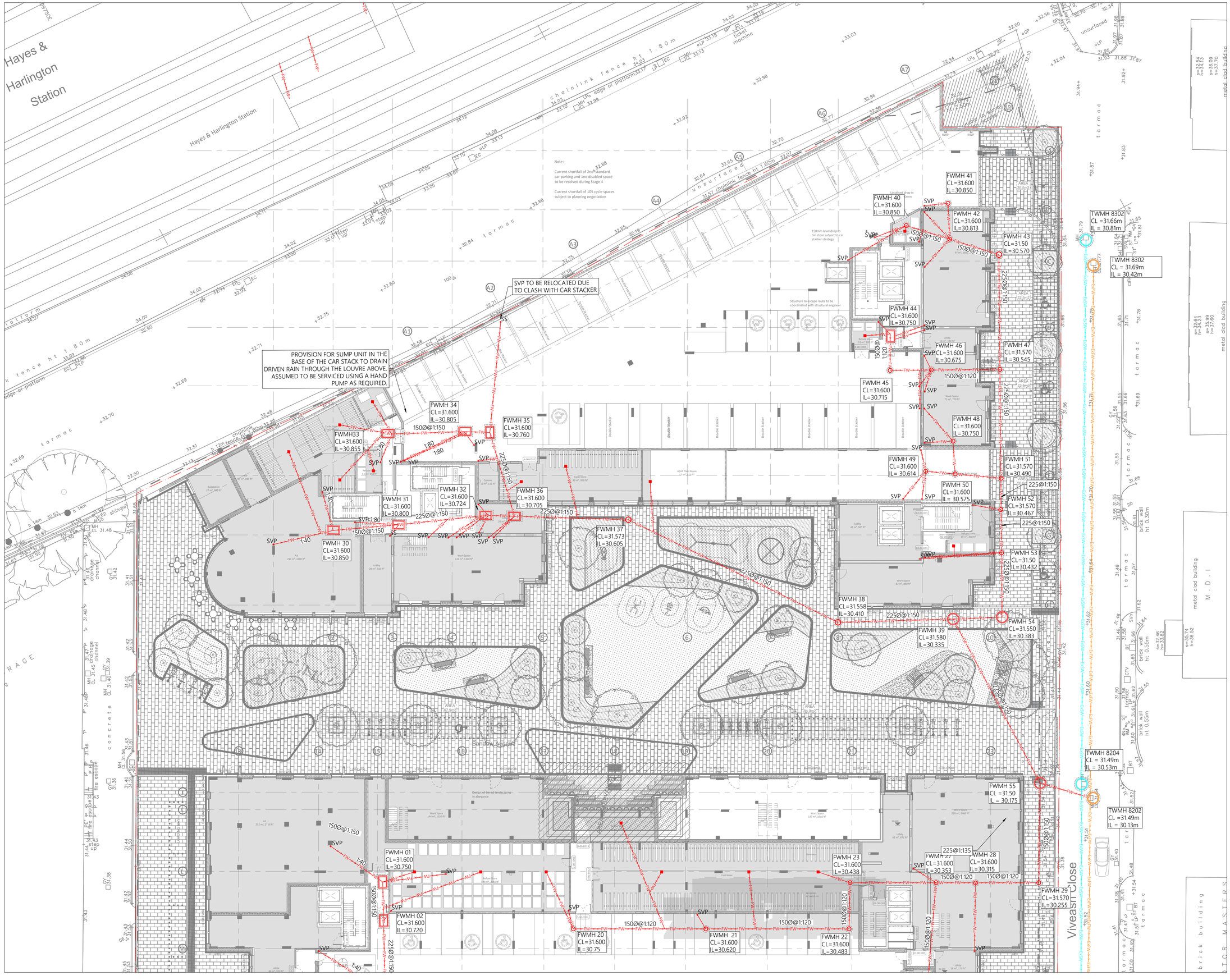




NOTES:

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2. THIS DRAWING IS FOR INFORMATION ONLY AND SHOULD BE USED FOR CONSTRUCTION PURPOSES.
3. ALL LEVELS ARE IN METRES ABOVE ORDINANCE DATUM AND ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
4. IN LINE WITH NPPF GUIDANCE THE DRAINAGE DESIGN HAS BEEN DESIGNED WITH NO FLOODING FOR A 100YEAR STORM PLUS 40% CLIMATE CHANGE EVENT.
5. BELOW GROUND DRAINAGE PIPEWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN COMPLIANCE WITH BS EN 12056, BS EN 752 AND THE NATIONAL BUILDING REGULATIONS APPROVED DOCUMENT H.
6. THE INFORMATION SHOWN ON THIS DRAWING IS PRELIMINARY AND INDICATIVE ONLY AND IS SUBJECT TO CHANGE THROUGH SITE INVESTIGATIONS, DETAILED DESIGN AND CO-ORDINATION.
7. DISCHARGE RATES AND LOCATIONS ARE SUBJECT TO CONFIRMATION THROUGH SURVEY AND DISCUSSIONS WITH THE LLFA AND THAMES WATER.
8. OPEN AREAS IN THE PODIUM DRAINED BY THE INTERNAL DRAINAGE SYSTEM WILL DISCHAGRE TO THE FOUL WATER SEWER DUE TO POTENTIAL CONTAMINATION FROM CAR PARKING AREAS.
9. SVP's, SS's AND RWP's LOCATIONS ARE CURRENTLY UNDER REVIEW BY MEP AND ARCHITECT AND WILL REQUIRE FURTHER COORDINATION AT THE NEXT DESIGN STAGE.
10. SURFACE WATER DISCHARGE RATES HAVE BEEN REDUCED IN LINE WITH PLANNING CONDITION REQUEST.
11. THE DRAINAGE NETWORK SHOULD BE CONSTRUCTED FROM THE OUTFALL BACKWARDS. THE FOUL WATER DRAINAGE SYSTEM IS VERY SHALLOW AND REQUIRES A HIGHER DEGREE OF ACCURACY IN CONSTRUCTION THAN USUAL DRAINAGE NETWORKS. THERE IS NO TOLERANCE FOR MIS-INSTALLED MANHOLES TO DEEP DUE TO THE CONSTRAINTS OF THE SURROUNDING THAMES WATER SEWERS WHICH ARE AT SHALLOW LEVELS.

KEY

- SITE BOUNDARY
- EXISTING SURFACE WATER SEWER
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER SEWER
- EXISTING FOUL WATER MANHOLE
- PROPOSED FOUL WATER SEWER
- PROPOSED FOUL WATER RISING MAIN
- PROPOSED FOUL WATER INSPECTION CHAMBER
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER DRAIN POINT
- PROPOSED FOUL WATER PLANT ROOM GULLY

| REV | DATE | DESCRIPTION | DRN | APP |
|---|---|---|---|---|
| P2 | 29/10/2021 | STAGE 3+ ISSUE | CR | CR |
| P1 | 20/08/2021 | STAGE 3 ISSUE | CR | CR |

STATUS

PRELIMINARY ISSUE

PREPARED IN PARTNERSHIP WITH

whitby wood
91-94 LOWER MARSH
LONDON SE1 7AB, UNITED KINGDOM
+44 (0)20 7442 2216 www.whitbywood.com

PREPARED BY

CUBE CONSULTING ENGINEERS
WWW.CONSULTTHECUBE.CO.UK

CLIENT

BUCCLEUCH PROPERTY

PROJECT

NESTLES AVENUE

DRAWING TITLE

FOUL WATER BELOW GROUND DRAINAGE LAYOUT SHEET 1

| JOB NO. | DATE | SCALE |
|---|---|---|
| 1026 | 20/08/21 | 1:200 |

| DRN | DES | CHK | APP |
|---|---|---|---|
| CR | CR | AOR | CR |

DRAWING NUMBER

1026-C-DR-0103

REV

P2

NOTES:

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8. OPEN AREAS IN THE PODIUM DRAINED BY THE INTERNAL DRAINAGE SYSTEM WILL DISCHAGRE TO THE FOUL WATER SEWER DUE TO POTENTIAL CONTAMINATION FROM CAR PARKING AREAS.
9. SVP's, SS's AND RWP's LOCATIONS ARE CURRENTLY UNDER REVIEW BY MEP AND ARCHITECT AND WILL REQUIRE FURTHER COORDINATION AT THE NEXT DESIGN STAGE.
10. SURFACE WATER DISCHARGE RATES HAVE BEEN REDUCED IN LINE WITH PLANNING CONDITION REQUEST.
11. THE DRAINAGE NETWORK SHOULD BE CONSTRUCTED FROM THE OUTFALL BACKWARDS. THE FOUL WATER DRAINAGE SYSTEM IS VERY SHALLOW AND REQUIRES A HIGHER DEGREE OF ACCURACY IN CONSTRUCTION THAN USUAL DRAINAGE NETWORKS. THERE IS NO TOLERANCE FOR MIS-INSTALLED MANHOLES TO DEEP DUE TO THE CONSTRAINTS OF THE SURROUNDING THAMES WATER SEWERS WHICH ARE AT SHALLOW LEVELS.

KEY

- SITE BOUNDARY
- EXISTING SURFACE WATER SEWER
- EXISTING SURFACE WATER MANHOLE
- EXISTING FOUL WATER SEWER
- EXISTING FOUL WATER MANHOLE
- PROPOSED FOUL WATER SEWER
- PROPOSED FOUL WATER INSPECTION CHAMBER
- PROPOSED FOUL WATER MANHOLE
- PROPOSED FOUL WATER DRAIN POINT
- PROPOSED FOUL WATER PLANT ROOM GULLY

WARNING
CAREFUL CONSIDERATION OF LEVELS OF PIPE WORK AND ACCURACY OF CONSTRUCTION REQUIRED TO AVOID PIPES CLASHING IN THE ROAD. DUE TO THE SHALLOW NATURE OF THE DESIGN ON SITE IT IS RECOMMENDED THAT THE THAMES WATER SEWER CONNECTION IS MADE FIRST PRIOR TO SITE DRAINAGE INSTALLATION TO ENSURE THAT THE LEVELS CAN BE MET.

| REV | DATE | DESCRIPTION | DRN | APP |
|---|---|---|---|---|
| P2 | 29/10/2021 | STAGE 3+ ISSUE | CR | CR |
| P1 | 20/08/2021 | STAGE 3 ISSUE | CR | CR |

STATUS
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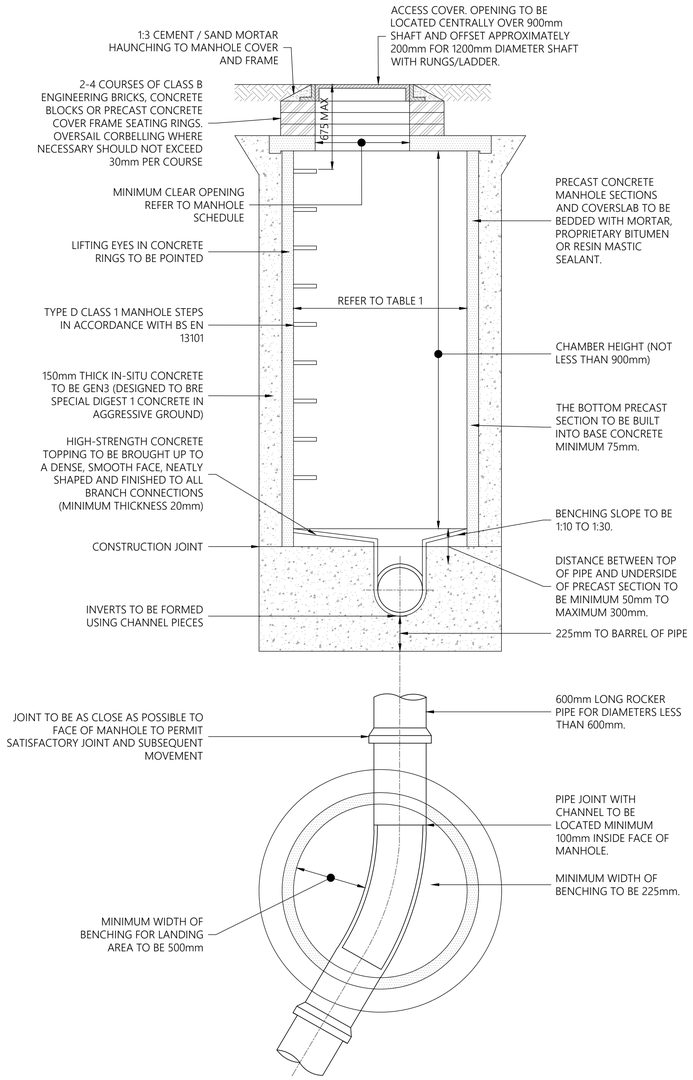
DRAWING TITLE
FOUL WATER BELOW GROUND DRAINAGE LAYOUT SHEET 2

| JOB NO | DATE | SCALE |
|---|---|---|
| 1026 | 20/08/21 | 1:200 |

| DRN | DES | CHK | APP |
|---|---|---|---|
| CR | CR | AOR | CR |

DRAWING NUMBER
1026-C-DR-0104 REV P2

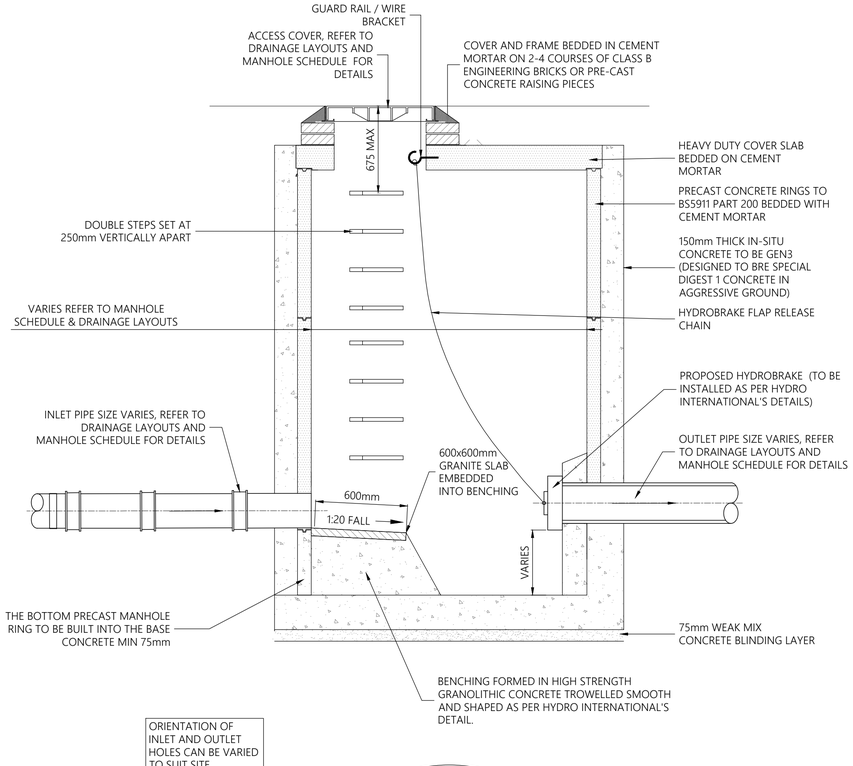



## TYPICAL MANHOLE - TYPE B

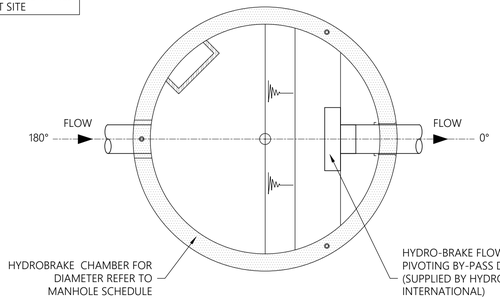
(EXTERNAL, MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3.0m)

TABLE 1

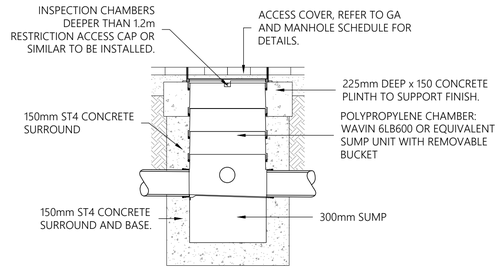
| MANHOLE DEPTH | PIPE Ø | INTERNAL DIAMETER OF MANHOLE |
|---|---|---|
| < 1.5m | ≤ 150 | 1000Ø |
| | 225 - 300 | 1200Ø |
| | 300 - 700 | 1500Ø |
| | ≥ 700 | THE LARGER OF 1800Ø OR (DN+450) |
| >1.5m | 100 - 375 | 1200Ø |
| | 375 - 700 | 1500Ø |
| | ≥ 700 | THE LARGER OF 1800Ø OR (DN+775) |




ORIENTATION OF INLET AND OUTLET HOLES CAN BE VARIED TO SUIT SITE




## MANHOLE CHAMBER WITH FLOW CONTROL DEVICE (HYDROBRAKE)




## 500mm DIAMETER POLYPROPYLENE CATCHPIT CHAMBER

(HARD LANDSCAPING - RECESSED COVER)




## TYPICAL INTERNAL MANHOLE/INSPECTION CHAMBER DETAIL



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3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
4. CHANNEL JUNCTIONS SHALL BE USED IN ALL MANHOLES TO SUIT LAYOUT OF PIPES AND DIRECTION OF FLOW.
5. SULPHATE RESISTING CEMENT SHALL BE USED FOR ALL MORTARS, CONCRETE AND PRECAST COMPONENTS.
6. WATER BARS SHALL BE USED AT CONSTRUCTION JOINTS BELOW THE WATER LINE, OR AS INSTRUCTED BY THE ENGINEER.
7. COVERS AND FRAMES SHALL BE IN ACCORDANCE WITH BS EN 124:1994 AND CONFORM TO CLAUSE 5.2.32 OF 'SEWERS FOR ADOPTION' 7TH EDITION.
8. NOTWITHSTANDING THE DETAILS SHOWN ANY HAUNCHING AND BASES, AND CHANNELS SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
9. CONCRETE PROVIDED AS A PROTECTION TO PIPES SHALL BE GRADE C16/C20. FLEXIBLE JOINTS SHALL BE FORMED AT INTERVALS NOT EXCEEDING 8 METERS. JOINTS SHALL BE FORMED OVER THE CROSS SECTION OF THE CONCRETE AND SHALL COINCIDE WITH PIPE JOINTS.
10. CONCRETE PIPES TO BE IN ACCORDANCE WITH APPROPRIATE SECTION OF THE SPECIFICATION.
11. VITRIFIED CLAY PIPES TO BE IN ACCORDANCE WITH APPROPRIATE SECTION OF THE SPECIFICATION.
12. MANHOLE COVERS TO BE ORIENTATED PARALLEL TO ROAD CENTRE LINE / BUILDING GRID.
13. BELOW GROUND DRAINAGE PIPEWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN COMPLIANCE WITH BS EN 12056, BS EN 752 AND THE NATIONAL BUILDING REGULATIONS APPROVED DOCUMENT H.
14. ALL PIPES BELOW THE BUILDING, PASSING UNDER FOUNDATIONS OR WITH LESS THAN 900mm COVER TO BE CAST IN CONCRETE.
15. PIPE CONNECTIONS NOT IN INSPECTION CHAMBER OR MANHOLES SHALL BE PERFORMED VIA OBLIQUE JUNCTIONS SWEPT IN THE DIRECTION OF FLOW.
16. THE CONTRACTOR SHOULD CONSULT MANUFACTURER'S INSTALLATION INFORMATION FOR FURTHER GUIDANCE BEFORE INSTALLATION.
17. DRAINAGE TO BE CAST IRON UNDER BUILDINGS AND THROUGH FOUNDATIONS.

| REV | DATE | DESCRIPTION | DRN | APP |
|---|---|---|---|---|
| P2 | 29/10/2021 | STAGE 3+ ISSUE | CR | CR |
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PROJECT

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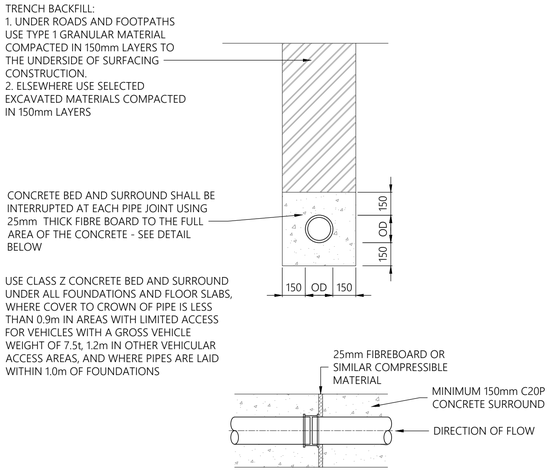
DRAWING TITLE

BELOW GROUND DRAINAGE DETAILS SHEET 1

| JOB NO. | DATE | SCALE |
|---|---|---|
| 1026 | 20/08/21 | 1:20 |

| DRN | DES | CHK | APP |
|---|---|---|---|
| CR | CR | AOR | CR |

DRAWING NUMBER: 1026-C-DR-0200 REV: P2




## CLASS Z CONCRETE BED AND SURROUND

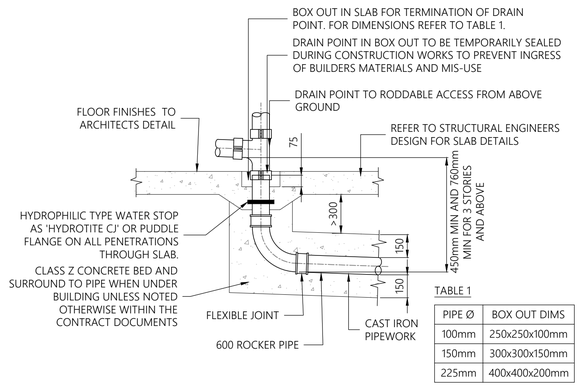
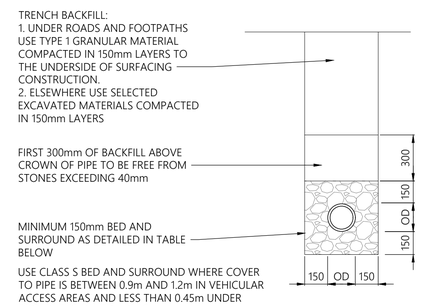



TABLE 1

| PIPE Ø | BOX OUT DIMS |
|---|---|
| 100mm | 250x250x100mm |
| 150mm | 300x300x150mm |
| 225mm | 400x400x200mm |

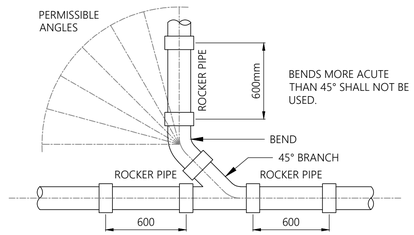
## TYPICAL DRAIN POINT



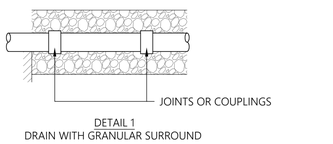

| PIPE DIAMETER: | BEDDING MATERIAL: |
|---|---|
| 100Ø | 10mm SINGLE SIZE AGGREGATE |
| 101Ø -150Ø | 10mm OR 14mm SINGLE SIZE AGGREGATE |
| 151Ø - 500Ø | 10mm, 14mm OR 20mm SINGLE SIZE AGGREGATE |

NOTE:
THE ABOVE MATERIALS ARE FOR GUIDANCE OTHER BEDDING MATERIALS CAN BE USED IN ACCORDANCE WITH THE PIPE MANUFACTURES RECOMMENDATIONS I.E. SINTERED PULVERISED FUEL ASH AND AIR COOLED BLAST FURNACE SLAGS

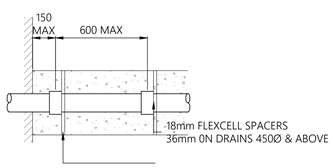
## CLASS S GRANULAR BED AND SURROUND




## OBLIQUE JUNCTION ARRANGEMENT DETAIL



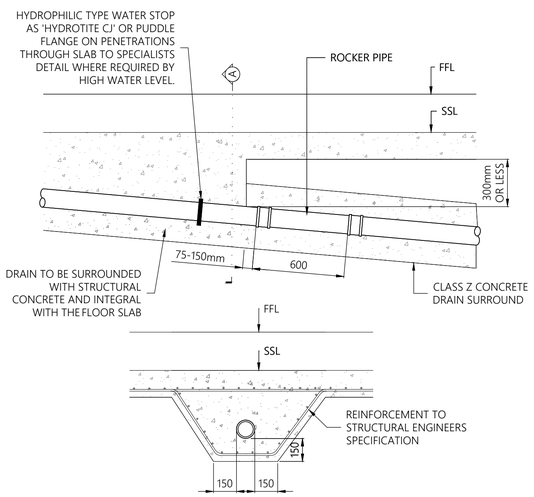

DETAIL 1
DRAIN WITH GRANULAR SURROUND



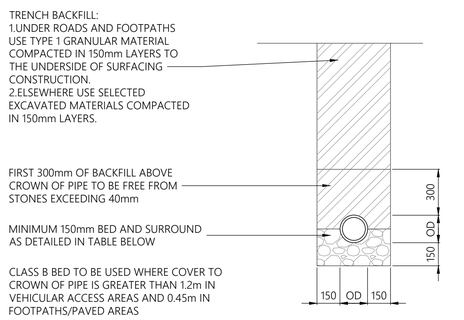

DETAIL 2
DRAIN WITH CONCRETE SURROUND

## ROCKER PIPE ASSEMBLY

THESE DETAILS APPLY TO ALL DRAINS AT FIXED POINTS I.E. AT FACE OF STRUCTURE, CHAMBERS ETC.



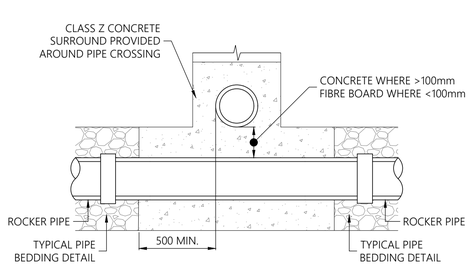

## CLASS Y CONCRETE SURROUND WITHIN 300mm OF FLOOR SLAB




| PIPE DIAMETER: | BEDDING MATERIAL: |
|---|---|
| 100Ø | 10mm SINGLE SIZE AGGREGATE |
| 101Ø -150Ø | 10mm OR 14mm SINGLE SIZE AGGREGATE |
| 151Ø - 500Ø | 10mm, 14mm OR 20mm SINGLE SIZE AGGREGATE |
| 501Ø AND ABOVE | 10mm, 14mm, 20mm OR 40mm SINGLE SIZE CRUSHED ROCK |

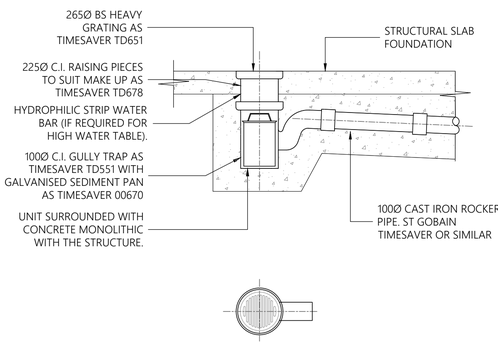
NOTE:
THE ABOVE MATERIALS ARE FOR GUIDANCE OTHER BEDDING MATERIALS CAN BE USED IN ACCORDANCE WITH THE PIPE MANUFACTURES RECOMMENDATIONS I.E. SINTERED PULVERISED FUEL ASH AND AIR COOLED BLAST FURNACE SLAGS

## CLASS B GRANULAR BED AND SURROUND



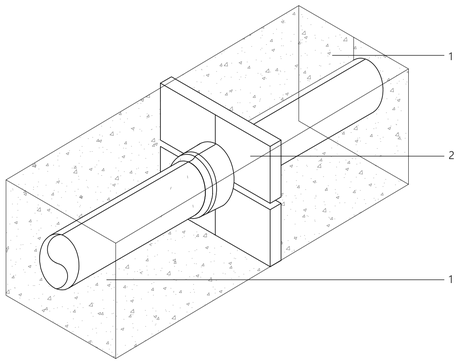

NOTE: REQUIRED FOR ALL PIPE CROSSING WITH 300mm CLEARANCE OR LESS BETWEEN PIPES.

## TYPICAL PIPE CROSSOVER DETAIL




## GARAGE GULLY (G3)

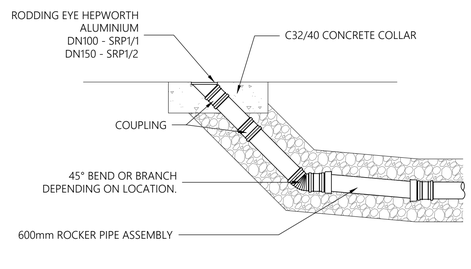
SLAB FOUNDATION




DESCRIPTION:

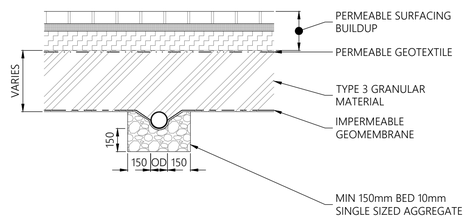
1. 150mm MINIMUM THICK CONCRETE SURROUND.
2. COMPRESSIBLE MATERIAL EITHER FIBRE BOARD OR POLYSTYRENE 18mm MINIMUM THICKNESS

## DRAIN WITH CONCRETE SURROUND




## EXTERNAL RODDING EYE

(PEDESTRIAN LOADING ONLY)




## PERMEABLE PAVING ATTENUATION COLLECTION PIPE TYPICAL SECTION



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| REV | DATE | DESCRIPTION | DRN | APP |
|---|---|---|---|---|
| P2 | 29/10/2021 | STAGE 3+ ISSUE | CR | CR |
| P1 | 20/08/2021 | STAGE 3 ISSUE | CR | CR |

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PROJECT
NESTLES AVENUE

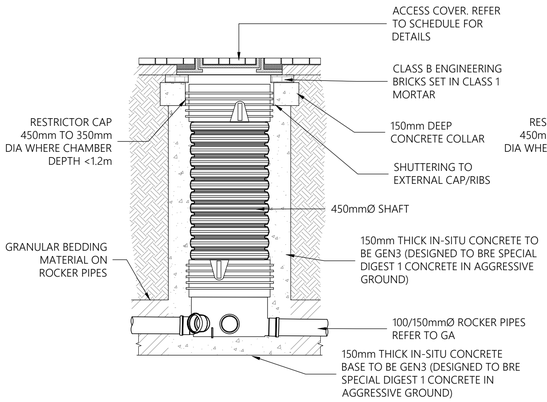
DRAWING TITLE
BELOW GROUND DRAINAGE DETAILS SHEET 2

| JOB NO. | DATE | SCALE |
|---|---|---|
| 1026 | 20/08/21 | 1:20 |

| DRN | DES | CHK | APP |
|---|---|---|---|
| CR | CR | AOR | CR |

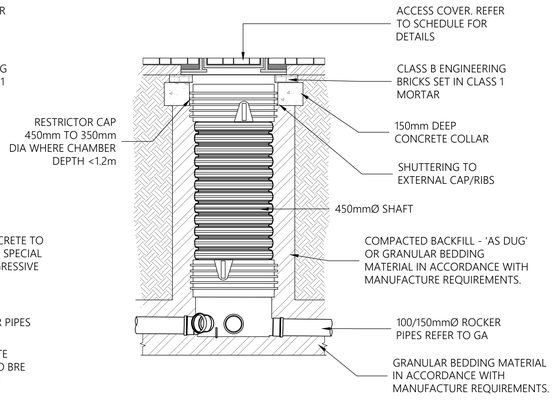
DRAWING NUMBER
1026-C-DR-0201

REV
P2



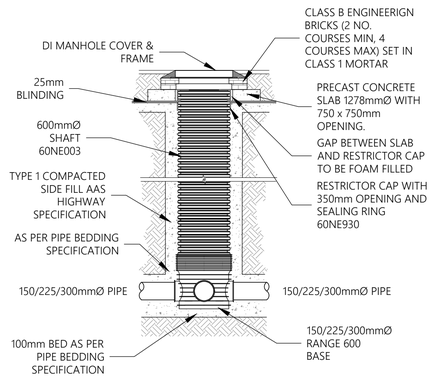

## TYPICAL WAVIN 450Ø POLYPROPYLENE INSPECTION CHAMBER

(IN AREAS SUBJECT TO VEHICULAR LOADING)

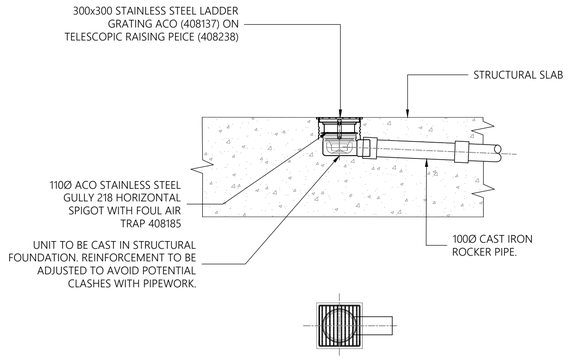



## TYPICAL WAVIN 450Ø POLYPROPYLENE INSPECTION CHAMBER

(IN PEDESTRIAN HARDLANDSCAPING AREAS)

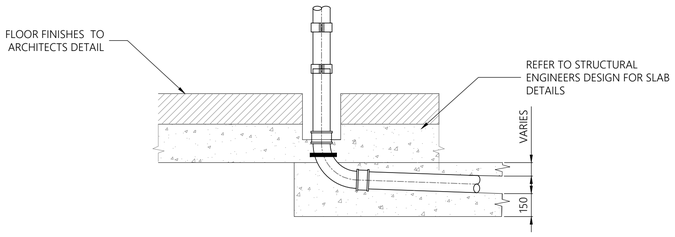



## RANGE 600 CHAMBER B125/D400 LOADING




## PLANT ROOM TRAPPED GULLY

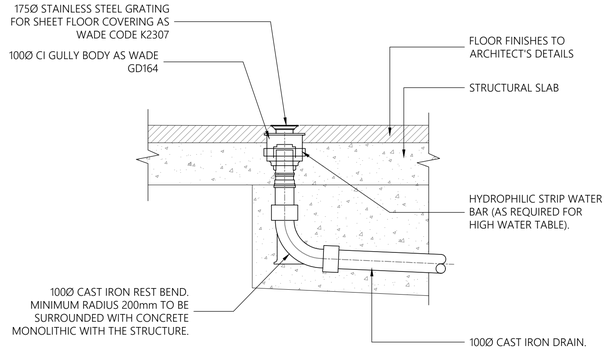
SIDE EXIT FOR SHALLOW LOACTIONS



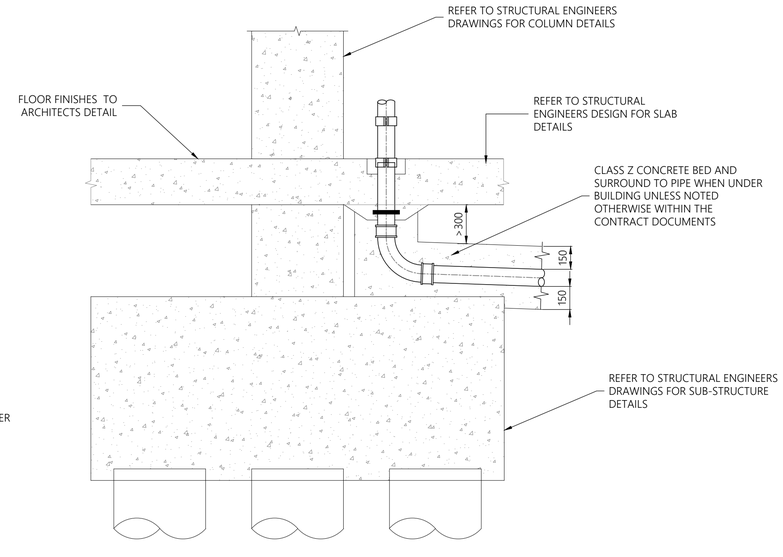

## TYPICAL DRAIN POINT WITH BEND LOCATED IN THE SLAB




## PLANT ROOM GULLY WITH ODOUR STOP




## FINISHED FLOOR, TOILET & CHANGING AREA FLOOR GULLY (G7)




## TYPICAL DRAIN POINT WITH DROPPED PILE CAP



NOTES:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN MILLIMETRES AND LEVELS ARE IN METRES OVER ORDINANCE DATUM UNLESS NOTED OTHERWISE.
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT, ENGINEERS AND CONSULTANTS DRAWINGS AND SPECIFICATIONS.
4. CHANNEL JUNCTIONS SHALL BE USED IN ALL MANHOLES TO SUIT LAYOUT OF PIPES AND DIRECTION OF FLOW.
5. SULPHATE RESISTING CEMENT SHALL BE USED FOR ALL MORTARS, CONCRETE AND PRECAST COMPONENTS.
6. WATER BARS SHALL BE USED AT CONSTRUCTION JOINTS BELOW THE WATER LINE, OR AS INSTRUCTED BY THE ENGINEER.
7. COVERS AND FRAMES SHALL BE IN ACCORDANCE WITH BS EN 124:1994 AND CONFORM TO CLAUSE 5.2.32 OF 'SEWERS FOR ADOPTION' 7TH EDITION.
8. NOTWITHSTANDING THE DETAILS SHOWN ANY HAUNCHING AND BASES, AND CHANNELS SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
9. CONCRETE PROVIDED AS A PROTECTION TO PIPES SHALL BE GRADE C16/C20. FLEXIBLE JOINTS SHALL BE FORMED AT INTERVALS NOT EXCEEDING 8 METERS. JOINTS SHALL BE FORMED OVER THE CROSS SECTION OF THE CONCRETE AND SHALL COINCIDE WITH PIPE JOINTS.
10. CONCRETE PIPES TO BE IN ACCORDANCE WITH APPROPRIATE SECTION OF THE SPECIFICATION.
11. VITRIFIED CLAY PIPES TO BE IN ACCORDANCE WITH APPROPRIATE SECTION OF THE SPECIFICATION.
12. MANHOLE COVERS TO BE ORIENTATED PARALLEL TO ROAD CENTRE LINE / BUILDING GRID.
13. BELOW GROUND DRAINAGE PIPEWORK SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND IN COMPLIANCE WITH BS EN 12056, BS EN 752 AND THE NATIONAL BUILDING REGULATIONS APPROVED DOCUMENT H.
14. ALL PIPES BELOW THE BUILDING, PASSING UNDER FOUNDATIONS OR WITH LESS THAN 900mm COVER TO BE CAST IN CONCRETE.
15. PIPE CONNECTIONS NOT IN INSPECTION CHAMBER OR MANHOLES SHALL BE PERFORMED VIA OBLIQUE JUNCTIONS SWEPT IN THE DIRECTION OF FLOW.
16. THE CONTRACTOR SHOULD CONSULT MANUFACTURER'S INSTALLATION INFORMATION FOR FURTHER GUIDANCE BEFORE INSTALLATION.
17. DRAINAGE TO BE CAST IRON UNDER BUILDINGS AND THROUGH FOUNDATIONS.

| REV | DATE | DESCRIPTION | DRN | APP |
|---|---|---|---|---|
| P2 | 29/10/2021 | STAGE 3+ ISSUE | CR | CR |
| P1 | 20/08/2021 | STAGE 3 ISSUE | CR | CR |

STATUS

PRELIMINARY ISSUE

PREPARED IN PARTNERSHIP WITH
whitby wood
91-94 LOWER MARSH
LONDON SE1 7AB, UNITED KINGDOM
+44 (0)20 7442 2216 www.whitbywood.com

PREPARED BY
CU BE CONSULTING ENGINEERS
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CLIENT

BUCCLEUCH PROPERTY

PROJECT

NESTLES AVENUE

DRAWING TITLE

BELOW GROUND DRAINAGE DETAILS SHEET 3

| JOB NO. | DATE | SCALE |
|---|---|---|
| 1026 | 20/08/21 | 1:20 |

| DRN | DES | CHK | APP |
|---|---|---|---|
| CR | CR | AOR | CR |

DRAWING NUMBER

1026-C-DR-0202

REV

P2

## SURFACE WATER MANHOLE SCHEDULE

| CHAMBER REFERENCE | COVER LEVEL (m) * | INVERT LEVEL (m) | DEPTH (m) | TYPE | ACCESS & COVER | SETTING OUT | | COMMENTS |
|---|---|---|---|---|---|---|---|---|
| | | | | | | EASTING | NORTHING | |
| SW01 | 31.980 | 30.700 | 1.280 | 450 PPIC | 450X450 C250 RECESSED COVER | 509682.555 | 179273.515 | |
| SW02 | 31.404 | 30.700 | 0.704 | 500 PPIC | 600X600 C250 RECESSED COVER | 509696.621 | 179299.387 | CATCHPIT MANHOLE |
| SW03 | 31.500 | 30.700 | 0.800 | 450 PPIC | 450X450 C250 RECESSED COVER | 509711.452 | 179326.637 | |
| SW04 | 31.570 | 30.700 | 0.870 | 500 PPIC | 600X600 C250 RECESSED COVER | 509721.791 | 179345.674 | CATCHPIT MANHOLE |
| SW05 | 31.580 | 30.700 | 0.880 | 500 PPIC | 600X600 C250 RECESSED COVER | 509731.775 | 179342.122 | CATCHPIT MANHOLE |
| SW06 | 31.570 | 30.700 | 0.870 | 500 PPIC | 600X600 C250 RECESSED COVER | 509736.044 | 179370.867 | CATCHPIT MANHOLE |
| SW07 | 31.520 | 30.700 | 0.820 | 450 PPIC | 450X450 C250 RECESSED COVER | 509788.944 | 179311.572 | |
| SW08 | 31.520 | 30.700 | 0.820 | 450 PPIC | 450X450 C250 RECESSED COVER | 509804.723 | 179303.160 | |
| SW09 | 31.600 | 30.700 | 0.900 | 450 PPIC | 450X450 C250 RECESSED COVER | 509782.219 | 179363.044 | |
| SW10 | 31.600 | 30.700 | 0.900 | 450 PPIC | 450X450 C250 RECESSED COVER | 509775.364 | 179350.230 | |
| SW11 | 31.600 | 30.700 | 0.900 | 450 PPIC | 450X450 C250 RECESSED COVER | 509783.801 | 179345.188 | |
| SW12 | 31.560 | 30.700 | 0.860 | 500 PPIC | 600X600 C250 RECESSED COVER | 509796.755 | 179326.791 | CATCHPIT MANHOLE |
| SW13 | 31.558 | 30.700 | 0.858 | 450 PPIC | 450X450 C250 RECESSED COVER | 509796.292 | 179323.401 | |
| SW14 | 31.610 | 30.700 | 0.910 | 450 PPIC | 450X450 C250 RECESSED COVER | 509842.879 | 179362.306 | |
| SW15 | 31.492 | 30.700 | 0.792 | 500 PPIC | 600X600 C250 RECESSED COVER | 509832.267 | 179341.142 | CATCHPIT MANHOLE |
| SW16 | 31.500 | 30.700 | 0.800 | 1200 PPC | 750X750 C250 RECESSED COVER | 509817.648 | 179311.988 | |
| SW17 | 31.560 | 30.700 | 0.860 | 450 PPIC | 450X450 C250 RECESSED COVER | 509709.372 | 179269.901 | |
| SW18 | 31.570 | 30.700 | 0.870 | 450 PPIC | 450X450 C250 RECESSED COVER | 509741.138 | 179253.306 | |
| SW19 | 31.560 | 30.700 | 0.860 | 500 PPIC | 600X600 C250 RECESSED COVER | 509771.563 | 179233.822 | CATCHPIT MANHOLE |
| SW20 | 31.505 | 30.243 | 1.262 | 1500 PPC | 750X750 C250 RECESSED COVER | 509770.560 | 179231.659 | HYDROBRAKE FLOW CONTROL CHAMBER |
| SW21 | 31.565 | 30.700 | 0.865 | 450 PPIC | 450X450 C250 RECESSED COVER | 509776.310 | 179241.478 | |
| SW22 | 31.560 | 30.700 | 0.860 | 450 PPIC | 450X450 C250 RECESSED COVER | 509781.125 | 179250.543 | |
| SW23 | 31.580 | 30.700 | 0.880 | 500 PPIC | 600X600 C250 RECESSED COVER | 509782.511 | 179253.122 | CATCHPIT MANHOLE |
| SW24 | 31.550 | 30.700 | 0.850 | 450 PPIC | 450X450 C250 RECESSED COVER | 509796.083 | 179278.570 | |
| SW25 | 31.540 | 30.700 | 0.840 | 450 PPIC | 450X450 C250 RECESSED COVER | 509798.379 | 179277.324 | |
| SW26 | 31.580 | 30.700 | 0.880 | 500 PPIC | 600X600 C250 RECESSED COVER | 509808.910 | 179297.342 | CATCHPIT MANHOLE |
| SW27 | 31.580 | 30.600 | 0.980 | 1500 PPC | 750X750 C250 RECESSED COVER | 509812.8593 | 179302.597 | HYDROBRAKE FLOW CONTROL CHAMBER |

** PROPOSED COVER LEVELS ESTIMATED AND TO BE CONFIRMED BY ARCHITECT INTERNALLY AND LANDSCAPE ARCHITECT EXTERNALLY*



NOTES:
1. DO NOT SCALE FROM THIS DRAWING.
2. ALL LEVELS ARE IN METRES ABOVE ORDINANCE DATUM AND ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
3. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE CUBE CONSULTING ENGINEERS BELOW GROUND DRAWINGS AND SPECIFICATION.
4. THE DRAINAGE NETWORK SHOULD BE CONSTRUCTED FROM THE OUTFALL BACKWARDS. THE SURFACE WATER DRAINAGE SYSTEM IS VERY SHALLOW AND REQUIRES A HIGHER DEGREE OF ACCURACY IN CONSTRUCTION THAN USUAL DRAINAGE NETWORKS. THERE IS NO TOLERANCE FOR MIS-INSTALLED MANHOLES TO DEEP DUE TO THE CONSTRAINTS OF THE SURROUNDING THAMES WATER SEWERS WHICH ARE AT SHALLOW LEVELS.

| REV | DATE | DESCRIPTION | DRN | APP |
|---|---|---|---|---|
| P1 | 29/10/2021 | STAGE 3+ ISSUE | CR | CR |

STATUS
PRELIMINARY ISSUE

PREPARED IN PARTNERSHIP WITH
whitby wood
91-94 LOWER MARSH
LONDON SE1 7AB, UNITED KINGDOM
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CLIENT
BUCCLEUCH PROPERTY

PROJECT
NESTLES AVENUE

DRAWING TITLE
SURFACE WATER DRAINAGE MANHOLE SCHEDULE

| JOB NO | DATE | SCALE |
|---|---|---|
| 1026 | 29/10/21 | NTS |

| DRN | DES | CHK | APP |
|---|---|---|---|
| CR | CR | AOR | CR |

DRAWING NUMBER: 1026-C-DR-0250
REV: P1

# FOUL WATER MANHOLE SCHEDULE

| CHAMBER REFERENCE | COVER LEVEL (m) * | INVERT LEVEL (m) | DEPTH (m) | TYPE | ACCESS & COVER | SETTING OUT | | COMMENTS |
|---|---|---|---|---|---|---|---|---|
| | | | | | | EASTING | NORTHING | |
| FW01 | 31.600 | 30.750 | 0.850 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509736.803 | 179321.851 | |
| FW02 | 31.600 | 30.720 | 0.880 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509734.757 | 179317.823 | |
| FW03 | 31.600 | 30.665 | 0.935 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509730.959 | 179310.396 | |
| FW04 | 31.600 | 30.638 | 0.962 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509723.452 | 179295.681 | |
| FW05 | 31.600 | 30.635 | 0.965 | 450 PPIC | 450X450 B125 RECESSED COVER | 509713.847 | 179289.924 | |
| FW06 | 31.600 | 30.574 | 1.026 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509723.452 | 179287.469 | |
| FW07 | 31.600 | 30.530 | 1.070 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509723.452 | 179281.013 | |
| FW08 | 31.600 | 30.595 | 1.005 | 450 PPIC | 450X450 C250 RECESSED COVER | 509708.181 | 179280.146 | |
| FW09 | 31.600 | 30.520 | 1.080 | 1800x900 | 2no. 900x900 C250 RECESSED COVER | 509723.452 | 179279.273 | |
| FW10 | 31.600 | 30.438 | 1.162 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509725.953 | 179273.288 | |
| FW11 | 31.600 | 30.409 | 1.191 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509728.625 | 179271.798 | |
| FW12 | 31.600 | 30.257 | 1.343 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509748.630 | 179260.643 | |
| FW13 | 31.600 | 30.225 | 1.375 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509752.745 | 179258.413 | |
| FW14 | 31.600 | 30.170 | 1.430 | 1800x900 | 2no. 900x900 C250 RECESSED COVER | 509723.452 | 179252.946 | |
| FW15 | 31.560 | 30.100 | 1.460 | 1200 PPC | 600X600 C250 RECESSED COVER | 509758.078 | 179244.228 | |
| FW16 | 31.560 | 30.055 | 1.505 | 1200 PPC | 600X600 C250 RECESSED COVER | 509763.897 | 179240.701 | |
| FW17 | 31.600 | 30.850 | 0.750 | 450 PPIC | 450X450 C250 RECESSED COVER | 509772.559 | 179256.177 | |
| FW18 | 31.600 | 30.760 | 0.840 | 450 PPIC | 450X450 C250 RECESSED COVER | 509768.704 | 179249.645 | |
| FW19 | 31.514 | 30.010 | 1.504 | 1200 PPC | 600X600 C250 RECESSED COVER | 509766.797 | 179233.885 | |
| FW20 | 31.600 | 30.750 | 0.850 | 450 PPIC | 450X450 C250 RECESSED COVER | 509753.724 | 179306.518 | |
| FW21 | 31.600 | 30.620 | 0.980 | 450 PPIC | 450X450 C250 RECESSED COVER | 509767.280 | 179299.204 | |
| FW22 | 31.600 | 30.483 | 1.117 | 450 PPIC | 450X450 C250 RECESSED COVER | 509781.943 | 179291.293 | |
| FW23 | 31.600 | 30.438 | 1.162 | 450 PPIC | 450X450 C250 RECESSED COVER | 509784.600 | 179295.953 | |
| FW24 | 31.600 | 30.850 | 0.750 | 450 PPIC | 450X450 C250 RECESSED COVER | 509778.288 | 179267.098 | |
| FW25 | 31.600 | 30.790 | 0.810 | 450 PPIC | 450X450 C250 RECESSED COVER | 509782.047 | 179273.349 | |
| FW26 | 31.600 | 30.755 | 0.845 | 450 PPIC | 450X450 C250 RECESSED COVER | 509785.311 | 179278.774 | |
| FW27 | 31.600 | 30.353 | 1.247 | 450 PPIC | 450X450 C250 RECESSED COVER | 509793.401 | 179291.205 | |

** PROPOSED COVER LEVELS ESTIMATED AND TO BE CONFIRMED BY ARCHITECT INTERNALLY AND LANDSCAPE ARCHITECT EXTERNALLY*



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1. DO NOT SCALE FROM THIS DRAWING.
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| REV | DATE | DESCRIPTION | DRN | APP |
|---|---|---|---|---|
| P1 | 29/10/2021 | STAGE 3+ ISSUE | CR | CR |

STATUS
PRELIMINARY ISSUE

PREPARED IN PARTNERSHIP WITH
whitby wood
91-94 LOWER MARSH
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PREPARED BY
CUBE CONSULTING ENGINEERS
WWW.CONSULTTHECUBE.CO.UK

CLIENT
BUCCLEUCH PROPERTY

PROJECT
NESTLES AVENUE

DRAWING TITLE
FOUL WATER DRAINAGE
MANHOLE SCHEDULE
SHEET 1

| JOB NO | DATE | SCALE |
|---|---|---|
| 1026 | 29/10/21 | NTS |

| DRN | DES | CHK | APP |
|---|---|---|---|
| CR | CR | AOR | CR |

DRAWING NUMBER: 1026-C-DR-0251
REV: P1

## FOUL WATER MANHOLE SCHEDULE

| CHAMBER REFERENCE | COVER LEVEL (m) * | INVERT LEVEL (m) | DEPTH (m) | TYPE | ACCESS & COVER | SETTING OUT | | COMMENTS |
|---|---|---|---|---|---|---|---|---|
| | | | | | | EASTING | NORTHING | |
| FW28 | 31.600 | 30.315 | 1.285 | 450 PPIC | 450X450 C250 RECESSED COVER | 509797.422 | 179288.999 | |
| FW29 | 31.600 | 30.255 | 1.345 | 450 PPIC | 450X450 C250 RECESSED COVER | 509803.908 | 179285.536 | |
| FW30 | 31.600 | 30.850 | 0.750 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509751.137 | 179360.570 | |
| FW31 | 31.600 | 30.800 | 0.800 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509758.181 | 179357.529 | |
| FW32 | 31.600 | 30.724 | 0.876 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509767.676 | 179353.633 | |
| FW33 | 31.600 | 30.855 | 0.745 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509762.084 | 179367.505 | |
| FW34 | 31.600 | 30.805 | 0.795 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509770.146 | 179363.361 | |
| FW35 | 31.600 | 30.760 | 0.840 | 1800x900 | 2no. 900x900 C250 RECESSED COVER | 509772.596 | 179361.942 | |
| FW36 | 31.600 | 30.705 | 0.895 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509770.486 | 179352.004 | |
| FW37 | 31.573 | 30.605 | 0.968 | 600 PPIC | 6000X600 C250 RECESSED COVER | 509781.957 | 179345.352 | |
| FW38 | 31.558 | 30.410 | 1.148 | 600 PPIC | 6000X600 C250 RECESSED COVER | 509797.734 | 179323.291 | |
| FW39 | 31.580 | 30.335 | 1.245 | 1200 PPC | 600X600 C250 RECESSED COVER | 509809.715 | 179317.251 | |
| FW40 | 31.600 | 30.850 | 0.750 | 450 PPIC | 450X450 C250 RECESSED COVER | 509826.644 | 179360.125 | |
| FW41 | 31.600 | 30.850 | 0.750 | 450 PPIC | 450X450 C250 RECESSED COVER | 509832.139 | 179360.095 | |
| FW42 | 31.600 | 30.813 | 0.787 | 450 PPIC | 450X450 C250 RECESSED COVER | 509830.340 | 179356.333 | |
| FW43 | 31.570 | 30.570 | 1.000 | 600 PPIC | 6000X600 C250 RECESSED COVER | 509834.530 | 179352.033 | |
| FW44 | 31.600 | 30.750 | 0.850 | 1800x750 | 2no. 900x750 C250 RECESSED COVER | 509818.898 | 179349.674 | |
| FW45 | 31.600 | 30.715 | 0.885 | 1200 PPC | 600X600 C250 RECESSED COVER | 509817.056 | 179346.187 | |
| FW46 | 31.600 | 30.675 | 0.925 | 450 PPIC | 450X450 C250 RECESSED COVER | 509821.230 | 179343.952 | |
| FW47 | 31.570 | 30.545 | 1.025 | 600 PPIC | 6000X600 C250 RECESSED COVER | 509828.290 | 179340.222 | |
| FW48 | 31.600 | 30.750 | 0.850 | 450 PPIC | 450X450 C250 RECESSED COVER | 509819.526 | 179335.475 | |
| FW49 | 31.600 | 30.614 | 0.986 | 450 PPIC | 450X450 C250 RECESSED COVER | 509815.073 | 179333.899 | |
| FW50 | 31.600 | 30.575 | 1.025 | 450 PPIC | 450X450 C250 RECESSED COVER | 509817.928 | 179331.999 | |
| FW51 | 31.570 | 30.490 | 1.080 | 600 PPIC | 6000X600 C250 RECESSED COVER | 509822.401 | 179329.023 | |
| FW52 | 31.570 | 30.467 | 1.103 | 600 PPIC | 6000X600 C250 RECESSED COVER | 509820.627 | 179325.824 | |
| FW53 | 31.500 | 30.432 | 1.068 | 600 PPIC | 6000X600 C250 RECESSED COVER | 509818.327 | 179321.365 | |
| FW54 | 31.550 | 30.383 | 1.167 | 1200 PPC | 600X600 C250 RECESSED COVER | 509814.834 | 179314.754 | |
| FW55 | 31.500 | 30.175 | 1.325 | 1200 PPC | 600X600 C250 RECESSED COVER | 509809.562 | 179295.670 | |

** PROPOSED COVER LEVELS ESTIMATED AND TO BE CONFIRMED BY ARCHITECT INTERNALLY AND LANDSCAPE ARCHITECT EXTERNALLY*



NOTES:
1. DO NOT SCALE FROM THIS DRAWING.
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4. THE DRAINAGE NETWORK SHOULD BE CONSTRUCTED FROM THE OUTFALL BACKWARDS. THE FOUL WATER DRAINAGE SYSTEM IS VERY SHALLOW AND REQUIRES A HIGHER DEGREE OF ACCURACY IN CONSTRUCTION THAN USUAL DRAINAGE NETWORKS. THERE IS NO TOLERANCE FOR MIS-INSTALLED MANHOLES TO DEEP DUE TO THE CONSTRAINTS OF THE SURROUNDING THAMES WATER SEWERS WHICH ARE AT SHALLOW LEVELS.

| REV | DATE | DESCRIPTION | DRN | APP |
|---|---|---|---|---|
| P1 | 29/10/2021 | STAGE 3+ ISSUE | CR | CR |

STATUS
PRELIMINARY ISSUE

PREPARED IN PARTNERSHIP WITH
whitby wood
91-94 LOWER MARSH
LONDON SE1 7AB, UNITED KINGDOM
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PREPARED BY
CUBE CONSULTING ENGINEERS
WWW.CONSULTTHECUBE.CO.UK

CLIENT
BUCCLEUCH PROPERTY

PROJECT
NESTLES AVENUE

DRAWING TITLE
FOUL WATER DRAINAGE
MANHOLE SCHEDULE
SHEET 2

| JOB NO | DATE | SCALE |
|---|---|---|
| 1026 | 29/10/21 | NTS |

| DRN | DES | CHK | APP |
|---|---|---|---|
| CR | CR | AOR | CR |

DRAWING NUMBER
1026-C-DR-0251

REV
P1

CUBE
CONSULTING ENGINEERS

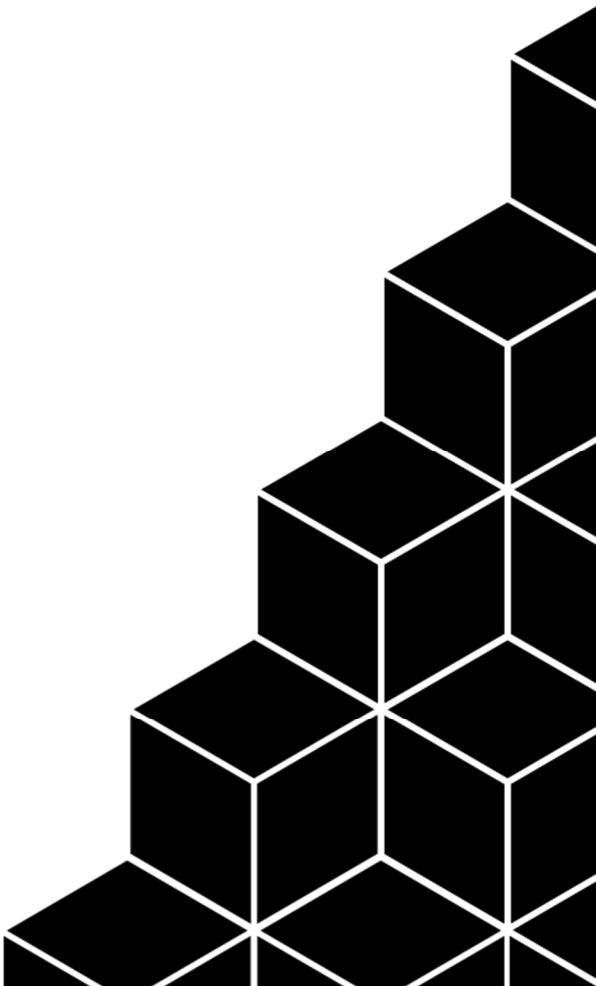
# Nestles Avenue, Hayes

## Below Ground Drainage Specification

Project No.: 1026
Document Ref: 1026-C-SP-0100
Issue: P02
Date: 29/10/2021

*Prepared in partnership with*

whitby wood



# Nestles Avenue, Hayes
## Below Ground Drainage Specification

## QUALITY CONTROL

| ISSUE: | DATE: | PREPARED: | CHECKED: | APPROVED: | COMMENTS: |
|---|---|---|---|---|---|
| P01 | 20/08/21 | CR | AOR | AOR | |
| P02 | 29/10/21 | CR | AOR | AOR | Stage 3+ Issue |
| | | | | | |

# CONTENTS

# R12 BELOW GROUND DRAINAGE

This specification is based on the National Building Specification (NBS) Section R12 – Below ground drainage systems and is to be read with Preliminaries/General conditions.

Ensure that the Local Water Authority and Building Control are fully aware for the proposed installation that they have all the necessary documentation and that approval has been gained before commencement of works on site. All work shall be in accordance with the current edition of the 'Civil Engineering Specification for the Water Industry' where required.

Complete the design and construction of the below ground drainage system in accordance with:

- Building Regulations 2015 – Approved Document H;
- BS EN 752:2008 Drain and sewer systems outside buildings;
- BS 12056-3:2000 Gravity drainage systems inside buildings. Roof drainage, layout and calculation;
- BS EN 1295-1:1997 Structural design of buried pipelines under various conditions of loading - Part 1: General requirements;
- BS EN 1610:1998 Construction and testing of drains and sewers;
- Design and Construction Guidance for foul and surface water sewers offered for adoption under the Code for adoption agreements for water and sewerage companies operating wholly or mainly in England ("the Code") for adoptable drainage or where required.

Also refer to all relevant Architectural, Landscape Architect, MEP Engineer, Ground Contamination Consultant drawings and specifications.

# GENERALLY

## 100 EXISTING DRAINS

- Before starting work, check invert levels and positions of existing drains, sewers, inspection chambers and manholes against information shown on drawings and report any discrepancies to CA.
- Adequately protect existing drains and maintain normal operation during construction.
- All existing drainage which forms part of the new works is to be CCTV surveyed at the earliest opportunity.

## 101 APPLICATIONS

- Submit Applications to the local Water authority and pay applicable fees where required.
- Apply for all appropriate licences (e.g. highways opening) and pay applicable fees.

## 102 WORKMANSHIP

- Comply with BS 8000 part 14 and BS 8000 part 0

## 103 SEQUENCE OF WORK

- At contractor's discretion. However, works should be undertaken to ensure that existing accesses are maintained throughout the works. Meetings with affected parties should be undertaken to ensure disruption is kept to a minimum.
- The contractor is responsible for managing surface run off and all temporary drainage during the construction phase. This should be completed in accordance with best practice and in line with any statutory authority requirements.

## 104 APPROVALS

- Ensure that the Local Authority, Drainage Authority and Building Control are fully aware of the proposed installation, and that they have all the necessary documentation and that approval, if required, has been gained before commencement of works on site.
- Any temporary discharge licences or approvals required shall be obtained by the contractor.

## 105 WORKS TO LOCAL AUTHORITY SEWERS AND APPLIANCES

- All work shall be in accordance with the current edition of the 'Civil Engineering Specification for the Water Industry' and be in accordance with the current edition of 'the Code'.
- All work shall be to the approval and supervision of the local Water Authority.
- All necessary precautions shall be taken to avoid causing any damage to, or interference with flow in, existing public sewers and ensure that debris, silt and mud, etc., do not enter the sewer. All necessary precautions shall be taken to avoid misconnections to existing public sewers.
- Relevant stakeholders should be notified in good time before works commence to ensure any approvals or supervision can be arranged.

## 106 IN-SITU CONCRETE

- Unless specified otherwise, in-situ concrete for use in drainage below ground to be to BS 8500 as shown in the table below or an equivalent or higher grade mix subject to approval:

| APPLICATION | CONCRETE MIX |
|---|---|
| Trench backfill | C10, ST2 or GEN1 |
| Structural protection to pipelines<br>Surrounds to chambers, separators and tanks<br>Bed and surround to drainage channels | C20, ST4 or GEN3 |
| Plain concrete in structures (eg manhole bases) | C20, ST4 or GEN3 with SR cement |
| Polypropylene inspection chamber surround | C25/30, FND3 |
| Reinforced concrete (eg. chamber cover slabs) | RC30 |

- Different mixes may be used for different parts of the drainage work.
- Wearing screeds (also known as "high strength toppings" or "granolithic finish") for benching to be to BS 8204-2:2003, class AR4/WS or AR4/DF or better.

## 107 AS BUILT RECORDS

- Keep marked up copies of drawings showing As Built information.
- Maintain records of inspections and tests carried out.
- Provide as built information on project completion

## 108 REDUNDANT DRAINS

- The following methods should be used as appropriate:
  1. The drain run should be removed in its entirety and sealed at the manhole/branch connection.
  2. The drain run should be filled with a weak mix concrete or cement grout to prevent collapse (this may not be necessary if the drain is under the building as it will be encased in concrete).
  3. The drain can be sealed at either end by the use of concrete plugs.
  4. Extend the drain to above ground level and seal with proprietary blank caps.

## 109 EXECUTION

- Study all drawings and specifications to familiarise with the structural and architectural details and the work of other trades.
- Ensure that the work under this section will not interfere with those of other trades and are compatible with the architectural finishes, prior to placing orders, fabrication and installation.
- Coordinate with structural, electrical and mechanical works to ensure drainage elements do not clash with other services.
- Furnish necessary templates, patterns, setting out plans and other items for incorporation in the works or for leaving necessary provisions for the work. Ensure timely placement of sleeves, inserts and the like.
- Where work is installed in close proximity to or will interfere with other works, assist in working out satisfactory space arrangements. Prepare composite site drawings to a suitable scale showing how the work is installed in relation to other trades.

## 110 QUALITY CONTROL

- For each product specified, provide from same manufacturer throughout where possible to the CA.
- Test certificates from approved independent laboratories, accreditation or testing agencies shall be furnished at no extra cost if required by the Contract Administrator
- Maintain uniformity in respect of connection standards, (socket or flange if required) throughout.

## 111 DELIVERY, STORAGE AND HANDLING

- Deliver products to site, store and protect.
- Store plastic and uPVC pipes on elevated racks only.
- Store plastic and uPVC pipes out of direct sunlight.
- Keep ends of pipes closed with factory manufactured plugs to prevent entry of foreign matter.
- Repaint ductile iron and cast iron fittings with factory recommended paint prior to installation where factory coating has been damaged.

# TYPE(S) OF PIPELINE

## 120 CAST IRON PIPELINES

- To be used for all drains cast in beneath or through structural foundations, located above ground level, located below the lowest slab and in vehicular areas where cover is less than 0.45m.
- Pipes, bends and junctions: Cast Iron to BS 437 with flexible joints to BS 6087.
- Manufacturer and reference: St Gobain Timesaver or equal
- Size(s): DN100, DN150, DN225
- Jointing: Flexible Bolted Mechanical Joints
- Additional corrosion protection: None
- Assumed type of subsoil: Refer to Site Investigation Reports.
- Bedding: Class Z (fully surrounded in concrete) unless noted otherwise
- Warning marker tape: N/A
- Alternative BS EN 877 'Ensign' may be used at discretion of the CA.

## 140 PLASTIC PIPELINE - TWIN WALL SURFACE WATER PIPE

- Pipes, bends and junctions: Structured wall pipes with flexible joints, to BS EN 13476-1 and Kitemark certified.
- Manufacturer and reference: Polypipe Civils Ridgidrain or equivalent approved
- Size(s): DN100, DN150, DN225
- Assumed type of subsoil: Refer to Site Investigation Reports.
- Bedding class: Bedding in strict accordance with manufacturers guidelines.
- Warning marker tape: Not required.
- Installation: All installation of pipework and fittings to be in accordance with manufacturer's requirements, recommendations and good practice.
- Any pipework or fittings suffering damage resulting from any means will be rejected. Making good of any damaged components will not be permitted.

## 141 PLASTIC PIPELINE – STRUCTURED WALL FOUL WATER PIPE

- Pipes, bends and junctions: Structured wall pipes with flexible joints, to BS EN 13476-1 and Kitemark certified.
- Manufacturer and reference: Polypipe Polysewer or equivalent approved
- Size(s): DN100, DN150, DN225.
- Assumed type of subsoil: Refer to Site Investigation Reports.
- Bedding class: Bedding in strict accordance with manufacturers guidelines.
- Warning marker tape: Not required.
- Installation: All installation of pipework and fittings to be in accordance with manufacturer's requirements, recommendations and good practice.
- Any pipework or fittings suffering damage resulting from any means will be rejected. Making good of any damaged components will not be permitted.

## 145 PLASTIC PIPELINE - TWIN WALL PEFORATED PIPE

- Pipes, bends and junctions: Perforated/Slotted, with flexible joints, to BS EN 13476-1 and Kitemark certified.
- Manufacturer and reference: Polypipe Civils Ridgidrain or equivalent approved
- Size(s): DN100, DN150, DN225, DN300
- Assumed type of subsoil: Refer to Site Investigation Reports.
- Bedding class: Pipes to be bedding in clean graded stone with no fines (type 3), Bedding in strict accordance with manufacturers guidelines.

## 190 SERVICE SLEEVES

- Material: CI for drainage services with puddle flange or Hydrophilic strip to provide waterproofing.
- Sleeve Size: To provide a minimum 25mm annular space between the outside diameter of the drainage service material and the inside diameter of the sleeve material
- Infill: The infill material to be of a suitable flexible consistency to form a watertight joint between the drain service and the sleeve.

# EXCAVATING/BACKFILL

## 205 EXCAVATED MATERIAL

- Unless otherwise specified, set aside turf, topsoil, hardcore, etc. for use in reinstatement.

## 210 LOWER PART OF TRENCH

- From bottom up to 300 mm above crown of pipe the trench must have vertical sides and be of a width as small as practicable but not less than external diameter of pipe plus 300 mm or larger dimension if specified.

| NOMINAL PIPE SIZE (DN) | 100 | 150 | 225 | 300 | 375 | 400 |
|---|---|---|---|---|---|---|
| MAXIMUM TRENCH WIDTH (mm) | 600 | 700 | 800 | 900 | 1200 | 1300 |

## 230 ASSUMED TYPE OF SUBSOIL

- Where the type of subsoil at the level of the crown of the pipe differs from that stated for the type of pipeline, obtain instructions before proceeding.

## 240 FORMATION FOR BEDS GENERALLY

- Excavate to formation immediately before laying beds or pipes.
- Remove mud, rock projections, boulders and hard spots and replace with consolidated bedding material.
- Harden local soft spots by tamping in bedding material or Type 1 sub-base material.
- Inform CA in advance to give him reasonable opportunity to inspect excavated formation for each section of the work.

## 250 COMBINED TRENCHES

- Where one pipe is at a lower level than another adjacent pipe in a common trench:
- A subtrench is permissible provided the soil of the step is stable and unlikely to break away.
- If a subtrench is not permissible, the whole trench must have a depth related to the lower pipe, with increased thickness of bedding to the upper pipe as necessary.
- The lower pipe must be backfilled with compacted granular material to not less than half way up the higher pipe.

## 260 TRENCH SUPPORTS

- Remove trench supports and other obstacles sufficiently to permit compacted filling of all spaces.

## 270 BACKFILLING TO PIPELINES GENERALLY

- Unless specified otherwise, backfill from top of specified surround or protective cushion with material excavated from the trench, compacted in layers not exceeding 150 mm thick. Do not use heavy compactors before there is 600 mm of material over pipes.
- Minimum times from placing concrete:
  - Backfilling generally: 24 h.
  - Heavy compactors and traffic loads: 72 h

## 280 BACKFILLING UNDER ROADS AND PAVINGS

- Backfill from top of specified surround or protective cushion up to formation level with Granular base Material Type 1 to DOT Specification for Highway Works, Clause 803, laid and compacted in 150 mm layers. Lower grade material such as Capping 6F1 may be used instead of Type 1 provided extra care is taken in monitoring its quality and compaction.

## 290 TEMPORARY BRIDGES

- Provide temporary bridges over trenches as necessary to prevent construction traffic damaging pipes after backfilling.

# BEDDING/JOINTING

## 310 INSTALLATION GENERALLY

- Obtain pipes and fittings for each pipeline from the same manufacturer unless otherwise specified. Joint differing pipes and fittings with adaptors recommended by pipe manufacturer.
- Lay pipes to true line and regular gradient on an even bed for the full length of the barrel with sockets (if any) facing up the gradient.
- Joint using recommended lubricants, leaving recommended gaps at ends of spigots to allow for movement.
- Adequately protect pipelines from damage and ingress of debris. Seal all exposed ends during construction.
- Arrange the work to minimise time between laying and testing. Backfill after successful testing.

## 330 CLASS B HALF DEPTH GRANULAR SUPPORT

- Granular material to BS 882 and BS EN 12620:

| PIPE SIZE (DN) | NOMINAL SINGLE SIZE | GRADED SIZE (mm) |
|---|---|---|
| 100 | 10 | Not permitted |
| 101-150 | 10 or 14 | Not permitted |
| 151-500 | 10, 14, or 20 | 2/14 or 4/20 |
| 501 and above | 10, 14, 20, or 40 | 2/14, 4/20, or 4/40 |

- Alternatively, as-dug material with a compaction fraction of not more than 0.3, or all-in aggregate, nominal size 10 mm, or fine aggregate to BS EN 13242 may be used
- Lay and compact to a thickness not less than 50 mm for sleeve jointed pipes, 100 mm for socket jointed pipes, over full width of trench. Where trench bottom is uneven due to hard spots or other reason, increase depth by 100 mm. Scoop out locally at couplings/sockets and lay pipes digging slightly into bed and resting uniformly on their barrels. Adjust to line and gradient.
- After initial testing, lay and compact more granular material uniformly to halfway up each side of pipe.
- Backfill to 150 m above crown of pipe with a protective cushion of selected fill, free from vegetable matter, rubbish, frozen soil and material retained on a 40 mm sieve. Compact by hand in 100 mm layers.

## 370 CLASS S GRANULAR SURROUND

- Granular material: To BS 882 and BS EN 12620

| PIPE SIZE (DN) | NOMINAL SINGLE SIZE | GRADED SIZE (mm) |
|---|---|---|
| 100 | 10 | Not permitted |
| 101-150 | 10 or 14 | Not permitted |
| 151-500 | 10, 14, or 20 | 2/14 or 4/20 |
| 501 and above | 10, 14, 20, or 40 | 2/14, 4/20, or 4/40 |

- Alternatively, as-dug material with a compaction fraction of not more than 0.3, or all-in aggregate, nominal size 10 mm, or fine aggregate to BS EN 13242 may be used
- Lay and compact to a thickness not less than 50 mm for sleeve jointed pipes, 100 mm for socket jointed pipes, over full width of trench. Where trench bottom is uneven due to hard spots or other reason, increase depth by 100 mm. Scoop out locally at couplings/sockets and lay pipes digging slightly into bed and resting uniformly on their barrels. Adjust to line and gradient.
- After initial testing, lay and compact more granular material in 100 mm layers to 150 mm (250 mm for adoptable sewers) above crown of pipe.

## 461 CLASS Z CONCRETE SURROUND

- Location: Class Z bed to be used under all foundations and floor slabs, where cover to crown of pipe is less than 0.9m in vehicular access areas and where pipes are laid within 1.0m of foundations.
- Concrete mix as specified under Generally.
- Lay concrete blinding, 25 mm thick over full width of trench and allow setting.
- Lay pipes on blinding on folding wedges of compressible board to give a minimum 150 mm clearance under the pipe. Anchor the pipeline or fill with water, if necessary, to prevent flotation.
- Form vertical construction joints in surround at face of flexible pipe joints using 18 mm thick compressible board (or similar compressible material) pre-cut to profile of pipe. Fill any gap between spigot and socket with resilient material to prevent entry of concrete.
- After initial testing, place and compact more concrete for full width of trench to encase pipe to 150mm above crown or to other height as specified or shown on the drainage details drawing.

## 470 TRENCHES LESS THAN ONE METRE FROM FOUNDATIONS

- Where bottom of trench is lower than bottom of foundation, use Class Z concrete surround as Clause 461. Top of concrete to be not lower than bottom of foundation.

## 480 TRENCHES MORE THAN ONE METRE FROM FOUNDATIONS

- Where bottom of drainage trench is below a critical level, (defined below) Class Z concrete surround as Clause 461 is to be used, the top of the concrete being not lower than the critical level.
- For the purpose of this clause the critical level is D mm lower than level of foundation bottom, D mm being equal to the horizontal distance of the near side of the trench from the foundation, minus 150 mm.

## 490 CROSSOVERS

- Where two pipelines (other than plastics pipes) cross with less than 300 mm separation, surround each with Class Z concrete surround as Clause 461 for not less than 1 m centred on the crossing point. Extend length of concrete surrounds as necessary to within 150 mm of next nearest flexible joints.

## 512 PIPELINES PASSING THROUGH STRUCTURES

- Pipelines that must be cast in or fixed to structures (including manholes, catchpits, bypass separator and cast iron pipes): Provide 600mm long rocker pipes adjacent to the external face of the structure (or both faces where appropriate, e.g. walls to footings, pipes entering or exiting basement walls, etc.), with flexible joints at both ends.
- Distance to rocker pipe from structure (maximum): 150mm

## 520 BENDS AT BASE OF SOIL STACKS

- Unless specified otherwise, use a 90 degree nominal rest bend with a minimum radius of 200 mm to centreline of the pipe.
- Invert of horizontal drain at base of stack to be not less than 450/750 mm below centreline of lowest branch pipe
- Stabilise bend(s) by bedding in concrete without impairing the flexibility of couplings.

## 530 RIGID BACKDROP PIPES

- outside the manhole wall: Encase with not less than 150mm of concrete as specified under 'Generally'. All excavation beneath the backdrop pipe and its surround must be replaced with concrete.

## 570 FLEXIBLE COUPLINGS

- To BS EN 295-4, WIS 4-41-01, or Agreement certified.
- Manufacturer and reference(s): Flex-Seal Couplings Ltd
- Ensure that the ends of pipes to be joined are cleanly cut and square.
- Ensure that outer surfaces of pipes to be joined are clean and smooth. Where necessary, e.g. on concrete or iron pipes, smooth out mould lines and/or apply a cement grout over the sealing area.
- Clamping bands: Tighten carefully to make gastight and watertight seals.

## 580 ROOT BARRIER

- Manufacturer and reference: Terram Root Guard or similar approved;
- Install in accordance with the manufacturer's recommendations
- To be installed around all below ground drainage that is located below any tree root zone or within 0.5m of any landscaped surface.

# TERMINAL/ACCESS FITTINGS

## 609 DRAIN POINT

- Manufacturer and reference: Vitrified Clay - Hepworth Code RBR1 or RBR2; Cast Iron to BS 437, and Kitemark certified, or Agreement certified.
- Drains cast in or through structural foundations - Timesaver Code TD15 Code 191244 or 191245
- Outlet size: DN100, DN150
- Install in accordance with manufacturer's recommendations
- Bed and surround with minimum 150mm concrete

## 618 PLANT ROOM TRAPPED GULLY

- Manufacturer and reference: Wade, product code G304 'S' trapped gully with removable grate, product code Wade L2104 or equal approved
- Install in accordance with manufacturer's recommendations
- Bed and surround with minimum 150mm concrete to R12/106 or structural concrete

## 619 SERVICE AREA TRAPPED GULLY (Open Refuse Stores/Plant Room) WITH ODOUR STOP

- Manufacturer and reference: Blucher Drain 155mmø with vertical outlet. Product code: 250.300.110. Floor Finishes to architects details.
- Grating: To be specified by Architect.
- Odour Stop Product Code: 503.001.110
- Removable Trap: Blucher Stainless Steel Water Trap product code: 502.052.110
- Install in accordance with manufacturer's recommendations
- Bed and surround with minimum 150mm concrete to R12/106 or structural concrete

## 617 GARAGE GULLY

- Standards: Cast iron: To BS 437 and Kitemark certified, or Agreement certified.
- Material: Cast Iron
- Manufacturer: St Gobain Timesaver TD551 or similar approved
- Outlet sizes: DN100
- Covers: Timesaver BS heavy grading TD651 – Maximum load 7.5 tonnes
- Accessories: Galvanised sediment pan (00670) and Raising pieces (TD678) where required and specified.
- Install in accordance with manufacturer's recommendations
- Bed and surround: Concrete to structural engineer's details.

## 641 CONNECTORS

- Material and standard: Plastics to BS 4660 and Kitemark certified.
- Manufacturer and reference: Hepworth or similar approved.

## 680 MANUFACTURE

- Obtain each complete assembly of fittings, traps, etc., including appropriate couplings, from the same manufacturer, and check compatibility of components with each other and with the pipe system.

## 690 INSTALLATION OF FITTINGS

- Set fittings square with and tightly jointed to adjacent construction as appropriate. If open to doubt obtain instructions.
- Bed and surround fittings, traps, etc. in concrete, 150 mm thick, mix as specified under Generally.
- Permissible deviation in level of gully gratings to be +0 to - 10 mm,
- Fit purpose made temporary caps over exposed openings in fittings and protect from site traffic.

# MANHOLES/CHAMBERS/SOAKAWAYS/TANKS/FLOW CONTROL DEVICES

## 710 CAST IRON ACCESS CHAMBERS

- Standards: BS 437, Kitemark Certified
- Material: Cast Iron
- Manufacturer and reference: St Gobain Timesaver TD14, TD17 or similar approved
- Outlet size: DN100, DN150, DN225.
- Surround: To be installed within void in structural slab to structural engineer's specification, Benching to be ST4 concrete fill with Highstrength (granolithic) concrete topping to Clause R12/106.
- Install in accordance with manufacturer's recommendations
- Accessories: Unused branch arms to be blanked off using TD34 blank end with TD01 coupling.

## 720 CONCRETE MANHOLES UP TO 3 METRES DEEP

- Standards: BS EN 1917 and BS 5911-3, Kitemark certified, all components from the same manufacturer
- Material: Precast Concrete
- Manufacturer and reference: FP McCann (Circular) or similar
- Bases: 225 mm thick plain concrete, mix as specified under Generally or to structural engineer's specification if chamber within structural slab.
- Cement type: OPC, but refer to Site Investigation Reports for any sulphate requirements.
- Chamber ring sizes: DN900, DN1050, DN1200,
- Rectangular chamber sizes: 600x450, 750x600, 1000x675, 1200x750
- Cover slabs: Heavy Duty Cover Slabs with openings to suit required access.
- Joints: Mortar for surface water manholes, Tokstrip for all foul and combined water manholes
- Steps: Double class 1 to BS EN 13101, Galvanized mild steel and plastic encapsulated steps are preferred. Bed in joints to all chambers over 900mm deep at 250mm vertical centres staggered 300mm horizontally, with lowest step not more than 300mm above benching and top step not more than 675mm below top of cover.
- Surround: insitu concrete 150 mm minimum thickness, mix as specified to Clause R12/106 or to structural engineer's specification if chamber within structural slab.
- Channels, branches and benching: Vitrified clay half round channel with ¾ section bends with high strength concrete benching with 20mm min wearing screed trowelled smooth.
- Access covers and seating: Shall comply with BS EN 124 and to be of a non-rocking design, bedded in polyester resin bedding mortar. Refer to manhole schedule and Clause R12/811.

## 735 PLASTICS INSPECTION CHAMBERS 600mm POLYPROPYLENE

- Standards: BS EN 13598-1, and Kitemark Certified, or Agreement Certified, all components from the same manufacturer.
- Material: Polypropylene
- Manufacturer and reference: Wavin Range 600 IC E-Base or similar
- Chamber size: DN600
- Pipe diameters required: DN100, DN150, DN225
- Install in accordance with manufacturer's recommendations
- Bedding: In landscaped areas not subject to significant traffic loading, either directly on trench bottom, on 150mm granular pipe bedding material. In paved areas subject to vehicle loading

150mm concrete class FND3 to Clause R12/106. To structural engineer's specification if chamber within structural slab.

- Surround: In paved areas, subject to vehicle loading, 150mm concrete class FND3 to Clause R12/106. In landscaped areas use selected backfill packed and rammed uniformly around chamber. To structural engineer's specification if chamber within structural slab.
- Concrete collar: Provided collar 150mm thick in FND3 class concrete to Clause R12/106 where no concrete bed and surround is required to form solid bed for the access cover etc. or to structural engineer's specification if chamber within structural slab.
- Access covers and seating: Shall comply with BS EN 124 and to be of a non-rocking design, bedded in polyester resin bedding mortar. Refer to manhole schedule and Clause R12/811.
- Accessories: Restriction access cap for all chambers deeper than 1.2m. Pipe connector kit and adaptors as required.

## 736 PLASTICS SLIT TRAP CHAMBERS 600mm POLYPROPYLENE

- Standards: BS EN 13598-1, and Kitemark Certified, or Agreement Certified, all components from the same manufacturer.
- Material: Polypropylene
- Manufacturer and reference: RIDGISTORMSeparate or similar
- Chamber size: DN600
- Pipe diameters required: DN100, DN150, DN225
- Install in accordance with manufacturer's recommendations
- Bedding: In landscaped areas not subject to significant traffic loading, either directly on trench bottom, on 150mm granular pipe bedding material. In paved areas subject to vehicle loading 150mm concrete class FND3 to Clause R12/106. To structural engineer's specification if chamber within structural slab.
- Surround: In paved areas, subject to vehicle loading, 150mm concrete class FND3 to Clause R12/106. In landscaped areas use selected backfill packed and rammed uniformly around chamber. To structural engineer's specification if chamber within structural slab.
- Concrete collar: Provided collar 150mm thick in FND3 class concrete to Clause R12/106 where no concrete bed and surround is required to form solid bed for the access cover etc. or to structural engineer's specification if chamber within structural slab.
- Access covers and seating: Shall comply with BS EN 124 and to be of a non-rocking design, bedded in polyester resin bedding mortar. Refer to manhole schedule and Clause R12/811.
- Accessories: Restriction access cap for all chambers deeper than 1.2m. Pipe connector kit and adaptors as required.

## 740 PLASTICS INSPECTION CHAMBERS 450mm POLYPROPYLENE

- Standards: BS EN 13598-1, and Kitemark Certified, or Agreement Certified, all components from the same manufacturer.
- Material: Polypropylene
- Manufacturer and reference: Wavin Range 450 IC E-Base or similar
- Chamber size: DN450
- Pipe diameters required: DN100, DN150
- Install in accordance with manufacturer's recommendations
- Bedding: In landscaped areas not subject to significant traffic loading, either directly on trench bottom, on 150mm granular pipe bedding material. In paved areas subject to vehicle loading

150mm concrete class FND3 to Clause R12/106. To structural engineer's specification if chamber within structural slab.

- Surround: In paved areas, subject to vehicle loading, 150mm concrete class FND3 to Clause R12/106. In landscaped areas use selected backfill packed and rammed uniformly around chamber. To structural engineer's specification if chamber within structural slab.
- Concrete collar: Provided collar 150mm thick in FND3 class concrete to Clause R12/106 where no concrete bed and surround is required to form solid bed for the access cover etc. or to structural engineer's specification if chamber within structural slab.
- Access covers and seating: Shall comply with BS EN 124 and to be of a non-rocking design, bedded in polyester resin bedding mortar. Refer to manhole schedule and Clause R12/811.
- Accessories: Restriction access cap for all chambers deeper than 1.2m. Pipe connector kit and adaptors as required.

## 745 PLASTICS INSPECTION CHAMBERS 500mm POLYPROPYLENE CATCH PIT

- Standards: BS EN 13598-1, and Kitemark Certified, or Agreement Certified, all components from the same manufacturer.
- Material: Polypropylene
- Manufacturer and reference: Wavin AquaCell Silt Trap BK 500x1250 or similar
- Chamber size: DN500
- Pipe diameters required: DN100, DN150
- Install in accordance with manufacturer's recommendations
- Bedding: In landscaped areas not subject to significant traffic loading, either directly on trench bottom, on 150mm granular pipe bedding material. In paved areas subject to vehicle loading 150mm concrete class FND3 to Clause R12/106. To structural engineer's specification if chamber within structural slab.
- Surround: In paved areas, subject to vehicle loading, 150mm concrete class FND3 to Clause R12/106. In landscaped areas use selected backfill packed and rammed uniformly around chamber. To structural engineer's specification if chamber within structural slab.
- Concrete collar: Provided collar 150mm thick in FND3 class concrete to Clause R12/106 where no concrete bed and surround is required to form solid bed for the access cover etc. or to structural engineer's specification if chamber within structural slab.
- Access covers and seating: Shall comply with BS EN 124 and to be of a non-rocking design, bedded in polyester resin bedding mortar. Refer to manhole schedule and Clause R12/811.
- Accessories: Restriction access cap for all chambers deeper than 1.2m. Pipe connector kit and adaptors as required.

## 760 CONVENTIONAL CHANNEL(S), BRANCHES AND BENCHING

- Bed main channel solid in 1:3 cement:sand mortar.
- Connect branches to channel, preferably at half pipe level, so that discharge flows smoothly in direction of main flow. Connect branches greater than nominal size 150mm with the soffit level with that of the main drain. Where the connecting angle is more than 45 degrees to direction of flow use three-quarter section channel bends.
- Use clips or ensure adequate mechanical key when bedding plastics channels on to mortar.
- Form benching in concrete, mix as specified under 'Generally', to rise vertically from top of main channel to a level not lower than soffit of outlet pipe, then slope upwards at 10% to walls. Within 3 hours float with coat of 1:3 cement:sand mortar and finish smooth with steel trowel

## 785 FLOW CONTROL CHAMBER – Hydrobrake Control

- Material: Stainless Steel
- Manufacturer and reference: Hydro International Hydrobrake Optimum
- Number: 2 no. units

| MH NO. | FLOW RATE | DESIGN HEAD | OUTLET DIA. |
|---|---|---|---|
| SWMH 27 | 7.5l/s | 0.80m | DN225 |
| SWMH 20 | 12l/s | 1.357m | DN225 |

- Install in accordance with manufacturer's recommendations

## 811W ACCESS COVERS AND SEATINGS

- Standards: Galvanised Steel to BS EN ISO 1461, Cast Iron Kitemark certified
- Covers: To BS EN 124, where applicable.
- Seating: Make up in engineering bricks to BS 3921 or in-situ concrete

| TYPE OF COVER | LOADING CAT. | CLEAR OPENING | MANUFACTURER AND REFERENCE |
|---|---|---|---|
| Internal solid cover, double sealed, lockable | C250 | 450x450 | Manhole Covers MHC-9123/DS |
| Internal solid cover, double sealed, lockable | C250 | 600x600 | Manhole Covers MHC-9125/DS |
| Internal recessed cover, lockable | FACTA AAA | 600x600 | Manhole Covers MHC-7125 |
| Internal recessed cover, lockable | FACTA AAA | 450x450 | Manhole Covers MHC-7123 |
| External recessed cover, lockable | C250 | 450x450 | Steelway Fig6333/450450/DS |
| External recessed cover, lockable | C250<br>D400 | 600x600 | Steelway Fig6333/600600/DS |
| External recessed cover, lockable | C250<br>D400 | 750x750 | Steelway Fig6333/750750/DS |
| Internal recessed cover, lockable | FACTA AAA | 900x750 | Manhole Covers MHC-7131/DSL/SSE |
| Internal recessed cover, lockable | FACTA AAA | 900x900 | Manhole Covers MHC-7132/DSL/SSE |

- Class B, laid in 1:3 cement:sand mortar
- Bed and haunch frame solidly in 1:3 cement:sand mortar over its whole base area, centrally over opening, top level and square with joints in surrounding finishes. Cut back top of haunching to 30mm below top of surface material.
- Refer to Manholes and Inspection Chambers schedule drawing for appropriate location
- Architect to confirm whether recessed covers are required or whether they are required in all areas.

## 835 LIFTING KEYS

- Provide suitable lifting keys for each type of access cover and hand over to the Employer at Practical Completion.

## 861W CONNECTIONS TO SEWERS

- Connect new pipework to existing adopted sewer(s) to the requirements of the Sewerage Undertaker or its agent.

# CLEANING/TESTING/INSPECTION

## 900 CLEANING

- Preparation: Lift covers to manholes, inspection chambers and access points. Remove mortar droppings, debris and loose wrappings.
- Flush out the whole of the installation with water to remove all silt and debris before final testing, before CCTV inspection if specified and immediately before handover.
- Safely dispose of washings and any detritus without discharging them into sewers or watercourses.
- Covers: Securely replace after cleaning and testing.

## 910 TESTING/INSPECTION GENERALLY

- Give CA advance notice to allow the opportunity to attend all tests and inspections.
- Give the Statutory Authority appropriate notice to enable pipelines to be inspected and tested as required.
- Provide water, assistance and apparatus as required.
- All lengths of drain, manholes and inspection chambers must pass the tests specified. If permitted test loss or infiltration is exceeded, remedy defect(s) before re-testing after an appropriate period.
- Note: where permanent sumps and pumps form part of a drainage system, waste water used for testing must not be conveyed nor discharged in to these chambers, if such instances occur, all effected sumps, pumps, valves and discharge pipelines shall be fully emptied of all debris, flushed/cleaned and verified free of waste matter and fit for purpose.

## 915 PIPE PROFILE

- Check pipeline profile to BS 8000-14 paragraph 5.1.4.2.

## 920 TESTING GRAVITY DRAINS AND SEWERS

- Before testing:
- Cement mortar jointing: Leave 24 h.
- Solvent welded pipelines: Leave 1 h.
- To ensure that all pipelines are sound and properly installed, air test short lengths to BS 8000-14, paragraph 5.1.4.4 immediately after completion of bedding/surround.
- For final checking and statutory authority approval, water test to BS 8000-14, clause 5.1.4.3 all lengths of pipeline from terminals and connections to manholes/chambers and between manholes/chambers.

## 940 WATER TESTING OF MANHOLES/INSPECTION CHAMBERS

- Before backfilling test each manhole or chamber in accordance with BS 8000-14, clause 5.1.4.5 for:
- Exfiltration: Drop in water level to be not more than relevant dimension in Table 2.
- Infiltration: Inflow to be not more than 5 litres per hour per manhole.

## 970 CCTV INSPECTION PIPELINES

- After practical completion and before practical completion of the drainage installation, carry out and record in a written illustrated report, internal inspection of all underground/underslab drainage with CCTV equipment.
- Provide all necessary equipment, including suitable covered accommodation for viewing monitor screen, together with personnel experienced in operation of the equipment and interpretation of the results.
- Ensure that adequate intensity of illumination within pipe(s) is maintained. Provide for continual position recording, still photographs and stopping movement of the camera at any point requested by CA. if present at the inspection, or at any point where the condition is suspect.
- Provide copy of DVD recording and the report to CA.
- Obtain instructions from CA on remedying any defects which may be revealed.

Nestle Avenue, Hayes

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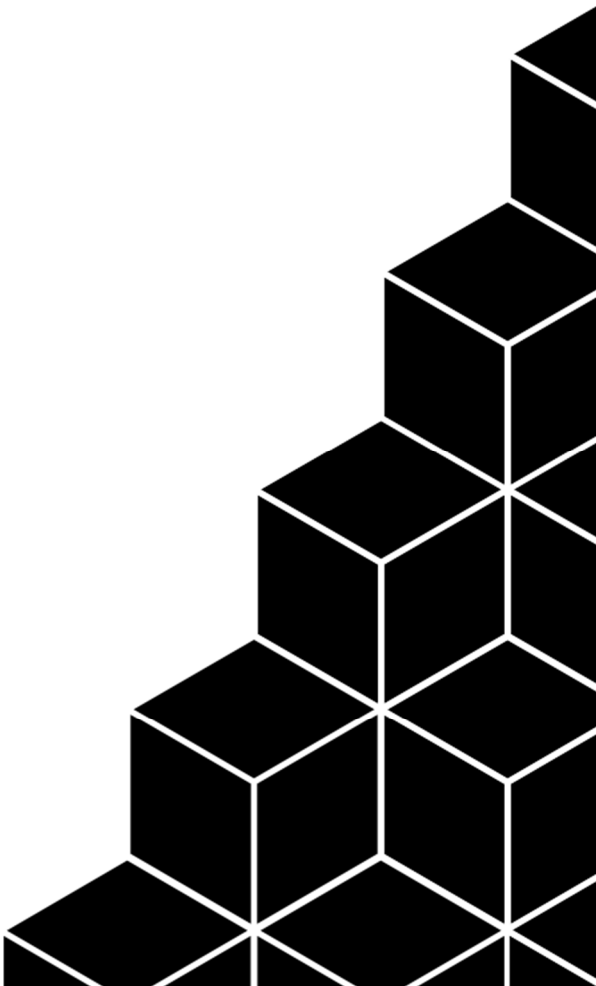

# Appendix G

## Landscape Levels Drawings for Exceedance Flow Paths

GENERAL KEY

SITE BOUNDARY

OWNERSHIP BOUNDARY

LEVELS

31.530 — PROPOSED SPOT LEVEL

FFL 31.600 — PROPOSED FINISH FLOOR LEVEL

TOP 31.534 BOP 31.613 — PROPOSED TOP AND BOTTOM OF PLANTER LEVELS

TOK 31.925 BOK 31.800 — PROPOSED TOP AND BOTTOM OF KERB LEVELS

SL 35.800 — PROPOSED SOIL LEVEL

TOS 35.750 — PROPOSED TOP OF STEPS LEVEL

BOS 35.350 — PROPOSED BOTTOM OF STEPS LEVEL

1:25 — PROPOSED GRADIENT

PROPOSED FOLD LINE

31.64 — EXISTING SPOT LEVEL

TOK 31.52 BOK 31.41 — EXISTING TOP AND BOTTOM OF KERB LEVELS

DRAINAGE

DRAINAGE TYPE DT01: LINEAR DRAINAGE TO CAR ACCESSIBLE AREAS
MARSHALLS BIRCO WITH 6MM HEELSURE CAST IRON GRATE
SIZE : TBD; COLOUR : AS SUPPLIED

DRAINAGE TYPE DT02: LINEAR DRAINAGE TO CAR AND PEDESTRIAN ACCESSIBLE AREAS
MARSHALLS DREXUS SLOT DRAIN DUO
SIZE : 160MM CHANNEL WIDTH; COLOUR : AS SUPPLIED

Double Stacker

Cycle Store
87 m², 940 ft²

Substation
27 m², 290 ft²

A3
17 m², 190 ft²

Refuse Store
14 m², 150 ft²

A3
212 m², 2280 ft²

Lobby
29 m², 310 ft²

Work Space
122 m², 1320 ft²

Comms
10 m², 110 ft²

Lobby
26 m², 280 ft²

Cycle Store
90 m², 970 ft²

4 NO. SOLO MOTOR CYCLES

REFER TO DRAWING REFERENCE 2044-EXA-ZZ-00-DR-L-00303

REFER TO DRAWING REFERENCE 2044-EXA-ZZ-00-DR-L-00302

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P:\LONDON PROJECTS\2020\2044 HAYES HARLINGTON, CROSSRAIL\01 CAD\02 SHEET LAYOUT\STAGE3+\2044-EXA-ZZ-00-DR-L-00301.DWG


EXTERIOR ARCHITECTURE

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Client
ZX (NESTLES SQUARE) LIMITED



| Rev | Description | Date |
|---|---|---|
| B | STAGE 3+ MINOR AMENDMENTS | 24.09.2021 |
| A | STAGE 3+ SUBMISSION | 17.09.2021 |

Project title
233-236 Nestles Avenue

Drawing title
GF LANDSCAPE LEVELS PLAN - SHEET 01

| | | | |
|---|---|---|---|
| Issued By | London | T: 020 7978 2101 | |
| Scale | 1:250 @ A1 | Drawn | EXA |
| Status | STAGE 3 + | Checked | PW |
| Date | 17.09.2021 | Approved | SM |

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B