HEMSLEY ORRELL PARTNERSHIP
CONSULTING CIVIL & STRUCTURAL ENGINEERS

HOP House, 41 Church Road, Hove BN3 2BE
T +44 (0) 1273 223900 F +44 (0) 1273 326767
engs@hop.uk.com www.hop.uk.com

# HIGHFIELD JUNIOR SCHOOL, EASTBOURNE PERMANENT CLASSROOM EXTENSION

## DRAINAGE STRATEGY REPORT

### MAY 2011


13525/01/DR



HOP Consulting Limited
t/a Hemsley Orrell Partnership
Registered Office:
73 Church Road, Hove, BN3
2BB Reg. no. 4402211 England

# CONTENTS



Client : Michael Cook Associates
Brooklyn Chambers
11 Goring Road
Worthing
West Sussex
BN12 4AP

| Prepared by | Checked by | Approved by |
|---|---|---|
| Mark Naumann | Andrew Keen | Mark Naumann |
| | | |

# 1.0 INTRODUCTION

Hemsley Orrell Partnership has been instructed by Michael Cook Associates to undertake a drainage strategy assessment to support the Planning Application for the permanent extension to the rear of Highfield Junior School, Eastbourne.

The proposed development consists of a three classroom extension to the block on the northern boundary of the site, as well as associated car park works to the frontage of the school.

The local topography of the site is generally flat with the area being associated with Willingden Levels. The site slopes generally north to south with ground levels in the vicinity of 4m above Ordnance Datum (AOD) to 3m AOD at the southern boundary of the site.

A watercourse is present along the southern boundary of the site called the Brickfield Ditch. This ditch drains surface water from the existing school development towards the Willingden Levels and is highlighted in the Environment Agency mapping as a main river.

Geological maps for the site show generally alluvium surface deposits with Gault mudstone at depth.

# 2.0 FOUL DRAINAGE

Foul drainage from the existing school runs from a manhole located outside of the existing toilets at the western end of the northern block, westwards across the site and exiting the site at the south west corner.

The new classroom extension block will be located over the existing manhole adjacent to the northern most block. This manhole will need to be retained during the course of the works.

No new toilets are to be constructed as part of this extension works, however, new sinks are to be located within the classrooms. The existing manhole will provide an outfall location for the new sink drainage.

In association with the new classroom block, refurbishment of the existing school is being carried out, comprising new partition walls and/or taking down existing partitions, resulting in relocated sinks within the main classroom block. The intention here is to either maintain drain runs to the existing sewer connections or to reconnect to the foul drain run that runs along the front to the side.

It can be seen from the sewer records in Appendix III that none of the existing sewer system on site is adopted by the statutory undertaker.

## 3.0 STORM DRAINAGE

The existing site is currently split in two by the existing building arrangement. The northernmost part of the site is all hard paved bar the raised planting beds. The southern portion of the site is generally soft landscaped with the exception of the access road and turning area adjacent to the reception.

Storm water drainage from the northernmost part of the site drains along the rear of the existing school building westwards to return south at the end of the building, picking up rainwater drainage from the frontage of the site. It is assumed that the outfall of the existing storm drainage is to the Brickfield Ditch that runs along the southern band of the site.

It was noted on site that the manhole at the far western end of the northernmost run was surcharged, possibly due to high water levels in the Brickfield Ditch or a blockage in the pipework. It is recommended that the existing storm water drainage system is jetted and CCTV surveyed to understand its suitability for use and rectify any problems that may be present in the pipework.

The northernmost extension is built primarily over existing hardstanding, however, it does encroach on the existing soft landscape areas. As a result of this, the runoff from the northernmost block will be required to be attenuated prior to discharging to the local drainage system.

As can be seen on the Drainage Schematic drawing included in Appendix I and the accompanying drainage calculations in Appendix II, the existing runoff rate generated by the hardstanding area beneath the proposed extension footprint is 3 litres/second.

An additional contributing area of 90m² is generated by the proposals and this can be attenuated by providing a tank with a volume of 6m³ and limiting the outflow to 3 litres/second by utilising a Hydrobrake with a design head of 1m.

The frontage of the site is to be remodelled to include a larger portion of car parking area as well as increased play space. The design intention here is for all new paving to the frontage of the site to be permeable, allowing water to drain at source.

It is understood that soakage rates at the site are likely to be fairly poor, however, permeable paving can be utilised in such situations to manage onsite drainage and replicate the existing soft landscape situation.

The existing concrete access road onto the site can be removed to further reduce the hard surfacing on the site and limit runoff further. This compensates for the additional volume of runoff entering the system to the east of the school from the proposed new canopy and lift roof areas to the north east of the school.

## 4.0 CONCLUSION

It can be seen from the scheme drainage arrangement in Appendix II that the drainage from the site can be adequately managed and drained effectively. Reduction in hard surfacing at the front of the site by use of permeable paving will reduce overall peak runoff rates into the Brickfield Ditch. Foul drainage generated by new sinks within the new classroom block can be connected to the existing system via a gravity system without the need to include a pumping station or other ancillary works.

# APPENDIX I
# Drainage Schematic Drawing

ORIGINAL DRAWING SIZE A3

EXISTING HARDSTANDING RUNOFF
AREA TO SW DRAIN = 215m²
FLOW RATE = 3 litres/second

PROPOSED HARDSTANDING RUNOFF
AREA TO SW DRAIN = 305m²
ADDITIONAL AREA = 90m²

ATTENUATION TANK DIMENSIONS
2.0m X 3.0m X 1.0m DEPTH
WITH HYDROBRAKE LIMITING FLOW
TO 3.0 litres/second
HYDROBRAKE TYPE MD6 WITH
1.0m DESIGN HEAD

EXISTING SW DRAIN

EXISTING FW DRAIN

FW FROM NEW CLASSROOM SINKS
TO CONNECT TO EXISTING FW DRAIN

NEW CANOPY AND LIFT
RUNOFF AREA TO SW
DRAIN = 105m²
ADDITIONAL FLOW RATE
= 1.5 litres/second
OFFSET BY REMOVAL
OF CAR PARK RUNOFF

EXISTING SW DRAIN

NEW ENTRANCE CANOPY TO DRAIN
TO PERMEABLE PAVING SUB-BASE

ALL NEW HARD SURFACING TO BE
PERMEABLE PAVING CONSTRUCTION

EXISTING CONCRETE ROAD REMOVED
AND REPLACED WITH PERMEABLE PAVING

DALLINGTON ROAD

3.1m

Gas Governor

100mm

50mm

0mm

P:\PROJECTS\13525 Highfield J.S. Eastbourne\Drawings\HOP\13525-01-DR01 Andrew Jones



## NOTES.

### 1. GENERAL

(i) This drawing is not to be scaled, work to figured dimensions only, confirmed on site.

(ii) This drawing is to be read in conjunction with all relevant architectural drawings, detailed specifications where applicable and all associated drawings in this series.

(iii) Any discrepancy on this drawing is to be reported immediately to the partnership for clarification.

(iv) The contractor is responsible for all temporary works and for the stability of the works in progress.

HOP
HEMSLEY ORRELL PARTNERSHIP
CONSULTING CIVIL & STRUCTURAL ENGINEERS

**PRELIMINARY DRAWING**
DRAWING FOR INFORMATION ONLY.
NOT FOR CONSTRUCTION.

| Revision | Date | By | Rev. No. |
|---|---|---|---|

Client: MICHAEL COOK ASSOCIATES

Project: HIGHFIELD JUNIOR SCHOOL, EASTBOURNE

Title: DRAINAGE SCHEMATIC

HOP
HEMSLEY ORRELL PARTNERSHIP
CONSULTING CIVIL & STRUCTURAL ENGINEERS
HOP House, 41 Church Road, Hove BN3 2BE
Tel : +44 (0)1273 223900 Fax : +44 (0)1273 326767
E-Mail : engineers@hop.uk.com
www.hop.uk.com

| Scales | Date | Drawn | Engineer | Checked | Approved | HOP Contact |
|---|---|---|---|---|---|---|
| 1:250 | 13.05.2011 | AK | AK | MN | – | MN |

| Project No. | Task No. | Dwg. No. | Rev. No. |
|---|---|---|---|
| 13525 | 01 | DR01 | – |

# APPENDIX II
# Micro Drainage Calculations

Summary of Results for 100 year Return Period (+20%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume ($m^3$) | Status |
|---|---|---|---|---|---|
| 15 min Summer | 0.759 | 0.759 | 2.7 | 4.6 | O K |
| 30 min Summer | 0.862 | 0.862 | 2.8 | 5.2 | O K |
| 60 min Summer | 0.872 | 0.872 | 2.8 | 5.2 | O K |
| 120 min Summer | 0.772 | 0.772 | 2.7 | 4.6 | O K |
| 180 min Summer | 0.653 | 0.653 | 2.5 | 3.9 | O K |
| 240 min Summer | 0.540 | 0.540 | 2.3 | 3.2 | O K |
| 360 min Summer | 0.341 | 0.341 | 2.2 | 2.0 | O K |
| 480 min Summer | 0.177 | 0.177 | 2.2 | 1.1 | O K |
| 600 min Summer | 0.120 | 0.120 | 2.1 | 0.7 | O K |
| 720 min Summer | 0.099 | 0.099 | 1.9 | 0.6 | O K |
| 960 min Summer | 0.079 | 0.079 | 1.5 | 0.5 | O K |
| 1440 min Summer | 0.061 | 0.061 | 1.1 | 0.4 | O K |
| 2160 min Summer | 0.049 | 0.049 | 0.8 | 0.3 | O K |
| 2880 min Summer | 0.042 | 0.042 | 0.7 | 0.2 | O K |
| 4320 min Summer | 0.034 | 0.034 | 0.5 | 0.2 | O K |
| 5760 min Summer | 0.029 | 0.029 | 0.4 | 0.2 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|---|---|---|
| 15 min Summer | 108.682 | 15 |
| 30 min Summer | 73.048 | 24 |
| 60 min Summer | 46.854 | 42 |
| 120 min Summer | 29.008 | 76 |
| 180 min Summer | 21.583 | 108 |
| 240 min Summer | 17.371 | 140 |
| 360 min Summer | 12.776 | 204 |
| 480 min Summer | 10.265 | 254 |
| 600 min Summer | 8.655 | 308 |
| 720 min Summer | 7.525 | 368 |
| 960 min Summer | 6.028 | 490 |
| 1440 min Summer | 4.402 | 730 |
| 2160 min Summer | 3.207 | 1096 |
| 2880 min Summer | 2.559 | 1456 |
| 4320 min Summer | 1.858 | 2180 |
| 5760 min Summer | 1.478 | 2888 |

Summary of Results for 100 year Return Period (+20%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 7200 min Summer | 0.026 | 0.026 | 0.3 | 0.2 | O K |
| 8640 min Summer | 0.024 | 0.024 | 0.3 | 0.1 | O K |
| 10080 min Summer | 0.022 | 0.022 | 0.2 | 0.1 | O K |
| 15 min Winter | 0.868 | 0.868 | 2.8 | 5.2 | O K |
| 30 min Winter | 0.986 | 0.986 | 3.0 | 5.9 | O K |
| 60 min Winter | 0.977 | 0.977 | 3.0 | 5.9 | O K |
| 120 min Winter | 0.806 | 0.806 | 2.7 | 4.8 | O K |
| 180 min Winter | 0.629 | 0.629 | 2.4 | 3.8 | O K |
| 240 min Winter | 0.466 | 0.466 | 2.2 | 2.8 | O K |
| 360 min Winter | 0.154 | 0.154 | 2.2 | 0.9 | O K |
| 480 min Winter | 0.099 | 0.099 | 1.9 | 0.6 | O K |
| 600 min Winter | 0.082 | 0.082 | 1.6 | 0.5 | O K |
| 720 min Winter | 0.073 | 0.073 | 1.4 | 0.4 | O K |
| 960 min Winter | 0.061 | 0.061 | 1.1 | 0.4 | O K |
| 1440 min Winter | 0.048 | 0.048 | 0.8 | 0.3 | O K |
| 2160 min Winter | 0.039 | 0.039 | 0.6 | 0.2 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|---|---|---|
| 7200 min Summer | 1.237 | 3592 |
| 8640 min Summer | 1.071 | 4344 |
| 10080 min Summer | 0.948 | 5032 |
| 15 min Winter | 108.682 | 15 |
| 30 min Winter | 73.048 | 25 |
| 60 min Winter | 46.854 | 44 |
| 120 min Winter | 29.008 | 80 |
| 180 min Winter | 21.583 | 114 |
| 240 min Winter | 17.371 | 148 |
| 360 min Winter | 12.776 | 196 |
| 480 min Winter | 10.265 | 248 |
| 600 min Winter | 8.655 | 306 |
| 720 min Winter | 7.525 | 368 |
| 960 min Winter | 6.028 | 484 |
| 1440 min Winter | 4.402 | 732 |
| 2160 min Winter | 3.207 | 1088 |

Summary of Results for 100 year Return Period (+20%)

| Storm Event | Max Level (m) | Max Depth (m) | Max Control (l/s) | Max Volume (m³) | Status |
|---|---|---|---|---|---|
| 2880 min Winter | 0.034 | 0.034 | 0.5 | 0.2 | O K |
| 4320 min Winter | 0.027 | 0.027 | 0.3 | 0.2 | O K |
| 5760 min Winter | 0.024 | 0.024 | 0.3 | 0.1 | O K |
| 7200 min Winter | 0.021 | 0.021 | 0.2 | 0.1 | O K |
| 8640 min Winter | 0.020 | 0.020 | 0.2 | 0.1 | O K |
| 10080 min Winter | 0.018 | 0.018 | 0.2 | 0.1 | O K |

| Storm Event | Rain (mm/hr) | Time-Peak (mins) |
|---|---|---|
| 2880 min Winter | 2.559 | 1452 |
| 4320 min Winter | 1.858 | 2168 |
| 5760 min Winter | 1.478 | 2928 |
| 7200 min Winter | 1.237 | 3592 |
| 8640 min Winter | 1.071 | 4360 |
| 10080 min Winter | 0.948 | 4968 |

## Rainfall Details

| | |
|---|---|
| Rainfall Model | FSR |
| Return Period (years) | 100 |
| Region | England and Wales |
| M5-60 (mm) | 19.300 |
| Ratio R | 0.350 |
| Summer Storms | Yes |
| Winter Storms | Yes |
| Cv (Summer) | 0.750 |
| Cv (Winter) | 0.840 |
| Shortest Storm (mins) | 15 |
| Longest Storm (mins) | 10080 |
| Climate Change % | +20 |

## Time / Area Diagram

Total Area (ha) 0.031

| Time (mins) | Area (ha) |
|---|---|
| 0-4 | 0.031 |

## Model Details

Storage is Online Cover Level (m) 1.500

## Tank or Pond Structure

Invert Level (m) 0.000

| Depth (m) | Area (m²) | Depth (m) | Area (m²) | Depth (m) | Area (m²) |
|---|---|---|---|---|---|
| 0.000 | 6.0 | 0.900 | 6.0 | 1.800 | 0.0 |
| 0.100 | 6.0 | 1.000 | 6.0 | 1.900 | 0.0 |
| 0.200 | 6.0 | 1.001 | 0.0 | 2.000 | 0.0 |
| 0.300 | 6.0 | 1.200 | 0.0 | 2.100 | 0.0 |
| 0.400 | 6.0 | 1.300 | 0.0 | 2.200 | 0.0 |
| 0.500 | 6.0 | 1.400 | 0.0 | 2.300 | 0.0 |
| 0.600 | 6.0 | 1.500 | 0.0 | 2.400 | 0.0 |
| 0.700 | 6.0 | 1.501 | 0.0 | 2.500 | 0.0 |
| 0.800 | 6.0 | 1.700 | 0.0 | | |

## Hydro-Brake® Outflow Control

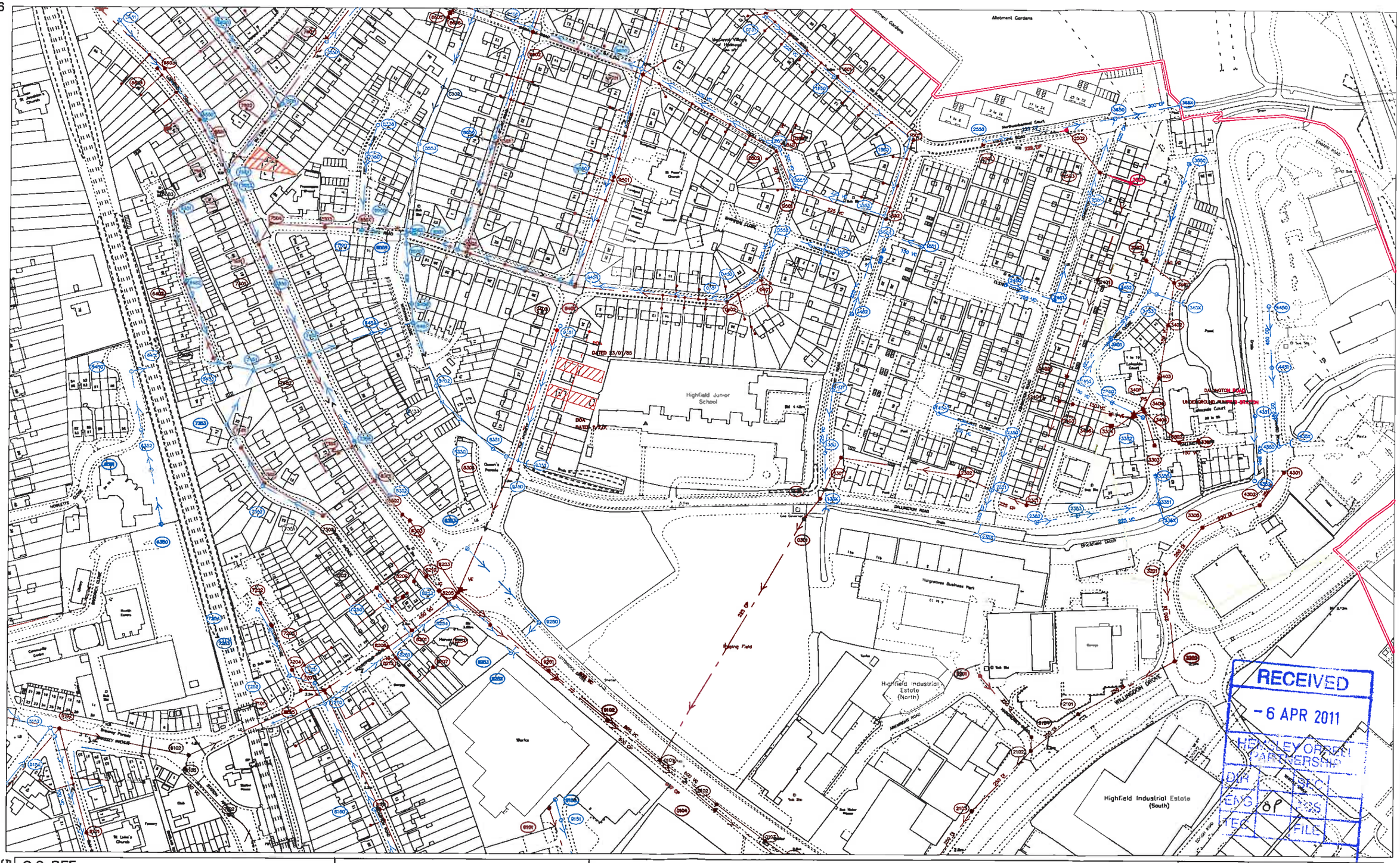
Design Head (m) 1.000 Diameter (mm) 73
Design Flow (l/s) 3.0 Invert Level (m) 0.000
Hydro-Brake® Type Md6 SW Only

| Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) | Depth (m) | Flow (l/s) |
|---|---|---|---|---|---|
| 0.100 | 1.9 | 1.600 | 3.8 | 5.000 | 6.8 |
| 0.200 | 2.1 | 1.800 | 4.1 | 5.500 | 7.1 |
| 0.300 | 2.0 | 2.000 | 4.3 | 6.000 | 7.5 |
| 0.400 | 2.0 | 2.200 | 4.5 | 6.500 | 7.8 |
| 0.500 | 2.2 | 2.400 | 4.7 | 7.000 | 8.0 |
| 0.600 | 2.4 | 2.600 | 4.9 | 7.500 | 8.3 |
| 0.800 | 2.7 | 3.000 | 5.3 | 8.000 | 8.6 |
| 1.000 | 3.0 | 3.500 | 5.7 | 8.500 | 8.9 |
| 1.200 | 3.3 | 4.000 | 6.1 | 9.000 | 9.1 |
| 1.400 | 3.6 | 4.500 | 6.5 | 9.500 | 9.4 |

# APPENDIX III
# Southern Water Records

# SEWER RECORDS PAGE 1 OF 2

102676






102099

560557

561500

| | | |
|---|---|---|
| O.S. REF. TQ6102SW | Drawn by: mahalaa | The positions of pipes shown on this plan are believed to be correct, but Southern Water Services Ltd accept no responsibility in the event of inaccuracy. The actual positions should be determnined on site. WARNING BAC pipes are constructed of Bonded Asbestos Cement WARNING Unknown (UNK) materials may include Bonded Asbestos Cement |
| | Scale: 1:2500 | |
| Title: 117350_Highfield Junior School | Date: 04/04/2011 | Based upon Ordnance Survey Digital Data with the permission of the controller of H.M.S.O. Crown Copyright Reserved Licence No. WU 298530. |

N

Southern Water

# SEWER RECORDS PAGE 2 OF 2

| Node | Cover | Invert | Size | Material | Shape |
|---|---|---|---|---|---|
| 0004X | 2.96 | −0.09 | 600 | VC | CIRC |
| 0101X | 3.53 | 0.26 | 600 | VC | CIRC |
| 0102X | 3.27 | 0.09 | 600 | VC | CIRC |
| 0103X | 3.1 | −0.05 | 600 | VC | CIRC |
| 0104X | 3.21 | 0.02 | 600 | CP | CIRC |
| 0301X | 3.32 | 1.19 | 225 | CP | CIRC |
| 0401X | 6.83 | 4.17 | 225 | VC | CIRC |
| 0402X | 6.84 | 4 | 225 | VC | CIRC |
| 044BX | | | 225 | VC | CIRC |
| 0450X | 6.59 | 4.45 | 225 | VC | CIRC |
| 0451X | 6.66 | 4.28 | 225 | VC | CIRC |
| 04CBX | | | UNK | UNK | CIRC |
| 04DBX | | | 225 | VC | CIRC |
| 04EBX | | | 225 | VC | CIRC |
| 04FBX | | | 225 | VC | CIRC |
| 04KBX | | | 225 | VC | CIRC |
| 0501X | 6.4 | 3.64 | 300 | VC | CIRC |
| 0502X | 6.53 | 3.5 | 300 | VC | CIRC |
| 050BX | | | 300 | VC | CIRC |
| 051BX | | | 300 | VC | CIRC |
| 052BX | | | 100 | VC | CIRC |
| 053BX | | | 100 | VC | CIRC |
| 054BX | | | 100 | VC | CIRC |
| 0550X | 6.39 | 3.9 | 300 | VC | CIRC |
| 0551X | 6.51 | 3.76 | 300 | VC | CIRC |
| 0552X | 6.57 | 4.67 | 225 | VC | CIRC |
| 0602X | 6.5 | 4.97 | 225 | VC | CIRC |
| 060DX | | | 300 | VC | CIRC |
| 061DX | | | 300 | VC | CIRC |
| 0651X | 6.49 | 5.21 | 225 | VC | CIRC |
| 06ABX | | | 225 | VC | CIRC |
| 06BBX | | | 225 | VC | CIRC |
| 06CBX | | | 225 | VC | CIRC |
| 1301X | 3.54 | 1.89 | 225 | CP | CIRC |
| 1302X | 2.87 | 1.85 | 225 | CP | CIRC |
| 1350X | 3.26 | 2.44 | 225 | VC | CIRC |
| 1450X | 4.79 | 3.56 | 150 | VC | CIRC |
| 1451X | 5.04 | 4.25 | 225 | VC | CIRC |
| 1452X | 5.84 | 4.97 | 225 | VC | CIRC |
| 1501X | 5.44 | 4.25 | 225 | VC | CIRC |
| 1502X | 5.73 | 3.98 | 225 | VC | CIRC |
| 150BX | | | 225 | VC | CIRC |
| 150DX | | | 225 | VC | CIRC |
| 152BX | | | 225 | VC | CIRC |
| 153DX | | | 225 | VC | CIRC |
| 1550X | 5.47 | 4.54 | 225 | VC | CIRC |
| 1551X | 6.2 | 4.91 | 150 | VC | CIRC |
| 1552X | 5.8 | 4.45 | 225 | VC | CIRC |
| 1553X | 5.73 | 4.27 | 225 | VC | CIRC |
| 1554X | 6.13 | 4.97 | 225 | VC | CIRC |
| 156DX | | | 225 | VC | CIRC |
| 1601X | 6 | 4.62 | 225 | VC | CIRC |
| 161BX | | | 225 | VC | CIRC |
| 161DX | | | 225 | VC | CIRC |
| 164DX | | | 225 | VC | CIRC |
| 1650X | 5.99 | 4.89 | 225 | VC | CIRC |
| 2101X | 3.3 | 0.789 | 250 | DI | CIRC |
| 2102X | 3.2 | 0.654 | 250 | DI | CIRC |
| 2103X | 3.05 | 0.516 | 250 | DI | CIRC |
| 2104X | 2.94 | 0.98 | 250 | DI | CIRC |
| 2201Y | 3.8 | 1.528 | 250 | DI | CIRC |
| 2301X | 3.04 | 2.19 | 225 | CP | CIRC |
| 2302X | 3.39 | 2.11 | 225 | CP | CIRC |
| 2350X | 4.32 | 2.82 | 225 | CP | CIRC |
| 2351X | 3.15 | 1.79 | 225 | CP | CIRC |
| 2352X | 3.04 | 2.38 | 225 | VC | CIRC |
| 2353X | 3.15 | 2.45 | 225 | VC | CIRC |
| 2401X | | | 225 | CP | CIRC |
| 2402X | 4.78 | 2.39 | 225 | CP | CIRC |
| 2403X | 4.31 | 2.63 | 150 | VC | CIRC |
| 2404X | 4.78 | 2.38 | 225 | CP | CIRC |
| 2450X | 5.17 | 4.17 | 150 | VC | CIRC |
| 2451X | 4.72 | 3.59 | 225 | CP | CIRC |
| 2452X | 4.62 | 2.33 | 225 | VC | CIRC |
| 2501X | 4.5 | 3.14 | 225 | CP | CIRC |
| 2502X | 3.74 | 2.98 | 225 | CP | CIRC |
| 2503X | 3.95 | 2.82 | 225 | CP | CIRC |
| 2550X | 4.46 | 3.03 | 225 | CP | CIRC |
| 2551X | 4.27 | 2.82 | 225 | CP | CIRC |
| 3201X | 2.887 | 1.308 | 250 | DI | CIRC |
| 3202X | 3.65 | 1.06 | 250 | DI | CIRC |
| 3301X | 3.68 | 2.34 | 150 | VC | CIRC |
| 3302X | 3.44 | 1.75 | 150 | VC | CIRC |
| 3303X | 3.55 | 1.35 | 150 | VC | CIRC |
| 3304X | 3.87 | 3.19 | 150 | VC | CIRC |
| 3305X | 2.646 | 1.439 | 250 | DI | CIRC |
| 3350X | 3.43 | 2.38 | 225 | VC | CIRC |
| 3351X | 3.42 | 2.19 | 225 | VC | CIRC |
| 3352X | 3.75 | 2.9 | 150 | VC | CIRC |
| 3401X | 3.39 | 1.45 | 150 | VC | CIRC |
| 3402X | 3.3 | 1.33 | 150 | VC | CIRC |
| 3403X | 3.34 | 1.17 | 150 | VC | CIRC |
| 3404X | 3.87 | 1.02 | 225 | VC | CIRC |
| 3405X | 3.85 | 1.2 | 225 | VC | CIRC |
| 3406X | 4.17 | 3.02 | 150 | VC | CIRC |
| 340PX | 3.8 | | 100 | CI | CIRC |
| 3450X | 4.05 | 2.58 | 150 | VC | CIRC |
| 3451X | 3.78 | 2 | 225 | VC | CIRC |
| 3452X | 3.49 | 1.73 | 300 | VC | CIRC |
| 3453X | 3.47 | 1.7 | 300 | VC | CIRC |
| 3501X | 3.91 | 2.75 | 225 | CP | CIRC |
| 3502X | 3.65 | 1.56 | 150 | VC | CIRC |
| 3550X | 3.14 | 2.38 | 225 | VC | CIRC |
| 3650X | 3.25 | | 300 | CP | CIRC |
| 3650X | 3.25 | 1.89 | 225 | CP | CIRC |
| 4301X | 3.42 | 1.669 | 250 | DI | CIRC |
| 4302X | 2.929 | 1.579 | 250 | DI | CIRC |
| 4350X | 3.545 | 1.116 | 450 | UNK | CIRC |
| 4351X | 2.4 | 0.54 | 450 | BRC | CIRC |
| 4450X | 2.622 | 1.338 | 450 | CO | CIRC |
| 4451X | 2.915 | 1.248 | 450 | CO | CIRC |
| 5102X | 5.49 | 1.67 | 450 | VC | CIRC |
| 512DX | | | UNK | UNK | CIRC |
| 5152X | 5.53 | 3.99 | 300 | VC | CIRC |
| 5153X | 5.46 | 3.84 | 300 | VC | CIRC |
| 6101X | 4.43 | | 225 | VC | CIRC |
| 6102X | 4.68 | 1.35 | 450 | VC | CIRC |
| 6103X | 4.32 | 1.92 | 150 | VC | CIRC |
| 610DX | | | 225 | VC | CIRC |
| 611DX | | | 225 | VC | CIRC |
| 6350X | 3.03 | 2.17 | 375 | CP | CIRC |
| 6351X | 3.27 | 2.02 | 375 | CP | CIRC |
| 6352X | 3.23 | 1.94 | 375 | CP | CIRC |
| 6401X | 2.88 | 1.72 | 225 | VC | CIRC |
| 6402X | 3.21 | 1.41 | 225 | VC | CIRC |
| 6450X | 2.88 | 1.78 | 375 | CP | CIRC |
| 6451X | 2.84 | 1.39 | 675 | CP | CIRC |
| 6452X | 3.2 | 1.73 | 225 | VC | CIRC |
| 6453X | 3.04 | 1.3 | 675 | CP | CIRC |
| 6501X | 3.8 | 1.86 | 375 | CP | CIRC |
| 6502X | 4.23 | 2.28 | 225 | VC | CIRC |
| 6503X | 3.9 | 1.47 | 225 | VC | CIRC |
| 653DX | | | 225 | VC | CIRC |
| 654DX | | | 225 | VC | CIRC |
| 6550X | 4.15 | 2.57 | 225 | VC | CIRC |
| 6551X | 3.55 | 2.01 | 225 | VC | CIRC |
| 6603X | 5.81 | 2.91 | 375 | CP | CIRC |
| 6604X | 5.92 | 3.5 | 225 | VC | CIRC |
| 660BX | | | 375 | CP | CIRC |
| 660DX | | | 225 | VC | CIRC |
| 662DX | | | 225 | VC | CIRC |
| 663DX | | | 225 | VC | CIRC |
| 664BX | | | 225 | VC | CIRC |
| 6650X | 4.49 | 2.6 | 225 | VC | CIRC |
| 6651X | 7.91 | 4.67 | 225 | VC | CIRC |
| 66ABX | | | 225 | VC | CIRC |
| 7101X | 3.76 | 1.08 | 450 | VC | CIRC |
| 7102X | 4.1 | 2.35 | 150 | VC | CIRC |
| 7201X | 3.29 | 0.92 | 450 | VC | CIRC |
| 7202X | 3.35 | 1.82 | 150 | VC | CIRC |
| 7203X | 3.16 | 1.68 | 150 | VC | CIRC |
| 7204X | 3.04 | 1.44 | 150 | VC | CIRC |
| 7205X | 3.29 | 1.37 | 150 | VC | CIRC |
| 720DX | | | 450 | VC | CIRC |
| 721DX | | | 450 | VC | CIRC |
| 722DX | | | 450 | VC | CIRC |
| 7250X | 3.32 | 1.7 | 375 | CP | CIRC |
| 7251X | 3.38 | 2 | 300 | VC | CIRC |
| 7252X | 3.06 | 2.09 | 300 | VC | CIRC |
| 7253X | 3.18 | 2.17 | 300 | VC | CIRC |
| 7254X | 3.33 | 2.29 | 300 | VC | CIRC |
| 7301X | 3.01 | 1.69 | 225 | VC | CIRC |
| 7302X | 3.13 | 1.34 | 225 | VC | CIRC |
| 7303X | 2.96 | 1.12 | 225 | VC | CIRC |
| 7304X | 3.19 | 0.38 | 600 | CP | CIRC |
| 7305X | | | 100 | UNK | CIRC |
| 732DX | | | UNK | UNK | CIRC |
| 733DX | | | 100 | UNK | CIRC |
| 734DX | | | UNK | UNK | CIRC |
| 7350X | 3.21 | 1.51 | 225 | VC | CIRC |
| 7351X | 3 | 2.39 | 225 | VC | CIRC |
| 7352X | 3.13 | 2.11 | 225 | VC | CIRC |
| 7353X | 3.28 | 1.89 | 225 | VC | CIRC |
| 7401X | 3.23 | 0.64 | 600 | CP | CIRC |
| 7402X | 3.25 | 0.56 | 600 | CP | CIRC |
| 7450X | 3.26 | 1.4 | 375 | CP | CIRC |
| 7451X | | | 675 | CP | CIRC |
| 7452X | 3.25 | 1.18 | 675 | CP | CIRC |
| 7501X | 3.38 | 0.73 | 600 | CP | CIRC |
| 7502X | 3.31 | | 600 | CP | CIRC |
| 7503X | 2.83 | 1.48 | 225 | VC | CIRC |
| 7504X | 3.13 | 1.22 | 225 | VC | CIRC |
| 7505X | 3.26 | 0.67 | 225 | VC | CIRC |
| 7505X | 3.26 | | 600 | CP | CIRC |
| 750BX | | | 600 | CP | CIRC |
| 750DX | | | 600 | CP | CIRC |
| 751BX | | | 600 | CP | CIRC |
| 752DX | | | 600 | CP | CIRC |
| 753DX | | | 600 | CP | CIRC |
| 7550X | 2.89 | 2.12 | 225 | VC | CIRC |
| 7551X | 2.8 | 1.84 | 225 | VC | CIRC |
| 7552X | 3.41 | 1.67 | 375 | CP | CIRC |
| 7553X | 3.33 | 1.59 | 375 | CP | CIRC |
| 7601X | 4.27 | 0.79 | 600 | CP | CIRC |
| 7602X | 3.38 | | 600 | CP | CIRC |
| 7602X | 3.38 | 0.77 | 600 | CP | CIRC |
| 760BX | | | 225 | VC | CIRC |
| 760DX | | | UNK | UNK | CIRC |
| 761BX | | | 225 | VC | CIRC |
| 761DX | | | 225 | VC | CIRC |
| 763DX | | | 225 | VC | CIRC |
| 7650X | 4.29 | 2.84 | 225 | VC | CIRC |
| 7651X | 3.39 | 1.94 | 225 | VC | CIRC |
| 8101X | 3.12 | 1.48 | 225 | VC | CIRC |
| 810DX | | | UNK | UNK | CIRC |
| 811DX | | | 225 | VC | CIRC |
| 8150X | 3.12 | 1.89 | 375 | CP | CIRC |
| 8201X | 2.56 | 0.66 | 450 | VC | CIRC |
| 8202X | 2.69 | 0.94 | 225 | VC | CIRC |
| 8203X | 2.67 | 0.37 | 600 | VC | CIRC |
| 8204X | 2.9 | 0.28 | 600 | CP | CIRC |
| 8205Y | 2.75 | 0.34 | 450 | VC | CIRC |
| 8205X | 2.75 | 0.34 | 450 | VC | CIRC |
| 8206X | | | UNK | UNK | CIRC |
| 8208X | | | 450 | VC | CIRC |
| 8209X | | | UNK | UNK | CIRC |
| 8210X | | | UNK | UNK | CIRC |
| 8211X | | | UNK | UNK | CIRC |
| 821BX | | | UNK | UNK | CIRC |
| 822BX | | | 450 | VC | CIRC |
| 823BX | 2.75 | 0.5 | 450 | VC | CIRC |
| 823DX | | | 225 | VC | CIRC |
| 824DX | | | 225 | VC | CIRC |
| 8250X | 2.66 | 1.92 | 225 | VC | CIRC |
| 8251X | 2.49 | 1.46 | 375 | CP | CIRC |
| 8252X | 2.67 | 1.36 | 375 | CP | CIRC |
| 8252X | 2.67 | | 375 | CP | CIRC |
| 8253X | 3.16 | | 450 | CP | CIRC |
| 8253X | 3.16 | 1.07 | 450 | CP | CIRC |
| 8254X | 2.89 | 1.08 | 450 | CP | CIRC |
| 8301X | 3.2 | 0.3 | 600 | CP | CIRC |
| 8302X | 3.2 | 0.44 | 600 | CP | CIRC |
| 8303X | 3.13 | 0.43 | 600 | CP | CIRC |
| 8304X | 3.11 | 2.2 | 225 | VC | CIRC |
| 8350X | 2.94 | 1.2 | 1000 | CP | CIRC |
| 8351X | 2.89 | 0.91 | 900 | CP | CIRC |
| 8352X | 3.19 | 1.72 | 225 | VC | CIRC |
| 8353X | 2.92 | 1.89 | 150 | CP | CIRC |
| 8450X | 3.11 | 1.16 | 825 | CP | CIRC |
| 8451X | 3.11 | 1.13 | 900 | CP | CIRC |
| 8452X | 3.24 | 1.13 | 900 | CP | CIRC |
| 8452X | 3.24 | | 900 | CP | CIRC |
| 8453X | 2.78 | | 1000 | CP | CIRC |
| 8453X | 2.78 | 1.16 | 900 | CP | CIRC |
| 8454X | 2.48 | | 525 | CP | CIRC |
| 8454X | 2.48 | 1.22 | 675 | CP | CIRC |
| 8501Y | 4.05 | | 225 | VC | CIRC |
| 8501X | 4.05 | | 225 | VC | CIRC |
| 8502X | 3.72 | | 225 | VC | CIRC |
| 8503X | 3 | 1.9 | 225 | VC | CIRC |
| 850GX | | | 225 | VC | CIRC |
| 852GX | | | UNK | UNK | CIRC |
| 853GX | | | UNK | UNK | CIRC |
| 854GX | | | 225 | VC | CIRC |
| 8550X | 4.03 | 2.61 | 225 | VC | CIRC |
| 8550X | 4.03 | | 225 | VC | CIRC |
| 8551X | 3.71 | 2.03 | 300 | CP | CIRC |
| 8552X | 3.14 | 1.68 | 300 | CP | CIRC |
| 8553X | 2.38 | 1 | 600 | CP | CIRC |
| 8554X | 3.08 | 1.29 | 600 | CP | CIRC |



LINE STYLES / COLOURS

Brown — Foul
Foul Syphon Sewer
Foul Vacuum Main
Foul Rising Main
Red — Combined
Combined Syphon Sewer
Combined Rising Main
Lateral Drain
Orange — Building Over Agreement Area
Dark Blue — Treated Effluent
Purple — Sludge
Sewer Catchment
Section 104 Area
Light Blue — Surface Water
Surface Water Rising Main
Yellow — Private
Green — Adopted Sewer
Decommissioned

MATERIALS

AC Asbestos
BAC Spun Asbestos Cement
BRC British (Concrete)
BRE British (Engineering)
CO Concrete Box Culvert
CI Cast Iron
CO Concrete (In-Situ)
CP Concrete (Pre-Cast)
CSB Concrete Segmental (bolted)
CSU Concrete Segmental (unbolted)
DI Ductile Iron
GRC Glass Reinforced Concrete
GRP Glass Reinforced Plastic
MAC Masonry in mortar Courses
MAR Masonry in random Courses
PE Polyethylene
PF Pitch Fibre
PP Polypropylene
PVC Polyvinyl Chloride
RPM Reinforced Plastic Mortar
SI Spun Iron
ST Steel
VC Vitrified Clay
XXX Other
ZZZ Unknown

Manhole (SW)
Manhole (FBC)
Lamp hole (SW)
Lamp hole (FBC)
Pumping Station (SW)
Pumping Station (FBC)
Side entry manhole (SW)
Side entry Manhole (FBC)
Wind shaft (SW)
Wind shaft (FBC)
Ejector station (SW)
Ejector station (FBC)
Watertight door (SW)
Watertight door (FBC)
Flushing ch. No-e (SW)
Flushing ch. No-e (FBC)
Flushing ch. No-s (SW)
Flushing ch. No-s (FBC)
Downstream Chamber

LEGEND - SEWERS

Washout (SW)
Washout (FBC)
Rodding Eye (SW)
Rodding Eye (FBC)
Cropping point (SW)
Cropping point (FBC)
Intercept chamber (SW)
Intercept chamber (FBC)
Storm Tank (SW)
Storm Tank (FBC)
Vortex chamber (SW)
Vortex chamber (FBC)
Lobed ellipse
Downstream manhole
Outfall
Penstock chamber
Downcomer
Storm Overflow
Bedding manhole

Other (+)
Other
Change in sewer (+)
Change in sewer
Reflux valve
Flap valve
Concrete
Arrow
Valve
Closed Valve
Air Valve
Hatch box (SW)
Hatch box (FBC)
Direction arrow
Emptying valve
Catchpit
Soakaway
Inlet
Balancing Pond

Wastewater treatment works
Marine treatment works
Outfall headworks
Vent
Vent column
Tidal storage tank
Blank end
Head of Public Sewer
Mains Pumping Station

SHAPES (S)

A Arched
B Barrel
C Circular
E Egg
H Horseshoe
R Rectangular
S Square
T Trapezoidal
U U Shape
X Other

NODE REFERENCING SYSTEM

1st digit: hundred metre spotting identifier
2nd digit: hundred metre matching identifier
other Nos identifier
3rd digit: 0-4 = Foul/Combined
5-9 = Surface Water
4th digit: next sequential node

| | |
|---|---|
| Drawn by: | mahalaa |
| Title: | 117350_Highfield Junior School |
| Date: | 04/04/2011 |

Southern Water