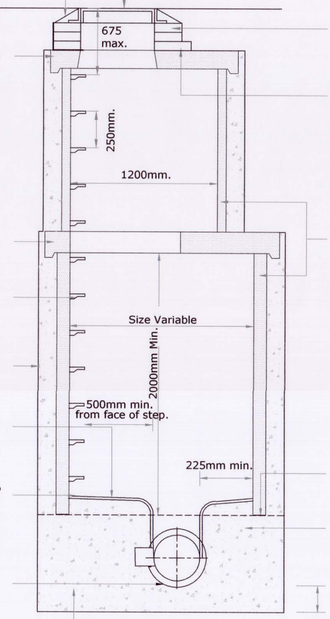
YW REF :H-3-264-078

TYPE A

Depth to soffit 3.00 - 6.00m



Mortar haunching to M.H cover and frame.

Reinforced concrete cover slab to BS EN 1917:2002 and carry BSI Kietmark with 600 x 600 eccentric access bedded with mortar,proprietary bitumen or resin mastic sealant.

Note:
Manhole cover slabs to be in accordance with BS EN1917:2002 and CSPA Technical Bulletin Autumn 2004, Table 1.

Reinforced concrete reducing slab with 900 opening.

Galvanised mild steel double rung step irons to BS EN 13101:2002.

GEN3 concrete surround 150mm thick with Sulphate Resisting Cement unless otherwise agreed.

Benching slope to be 1 in 10 to 1 in 30.

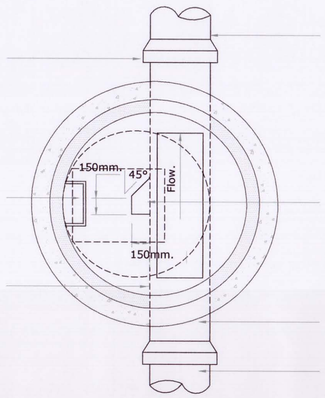
High strength concrete topping to be brought up to a dense smooth face neatly shaped and finished to all branch connections (minimum thickness 20mm).

Inverts formed using clay channel pipes.

GEN3 concrete with Sulphate Resisting Cement unless otherwise agreed.

Lifting eyes to be pointed.

Joint to be as close as practicable to face of manhole to permit satisfactory joint and subsequent movement.



Galvanised mild steel double rung step irons to BS EN 13101:2002.

Pipe joint with channel to be located 100mm to inside face of chamber.

Cover and frame to be CLASS D400 to BS EN 124 with 150mm deep frame in Roads and CLASS B125 in open space having a 600mm clear opening All covers to be kitemarked Manufacturers name to be clearly visible.

Type 2 cover seating rings with 600x600 access hole.

Type 1 cover seating ring with 600x600 access hole positioned to align with double step irons. Total no of seating rings = 4 max, 2 min.

On manholes less than 1.5m dia a reducing slab is not to be used. Precast concrete rings to continue up to cover slab.

Precast concrete shaft, chamber sections and cover slab to be bedded with mortar, proprietary bitumen or resin mastic sealant.

Bottom chamber section to be built into base concrete minimum of 100mm.

Distance between top of pipe and underside of PC chamber to be 50mm (min) - 300mm (max).

225mm to barrel of pipe from base.

ROCKER PIPES

Nominal diameter (mm)	Effective length (m)
150-600	0.60
675-750	1.00
>750	1.25

150mm Deep toe holes to be provided in benching of sewer greater than 600mm dia. for access to invert. Holes should be staggered horizontally by 150mm either side of the CL and spaced vertically so that the max. step will be 300mm.

Short length pipe to be similar length to rocker pipe.

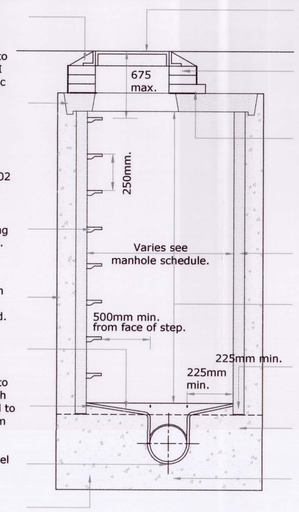
Rocker pipe.

ALL SEWERAGE WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE WATER AUTHORITIES ASSOCIATION "SEWERS FOR ADOPTION" - 6th EDITION MANHOLE COVERS AND FRAMES SHALL COMPLY WITH THE RELEVENT PROVISIONS OF BS EN 124 AND SHALL BE OF A NON-ROCKING DESIGN WHICH DOES NOT RELY ON THE USE OF CUSHION INSERTS. ALL MANHOLE COVERS SHALL BE NON-VENTILATING TYPE AND SHALL HAVE CLOSED KEYWAYS.

DIAMETER OF LARGEST PIPE IN MANHOLE (mm)	INTERNAL DIAMETER OF MANHOLE (mm)
less than 375	1200
375 - 700	1500
750 - 900	1800
>900	Consult Undertaker

TYPE B

Max depth from cover to soffit of pipe 1.5 - 3.0m



Mortar haunching to M.H cover and frame.

Reinforced concrete cover slab to BS EN 1917:2002 and carry BSI Kietmark with 600x600 eccentric access bedded with mortar,proprietary bitumen or resin mastic sealant.

Note:
Manhole cover slabs to be in accordance with BS EN1917:2002 and CSPA Technical Bulletin Autumn 2004, Table 1.

Galvanised mild steel double rung step irons to BS EN 13101:2002.

GEN3 concrete surround 150mm thick with Sulphate Resisting Cement unless otherwise agreed.

Benching slope to be 1 in 10 to 1 in 30.

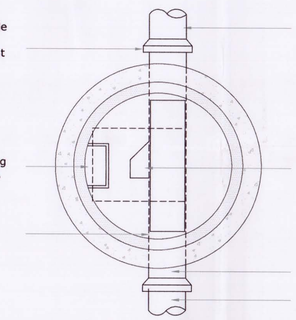
High strength concrete topping to be brought up to a dense smooth face neatly shaped and finished to all branch connections (minimum thickness 20mm).

Inverts formed using clay channel pipes.

GEN3 concrete with Sulphate Resisting Cement unless otherwise agreed.

Lifting eyes to be pointed.

Joint to be as close as practicable to face of manhole to permit satisfactory joint and subsequent movement.



Galvanised mild steel double rung step irons to BS EN 13101:2002.

Pipe joint with channel to be located 100mm to inside face of chamber.

Cover and frame to be CLASS D400 to BS EN 124 with 150mm deep frame in Roads and CLASS B125 in open space having a 600mm clear opening All covers to be kitemarked Manufacturers name to be clearly visible.

Type 2 cover seating rings with 600x600 access hole.

Type 1 cover seating ring with 600x600 access hole positioned to align with double step irons. Total no of seating rings = 4 max, 2 min.

Precast concrete shaft, chamber sections and cover slab to be bedded with mortar, proprietary bitumen or resin mastic sealant.

Chamber height to be not less than 900mm.

Bottom chamber section to be built into base concrete min. 75mm.

Distance between top of pipe and underside of PC chamber to be 50mm (min) - 300mm (max).

225mm to barrel of pipe from base.

ROCKER PIPES

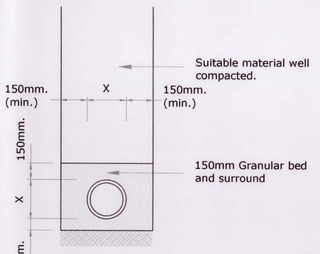
Nominal diameter (mm)	Effective length (m)
150-600	0.60
675-750	1.00
>750	1.25

Toe holes to be provided in benching of sewer greater than 600mm dia. for access to invert.

Short length pipe to be similar length to rocker pipe.

Rocker pipe.

LIFTING EYES TO ALL MANHOLE TYPES TO BE POINTED.



Suitable material well compacted.

150mm Granular bed and surround

BED TYPE S.

Bedding Factor 2.5
(For clayware or concrete)

Nominal diameter of pipe (mm)	Single size (mm)	Graded
100-125	10	--
150-200	10 14	-- 14-5
225-300	10 14 20	-- 14-5 20-5
375-500	14 20	14-5 20-5
Exceeding 500	14 20 40	14-5 20-5 40-5

BEDDING DETAILS.

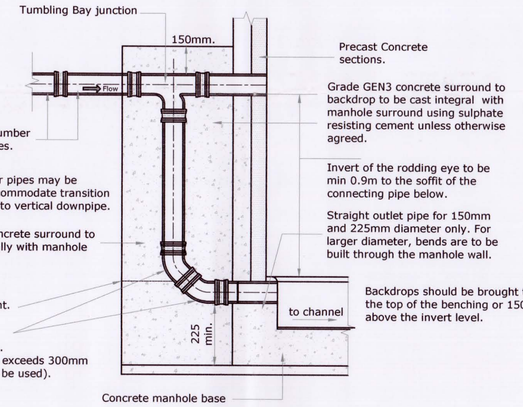
All granular materials to be single sized or graded in accordance with WIS 4-08-02 All bedding to be clean washed.

BEDDING NOTES.

1. All bed and surround to be single size or graded gravel to WIS 4-08-02. See table A2 for details. (Yorkshire Water prefer single size 10mm clean gravel).
2. Trench width to be Pipe Ø + 300mm - minimum.
3. Mechanical compaction of main backfill material should not be commenced until there is a total cover deth of 300mm above the crown of the pipe.
4. Sidefill material to be placed evenly on both sides of pipe taking care to work the material under the lower quadrant of the pipe ensuring the pipe is not lifted. Both sides of the trench should be filled simultaneously to avoid horizontal movement of the pipe.

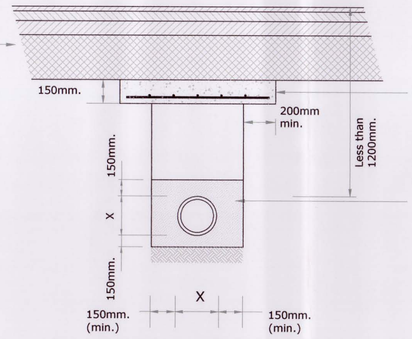
ADOPTABLE DRAINAGE (YORKSHIRE WATER) NOTES

1. No work should commence on site until written approval is received from Yorkshire Water/Adopting Highway Authority or any relevant Authority. Works undertaken prior to approval are at the Developers risk and iD Civils Design will not be held responsible for subsequent delays in approvals, remedial costs or construction programme delays.
2. All adoptable sewer works and materials to be in accordance with "Sewers for Adoption" (6th Edition), the relevant British/European and Yorkshire Water's Standards/Requirements/Addendum to the Mechanical and Electrical Specification and "Kitemarked".
3. Manhole covers shall/must have a clear opening of 600 x 600mm and shall be Class D400 to BS EN 124 with 150mm deep frames in highways.
4. Bedding and Backfill material to conform to the requirement of Water Industry Specification 4-08-02 (Table A2).
5. The adoptable sewers should be a minimum of 1.0m and manholes 0.5m from kerb faces and service margins.
6. Sewers must have 5 metres clearance from trees and hedges (refer to Figure 2.3 page 33 "Sewers for Adoption" 6th Edition for restrictions on tree planting adjacent to sewers).
7. Sewers to be laid in Class S Bedding (150mm granular bed and surround). Where depth of cover to top of sewer is less than 1.2m in highways and verges (or 900mm in non-vehicular access areas) then a reinforced concrete slab should be provided above the granular bed and surround.
8. Prior to the commencement of on site works the contractor is to check the location, invert levels, sizes and conditions of manholes, pipes, and any ditches or watercourses in which it is intended to outfall. Any discrepancy is to be reported immediately to iD Civils Design.
9. Prior to construction the actual position and depth of services likely to be affected by the work should be established by means of a hand dig in close liaison with the statutory service authorities. The contractor shall immediately inform iD Civils Design of any services exposed that may affect the design.
10. The Local Authority and statutory service providers are to be notified prior to the commencement of work on site.
11. Filled ground must be filled and consolidated under the supervision and satisfaction of Yorkshire Water before any sewer works are carried out.
12. 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 wiht regard to the disposal of the filter drain/land drainage runoff.
13. Manhole cover slabs must carry the BSI Kitemark or will be rejected by the Yorkshire Water Inspector. Where the clear opening of the kitemarked product is different to that of the cover and frame, a load bearing slab should be fitted above the cover slab to bring the size down to 600mm x 600mm 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.
14. Sulphate resistant cement (C20-DC2) and precast concrete products must be used unless a laboratory report is provided proving these precautions are not necessary.
15. The minimum crushing strength for clay pipes should be as follows: 100mmØ - 40KN/m, 150mmØ - 40KN/m, 225mmØ - 45KN/m, 300mmØ - 72Kn/m.
16. The minimum crushing strength for concrete pipes should be (Class 120 to EN1916/BS5911-1 2002). Plastic pipes to conform to WIS 4-35-01 and BS EN 13476.
17. Adoptable plastic sewer pipes to be BSI Kitemarked (certified to WIS 4-35-01 and BS/EN13476). Adoptable plastic sewer pipes to be laid in maximum 3.0m lengths unless there is a specific operational need to lay longer lengths. plastic channel sections in manholes are not acceptable and Yorkshire Water would prefer clayware channels in manholes. They have found that plastic channels are difficult to set in concrete because they float and a satisfactory finish cannot be achieved on the benching.
18. All new connections to adopted sewers to be covered by a Section 106 Agreement with Yorkshire Water. The application form to be completed by the Main Contractor and accompanied by the relevant fee.
19. Prior to commencement, the Main Contractor is to provide Yorkshire Water with documentary evidence from the manufacturer that any plastic pipes used are suitable for the ground conditions.
20. The chamber size of manholes with more than one connection in may need to be increased an increment to accommodate the connections and bends.
21. Yorkshire Water policy is not to accept Type "C" brick manholes and 1050mmØ manhole rings. Instead it is preferred that you use a Type "B" manhole with 1200mmØ or 1500mmØ rings, with the opening sited over the channel where depth of cover to pipe soffit is 1.0m - 1.5m.
22. 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.



TYPICAL EXTERNAL VERTICAL BACKDROP DETAIL.

For pipe diameters 225mm or less. Where pipe diameter exceeds 300mm, a 300mm diameter 90° Rest Bend may be used.



150mm Reinforced slab, min. GEN3 concrete with A393 mesh reinforcement or as agreed with adopting authority.

150mm Granular bed and surround

CONCRETE PROTECTION.

(at depths of cover less than 1.2m)

Health and Safety Notes/CDM Regulations 2015

In line with the above regulations we are obliged to inform the Contractor of the abnormal risks that may be encountered in the construction of these works. As part of the design process all the salient health & safety aspects are given full consideration and these are observed within the designs viewed on this document. Although considerable effort is undertaken to eliminate risks, the very nature of the project gives rise to some hazards and risks.

Significant risks that cannot be eliminated by design and could not be foreseen by a competent contractor are noted in the risk assessment boxes on the drawings.

NOTES

1. All existing drainage levels are to be checked prior to commencement of any works on site and iD Civils Design informed of any discrepancies to the design drawings.
2. All adoptable drainage works are to be in accordance with "Sewers for Adoption" 6th Edition. The relevant British/European and Yorkshire Water's Standards/Requirements/ Addendum and "Kitemarked".
3. Manhole covers shall have a minimum clear opening of 600mm and shall be Class D400 to BS EN 124 with 150mm deep frames in highways.
4. All adoptable sewers should be a minimum of 1m and manholes 0.5 metres from kerb lines and service margins.
5. Sewers must have 5 metre clearance from trees and hedges. Where it is not possible to achieve this clearance concrete bed and surround is required.
6. Where depth of cover to the top of the sewer is less than 1.2 metres in highways and verges then 150mm concrete bed and surround is required.
7. The chamber size of manholes with more than one connection in them may need to be increased an increment to accommodate connections and bends.
8. Bedding and Backfill material to conform to the requirement of Water Industry Specification 4-08-02 (Table A2).

Rev	Description	By	Date
B	Updated following YW comments	CR	23.11.18
A	Updated following YW comments	CR	23.10.18

Client:

Rouse Homes

Project Title:

Birkenshaw

Drawing Title:

Drainage Construction Details Sheet 1.

Scale	Date
N.T.S. @ A1	May 2018

Drawing No	Revision	Status
4733-C-D4-01	B	Approval.

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