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C3577 – PROPOSED RESIDENTIAL DEVELOPMENT AT DEVERON ROAD, HUNTLY, ABERDEENSHIRE

DRAINAGE IMPACT ASSESSMENT

Revision A – 24/04/2019
Revision B – 03/08/2022

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DRAINAGE IMPACT ASSESSMENT 03/08/2022

1. DEVELOPMENT DESCRIPTION.

The proposed development (OS Grid Ref: 351815E, 840267N) consists of the construction of a 37 No. affordable housing development. The housing will be a mixture of terraced units and flats.

The site is currently undeveloped land. The site is located to the west of Huntly and is bounded by the A96 to the west and the A920 – Deveron Road to the north. An existing access road serving an existing supermarket is located to the south. An existing petrol station is located to the east of the site. The development has an approximate area of 0.74 Hectares.

A copy of Ramsay and Chalmers' drawing C3577/001/- showing the site location plan is included in Appendix 1.

2. CURRENT AND HISTORICAL DRAINAGE PATTERNS.

The site is currently undeveloped land. The site generally falls from a high point located in southeast of the site towards the site boundaries. It is anticipated that the surface water run-off from the site will infiltrate into the natural subsoils.

An existing private infiltration basin is located to the southwest of site.

An unnamed watercourse is located on the opposite side of the A96 trunk road.

A copy of Ramsay and Chalmers drawing C3577/108/A showing the pre-development overland flow routes is included in Appendix 1.

3. SUDS PROVISION.

The proposed development requires that the SUDS measures are designed in accordance with CIRIA C753 : The SUDS Manual.

The levels of treatment for various land uses are now required to be based on the pollution hazard level for any given land use.

The Simple Index Approach is used to assess the requirements for surface water discharge from land uses which are classed as low and medium hazard risks.

		Pollution Hazard Indices		
Land Use	**Hazard Level**	**Suspended Solids**	**Metals**	**Hydrocarbons**
Private Access Roads	Low	0.5	0.4	0.4
Private Car Parking Bays	Low	0.5	0.4	0.4
Residential Roofing	Very Low	0.2	0.2	0.05

Table 1 : Land Use Pollution Hazard Index

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3. SUDS PROVISION (CONT).

The access road and car parking areas are identified to be the worst-case land use hazard level.

		Pollution Hazard Indices		
Component	**Component Description**	**Suspended Solids**	**Metals**	**Hydrocarbons**
1	Porous Paving	0.7	0.6	0.7
2	-	-	-	-
3	-	-	-	-
	Aggregated Surface Water Pollution Mitigation Index	0.7	0.6	0.7

Table 2 : Access Road Component Design (2nd Component Indices Halved)

Sufficiency Of Pollution Mitigation Indices		
Suspended Soils	**Metals**	**Hydrocarbons**
Sufficient	**Sufficient**	**Sufficient**

Table 3 : Sufficiency Of Pollution Mitigation Indices For Access Road

		Pollution Hazard Indices		
Component	**Component Description**	**Suspended Solids**	**Metals**	**Hydrocarbons**
1	Porous Paving	0.7	0.6	0.7
2	-	-	-	-
3	-	-	-	-
	Aggregated Surface Water Pollution Mitigation Index	0.7	0.6	0.7

Table 4 : Car Parking Bays Component Design (2nd Component Indices Halved)

Sufficiency Of Pollution Mitigation Indices		
Suspended Soils	**Metals**	**Hydrocarbons**
Sufficient	**Sufficient**	**Sufficient**

Table 5 : Sufficiency Of Pollution Mitigation Indices For Access Road

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3. SUDS PROVISION (CONT).

Private Access Roads:-

The road water from the proposed private access roads will be collected in trapped gullies or will run into the car parking bays. The gullies will connect to a surface water system and tie into the cellular subbase below the parking spaces.

The surface water will move through the porous paving and into the filter material below. The surface water will be collected and directed to infiltration cells. The water will the infiltrate into the existing sub-soils.

Access Roads => Trapped Gullies / Car Parking Bays => Porous Paving => Infiltration

Car Parking Bays:-

The car parking bays will be surfaced using porous paving.

The surface water will move through the porous paving and into the filter material below. The surface water will be collected and directed to infiltration cells. The water will the infiltrate into the existing sub-soils.

Car Parking Bays => Porous Paving => Infiltration

Residential Roofs:-

The roof water will be collected in private plot drainage. The plot drainage will discharge to the infiltration cells below the porous paving. The water will then infiltrate into the existing sub-soils.

Residential Roofs => Private Plot Drainage => Porous Paving => Infiltration

A copy of Ramsay and Chalmers drawing C3577/103/U showing the proposed drainage scheme is included in Appendix 1.

4. SOIL CLASSIFICATION.

The soil classification for the site is Type 3 as taken from the “Wallingford Maps Volume 3”.

5. SUBSOIL POROSITY.

The site subsoils are suitable for a soakaways to be installed on this site.

A copy of the latest Site Investigation Report is available upon request.

6. PRE & POST DEVELOPMENT PEAK FLOW RUN-OFF.

The surface water will discharge to the existing subsoils via cellular subbase in the car parking areas. This will be in compliance with CIRIA C753.

A preliminary design has been undertaken by R&C to prove that subbase infiltration can be achieved. A specialist design is ‘in progress’ by Polypipe.

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7. DESIGN ATTENUATION.

A preliminary design has been undertaken by R&C to prove that subbase storage and infiltration can be achieved. The attenuation measures are being designed by Polypipe for a specialist subbase cellular product called Polystorm. The Polypipe Engineers will design the cellular subbase for a M200 storm event.

8. WASTEWATER DRAINAGE PROPOSALS.

The wastewater from the development will discharge to an existing Scottish Water foul sewer located on the existing access road serving the existing supermarket.

9. EXISTING TRUNK SEWER INFORMATION.

There is foul sewers located in the vicinity of the proposed development. The surface water sewer is at capacity and cannot be tied into.

A copy of the existing Scottish Water infrastructure plan is located in Appendix 2.

10. FLOODING HISTORY.

No known flooding has occurred on this site.

The unnamed watercourse located on the opposite side of the A96 is shown on SEPA's Flood Map as having the potential to flood during a M200 storm event.

The A96 is at a higher elevation than the area that has the potential to flood during a M200 storm event and that it is anticipated that the proposed development site is unlikely to flood.

11. MAINTENANCE RESPONSIBLITY.

Drainage Item	Maintenance Responsibility
Road Gullies	Aberdeenshire Council Housing
Surface Water Drainage	Aberdeenshire Council Housing
Porous Paving	Aberdeenshire Council Housing
Foul Water Drainage	Aberdeenshire Council Housing
Individual Plot Drainage	Aberdeenshire Council Housing

During construction and prior to Aberdeenshire Council adoption, all drainage infrastructure will remain the responsibility of the developer and be maintained in compliance with the relevant sections of CIRIA SUDS Manual (C753).

12. CONSTRUCTION STAGE SUDS.

The site is to be temporarily bunded. Any fuel storage areas are to be protected against any contamination of ground water. The construction stage SUDS will be evaluated by the Contractor and agreed with SEPA prior to site start.

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13. M200 FLOOD FLOWS.

During a M200 storm event, additional flows which surcharge the proposed drainage system and bypass the proposed gullies will follow the road contours and discharge into the porous paving car parking spaces.

A copy of Ramsay and Chalmers drawing C3577/109/G showing the proposed flow routes is included in Appendix 1.

13. CALCULATIONS.

Total Site Area = 7,400m2

Total Hardstanding Area = 3,800m^2

Infiltration rate = 5.07 E^{-5} m/s

M200 + 40% Subbase Cellular Infiltration Basin Storage Required = 162.610m^3
(Specialist design underway by Polypipe for Polystorm system).

Attenuation Tank Storage required = 307m^3

Please refer to Appendix 3 for full copies of our calculations.

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APPENDIX 1
DRAWINGS

NOT FOR CONSTRUCTION

Project PROPOSED RESIDENTIAL DEVELOPMENT AT DEVERON ROAD, HUNTLY, ABERDEENSHIRE.

Drawing Title
SITE LOCATION PLAN.

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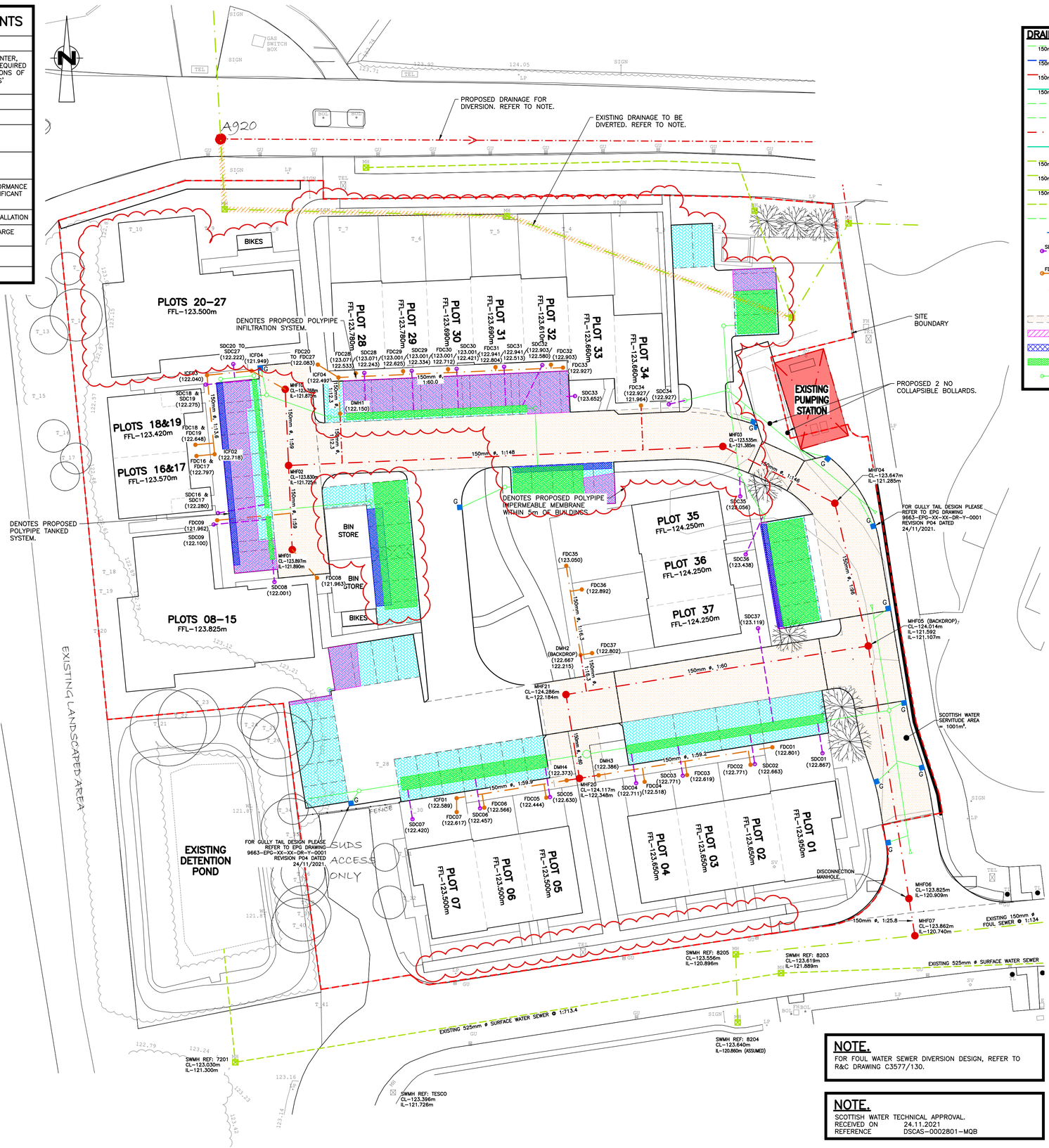
Date.	Job No.
11/05/18	C3577
Scale.	Drawing No.
N.T.S.–A3	001

POROUS BLOCK PAVING OPERATION AND MAINTENANCE REQUIREMENTS

MAINTENANCE SCHEDULE	REQUIRED ACTIONS	FREQUENCY
REGULAR MAINTENANCE	BRUSHING AND VACUUMING	THREE TIMES/YEAR AT END OF WINTER, AFTER AUTUMN LEAF FALL, OR AS REQUIRED BASED ON SITE SPECIFIC OBSERVATIONS OF CLOGGING OR MANUFACTURERS' RECOMMENDATIONS
OCCASIONAL MAINTENANCE	STABILISE AND MOW CONTRIBUTING AND ADJACENT AREAS	AS REQUIRED
	REMOVAL OF WEED	AS REQUIRED
REMEDIAL ACTIONS	REMEDIATE ANY LANDSCAPING WHICH, THROUGH VEGETATION MAINTENANCE OR SOIL SLIP, HAS BEEN RAISED TO WITHIN 50mm OF LEVEL OF THE PAVING	AS REQUIRED
	REMEDIATE ANY LANDSCAPING WHICH, THROUGH VEGETATION MAINTENANCE OR SOIL SLIP, HAS BEEN RAISED TO WITHIN 50mm OF LEVEL OF THE PAVING	AS REQUIRED
	REHABILITATION OF SURFACE AND UPPER SUB-STRUCTURE	AS REQUIRED (IF INFILTRATION PERFORMANCE IS REDUCED AS A RESULT OF SIGNIFICANT CLOGGING)
MONITORING	INITIAL INSPECTION	MONTHLY FOR 3 MONTHS AFTER INSTALLATION
	INSPECT FOR EVIDENCE OF POOR OPERATION AND/OR WEED GROWTH IF REQUIRED TAKE REMEDIAL ACTION	3 MONTHLY, 48 HOURS AFTER LARGE STORMS
	INSPECT FOR SILT ACCUMULATION RATES AND ESTABLISH APPROPRIATE BRUSHING FREQUENCIES	ANNUALLY
	MONITOR INSPECTION CHAMBERS	ANNUALLY



DRAINAGE LEGEND:–

- 150mm ø, 1:20 — DENOTES PRIVATE SURFACE WATER SEWER.
- 150mm ø, 1:20 — DENOTES SURFACE WATER SEWER
- 150mm ø, 1:20 — DENOTES FOUL WATER DRAIN.
- 150mm ø, 1:20 — DENOTES COMBINED SEWER.
- MHS1 — DENOTES PRIVATE SURFACE WATER MANHOLE.
- ICS1 — DENOTES INSPECTION CHAMBER
- MHF1 — DENOTES FOUL WATER MANHOLE.
- MHC1 — DENOTES COMBINED MANHOLE.
- 150mm ø, 1:20 — DENOTES EXISTING SURFACE WATER SEWER.
- 150mm ø, 1:20 — DENOTES EXISTING FOUL WATER SEWER.
- 150mm ø, 1:20 — DENOTES EXISTING COMBINED SEWER.
- EXMHS1 — DENOTES EXISTING MANHOLE.
- ST1 — DENOTES PRIVATE SILT TRAP MANHOLE.
- G — DENOTES ROAD GULLY AND TAIL.
- SDC — DENOTES PRIVATE 150mmø SURFACE WATER SEWER AND MANHOLE.
- FDC — DENOTES PRIVATE 150mmø FOUL WATER SEWER AND MANHOLE.
- G — DENOTES PRIVATE OVERFLOW GULLY AND TAIL.
- DMH1 — DENOTES DISCONNECTING MANHOLE.
- DENOTES SCOTTISH WATER SERVITUDE.
- DENOTES IMPERMEABLE MEMBRANE.
- DENOTES POLYPIPE PERMAVOID STORAGE TANK.
- DENOTES POLYPIPE POLYSTORM INFILTRATION TANK.
- DENOTES POLYPIPE CHAMBERS AND SEWERS.

NOTE.
TOPOGRAPHICAL SURVEY BASED ON GRANITE CITY SURVEY PROJECT 'GCS 5725' DATED 27/03/2019.

NOTE.
RESIDENTIAL HOUSING LAYOUT BASED ON NORR ARCHITECTS DRAWING 'DEV-THE-ZZ-ZZ-DR-A-90006 – Proposed Site Layout' DATED 01/08/2022.

NOTE.
FOR POLYPIPE CAR PARK DRAINAGE DESIGN, PLEASE REFER TO EPG DRAWINGS 9663-EPG-XX-XX-DR-Y-0001 AND 9663-EPG-XX-XX-DR-Y-0100.

NOT FOR CONSTRUCTION

NOTE.
EXISTING FOUL WATER SEWER INVERT LEVEL HAS BEEN CHECKED AND SUPPLIED BY MORRISON CONSTRUCTION DATED 08/10/2021.

NOTE.
FOR UNDERBUILDING DRAINAGE PROPOSALS, REFER TO R&C DRAWINGS C3577/160 TO 168.

NOTE.
DISCONNECTING MANHOLE LOCATIONS HAVE BEEN SET BASED ON UNDERBUILDING DRAINAGE DENOTED ON THE ARCHITECT'S GA FOUNDATION LAYOUT DRAWINGS.

NOTE.
FOR FOUL WATER SEWER DIVERSION DESIGN, REFER TO R&C DRAWING C3577/130.

NOTE.
SCOTTISH WATER TECHNICAL APPROVAL.
RECEIVED ON 24.11.2021
REFERENCE DSCAS-0002801-MQB

NOTE.
ALL FINISHED FLOOR LEVELS TO BE VERIFIED BY ARCHITECT.

DRAINAGE LAYOUT PLAN. (1:250)

GENERAL NOTES:–

THE CONTRACTOR MUST CONSULT THE CIVIL/STRUCTURAL DESIGN ENGINEER IMMEDIATELY IF:

a) GROUND CONDITIONS VARY ON SITE.
b) EXISTING BUILDINGS VARY ON SITE.
c) DIMENSIONS OR LEVELS SHOWN ARE CHANGED BY ANYONE ON SITE.
d) COMPLETE OR PARTIALLY COMPLETE STRUCTURES ARE TO BE SUBJECT TO CONSTRUCTION LOADING OR AFFECTED BY TEMPORARY WORKS.

DO NOT SCALE – IF IN DOUBT, ASK.

LARGE SCALE DETAILS TAKE PRECEDENCE OVER SMALL SCALE DETAILS.

ALL MATERIALS ARE TO BE USED STRICTLY IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.

THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS INVOLVED IN CHANGES OR MODIFICATIONS REQUESTED AND APPROVED, TO SUIT HIS PREFERED WORK METHOD.

ALL NECESSARY METHOD STATEMENTS MUST BE PROVIDED PRIOR TO COMMENCEMENT OF ASSOCIATED SITE OPERATIONS.

THIS DRAWING SHOULD ONLY BE USED FOR CONSTRUCTION PURPOSES ONLY WHEN THE ISSUE STATUS IS "FOR CONSTRUCTION".

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

ALL LEVELS ARE IN METERS UNLESS OTHERWISE STATED.

Rev.	By	App.	Description	Date
U	NJH	MJD	UPDATED TO LATEST ARCHITECTS LAYOUT.	01/08/22
T	DNM	MJD	GENERAL UPDATE TO SUIT SCHEDULES.	04/02/22
S	JCB	MJD	REVISED TO LATEST LAYOUT. ISSUED FOR CONSTRUCTION.	20/01/22
R	MJD	–	REVISED TO MATCH LATEST POLYPIPE DRAWING.	11/01/22
Q	JCB	MJD	REVISED TO MATCH LATEST POLYPIPE DRAWING.	15/12/21
P	MJD	–	DRAINAGE DESIGN REVISED TO CLIENT COMMENTS. GULLY TAIL INVERT LEVELS ADDED.	18/10/21
N	MJD	–	SURFACE WATER LAYOUT REVISED FOR SOAKAWAYS.	20/08/21
M	LD	MJD	SURFACE WATER LAYOUT REVISED.	14/12/20
L	LD	MJD	BOLLARDS ADDED TO LAYOUT.	18/12/19
K	LD	MJD	REVISED DRAINAGE CONNECTION AND ROAD LAYOUT	17/12/19
J	MJD	–	DESIGN REVISED TO REFLECT VALUE ENGINEERING.	25/11/19
H	LD	MJD	UPDATED AS PER SCOTTISH WATER COMMENTS. ISSUED FOR TECHNICAL APPROVAL.	02/10/19
G	MJD	–	ISSUED FOR TECHNICAL APPROVAL.	12/08/19
F	MJD	–	FOUL WATER DRAINAGE REVISED TO REMOVE CLASH. DISCONNECTOR RUNS ADDED. ISSUED FOR TA.	07/08/19

Project

PROPOSED RESIDENTIAL DEVELOPMENT AT DEVERON ROAD, HUNTLY, ABERDEENSHIRE.

Drawing Title

DRAINAGE LAYOUT PLAN.

Architect

T.H.E.

Job No.	Drawing No.	Revision	Scale	Issue Status
C3577	103	U	1:250–A1 1:500–A3	FOR PLANNING

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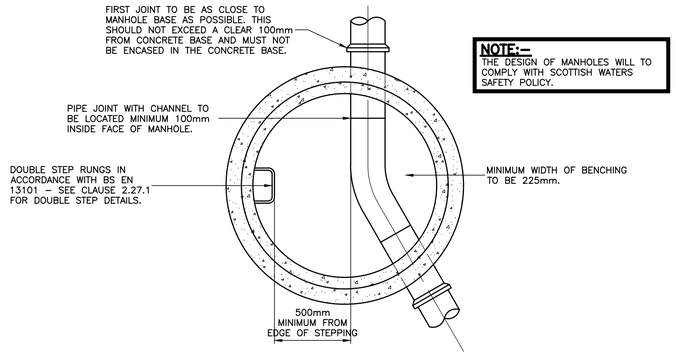
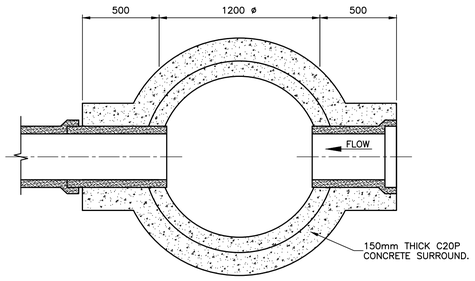
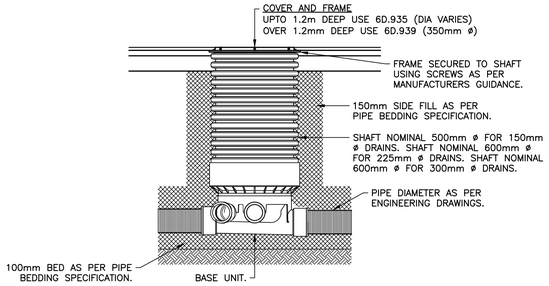


NOTE:–
THE DESIGN OF MANHOLES WILL TO COMPLY WITH SCOTTISH WATERS SAFETY POLICY.

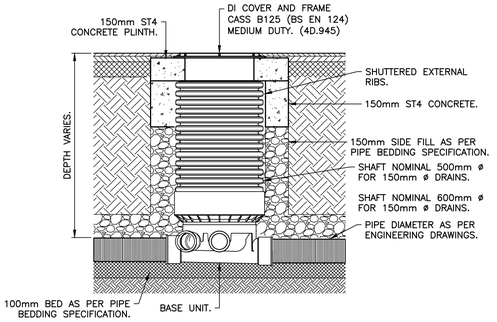
PLAN ON TYPICAL MANHOLE DETAIL – TYPE B (1:20)



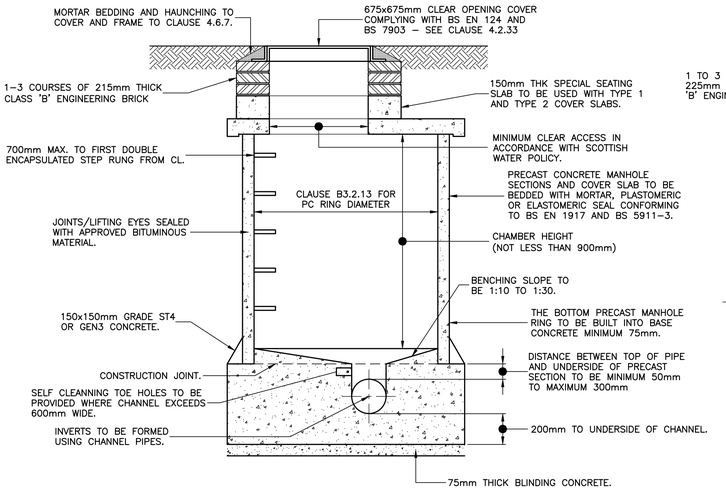
PLAN ON SILT TRAP (1:20)



OSMA ULTRARIB NON–ENTRY INSPECTION CHAMBER DETAIL OR EQUAL AND APPROVED. (1:20)

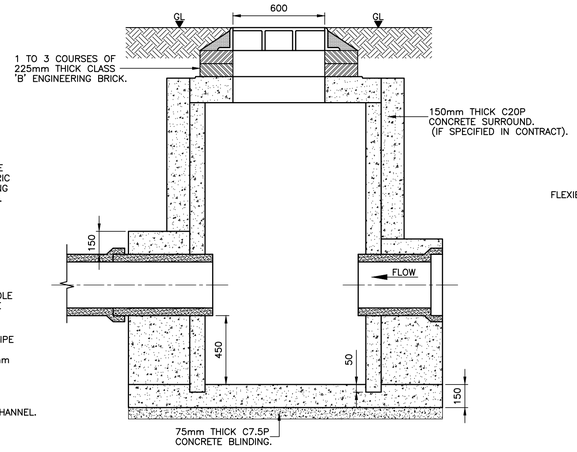


OSMA ULTRARIB NON–ENTRY INSPECTION/DISCONNECTION CHAMBER DETAIL OR EQUAL AND APPROVED LOCATED IN LIGHT TRAFFICKED AREAS ONLY. (1:20)

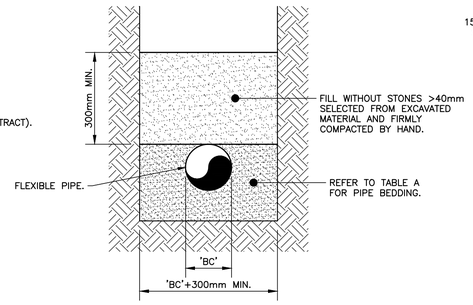


TYPICAL MANHOLE DETAIL – TYPE B (1:20)

(MAXIMUM DEPTH FROM COVER LEVEL TO SOFFIT OF PIPE 3.0m)
(STEP IRONS OR OTHERWISE TO BE FITTED AS REQUIRED BY SCOTTISH WATER'S POLICY)

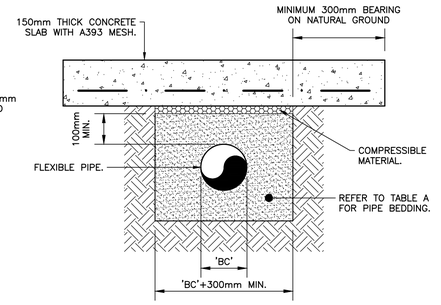


ELEVATION ON SILT TRAP (1:20)



FLEXIBLE PIPE BEDDING DETAIL. (1:10)

(COVER GREATER THAN 1.2m TO SOFFIT TRAFFICKED OR GREATER THAN 0.9m TO SOFFIT UNTRAFFICKED)



FLEXIBLE PIPE CONCRETE SLAB DETAIL. (1:10)

(COVER LESS THAN 1.2m TO SOFFIT TRAFFICKED OR LESS THAN 0.9m TO SOFFIT UNTRAFFICKED)

TABLE A – BEDDING MATERIAL

PIPE NOMINAL SIZE (DN)	ALLOWABLE BEDDING MATERIALS
100	10mm NOMINAL SINGLE–SIZED
OVER 100 TO 150	10mm NOMINAL SINGLE–SIZED OR 14mm NOMINAL SINGLE–SIZED OR 14mm TO 5mm GRADED
OVER 150 TO 300	10mm NOMINAL SINGLE–SIZED OR 14mm NOMINAL SINGLE–SIZED OR 20mm NOMINAL SINGLE–SIZED OR 14mm TO 5mm GRADED OR 20mm TO 5mm GRADED
OVER 300 TO 550	14mm NOMINAL SINGLE–SIZED OR 20mm NOMINAL SINGLE–SIZED OR 14mm TO 5mm GRADED OR 20mm TO 5mm GRADED
OVER 550	14mm NOMINAL SINGLE–SIZED OR 20mm NOMINAL SINGLE–SIZED OR 40mm NOMINAL SINGLE–SIZED OR 14mm TO 5mm GRADED OR 20mm TO 5mm GRADED OR 40mm TO 5mm GRADED

NOTE: PIPE BEDDING MATERIAL TO BE IN ACCORDANCE WITH "WATER INDUSTRY INFORMATION & GUIDANCE NOTE: IGN 4–08–01)" FIRMLY COMPACTED BY HAND OR AS OTHERWISE AGREED WITH THE ENGINEER.

FOR CONSTRUCTION

NOTE.
THESE DETAILS ARE IN COMPLIANCE WITH SEWERS FOR SCOTLAND 4TH EDITION, BS 9295:2020 AND BS EN 1610:2015.

NOTE.
THE TERRAM GEOTEXTILE PRODUCT SPECIFIED ON THESE DETAILS HAS BEEN BASED ON THE SOIL GRADING RESULTS PROVIDED IN THE GRAMPIAN GEOTECHNICAL REPORT '3366–21' DATED 14/04/2022. THE GEOTEXTILE MANUFACTURER SHOULD BE CONTACTED AND SUPPLIED WITH THE LATEST SITE INVESTIGATION TO ALLOW THEM TO SPECIFY ADEQUATELY.

NOTE.
THESE DETAILS ARE NOT A SUBSTITUTE FOR ENSURING THAT NO FINES ARE REMOVED DURING ANY TEMPORARY DE–WATERING OPERATIONS.

NOTE:–
1. ALL MANHOLES WITH PIPE EXCEEDING 450mm ø SHALL BE FITTED WITH SAFETY CHAINS ON THE DOWNSTREAM SIDE.

2. BURIED MANHOLES – COVERS TO BE SET BELOW GROUND LEVEL (600mm IN FIELDS AND 300mm IN GARDENS) AND COVERED WITH A SHEET OF HEAVY DUTY POLYTHENE SHEET HELD IN PLACE WITH WATERPROOF PROTECTIVE TAPE.

3. SELF CLEANING TOE HOLES TO BE PROVIDED WHERE CHANNELS EXCEED 600mm WIDE.

675x675mm DI DOUBLE TRIANGULATED COVER AND FRAME IN ACCORDANCE WITH BS EN 124: 1994 (CL 4.2.30).

CLASS A15 – PEDESTRIAN AREAS

CLASS B125 – LIGHT USEAGE CARPARKS, DOMESTIC DRIVEWAYS

CLASS C250 – HEAVY USEAGE CARPARKS

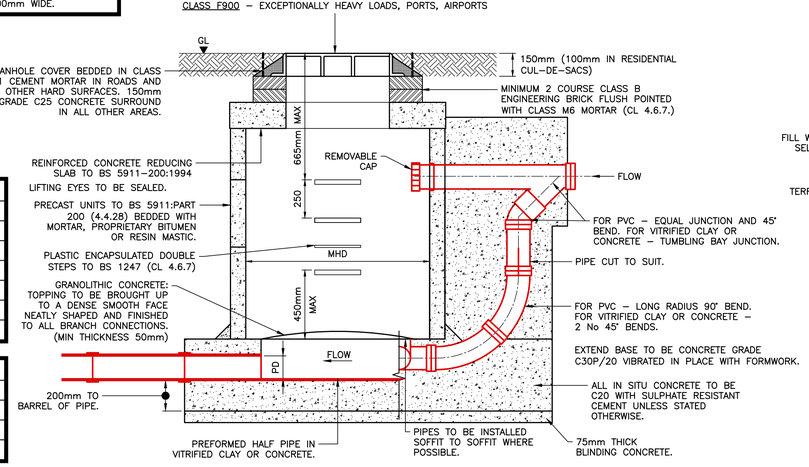
CLASS D400 – CARRIAGEWAYS

CLASS E600 IN LOADING AREAS, DOCKS, COMMERCIAL/INDUSTRIAL AREAS

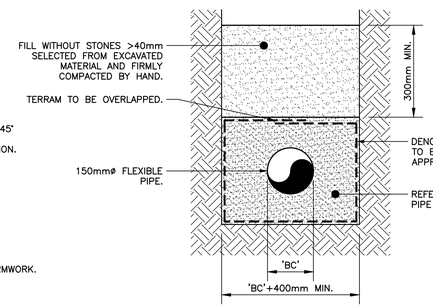
CLASS F900 – EXCEPTIONALLY HEAVY LOADS, PORTS, AIRPORTS

MANHOLE DIMENSIONS(mm)	
PD (LARGEST ø)	MHD
<375	1200
375 – 450	1350
450 – 700	1500
750 – 1050	1800
1125 – 1500	2100
ABOVE 1500	TO BE ADVISED.

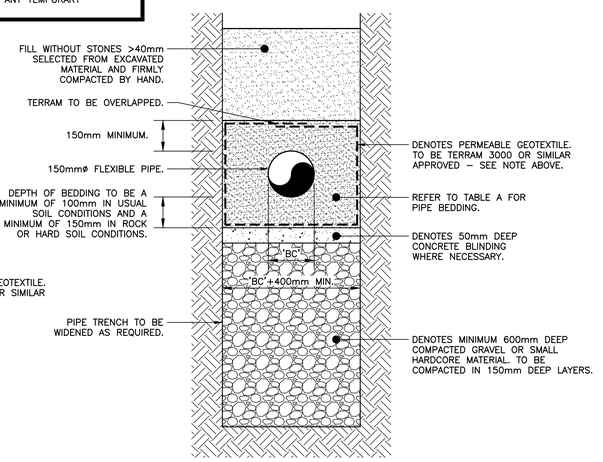
ROCKER PIPE LENGTHS(mm)	
NOMINAL ø (mm)	ROCKER PIPE LENGTH
150–600	600
600–750	1000
>750	1250



BACKDROP DETAIL FOR PRECAST CONCRETE MANHOLE. (1:20)



ALTERNATIVE FLEXIBLE PIPE BEDDING DETAIL FOR PIPES LAID BELOW LEVEL OF EXISTING GROUNDWATER FOUND ON SITE (1:10)



ALTERNATIVE FLEXIBLE PIPE BEDDING DETAIL FOR PIPES LAID BELOW LEVEL OF EXISTING GROUNDWATER AND IN SOFT GROUND CONDITIONS (1:10)

GENERAL NOTES:–

THE CONTRACTOR MUST CONSULT THE CIVIL/STRUCTURAL DESIGN ENGINEER IMMEDIATELY IF:
a) GROUND CONDITIONS VARY ON SITE.
b) EXISTING BUILDINGS VARY ON SITE.
c) DIMENSIONS OR LEVELS SHOWN ARE CHANGED BY ANYONE ON SITE.
d) COMPLETE OR PARTIALLY COMPLETE STRUCTURES ARE TO BE SUBJECT TO CONSTRUCTION LOADING OR AFFECTED BY TEMPORARY WORKS.

DO NOT SCALE – IF IN DOUBT, ASK.

LARGE SCALE DETAILS TAKE PRECEDENCE OVER SMALL SCALE DETAILS.

ALL MATERIALS ARE TO BE USED STRICTLY IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.

THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS INVOLVED IN CHANGES OR MODIFICATIONS REQUESTED AND APPROVED, TO SUIT HIS PREFERED WORK METHOD.

ALL NECESSARY METHOD STATEMENTS MUST BE PROVIDED PRIOR TO COMMENCEMENT OF ASSOCIATED SITE OPERATIONS.

THIS DRAWING SHOULD ONLY BE USED FOR CONSTRUCTION PURPOSES ONLY WHEN THE ISSUE STATUS IS "FOR CONSTRUCTION".

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE STATED.

ALL LEVELS ARE IN METERS UNLESS OTHERWISE STATED.

Rev.	By	App.	Description	Date
J	MJD	–	ADDITIONAL PIPE BEDDING DETAILS ADDED.	30.06.22
H	MJD	–	ADDITIONAL NOTE ADDED AS REQUESTED BY SW.	24/05/22
G	MJD	–	ADDITIONAL PIPE BEDDING DETAIL ADDED. ISSUED TO SCOTTISH WATER.	20/05/22
F	MJD	–	ADDITIONAL INSPECTION CHAMBER DETAIL ADDED.	04/02/22
E	JCB	MJD	ISSUED FOR CONSTRUCTION.	20/01/22
D	MJD	–	GENERAL UPDATE.	18/10/21
C	JCB	MJD	GENERAL UPDATE.	20/08/21
B	MJD	–	ISSUED FOR TECHNICAL APPROVAL.	12/07/19
A	MSB	–	INITIAL ISSUE.	19/06/19

Project
PROPOSED RESIDENTIAL DEVELOPMENT AT DEVERON ROAD, HUNTLY, ABERDEENSHIRE.

Drawing Title
DRAINAGE DETAILS.

Architect
T.H.E.

Job No.	Drawing No.	Revision	Scale	Issue Status
C3577	113	J	1:20–A1 1:40–A3	FOR CONSTRUCTION

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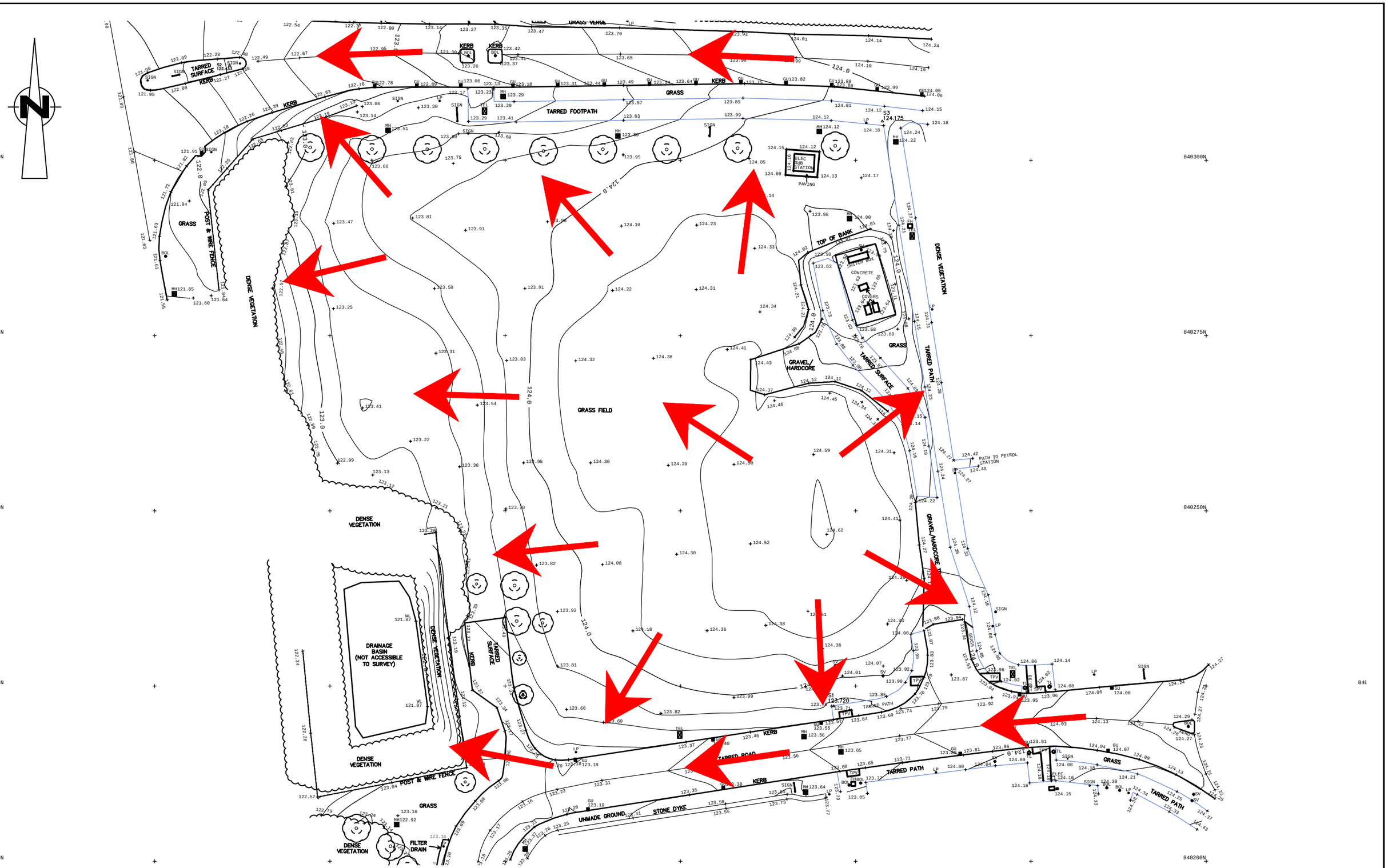

NOT FOR CONSTRUCTION

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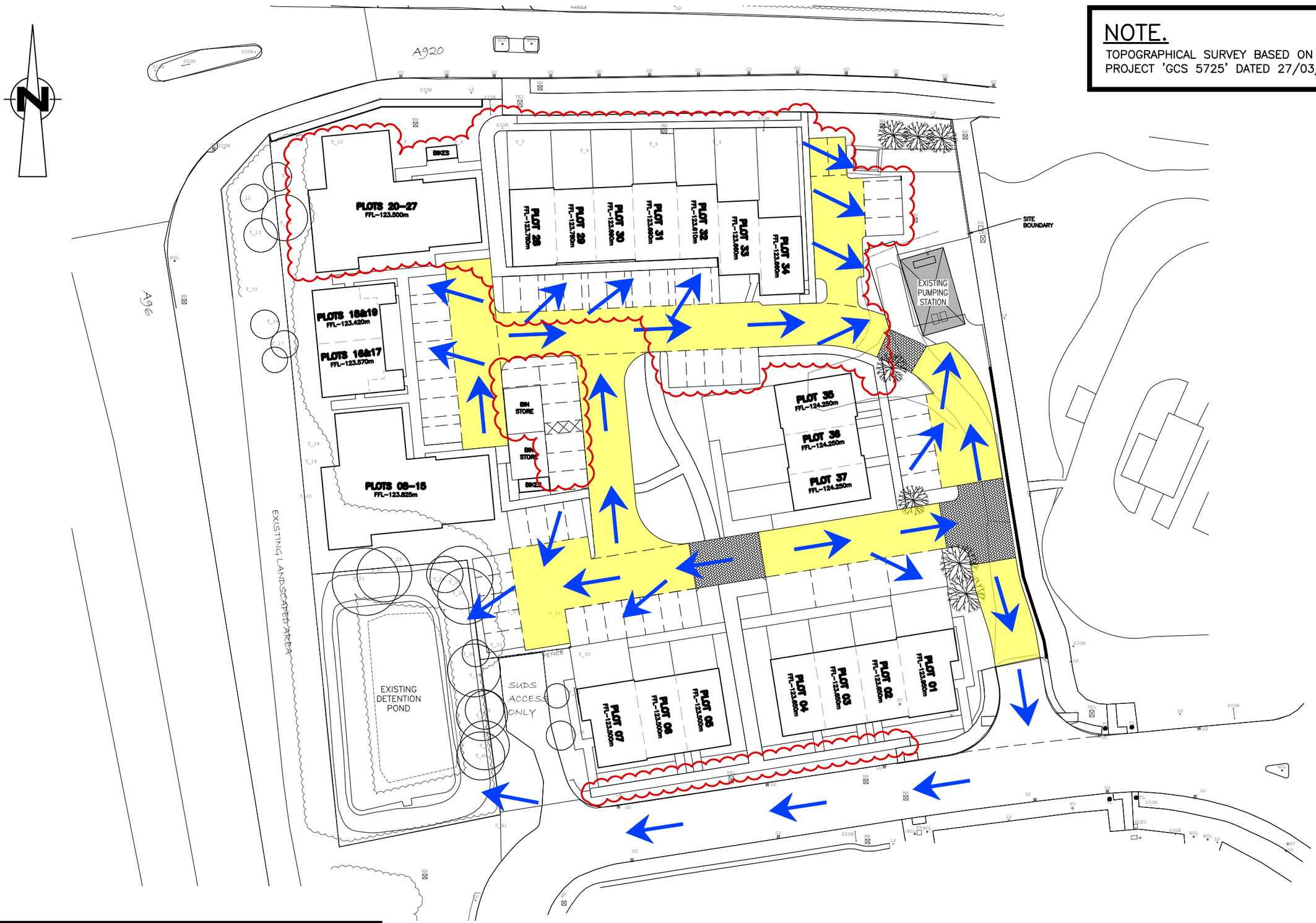
Project
PROPOSED RESIDENTIAL DEVELOPMENT AT DEVERON ROAD, HUNTLY, ABERDEENSHIRE.

Drawing Title
PRE-DEVELOPMENT OVERLAND FLOW ROUTE.

Rev.	By	App.	Description	Date
A	MSB	-	INITIAL ISSUE.	23/04/19

Architect
NORR.

Job No.	Drawing No.	Revision	Scale	Issue Status:
C3577	108	A	1:500-A3	-



NOTE.

TOPOGRAPHICAL SURVEY BASED ON GRANITE CITY SURVEY PROJECT 'GCS 5725' DATED 27/03/2019.

NOTE.

RESIDENTIAL HOUSING LAYOUT BASED ON NORR ARCHITECTS DRAWING 'DEV–THE–ZZ–ZZ–DR–A–90006 – Proposed Site Layout' DATED 01/08/2022.

NOT FOR CONSTRUCTION

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Project
PROPOSED RESIDENTIAL DEVELOPMENT AT DEVERON ROAD, HUNTLY, ABERDEENSHIRE.

Drawing Title
PRE–DEVELOPMENT OVERLAND FLOW ROUTE.

Rev.	By	App.	Description	Date
F	NJH	MJD	UPDATED TO LATEST ARCHITECTS LAYOUT.	01/08/22
E	MJD	–	INFORMATION REVISED TO LATEST ARCHITECTS LAYOUT.	25/11/19
D	MJD	–	INFORMATION REVISED TO LATEST ARCHITECTS LAYOUT.	01/08/19
C	MSB	–	FFL'S UPDATED.	24/06/19
B	MSB	–	GENERAL UPDATE.	20/06/19

Architect
T.H.E.

Job No.	Drawing No.	Revision	Scale	Issue Status:
C3577	109	F	1:500–A3	FOR PLANNING

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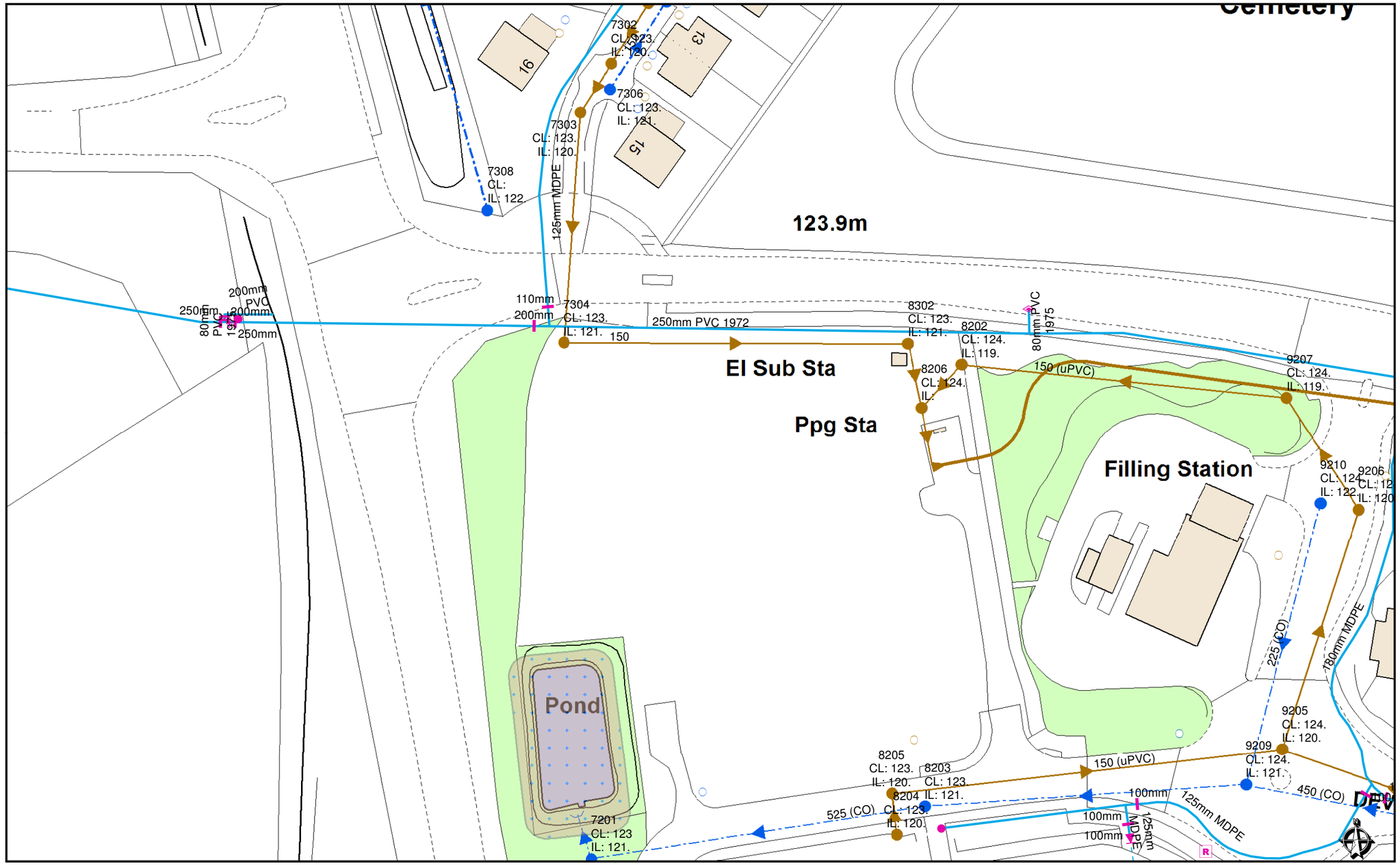
APPENDIX 2
EXISTING SCOTTISH WATER INFRASTRUCTURE



Warning! Damaging a Large diameter Trunk main (12"/300mm and above) can result in loss of life and major Water Supply and Water Quality problems. If you're planning any extension work in the vicinity of any large diameter mains shown on our maps you MUST contact Scottish Water to arrange a site visit on 08000778778 WELL IN ADVANCE OF THE WORKS.

Legend

Main - Water Distribution

SubType
- Distribution
- Trunk

Main - Raw Water

SubType
- Raw Supply

Gravity Pipe

SubType
- Combined (C)
- Foul (F)
- Surface Water (S)

The representation of physical assets and the boundaries of areas in which Scottish Water and others have an interest does not necessarily imply their true positions. For further details contact the appropriate District office.

Sewer Diversion

335283 672149

Date Plotted: 07/10/2019

SCALE : 1:798

Plotted By: SHAWSC

Scottish Water
Trusted to serve Scotland

**Castle House,
6 Castle Drive,
Dunfermline,
KY118GG**

Tel No: 08000778778

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APPENDIX 3
CALCULATIONS

Ramsay & Chalmers
Consulting Structural & Civil Engineers

Project:	Job No:	C3577
Proposed Residential Development At Deveron Road, Huntly	Date:	01/08/2022
	By:	MJD
	Page:	1

SITE INFORMATION (USED IN FURTHER CALCULATIONS)

SITE AREA (OVERALL) =	7400	m^2
SITE HARDSTANDING AREA =	3800	m^2
SAAR =	870	mm (Taken from Wallingford maps)
WRAP =	3	(Taken from Wallingford maps)
Therefore **SOIL =**	0.4	
INFILTRATION RATE =	5.07E-05	m/s
(M5-60 min to M5-2 day ratio) **r =**	0.2	(Taken from Wallingford maps)
(M5-60 min rainfall) **d =**	17	mm (Taken from Wallinford maps)
Climate Change =	40	%

POLYPIPE ATTENUATION DESIGN for MT

(Below is the preliminary design by R&C. Polypipe specialist design is in progress.)

Infiltration rate = 5.07E-05 m/s
Hardstanding area = **3800** **m^2**
Additional flow = 0 litres/second

Rainfall Data	
r =	0.2
d =	17
T =	200

Duration (min)	MT-D (mm)	MT-D with CC (mm)	Inflow (m^3)	Outflow (m^3)	Storage (m^3)
5	9.27	12.97	49.29	1.47	47.83
10	15.01	21.02	79.87	2.93	76.94
15	19.33	27.07	102.86	4.40	98.46
30	28.39	39.74	151.02	8.80	142.23
60	38.73	54.23	206.06	17.59	188.47
120	51.05	71.46	271.57	35.18	236.39
240	66.00	92.40	351.11	70.36	280.75
360	76.31	106.83	405.95	105.54	300.41
720	97.41	136.37	518.20	211.08	307.12
1440	123.79	173.31	658.58	422.17	236.41
2880	156.11	218.55	830.48	844.34	-13.85

Allowing for **40** % climate change, storage required = **307.12** **m^3**

CELLULAR SYSTEM CAPACITY CHECK

Based on 95% void storage capacity:

Aquacell units:	1	m long	x	0.5	m wide	x	0.4	m high.	Capacity =	0.19	m^3
Polypipe units:	1	m long	x	0.5	m wide	x	0.15	m high.	Capacity =	0.07	m^3
Stormcell units:	2.4	m long	x	1.2	m wide	x	0.52	m high	Capacity =	1.42	m^3

Capacity per cell of unit specified = 0.07 m^3
Minimum number of cells required = **4311** **No.**

Depth of system specified = 0.75 m
Plan width of system specified = 3.5 m
Plan length of system specified = 125 m

Therefore total number of cells = **4375** **No.**
Therefore total storage provided = **311.72** **m^3**