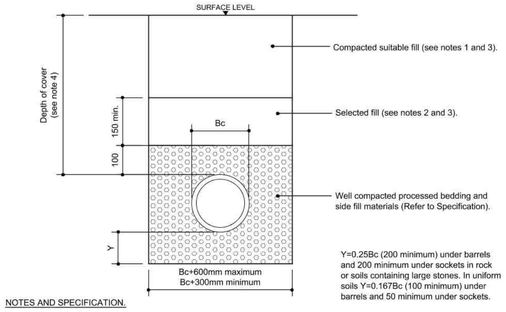



NOTES AND SPECIFICATION.

1. Suitable fills shall be capable of accepting compaction plant subject to the Engineer's approval and shall exclude boulders, lumps of concrete, bricks, timber and vegetable matter.

2. Selected fill shall be readily compatible material free from roots, organic material, building material, and shall be in an unfrozen condition. Selected fill shall exclude clay lumps exceeding 25mm size. Selected fill shall be carefully compacted around and above the pipe, taking care not to damage the pipe.

3. Where the pipe is installed in areas which are paved or future settlement of back fills is not acceptable then back filling of the trench shall be carried out using type 1 sub-base to Highways Agency specification for Highway Works compacted to the same specifications.

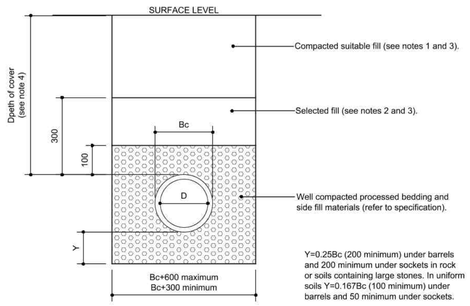
4. Minimum cover:
   Cover shall be greater than:
   2000mm in areas subject to heavy construction plant.
   1000mm in areas subject to normal construction traffic.
   1200mm to finished level of new main road pavements.
   600mm in landscape areas, foot ways, gardens or fields
   Otherwise use class Z bedding and surround or bridging slab if drainage is to be adopted by a Water Company.

5. Rigid pipes shall be:
   (i) Clay pipes with min FN of 40 to BS En 295 and BS65.
   (ii) Concrete pipes to BS 5911 and BS EN 1916.
   Concrete pipes shall not be used for foul sewers unless otherwise stated.

6. Construction, subsequent testing, operation and maintenance shall be carried out in accordance with BS EN 752. Sewers to be adopted by water companies shall be installed in accordance with the current edition of 'Sewers for Adoption' produced by the Water Services Association. Sewers to be adopted by highway authorities shall be installed in accordance with the authority's specification.

7. Workmanship shall be in accordance with BS 8000 - 14:1989

## RIGID CARRIER DRAIN - CLASS S, BEDDING, SIDEFILL AND BACKFILL




NOTES AND SPECIFICATION.

1. Suitable fills shall be capable of accepting compaction plant subject to the Engineer's approval and shall exclude boulders, lumps of concrete, bricks, timber and vegetable matter.

2. Selected fill shall be readily compatible material free from roots, organic material, building material, and shall be in an unfrozen condition. Selected fill shall exclude clay lumps exceeding 25mm size. Selected fill shall be carefully compacted around and above the pipe, taking care not to damage the pipe.

3. Where the pipe is installed in areas which are paved or future settlement of back fills is not acceptable then back filling of the trench shall be carried out using type 1 sub-base to Highways Agency specification for Highway Works compacted to the same specifications.

4. Minimum cover:
   Cover shall be greater than:
   2000mm in areas subject to heavy construction plant.
   1000mm in areas subject to normal construction traffic.
   1200mm to finished level of new main road pavements.
   600mm in landscape areas, foot ways, gardens or fields
   Otherwise use class Z bedding and surround.

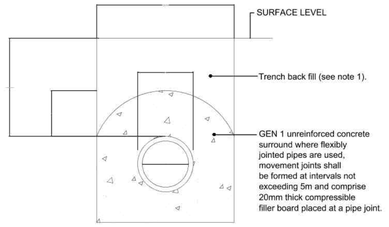
5. Flexible pipes shall be unplasticised UPVC to BS EN 13598

6. Construction, subsequent testing, operation and maintenance shall be carried out in accordance with BS EN 752. Sewers to be adopted by water companies shall be installed in accordance with the current edition of 'Sewers for Adoption' produced by the Water Services Association. Sewers to be adopted by highway authorities shall be installed in accordance with the authority's specification.

7. Workmanship shall be in accordance with BS 8000 - 14:1989

## FLEXIBLE CARRIER DRAIN - CLASS S, BEDDING, SIDEFILL AND BACKFILL

NB ALL DRAINAGE TO COMPLY WITH ANGLIAN WATER APPROVED CONSTRUCTION DETAILS




Notes and Specification

1. Trench excavation shall be back filled as follows:
   a) Outside road pavements or areas where surface settlement cannot be accepted, back filling shall be carried out using suitable fills. Suitable fills shall be capable of accepting compaction plant subject to the Engineer's approval and shall exclude boulders, lumps of concrete, bricks, timber and vegetable matter.

   b) In areas below road pavements (or where surface settlement cannot be accepted)
      (i) Where soffit of pipe is less than 0.5m below formation, back fill with GEN 0 unreinforced concrete.
      (ii) Where soffit of pipe is between 0.5m and 1.0m below formation, back fill with Type 1 sub-base.

2. Cover to pipes shall be:
   2000mm or less in areas subject to heavy construction plant.
   1000mm or less in areas subject to normal construction traffic.
   1200mm or less to finished level of new main road pavements.
   600mm or less in landscape areas, foot ways, gardens or fields
   Otherwise use other specified surround and back fill details.

3. Pipes, unless otherwise stated, shall be:
   (i) Clay pipes with min FN of 40 to BS EN 295 and BS65
   (ii) Concrete pipes to BS 5911 and BS EN 1916 or,
   (iii) Flexible pipes shall be unplasticised UPVC to BS EN 13598.
   Concrete pipes shall not be used for foul sewers unless otherwise stated.

4. Construction, subsequent testing, operation and maintenance shall be carried out in accordance with BS EN 752. Sewers to be adopted by water companies shall be installed in accordance with the current edition of 'Sewers for Adoption' produced by the Water Services Association. Sewers to be adopted by highway authorities shall be installed in accordance with the authority's specification.

5. Back filling shall only be undertaken when the concrete bedding and surround has obtained sufficient strength to accommodate back filling operations.

6. This detail shall not be used where the drainage is to be adopted by Water companies.

7. Workmanship shall be in accordance with BS 8000 - 14: 1989

## CARRIER DRAIN - CLASS Z BEDDING, SURROUND AND BACKFILL.

NOTES AND SPECIFICATION

1. Processed granular bedding and side fill materials shall include aggregates to BS EN 12620 + A1 and lightweight aggregates to BS EN 13055-1 and shall be graded as defined in the following tables:

TABLE 1

| Pipe Nominal Size (mm) | Maximum Partical Size (mm) | Class of Bedding | Maximum CF Value | Material |
|---|---|---|---|---|
| 100 | 10 | S<br>B | 0.15<br>0.30 | 10mm nominal single size |
| over 100 to 150 | 15 | S<br>B | 0.15<br>0.30 | 10 or 14mm nominal single size or 14 to 5mm graded. |
| over 150 to 300 | 20 | S<br>B | 0.15<br>0.30 | 10, 14 or 20mm nominal single size or 14 to 5mm graded or 20mm to 5mm graded. |
| over 300 to 550 | 20 | S<br>B | 0.15<br>0.30 | 14 or 20mm nominal single size or 14 to 5mm graded or 20mm to 5mm graded. |
| over 550 | 40 | S<br>B | 0.15<br>0.30 | 14, 20 or 40mm nominal single sized crushed rock or 14 to 5mm graded or 20mm to 5mm graded or 40 to 5mm graded. |

2. The sulphate content of bedding and side fill materials shall not be greater than 0.3% as sulphur trioxide.

3. The above specification has been produced based on the Water Industry specification publication No. 4-08-01 (issue 4) February 1994.

4. Compaction factor (CF) shall be determined in accordance with water industry publication No 4-08-02 (issue 1) February 1994 - appendix B.

## RIGID CARRIER DRAIN - SPECIFICATION OF BEDDING AND SIDEFILL MATERIALS (CLASS S BEDDING)

NOTES AND SPECIFICATION

1. Processed granular bedding and side fill materials shall include aggregates to BS EN 12620 + A1 and lightweight aggregates to BS EN 13055-1 and shall be graded as defined in the following tables:

TABLE 1

| Pipe Nominal Size (mm) | Maximum Partical Size (mm) | Maximum CF Value | Material |
|---|---|---|---|
| 100 | 10 | 0.15 | 10mm nominal single size |
| over 100 to 150 | 15 | 0.15 | 10 or 14mm nominal single size or 14 to 5mm graded. |
| over 150 to 300 | 20 | 0.15 | 10, 14 or 20mm nominal single size or 14 to 5mm graded or 20mm to 5mm graded. |
| over 300 to 550 | 20 | 0.15 | 14 or 20mm nominal single size or 14 to 5mm graded or 20mm to 5mm graded. |
| over 550 | 40 | 0.15 | 14, 20 or 40mm nominal single size or 14 to 5mm graded or 20mm to 5mm graded or 40 to 5mm graded. |

2. The sulphate content of bedding and side fill materials shall not be greater than 0.3% as sulphur trioxide.

3. The above specification has been produced based on the Water Industry specification publication No. 4-08-01 (issue 4) February 1994.

4. Compaction factor (CF) shall be determined in accordance with the water industry publication No 4-08-02 (issue 1) February 1994 - appendix B.

## FLEXIBLE CARRIER DRAIN - SPECIFICATION OF BEDDING AND SIDEFILL MATERIALS (CLASS S BEDDING)

| Rev. | Date | By | Description |
|---|---|---|---|

SEA
STRUCTURAL ENGINEERS
[ CONSULTING CIVIL & STRUCTURAL ENGINEERS ]
E: andy@seastructuralengineers.co.uk
T: 07940 340792

PROJECT
RESIDENTIAL DEVELOPMENT
OFF NIGHTINGALE WAY
SUTTON BRIDGE

DRAWING
PROPOSED DRAINAGE DETAILS

| | |
|---|---|
| SCALE: AS SHOWN @A1 | DATE: 29.11.2019 |
| DRAWN BY: SEA | REV: -- |
| STATUS: | |

DWG No: 1886/S/E55