1.20 metres cover in roads or 0.9m metres cover in fields shall have Class S granular bed and surround.
15. Any sewer for adoption with less than 1.2 metres cover in roads or 0.9 metres cover in fields shall have a minimum of 150mm ST4 concrete surround. Flexibility shall be maintained by the provision of Flexcell or similar approved joint filler breaks in the concrete surround at each pipe joints
16. Pumping Station to be designed and constructed in accordance with Design and Construction Guidance and United Utilities Pumping Station Addendum

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 Design & Construction Guidance

Contractor to be aware of and take appropriate action to ensure de-stabilization of any existing structures, trees, embankments or other features does not occur as a result of any excavation 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

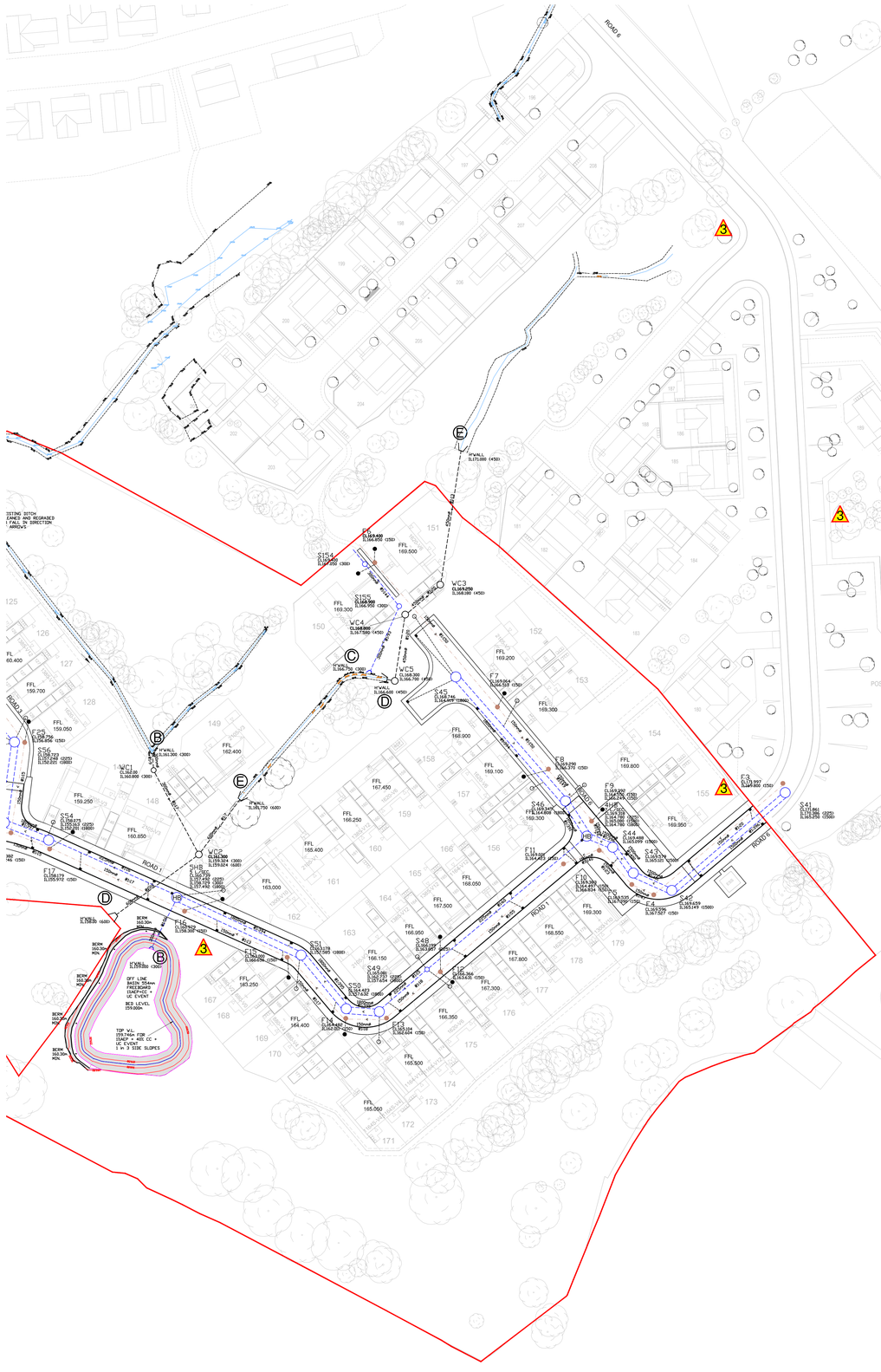
SCALE IN METRES
0 5 10 20 50

CIVILS DESIGN RISK MANAGEMENT

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

1. EXISTING SERVICES
2. WORKING ON EXISTING ROAD
3. DANGER OF COLLAPSE TO ALL EXCAVATIONS – RISK TO BE ASSESED AND MANAGED BY CONTRACTOR IN ACCORDANCE WITH HSE GUIDANCE
4. WORKING IN AREAS WHERE MEMBERS OF THE PUBLIC HAVE ACCESS E.G. MAIN ROAD
5. WORKING ADJACENT ON LIVE FOUL / COMBINED SEWERS (Weil's disease)

REFA Ltd has followed its Design Risk Monagement 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 engoged on work of this nature or type



FLOW CONTROL DETAILS

HYDROBRAKE DETAILS

MH. No.	1HB
TYPE	SHE-0120-8000-1750-8000
DESIGN HEAD (m)	1.75
MAX. FLOW (litres/sec)	8.00
ORIFICE DIA. (mm)	120
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	2HB
TYPE	SHE-0150-1000-0700-1000
DESIGN HEAD (m)	0.70
MAX. FLOW (litres/sec)	10.00
ORIFICE DIA. (mm)	150
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	3HB
TYPE	SHE-0099-7000-2931-7000
DESIGN HEAD (m)	2.931
MAX. FLOW (litres/sec)	7.00
ORIFICE DIA. (mm)	99
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	4HB
TYPE	SHE-0104-7000-2400-7000
DESIGN HEAD (m)	2.40
MAX. FLOW (litres/sec)	7.00
ORIFICE DIA. (mm)	104
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	5HB
TYPE	SHE-0101-5000-1300-5000
DESIGN HEAD (m)	1.30
MAX. FLOW (litres/sec)	5.00
ORIFICE DIA. (mm)	101
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	6HB
TYPE	SHE-0178-2000-2400-2000
DESIGN HEAD (m)	2.40
MAX. FLOW (litres/sec)	20.00
ORIFICE DIA. (mm)	178
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	7HB
TYPE	SHE-0098-6800-2900-6800
DESIGN HEAD (m)	2.90
MAX. FLOW (litres/sec)	6.80
ORIFICE DIA. (mm)	98
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	8HB
TYPE	SHE-0138-1200-2400-1200
DESIGN HEAD (m)	2.40
MAX. FLOW (litres/sec)	12.00
ORIFICE DIA. (mm)	138
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	9HB
TYPE	SHE-0240-3700-2350-3700
DESIGN HEAD (m)	2.35
MAX. FLOW (litres/sec)	37.00
ORIFICE DIA. (mm)	240
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	10HB
TYPE	SHE-0251-3800-1800-3800
DESIGN HEAD (m)	1.80
MAX. FLOW (litres/sec)	38.00
ORIFICE DIA. (mm)	251
SURCHARGED OUTFALL PIPE	NO

HYDROBRAKE DETAILS

MH. No.	11HB
TYPE	SHE-0105-5000-1000-5000
DESIGN HEAD (m)	1.00
MAX. FLOW (litres/sec)	5.00
ORIFICE DIA. (mm)	106
SURCHARGED OUTFALL PIPE	NO

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	Revby	Date
F	TD PLANNING REV F	GWH	3.5.23
E	REVISED FOLLOWING S104 COMMENTS	RW	31.04.23
D	DRAGOUT POSITIONS REVISED	RW	17.02.23
C	UPDATES TO SWALES/BASINS AND FFL'S FOLLOWING CLIENTS COMMENTS	RW	31.01.23
B	FFL'S FINALISED	RW	23.11.22
A	CENTRAL SWALE REVISED FOR CLIENT	GWH	8.11.22

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

Client
NORTHSTONE LIMITED

Job title
HORWICH GOLF CLUB HORWICH

Drawing title
ROAD AND MAIN DRAINAGE 2 OF 2

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GEOTECHNICAL • ENVIRONMENTAL

Date	Scale	Drawn
2.11.22	1/500	GWH

DRAWING No 22108/104/2 Rev F

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