A1 - Do not scale

Key :

- Site Boundary
- Thames Water Storm Sewer
- Thames Water Foul Sewer
- 3m offset from Thames Water Assets
- Storm Water Carrier Pipe
- Storm Water Perforated Collector Pipe Permeable & Cellular Pavement
- Foul Water Carrier Pipe
- Storm Water Manhole
- Catchpit
- Foul Water Manhole
- Rodding Eye
- Storm Water Linear Channel
- Storm Water Gully
- Storm Water Storage Tank
- Storm Water Storage Tank Access
- Storm Water Infiltration trench to Tank
- Permeable Pavement
- Cellular Grassed Paving (Lined unless otherwise noted)
- Soft Landscaping (As per Landscape Architect's design)

Connections from fuel store roof and area
Connections from substation.
Substation drainage by specialist drainage contractor.
Interceptor
Refer to note 11
SBCFS01: 150Ø
SBCFS02: 150Ø
SBCFS03: 150Ø
SBCSS01: 225Ø
SBCSS02: 225Ø
C1
C2
C3 (Outfall 2)
C4
C3 (Outfall 1)
Tank 2
PS Access Tank 2
Tank 4
Tank 3
Permeable Paving
Subbase formation
to locally fall towards
tank 4
Permeable Paving
Subbase formation
to locally fall towards
tank 3
Permeable Paving
Subbase formation
to locally fall towards
FP102
S1
S1.000: 225Ø
S1.001: 225Ø
S1.003: 225Ø
S1.004: 225Ø
S1.005: 300Ø
S1.006: 300Ø
S1.007: 300Ø
S1.008: 375Ø
S2
S3
S4
S5
S6
S7
S8
S10
S2.000: 225Ø
S2.001: 300Ø
S2.002: 300Ø
S2.003: 300Ø
S2.004: 300Ø
PS Access Tank 1 (1)
PS Access Tank 1 (2)
PS Access Tank 3
PS Access Tank 4
S13
SBCB201: 150Ø
SBCB202: 150Ø
SBCB203: 150Ø
SBCB204: 150Ø
C5
PS Access Tank 5 (2)
Tank 5
S3.000: 150Ø
FP102: 150Ø
RE
Permeable Paving
Subbase formation
to locally fall towards
filter drains to north and south
PS Access Tank 5 (1)
S1.009: 375Ø
SBCB101: 200Ø
SBCB205: 150Ø
S14
SBCB209: 150Ø
S11
S1.010: 375Ø
Living / green wall to east facade
RE
S3.001: 225Ø
G1
PS Access Tank 6 (1)
FP103: 150Ø
PS Access Tank 8 (1)
SBCB206: 150Ø
F1
SBCB102: 250Ø
FPC2
(PPIC)
SBC201: 150Ø
Tank 12
C6
PS Access Tank 6 (2)
SBCB210: 150Ø
F1.000: 150Ø
Tank 6
Permeable Paving
Subbase to step
under landscaping and drain
into carriageway subbase.
Tank 8
G2
S1.011: 375Ø
Living / green wall to south facade
SBCB104: 375Ø
Connection from rainwater harvesting
tank overflow in Building 1.
Tank to be 35m3 dedicated
to meet 100% WC flushing
requirements under normal
seasonal conditions.
S3.001A: 225Ø
F2
FBCB101: 150Ø
FP104: 150Ø
S14A
SBCB211: 150Ø
SBCB207: 150Ø
S12
S1.012: 375Ø
Permeable Paving
Subbase to step
under landscaping and drain
into carriageway subbase.
FPC3
(PPIC)
Tank 8A
S3.002: 225Ø
SBCB103: 250Ø
PS Access Tank 7 (1)
PS Access Tank 7 (2)
C8A
C8
Tank 12
S4.001: 150Ø
S22
S21
S1.017: 525Ø
S23
S5.000: 150Ø
SBCB212: 150Ø
FP205: 150Ø
SBCB213: 150Ø
S15
S1.016: 525Ø
S1.018: 525Ø
G5
PS Access Tank 9
RE
SBC203: 150Ø
C12
SBCB214: 150Ø
C13
S1.020: 300Ø
S25
G4
(Chute Only)
C11
Tank 7
C7
F1.001: 150Ø
Non return valve
S1.021: 300Ø
FPC1
S3.003: 225Ø
F3
F2.000: 100Ø
F4
F2.001: 150Ø
S1.013: 375Ø
S1.014: 500Ø
F5
C14
S24
1 to 30 year = 7.5 l/s
30 to 100+40%CC = 20.3 l/s
FP206: 150Ø
S16
Tank 9
S3.005: 300Ø
S3.006: 300Ø
Tank 11
PS Access Tank 11 (1)
PS Access Tank 12
S1.019: 300Ø
S3.004: 300Ø
PS Access Tank 10 (1)
S3.008: 375Ø
S19
S20
S1.015: 525Ø
S18
RE
FP101: 150Ø
Interceptor
Refer to note 11
S17
S3.007: 300Ø
SBCGHB1: 150Ø
Tank 10
G3
Reuse existing
outfall to Thames
Water sewer
PS Access Tank 10 (3)
PS Access Tank 10 (2)
Entrance area to match existing
with line from back of footway
falling towards bullsbrook road
and area to north to fall into the
site.
Footway to drain to localised landscaping / planters

Notes:

1. Existing drainage information taken from Cat Surveys Survey GPR drawing Rev P04 11/10/21.
2. All filter drains to be Ø150mm unless noted otherwise.
3. All gully leads to be Ø150mm unless noted otherwise.
4. For size of geocellular storage, refer to drainage schedules.
5. A Pre-Planning Enquiry response has been received from Thames Water Ltd confirming acceptance in principle to the site discharge to their sewers. Contractor to apply for consent to discharge.
6. All covers within trafficked areas to be Grade D400.
7. This drawing is to be read in conjunction with:
   - 7.1. Drainage Schedules DCS20109-ARUP-PL-ZZ-XX-DR-C-52700
   - 7.2. Drainage Details DCS20109-ARUP-PL-ZZ-XX-DR-C-52500 to 52503.
8. Drainage layout and tank sizes subject to further coordination as detail design of other utilities is progressed.
9. Tanks to be procured by the contractor and designed by manufacturer including access and venting arrangements. Polystorm Xtra or similar approved.
10. Interceptor to be Class 1 Full Retention with high level alarm. SPEL Puraceptor or similar approved.
11. Signage and public realm furniture foundations to be positioned out with the line of the drainage infrastructure. Where foundations require locating in proximity to the line of the Thames Water drainage infrastructure the contractor is to coordinate with Thames Water.
12. Contractor to coordinate with Thames Water to gain relevant approvals and agree any asset protection requirements.
13. Refer to the drainage strategy report (DCS20109-ARUP-DC-XX-XX-RP-C-52001) and the Architects / Landscape Architect's plans and details for green roof locations and information.

Rev	Details	By / Chkd / App	Date
P02	Planning Submission Update	LD / CH / GM	06 / 06 / 22
P01	Planning Submission	JT / CH / GM	15 / 10 / 21

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Project Title
London 4

Drawing Title
Site Plan
Underground Drainage

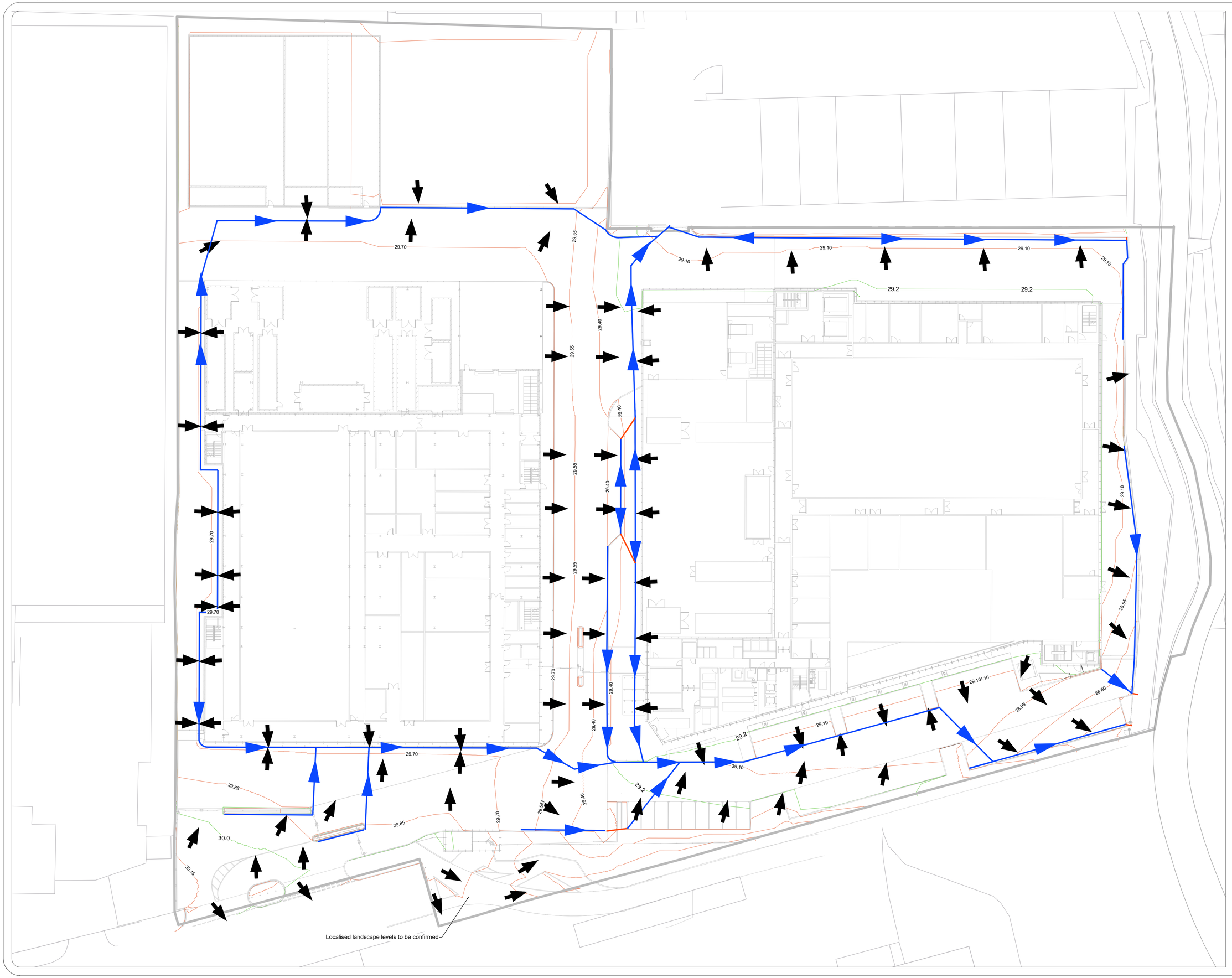
Project Status
PLANNING

Discipline	Status Code
Civil - Drainage	S4

Project Number	Scale @ A1	Revision
281528	1:300	P02

Drawing Number
DCS20109-ARUP-PL-ZZ-LP-DR-C-52200
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

A1 - Do not scale



Notes:

1. Flow routes based upon Architect layout from February 2022.
2. Existing levels have been taken from CatSurveys Topographical survey Information provided 11/10/21.
3. This drawing is to be read in conjunction with Drainage Layout DCS20109-ARUP-PL-ZZ-XX-DR-C-52200

Key :

- Site Boundary
- Proposed direction of ground fall
- Proposed watershed route
- Proposed watershed route of water overtopping a kerb or low point
- 29.1 Proposed Contours (m AOD)

Rev	Details	By / Chkd / App	Date
P02	Planning Submission Update	LD / CH / GM	06 / 06 / 22
P01	Planning Submission	JT / CH / GM	15 / 10 / 21

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Project Title

London 4

Drawing Title

Exceedance Flow Routes

Project Status

PLANNING

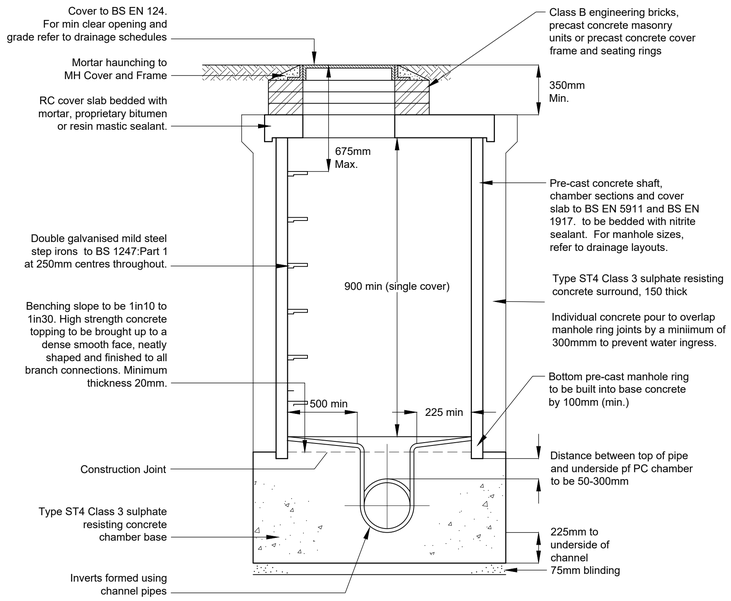
Discipline	Status Code
Civil - Drainage	S4

Project Number	Scale @ A1	Revision
281528	1:300	P02

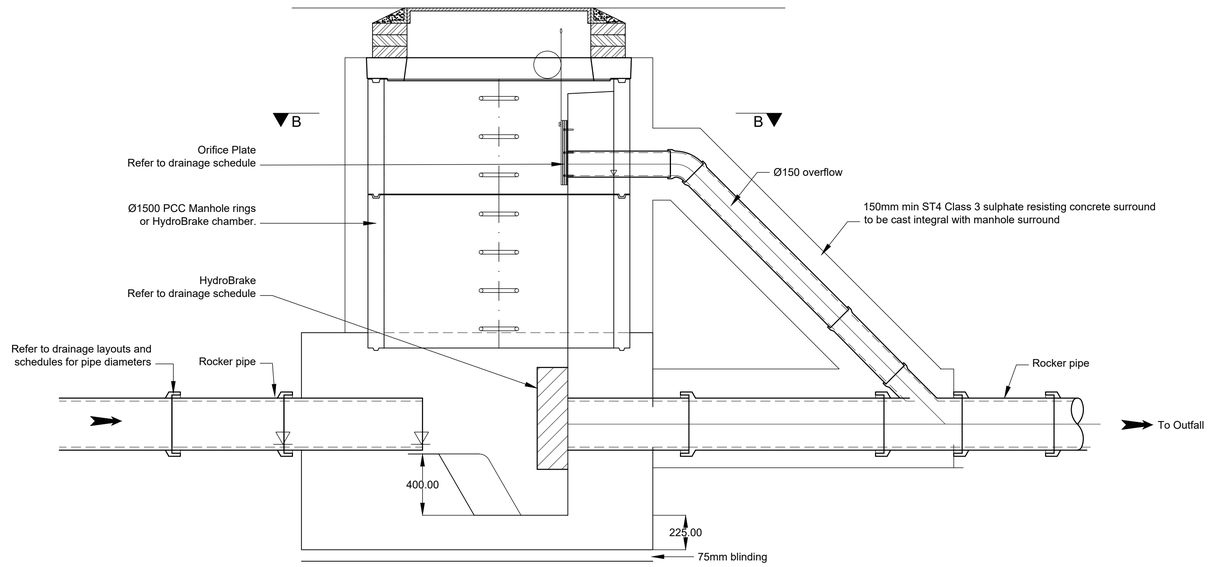
Drawing Number

DCS20109-ARUP-PL-ZZ-LP-DR-C-52201

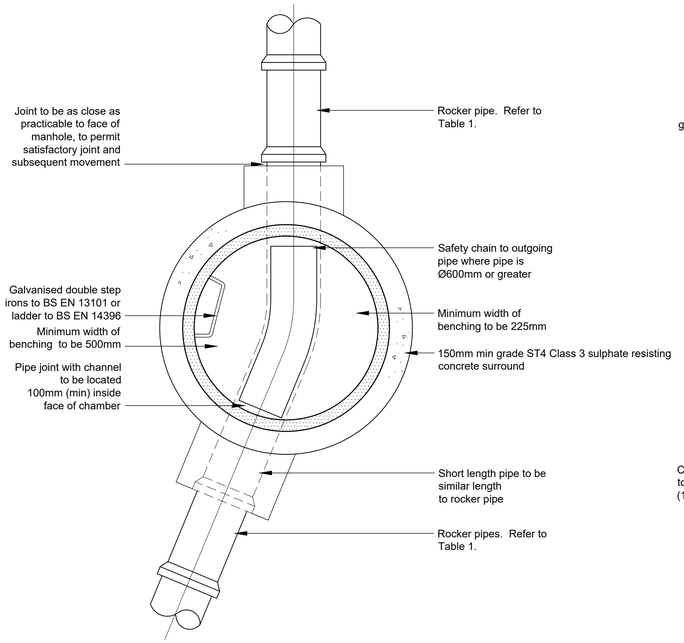
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number



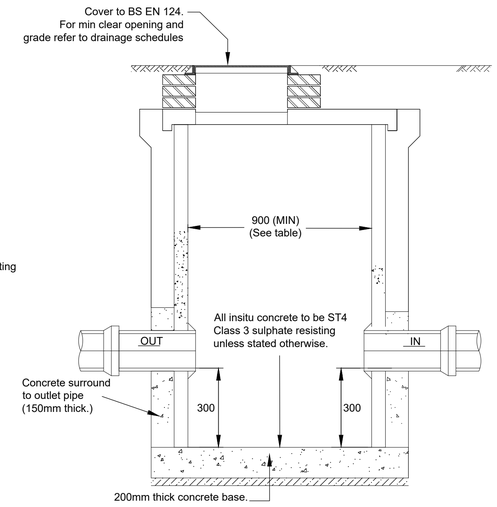
Type B PCC Manhole - Maximum depth from to soffit from cover 3m
Typical Detail - Section



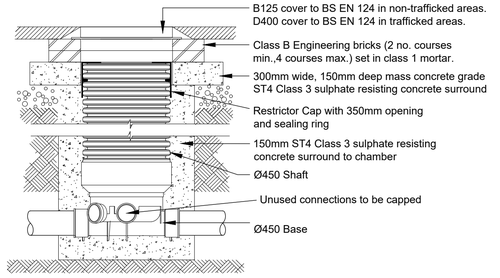
Control Chamber - Section



Type B PCC Manhole - Maximum depth from to soffit from cover 3m
Typical Detail - Plan



Typical Catchpit Detail



Reduced Access PPIC
Typical Detail

Diameter of pipe (mm)	Length of rocker pipe (mm)
150 - 600 600 - 750 > 750	600 1000 1250

TABLE 1 Rocker Pipe Lengths

Depth to pipe soffit (mm)	Diameter of largest pipe DN (mm)	Min internal diameter of manhole (mm)	Min clear opening size (mm)
< 1500	150 225 300 > 300	1200 1200 1200 Larger of 1800 or DN+450	750 x 675 1200 x 675
> 1500	225 300 375-450 > 450	1200 1200 1200 Larger of 1800 or DN+775	600 x 600
Manhole Shaft > 3000	Steps Ladder Winch	1050 1200 900	600 x 600

TABLE 2 Minimum chamber dimensions

Notes

1. All dimensions are in millimeters (mm) and all levels are in meters (m) Above Ordnance Datum (AOD) unless otherwise stated.
2. Cover and invert levels of existing manholes and pipes to be confirmed prior to commencement of construction.
3. All drainage <300mm to be HDPE. All drainage ≥300mm to be concrete.
4. All pipes and manholes to have Nitrile Seals
5. All covers within trafficked areas to be Grade D400. All other covers to be Grade B125.
6. Minimum clear openings to BS EN 752 as shown on Table 2 on DCS20109-ARUP-PL-ZZ-XX-DR-C-52500
7. Drainage to be laid, bedded and backfilled in accordance with manufacturer's recommendations.
8. Pipes with less than 900mm cover in areas not subjected to vehicular loading to be concrete protected. Pipes with less than 1200mm cover in areas subjected to vehicular loading to be concrete protected.
9. Interceptors to be Class 1 Full Retention separators with high level alarm, SPEL Puraceptor or similar approved. For standard details refer to spelproducts.co.uk.
10. Surface Water Tanks to be procured by the contractor and designed by manufacturer including access and venting arrangements. Polystorm Xtra or similar approved. For standard details refer to PSM series available on Polystorm.com
11. This drawing is to be read in conjunction with:
    - Drainage Layout DCS20109-ARUP-PL-ZZ-LP-DR-C-52200
    - Drainage Schedule DCS20109-ARUP-PL-ZZ-LP-DR-C-52700
    - Drainage Details DCS20109-ARUP-PL-ZZ-XX-DR-C-52500 to 52503

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Project Title

London 4, Hayes

Drawing Title

Underground Drainage Details
Sheet 1 of 3

Project Status

Planning

Discipline	Status Code
Civil - Drainage	**S4**

Project Number	Scale @ A1	Revision
281528	**NTS**	**P02**

Drawing Number

DCS20109-ARUP-PL-ZZ-XX-DR-C-52500

Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

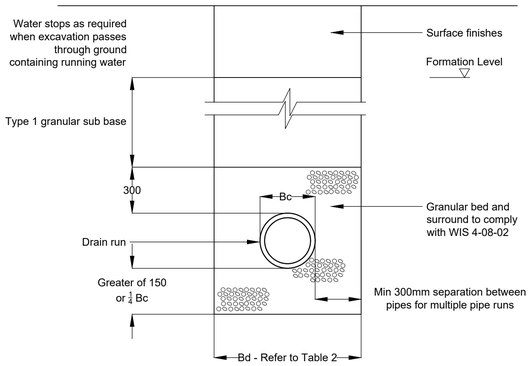
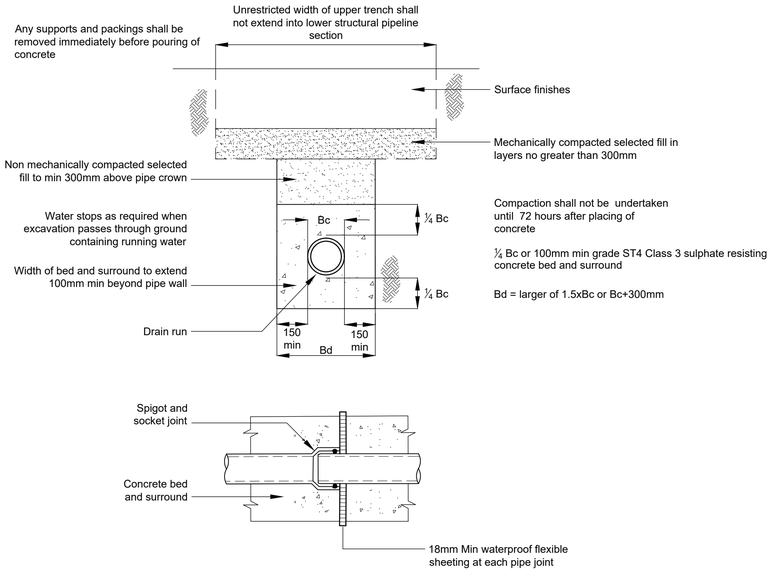


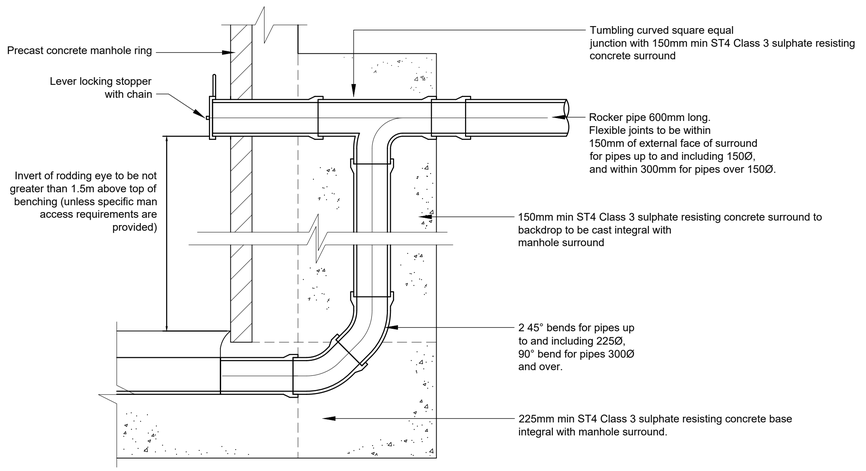
Table 1 - Granular Bed and Surround	
Pipe Diameter (mm)	Aggregate
150	10mm or 14mm single size or 14mm to 5mm graded
225-525	14mm or 20mm single size or 20mm to 5mm graded or 14mm to 5mm graded
1200	10,14,2mm or 40mm single size or 40mm to 5mm graded or 20mm to 5mm graded or 14mm to 5mm graded.

Table 2 - Trench Width (Bd)	
Pipe Diameter (mm)	Recommended Trench Width (mm)
150	600
225	700
300	750
375	1050
450	1150
500	1200
525	1200

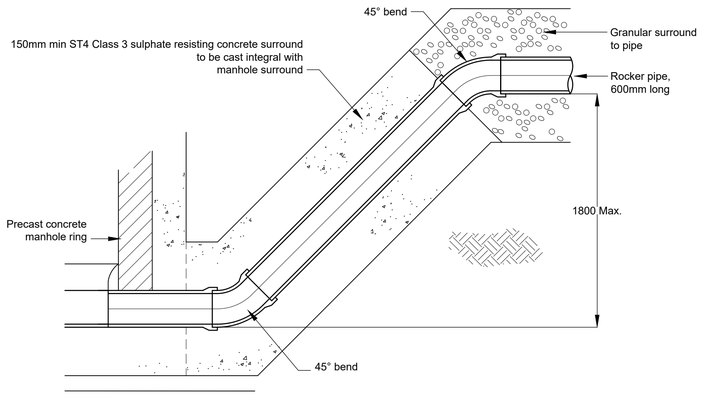
Class S Pipe Bed and Surround



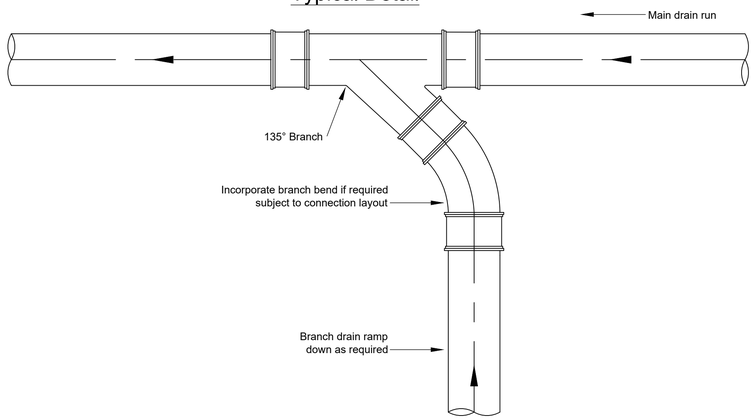
Unreinforced Concrete Bed and Surround



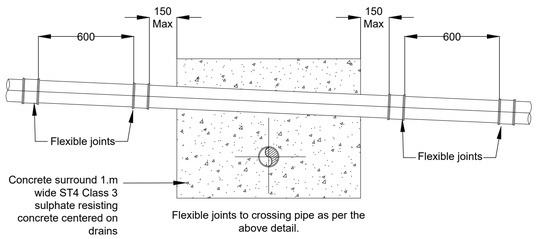
External Backdrop Typical Detail



Drainage Ramp Typical Detail



Typical External Drainage Branch Connection



Drain Crossing with less than 300mm clearance

Notes

1. All dimensions are in millimeters (mm) and all levels are in meters (m) Above Ordnance Datum (AOD) unless otherwise stated.
2. Cover and invert levels of existing manholes and pipes to be confirmed prior to commencement of construction.
3. All drainage <300mm to be HDPE. All drainage ≥300mm to be concrete.
4. All pipes and manholes to have Nitrile Seals
5. All covers within trafficked areas to be Grade D400. All other covers to be Grade B125.
6. Minimum clear openings to BS EN 752 as shown on Table 2 on DCS20109-ARUP-PL-ZZ-XX-DR-C-52500
7. Drainage to be laid, bedded and backfilled in accordance with manufacturer's recommendations.
8. Pipes with less than 900mm cover in areas not subjected to vehicular loading to be concrete protected. Pipes with less than 1200mm cover in areas subjected to vehicular loading to be concrete protected.
9. Interceptors to be Class 1 Full Retention separators with high level alarm, SPEL Puraceptor or similar approved. For standard details refer to spelproducts.co.uk.
10. Surface Water Tanks to be procured by the contractor and designed by manufacturer including access and venting arrangements. Polystorm Xtra or similar approved. For standard details refer to PSM series available on Polystorm.com
11. This drawing is to be read in conjunction with:
    - 11.1. Drainage Layout DCS20109-ARUP-PL-ZZ-LP-DR-C-52200
    - 11.2. Drainage Schedule DCS20109-ARUP-PL-ZZ-LP-DR-C-52700
      Drainage Details DCS20109-ARUP-PL-ZZ-XX-DR-C-52500 to 52503

Rev	Details	By / Chkd / App	Date
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P01	Planning Submission	JT / CH / GM	15 / 10 / 21

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Project Title
London 4, Hayes

Drawing Title
Underground Drainage Details
Sheet 2 of 3

Project Status
Planning

Discipline	Status Code
Civil - Drainage	S4

Project Number	Scale @ A1	Revision
281528	NTS	P02

Drawing Number
DCS20109-ARUP-PL-ZZ-XX-DR-C-52501
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number

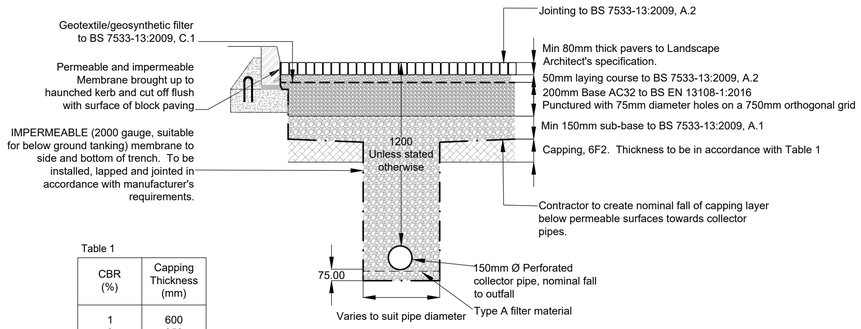
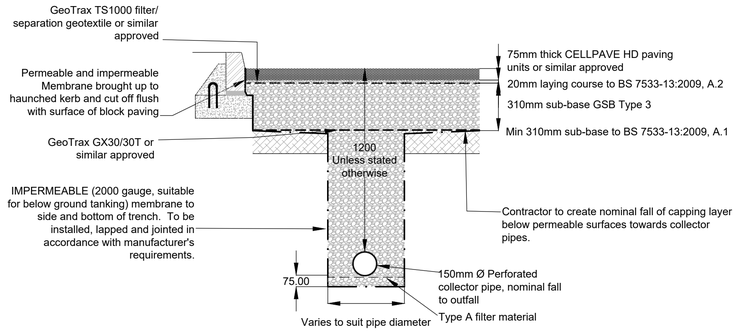


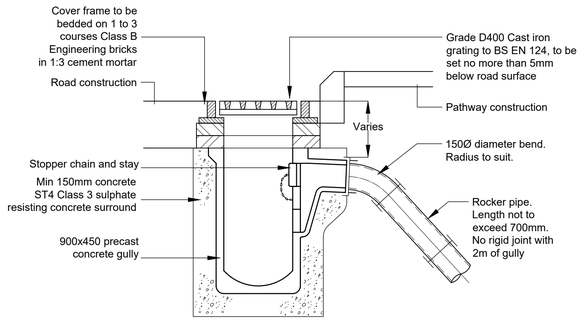
Table 1

CBR (%)	Capping Thickness (mm)
1	600
2	350
3	250
4	200
5+	150

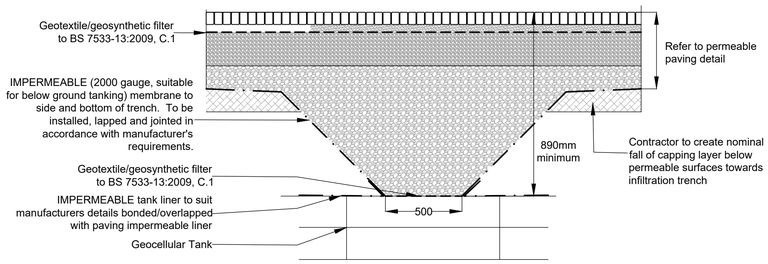
Typical Detail
Permeable Paving & Collector Pipe



Typical Detail
Cellular Grass Paving - Impermeable wilth Collector Pipe



Precast Concrete Highway Gully
Typical Detail

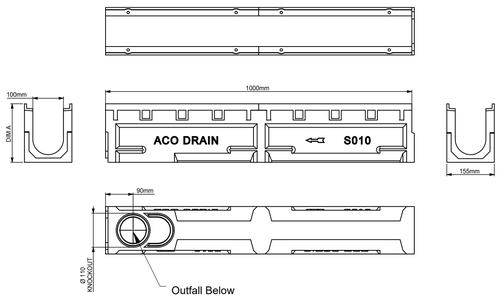


Indicative Detail Permeable Paving
Infiltration Directly To Tank

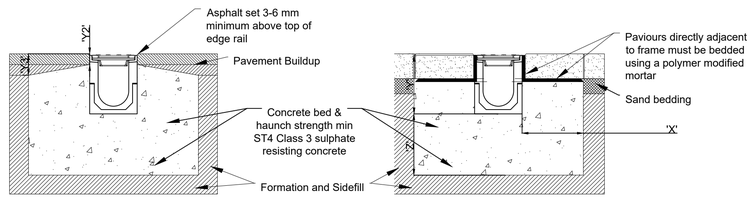
Table 2

CHANNEL	DIM A
S01	137
S010	191
S020	251
S030	311

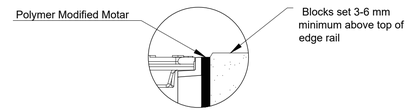
Linear channel details based on ACO S Range, S Range or similar approved



Linear Drainage



Load Class		F 900*
Minimum Dimensions (mm)	X	200
	Y	Full Channel Height (Less Y2 where applicable)
	Z	200
Maximum Dimensions (mm)	Y2	35
	Y3	70



Linear Drainage Surround

Notes

1. All dimensions are in millimeters (mm) and all levels are in meters (m) Above Ordnance Datum (AOD) unless otherwise stated.
2. Cover and invert levels of existing manholes and pipes to be confirmed prior to commencement of construction.
3. All drainage <300mm to be HDPE. All drainage ≥300mm to be concrete.
4. All pipes and manholes to have Nitrile Seals
5. All covers within trafficked areas to be Grade D400. All other covers to be Grade B125.
6. Minimum clear openings to BS EN 752 as shown on Table 2 on DCS20109-ARUP-PL-ZZ-XX-DR-C-52500
7. Drainage to be laid, bedded and backfilled in accordance with manufacturer's recommendations.
8. Pipes with less than 900mm cover in areas not subjected to vehicular loading to be concrete protected. Pipes with less than 1200mm cover in areas subjected to vehicular loading to be concrete protected.
9. Interceptors to be Class 1 Full Retention separators with high level alarm, SPEL Puraceptor or similar approved. For standard details refer to spelproducts.co.uk.
10. Surface Water Tanks to be procured by the contractor and designed by manufacturer including access and venting arrangements. Polystorm Xtra or similar approved. For standard details refer to PSM series available on Polystorm.com
11. This drawing is to be read in conjunction with:
    - Drainage Layout - DCS20109-ARUP-PL-ZZ-LP-DR-C-52200
    - Drainage Schedule DCS20109-ARUP-PL-ZZ-LP-DR-C-52700
    - Drainage Details DCS20109-ARUP-PL-ZZ-XX-DR-C-52500 to 52503

Rev	Details	By / Chkd / App	Date
P02	Planning Submission Update	LD / CH / GM	06 / 06 / 22
P01	Planning Submission	JT / CH / GM	15 / 10 / 21

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Drawing Title
Underground Drainage Details
Sheet 3 of 3

Project Status
Planning

Discipline	Status Code
Civil - Drainage	**S4**

Project Number	Scale @ A1	Revision
281528	**NTS**	**P02**

Drawing Number
DCS20109-ARUP-PL-ZZ-XX-DR-C-52502
Project — Originator — Functional Breakdown — Spatial Breakdown — Level — Form — Discipline — Number