

Legend

Drainage (Non-adopted)

Surface Water

- Inspection Chamber
- Manhole
- Rodding Eye
- Rainwater Pipe
- Foul Water
- SVP/SS
- Inspection Chamber
- Combined
- Inspection Chamber
- Pumped Main
- Pumping Station
- Existing Chamber

Symbols

- Site Boundary
- Proposed Level
- Existing Level
- Existing Level (interpolated)
- Proposed Gradient
- Tree Retained (RPA)
- Tree Removed
- No Dig Construction (permeable)
- Blue roof

General Notes

- Any indication of site boundaries are to be considered diagrammatic. This drawing is based on layouts prepared by others and our details are not in themselves intended to be any definition of land ownership.
- The contractor shall check all levels and dimensions, any errors or omissions are to be reported to the Engineer.
- All information regarding below ground obstructions has been added to our general arrangement drawing as far as we are reasonably able to obtain at the time. The contractor shall allow for breaking out obstructions where necessary and increasing the depth of foundations to a suitable and approved formation, in accordance with our details.
- Refer to Architect's drawings for location and details of all fencing and soft landscaping.

Surface Water Strategy

The surface water strategy has been developed in accordance with the following criteria;

- Total site area = 1317m²
- Greenfield run-off rate (Q_{bar}) has been established as 0.71/s
- The proposed development incorporates blue roofs with outlets restricted to 0.25l/s (minimum 2 outlets per roof). The maximum total flow from the building into the sub-surface drainage system is 0.5l/s.
- Blue roof storage has been provided to accommodate the 100yr +40% climate change critical storm event.
- The climate change allowance has been established from DEFRA guidance; Medway Management Catchment peak rainfall allowances, 15 annual exceedance rainfall event 2070s, Epoch Upper end allowance 40%, (2070s epoch for development with a lifetime between 2061 and 2125).
- Proposed external works for the driveway and parking areas are formed of permeable construction.
- Surface water discharge from the development site by means of a pumping station as there is no gravity outfall solution.
- The proposed pumping station flows have been limited to a rate of 3l/s. It is recognised that this rate is higher than Q_{bar} , however, this rate is dictated by the minimum practicable operational rate of the pumps and pumped main.
- The final outfall from the pumping station is to an existing combined sewer to the south of the site.

All drainage pipes are 100mm $\varnothing$ unless noted otherwise

B Outfall chamber added. JT 19.07.23
A First Issue. JT 03.05.23

Rev Description By Date

KRYSTAL ENGINEERING LTD
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Project
NEW BUILD HOUSE AT
TILTWOOD EAST,
HOPHURST LANE,
CRAWLEY DOWN RH19 4LL

Drawing Title
DRAINAGE AND EXTERNAL
WORKS LAYOUT

Drawing No. 7107-200 Revision B

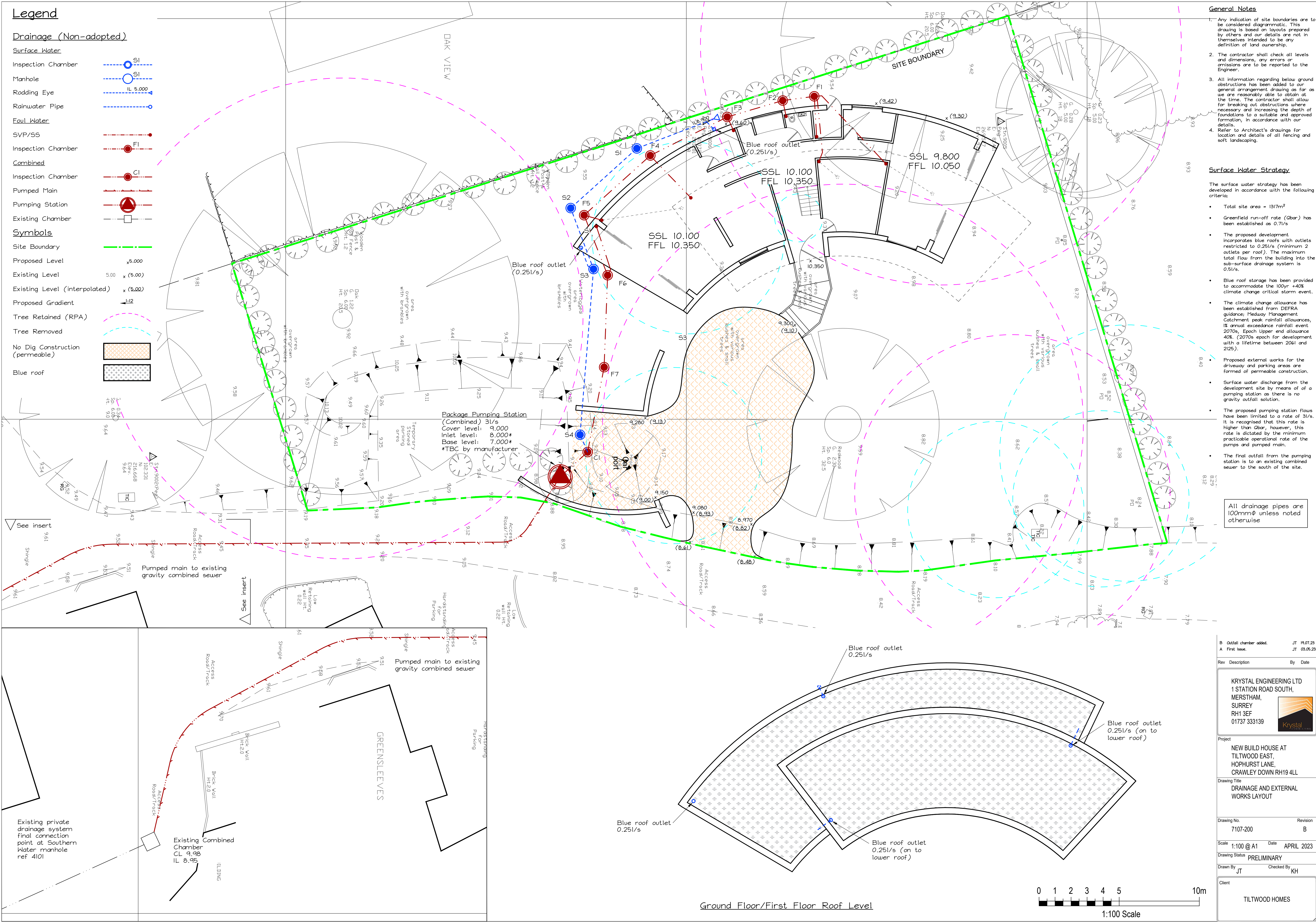
Scale 1:100 @ A1 Date APRIL 2023

Drawing Status PRELIMINARY

Drawn By JT Checked By KH

Client

TILTWOOD HOMES



sealed cover and frame assembly complying with BS EN 124 (highways D400, driveways/footways B125). refer to inspection chamber detail for A15 cover and frame support requirements

temporarily cap shaft during construction

150mm deep concrete collar (grade ST3) to support cover and frame

Selected backfill material with stones not bigger than 25mm (Class A or B) or where subject to light vehicular traffic e.g. driveway 150mm concrete (grade ST2)

joint of rocker pipe to be as close as possible to face of chamber to permit satisfactory joint and subsequent movement

100mm thick granular bedding material

class B engineering brick, 2 courses min, 4 courses max set in class I mortar.

restrictor cap with max 350mmØ or 300x300mm sq opening and sealing ring

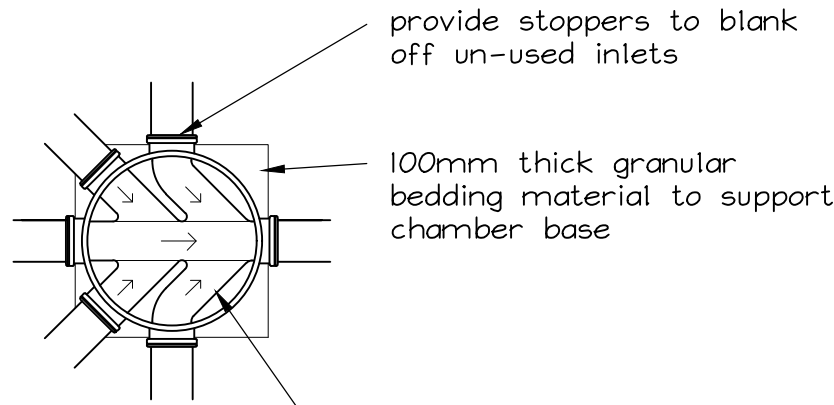
'Wavin range 450 or range 600' inspection chamber base with 450mmØ or 600mmØ compatible shaft or equal approved

clay/plastic pipe, see drainage layout for diameter and details

base unit to have all connections with soffit levels set no lower than that of the main channel

150 concrete bed (grade ST3) Chamber is to be positioned whilst concrete is wet in order that it takes the shape of the chamber base

Section



provide stoppers to blank off un-used inlets

100mm thick granular bedding material to support chamber base

number and orientation of inlets to chamber base as per drainage layout

Plan

Deep Non-Entry Inspection Chamber Detail (Polypropylene)

(Suitable for depths ranging from 1.2m-5m deep)

temporarily cap shaft during construction

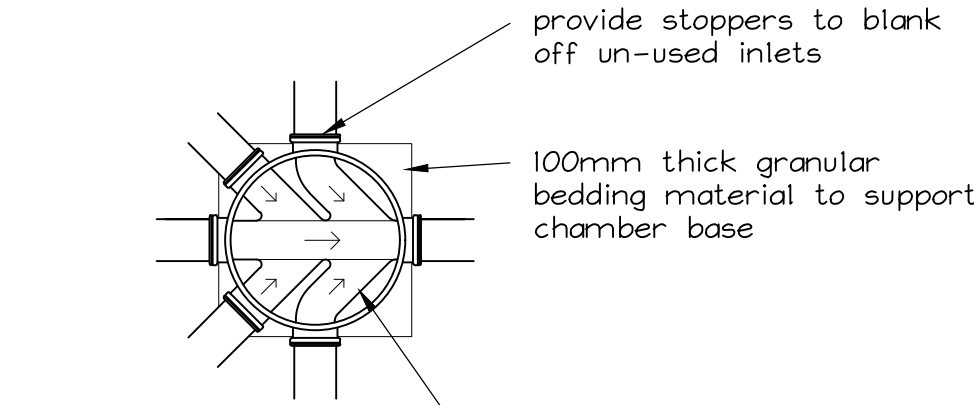
150mm deep concrete collar to support cover and frame (can be omitted when chamber is located in domestic garden)

Selected backfill material with stones not bigger than 25mm (Class A or B) or where subject to light vehicular traffic e.g. driveway 150mm concrete (grade ST2)

joint of rocker pipe to be as close as possible to face of chamber to permit satisfactory joint and subsequent movement

100mm thick granular bedding material

Section

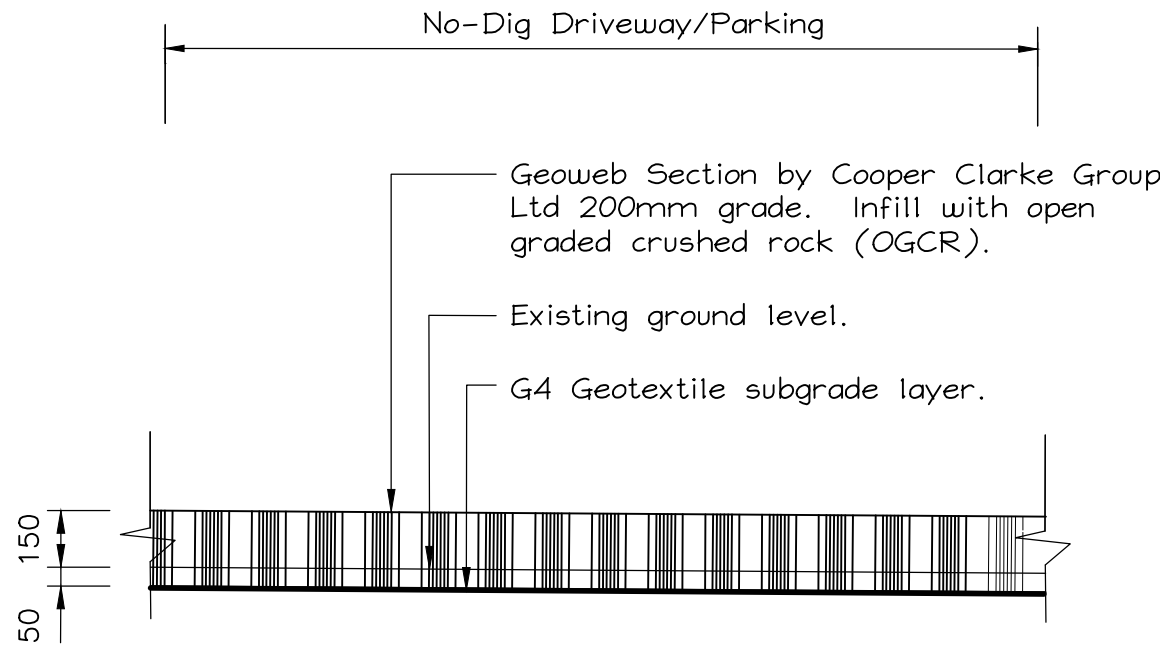


number and orientation of inlets to chamber base as per drainage layout

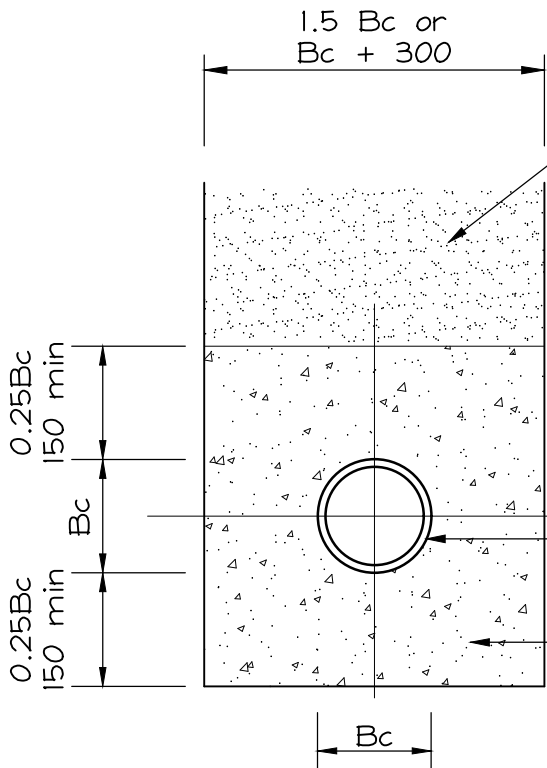
Plan

Inspection Chamber Detail (Polypropylene)

(for depths up to 1.2m)

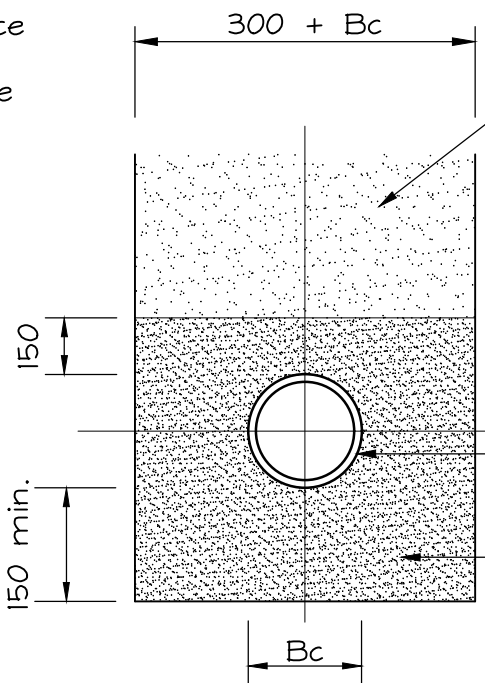


Permeable No-Dig Driveway/Parking Bays



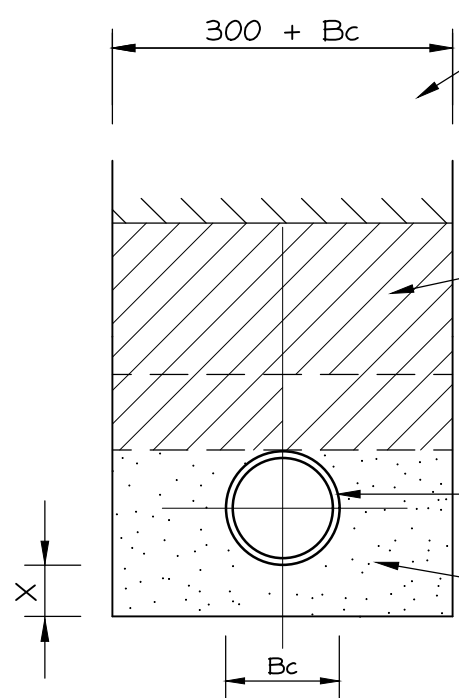
Class 'A'

Use where depth to pipe soffit <1200mm beneath adoptable highway, < 900 beneath private trafficked areas & <600mm beneath other areas



Class 'S'

Use beneath adoptable highway areas where depth to pipe soffit is >1200mm and other trafficked areas where depth to pipe soffit is > 900mm



Class 'F'

Use beneath non-trafficked areas only where depth to pipe soffit is > 600mm

NOTE: X = 50mm but in rocky ground or very soft or wet ground bedding to be increased to 100mm Pipe bedding to be in accordance with BS 8301

sealed cover and frame assembly complying with BS EN 124 (soft landscaping/footways A15). refer to deep non-entry inspection chamber detail for B125/D400 cover and frame support requirements

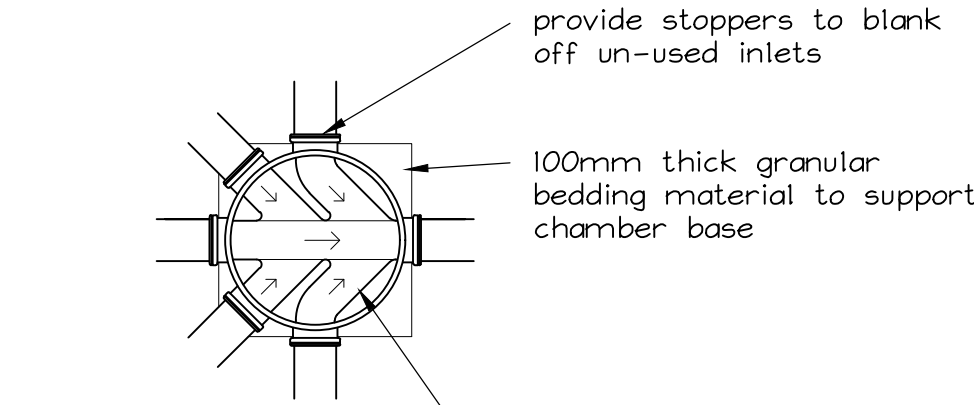
'Wavin range 450' inspection chamber base with 450mmØ shaft or similar approved

joints between base and shaft components to be fitted with watertight seals

clay/plastic pipe, see drainage layout for diameter and details

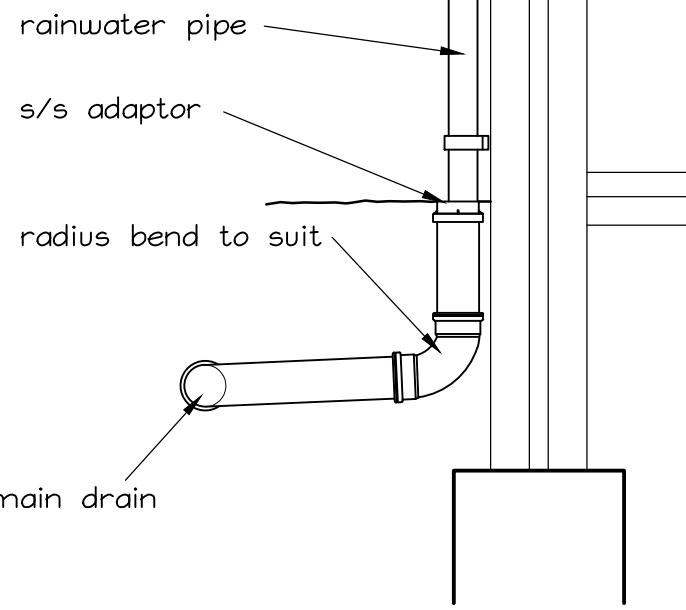
base unit to have all connections with soffit levels set no lower than that of the main channel

Section



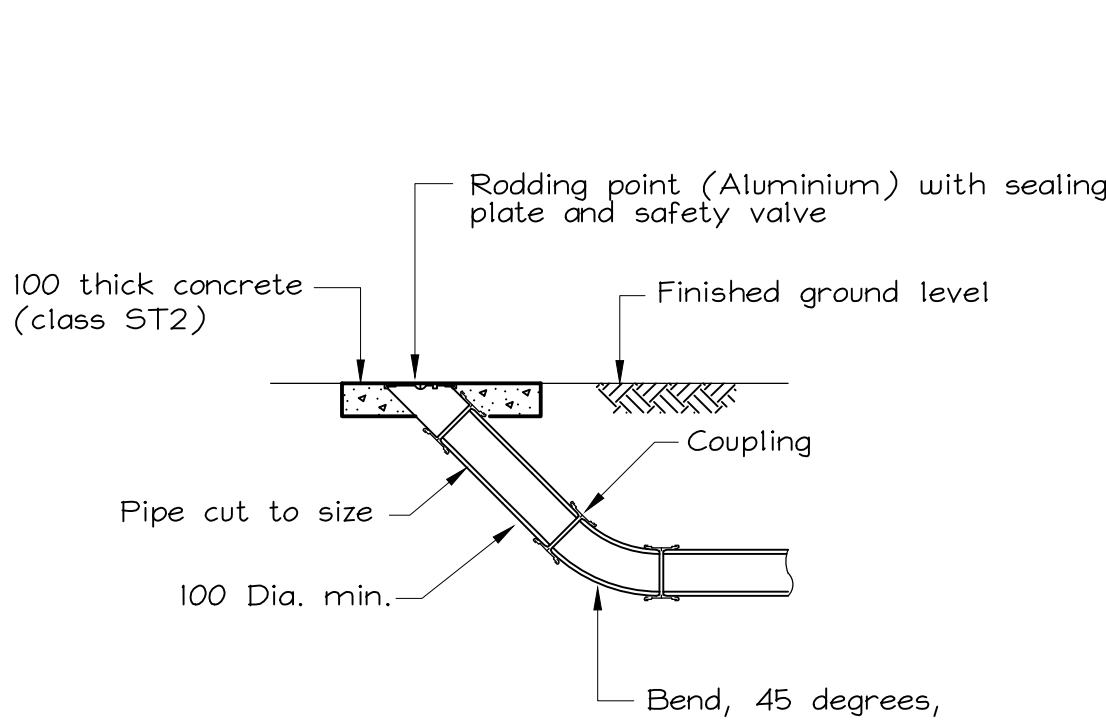
number and orientation of inlets to chamber base as per drainage layout

Plan



Rainwater Pipe Detail

(Suitable for use with separate foul and surface water drains)



Rodding Eye Detail

Pipe Bedding & Sidefill Materials.

Type A bedding material shall be aggregates conforming to BS 882, or BS EN 12620, nominal single-size or graded complying with the recommendations of WIs No. 4-08-01 as follows :-

TABLE 1 :-

Pipe dia. (minimum)	Single-size.	Graded.
Over 100 to 150	10mm nominal single-size.	
Over 150 to 500	10 or 14mm nominal single-sized.	14mm to 5mm graded
Over 500	10,14 or 20mm nominal single-sized.	14 or 5mm graded or 20mm to 5mm graded.

Type B material shall be selected excavated or imported material consisting of uniform, readily compactable material, free from vegetable matter, building rubbish and frozen material, or materials susceptible to spontaneous combustion, and excluding clay of liquid limit greater than 80 and/or plastic limit greater than 55 and materials of excessive high moisture content. Clay lumps and stones retained on 75mm and 37.5mm sieves respectively shall be excluded from the fill material.

Pipes Laid with a Concrete Bedding Surround

Class A concrete surround to be minimum cube strength at 28 days of 20N/mm² for non-aggressive soils. For aggressive soil conditions the concrete mix shall be in accordance with the requirements of BRE Digest 250, or BRE paper CP23/77 as appropriate.

The backfill, other than the first 150mm of cover, should not be placed before the compressive strength of the site concrete has reached 14N/mm². The concrete mix should be so designed that this is reached without unnecessary delay.

A compressible filler shall be placed throughout the concrete surround at all pipe joints. This shall consist of bitumen impregnated insulating board to BS EN 322, or other equally compressible material. The thickness of compressible filler shall be as follows :-

Nominal diameter of pipe (mm)	Thickness of Compressible filler (mm)
Less than 450	18
450 - 1200	36
Exceeding 1200	54

Compressible packing for use between pipes and precast concrete setting blocks shall consist of bitumen damp proof sheeting complying with BS 743.

Dimension 'a'

In machine dug uniform soils :-

a = For sleeve jointed pipes, a minimum of 50mm or 1/6Bc, whichever is the greater, for socketed pipes a minimum of 100mm or 1/6Bc, whichever is the greater under barrels but not less than 50mm under sockets.

In rock or mixed soils containing rock bands, boulders, large flints or stones or other irregular hard spots these values will need to increase accordingly.

General Notes

1. All concrete used in drainage works shall comply with BRE Special Digest SD1 for the following aggressive conditions in the ground:

Design sulphate class DS-1 Aggressive chemical environment class AC-2t Design concrete class DC-1 (TBC) No additional protective measures (APMs).

The strength criteria for the specified standard mixes (ST4 etc.) should also be observed. Concrete mixes should meet the most onerous design criteria between strength and resistance to chemical attack.

2. Pipes and channels to be either:

Concrete to BS EN 1916 & BS 5911 Extra Strength Vitrified Clay to BS EN 298 Unplasticised PVC to BS EN 1452

3. All flexible pipes in trafficked areas with less than 400mm cover to have concrete surround.

4. All flexible pipes in gardens and planted areas with less than 600mm cover to have concrete surround.

5. Backfill material to pipe trenches beneath trafficked areas to be selected and compacted in accordance with the Highway Authorities & Utilities Committee Specification for the Reinforcement of Openings in Highways-June 1992.

Acceptable materials (HAUC Specification Appendix A1): Class A - Graded granular Class B - Granular Class C - Cohesive/granular. Compaction to be in accordance with HAUC Specification Appendix AB).

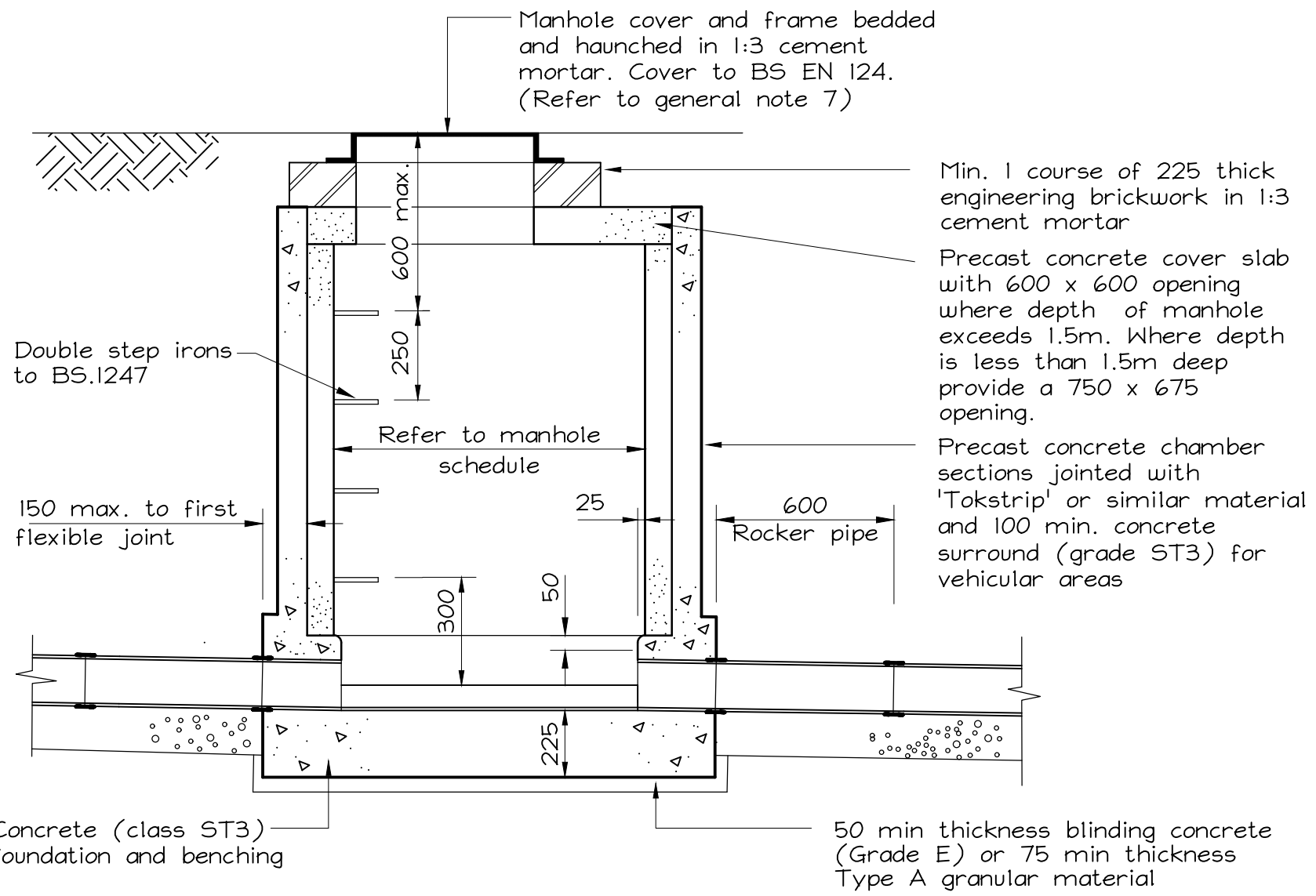
6. Beneath non-trafficked areas backfill shall be Type B

7. Manhole covers and frames are to be in accordance with BS EN124:

Class D400 for carriageways Class B125 for footways, pedestrian areas & car parks Class A15 for areas only subject to pedestrians.

8. The minimum size of any manhole serving a sewer (i.e. any drain serving more than one property) should be 1200mm x 675mm rectangular or 1200mm diameter.

9. Where drainage passes within 300mm of the underside of the floor slab, concrete protection is required. Greater than 300mm, granular bed and surround 100mm thick is to be used.



Typical Concrete Inspection Chamber

For construction details of flow control chambers refer to specialist design for sump and mounting block requirements

A First Issue. JT 29.04.23

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Project
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Drawing Title
DRAINAGE AND EXTERNAL
WORKS DETAILS

Drawing No. 7107-250 Revision A

Scale 1:20 @ A1 Date APRIL 2023

Drawing Status PRELIMINARY

Drawn By JT Checked By KH

Client

TILTWOOD HOMES

Typical Pipe Bedding Details