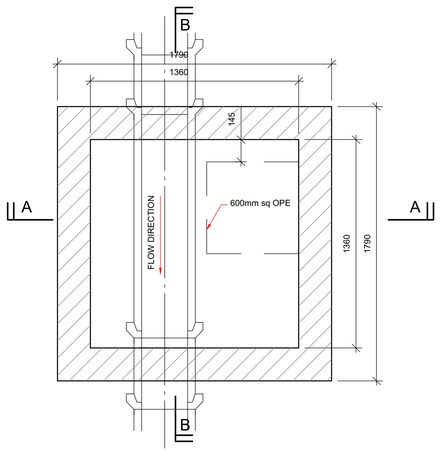
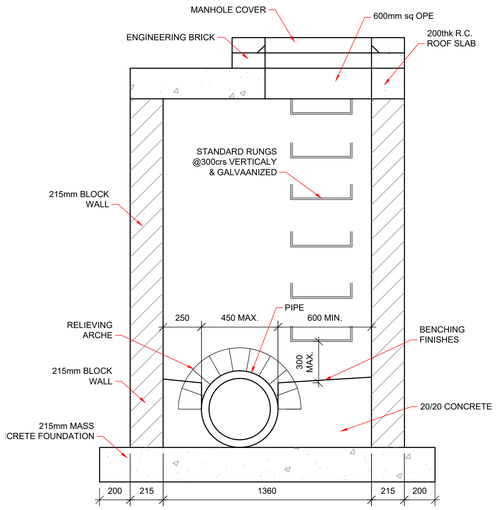


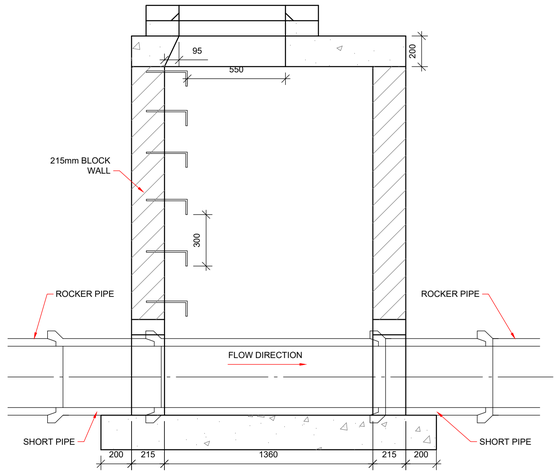
TYPE B SURFACE WATER MANHOLES SW01 & SW02

SCALE 1:20



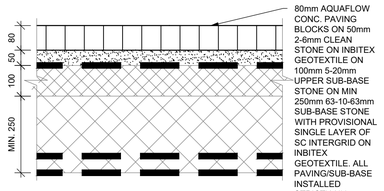
TYPE B SECTION A-A

SCALE 1:20



TYPE B SECTION B-B

SCALE 1:20



PERMEABLE PAVING TYPICAL DETAIL

SCALE 1:10

SUSTAINABLE URBAN DRAINAGE SYSTEM (SuDs):

PERMEABLE PAVING:

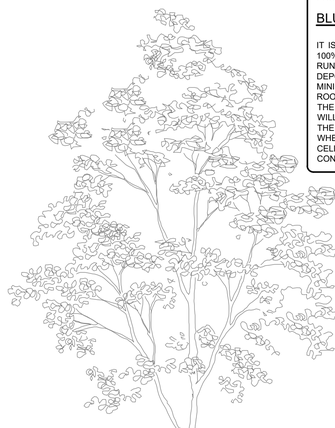
IT IS PROPOSED TO INCORPORATE A PERMEABLE PAVING SYSTEM ("AQUAFLOW" BY ROADSTONE OR SIMILAR APPOVED) INTO THE PAVED AREA SURROUNDING THE DEVELOPMENT, WITH THE AIM OF REDUCING RUNOFF FROM THE SITE IN TIMES OF PRECIPITATION AND IMPROVING QUALITY OF RUNOFF GENERALLY. A MINIMUM OF 300mm DEPTH OF 63mm-10mm SUB BASE WITH APPROXIMATELY 30% VOIDS IS TO BE USED TO PROVIDE ADDITIONAL SUB-GROUND STORAGE VOLUME FOR RAINFALL EVENTS. THE INTENTION IS TO PROVIDE A SUSTAINABLE FORM OF STORMWATER SOURCE CONTROL WITHIN THE SITE THAT WILL REDUCE THE TOTAL RUNOFF FROM THE SITE BY TEMPORARILY RETAINING THE RUNOFF WITHIN THE PAVIORS/BEDDING, PROMOTING EVAPORATION AND FACILITATING INFILTRATION INTO THE SUB-SOILS. THE QUALITY OF RUN-OFF FROM THE SITE SHALL ALSO BE IMPROVED DUE TO THE FILTERING PROCESS OF THE PAVING, WHICH RETAINS SILTS AND DEGRADES HYDROCARBONS.

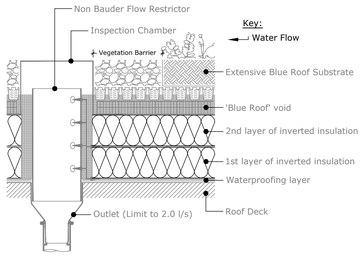
GREEN PODIUM:

SIMILARLY TO A GREEN ROOF, IT IS PROPOSED TO INCORPORATE A COMBINATION OF A SOFT AND A HARD LANDSCAPING SYSTEM INTO THE DESIGN TO FORM AN ACCESSIBLE, INTENSIVE GREEN PODIUM. RESIDENTIAL DEVELOPMENT FOR HARD & SOFT OPTIONS TO BE CONSIDERED AS A GREEN ROOF/PODIUM SYSTEM, BOTH HAVE TO BE PERMEABLE, CAPABLE OF FILTERING THE WATER THROUGH INTO THE WATER STORAGE AND DRAINAGE LAYERS. THE TOP LAYERS OF SOFT LANDSCAPING WILL CONSIST OF AN INTENSIVE VEGETATION LAYER ON AN INTENSIVE SUBSTRATE LAYER, WHILE HARD LANDSCAPING WILL BE CONSISTING OF PAVING BLOCKS ON GRANITE CHIPPING/GRAVEL BASE. THE INTENTION IS TO PROVIDE AN ADDITIONAL NATURAL AND SUSTAINABLE FORM OF ATTENUATION WITHIN THE SITE THAT WILL REDUCE THE TOTAL RUNOFF FROM THE SITE BY TEMPORARILY RETAINING THE RUNOFF WITHIN THE SEDUM LAYER AND PROMOTING EVAPORATION. ADDITIONALLY, GREEN ROOF/PODIUM SURFACE WATER TREATMENT PROCESS REMOVES ATMOSPHERICALLY DEPOSITED URBAN POLLUTANTS.

BLUE ROOF:

IT IS PROPOSED TO PROVIDE AN EXTENSIVE BLUE ROOFING SYSTEM BY BAUDER, COVERING 100% OF THE TOTAL ROOF AREA WITH THE AIM, SIMILARLY TO A GREEN ROOF TO REDUCE RUNOFF FROM THE SITE IN TIMES OF PRECIPITATION AND REMOVE THE ATMOSPHERICALLY DEPOSITED URBAN POLLUTANTS. A BLUE ROOF WILL ACT AS A ROOF LEVEL ATTENUATION TANK, MINIMIZING THE IN-GROUND ATTENUATION TANKS AT GROUND LEVEL. RAINWATER ON THE BLUE ROOF WILL BE ABSORBED BY THE VEGETATION LAYER. FOR HEAVIER STORM EVENTS, WHEN THE VEGETATION LAYER IS NO LONGER CAPABLE OF RETAINING ANY MORE WATER. THE WATER WILL THEN BE DEPOSITED INTO A 100MM DEEP "BAUDER ATTENUATION CELL 100" AND USED BY THE VEGETATION LAYER ONCE IT HAS RECOVERED. IN HEAVY 1 IN A 100 YEAR STORM EVENT, WHEN THE WATER CAN NO LONGER BE HELD WITHIN THE VEGETATION LAYER OR ATTENUATION CELLS IT WILL DISCHARGE INTO THE SURFACE WATER SEWER LOCATED AT GROUND LEVEL AT A CONTROLLED RATE VIA FLOW RESTRICTORS OF 2 l/s.



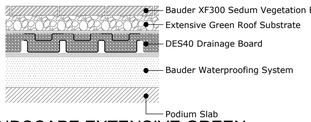


NFRC Guidance Notes:

- BBA, GRO and LRWA guidance recommends that Blue Roofs should be built with zero falls and that the roof should have no back falls from the outlet
- Deflections within a concrete slab often leads to ponding on the roof, with outlets being positioned close to walls or pillars
- In a normal warm roof the insulation is dry, fully encapsulated within the build up. Any ponding due to the uneven roof surface does not effect the thermal performance / U Value
- In a normal inverted system an allowance is made for a small amount of water that makes its way through the vapour control layer, however these calculations assume no deflections in the deck that would allow ponding water
- In heavy rainfall the restricted flow of the outlet allows water to build up. This will quickly be as deep as the insulation (often 500-600mm), the water is now under pressure and can be forced back between the layer of insulation. At present there is no way of calculating the U-Value for these Blue Roof systems

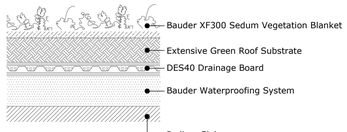
BLUE ROOF SYSTEM BY BAUDER

SCALE 1:10



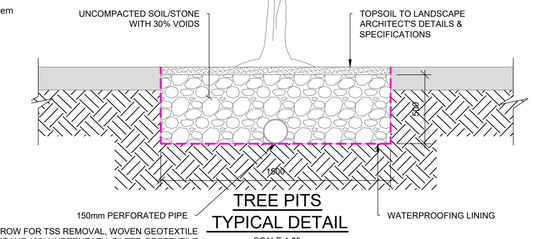
HARD LANDSCAPE EXTENSIVE GREEN PODIUM SYSTEM BY BAUDER

SCALE 1:10



SOFT LANDSCAPE EXTENSIVE GREEN PODIUM SYSTEM BY BAUDER

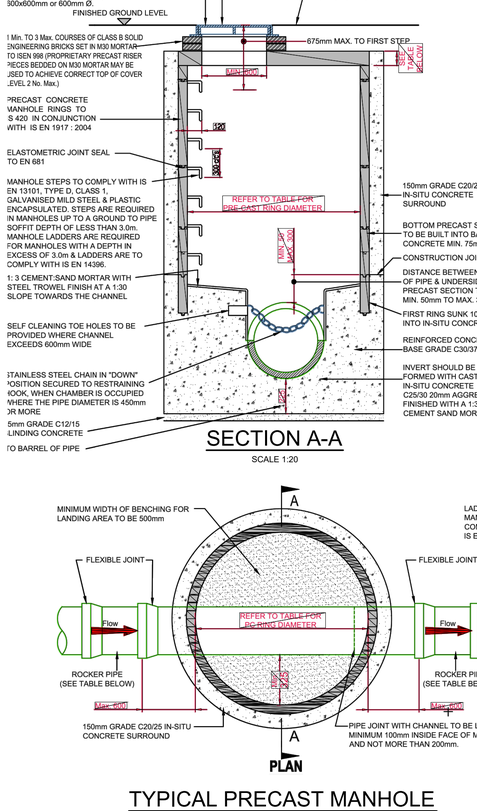
SCALE 1:10



TREE PITS TYPICAL DETAIL

SCALE 1:20

NOTE:
PRECAST CONCRETE MANHOLES SHALL ONLY BE USED WHERE THE WATER TABLE IS LOW. THEY SHALL NOT BE USED WHERE THERE IS A PERCHED WATER TABLE, WHERE THE SEWER IS LOCATED NEXT TO A RIVER, LAKE OR OTHER WATER BODY AND WITHIN AREAS THAT ARE IDENTIFIED BY THE OFFICE OF PUBLIC WORKS CATCHMENT FLOOD RISK ASSESSMENT AND MANAGEMENT (CFRAM) WITH A FLOOD RISK OF 1 IN 10 YEARS.



SECTION A-A

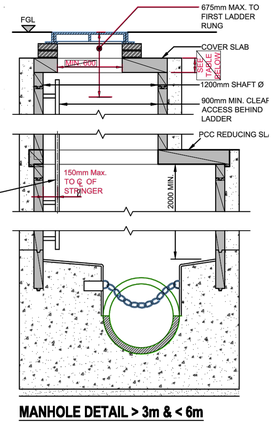
SCALE 1:20

PLAN

TYPICAL PRECAST MANHOLE

SCALE 1:20

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. PRE-CAST MANHOLES UNITS: COMPLYING WITH REQUIREMENTS OF IS EN 1917 AND IS 420.
3. THICKER MANHOLE BASES REQUIRED FOR SEWERS IN EXCESS OF 3m DEEP WHERE THE SIZE IS GREATER THAN THE STANDARD MINIMUM SIZE.
4. APPROVED PRE-CAST CONCRETE BASES MAY BE USED INCORPORATING CHANNELS, BENCHING ETC. SUBJECT TO IRISH WATER REVIEW AND COMPLYING WITH ISEN 1719 AND IS 420.
5. STRUCTURAL DESIGN AND REINFORCEMENT DETAILS TO BE PROVIDED BY THE DEVELOPER AND SUBMITTED TO IRISH WATER FOR REVIEW.
6. MANHOLES GREATER THAN 3m IN DEPTH WILL REQUIRE A DETAILED STRUCTURAL DESIGN AND BE SUBJECT TO IRISH WATER REVIEW.
7. MANHOLE ROOFS SHALL CONSIST OF A RE-INFORCED CONCRETE SLAB OF IN-SITU CONCRETE, C30/37, WITH A MINIMUM THICKNESS OF 225mm DESIGNED TO CARRY ALL LIVE AND DEAD LOADS, ALTERNATIVELY, APPROVED PRE-CAST CONCRETE ROOF SLABS MAY BE USED SUBJECT TO IRISH WATER REVIEW AND COMPLIANCE WITH IS EN 1917.
8. COVERS AND FRAMES SHALL BE SUITABLE FOR ROAD AND TRAFFIC CONDITIONS SUBJECT TO REVIEW BY IRISH WATER.
9. 200mm ALL AROUND x 100mm DEEP, C20/25 CONCRETE PLINTH COMPLETE WITH BULL NOSE FINISH AND TO BE PROVIDED COMPLETE WITH MILD STEEL REINFORCEMENT LINK AROUND COVERS IN GREEN AREAS.
10. ALL CHAMBERS TO BE CHECKED FOR UPLIFT BY THE DEVELOPER BASED ON GROUND CONDITIONS WITHIN THE SITE. SHOULD ANTI FLOATATION MEASURES BE REQUIRED THEY SHALL BE SUBJECT TO REVIEW BY IRISH WATER.
11. ALL CONCRETE TO BE IN ACCORDANCE WITH IS EN 206 : 2013.
12. ANY SPECIAL ROAD REINSTATEMENT AROUND COVER & FRAME SHALL BE TO ROAD AUTHORITY'S REQUIREMENTS.
13. NEW ROAD CONSTRUCTION & SURFACE FINISH TO BE TO ROAD AUTHORITY REQUIREMENTS.
14. EXISTING ROAD REINSTATEMENT TO COMPLY WITH CURRENT VERSION OF "GUIDELINES FOR MANAGING OPENINGS IN PUBLIC ROADS" BY THE DEPT. OF TRANSPORT, TOURISM & SPORT, OR TRANSPORT INFRASTRUCTURE IRELAND REQUIREMENTS.
15. IF DEPTH FROM GROUND TO PIPE SOFFIT IS GREATER THAN 6m DEEP, A SITE SPECIFIC ENGINEERED SOLUTION FOR ACCESS SHALL BE PROVIDED.
16. PROPRIETARY WATERTIGHT PCC MANHOLE RING SYSTEMS WITH A WALL THICKNESS > 125mm, & A WATER TIGHT JOINT SEALING SYSTEM, MAY BE USED WITHOUT CONCRETE SURROUND, SUBJECT TO THE GROUND WATER LEVEL AT THE MANHOLE BEING LOW, & SUBJECT TO REVIEW BY IRISH WATER.
17. THE INTERNAL MANHOLE DIAMETERS SHOWN IN THE TABLE BELOW ARE MINIMUM DIMENSIONS AND WILL INCREASE DEPENDING ON THE NUMBER AND DIAMETER OF ADDITIONAL INLETS AND FINISHED WITH A 1:3 SAND/CEMENT FINISH TO SUIT FLOW OF INLETS AND OUTLET.



MANHOLE DETAIL > 3m & < 6m GROUND TO SOFFIT DEPTH

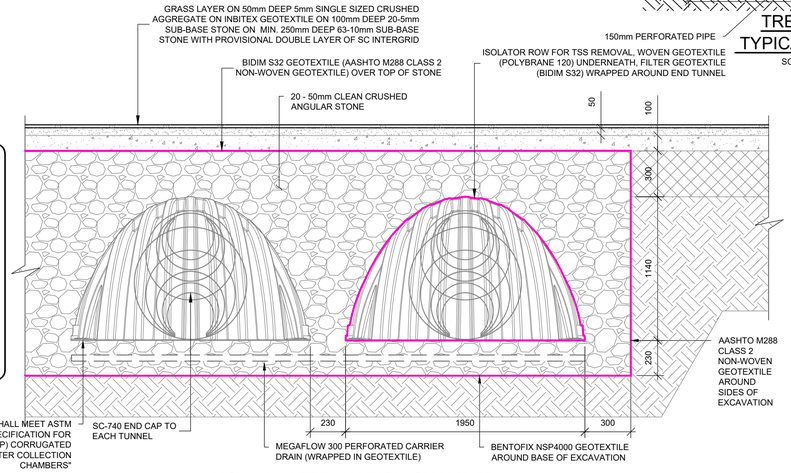
(NOTE: ON MANHOLES <1.5mØ, REDUCING SLAB NOT TO BE USED & PCC RINGS TO CONTINUE UP TO COVER SLAB)

STORMTECH ATTENUATION CHAMBERS:

THE PROPOSED STORMTECH ATTENUATION CHAMBERS IS TO BE SURROUNDED IN A PERMEABLEGEOTEXTILE TO INCREASE THE PROCESS OF PERCOLATION.

STORMTEC ISOLATOR ROW TREATMENT

STORMTEC MC-3500 ATTENUATION CHAMBERS ALLOW THE REMOVAL OF TOTAL SUSPENDED SOLIDS AND PROVIDE EASY ACCESS FOR INSPECTION AND MAINTENANCE. THE STORMTECH ISOLATOR ROW IS A ROW OF STANDARD STORMTECH CHAMBERS SURROUNDED WITH APPROPRIATE FILTER FABRICS AND CONNECTED TO A MANHOLE FOR EASY ACCESS.



MC-3500 ATTENUATION CHAMBER TYPICAL SECTION

SCALE 1:20

NOTES:

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECT'S AND ENGINEER'S DETAIL DRAWINGS AND SPECIFICATIONS.

DO NOT SCALE DIMENSIONS, REFER TO ARCHITECTS DRAWINGS FOR ALL SETTING OUT DIMENSIONS. WORK TO FIGURED DIMENSIONS ONLY.

THE ENGINEER IS TO BE AFFORDED SUFFICIENT TIME TO CARRY OUT INSPECTIONS OF THE WORKS IN ACCORDANCE WITH THE PROJECT INSPECTION PLAN AND INSPECTION NOTIFICATION FRAMEWORK.

ALL CONSTRUCTION PRODUCTS TO HAVE RELEVANT CE MARKING WHERE APPLICABLE.

ALL DEMOLITION WORKS TO BE IN ACCORDANCE WITH BS 6187: 2011.

ALL CONTRACTORS OR SUB-CONTRACTORS RESPONSIBLE FOR SPECIALIST DESIGN MUST PROVIDE PROFESSIONAL INDEMNITY INSURANCES, ANCILLARY CERTIFICATES FOR DESIGN AND ANCILLARY CERTIFICATES FOR INSPECTION IN ACCORDANCE WITH BCAR 2014.

DRAINAGE

ALL DRAINAGE WORK TO BE CARRIED OUT IN ACCORDANCE WITH IS EN 752: 2008, TGD PART H, GDR CODE OF PRACTICE FOR DRAINAGE WORKS V6.0 AND IRISH WATER SPECIFICATIONS.

MIN. 150mm C16/20 CONCRETE BED & SURROUND TO BE PROVIDED TO SEWER PIPELINES WHERE THE COVER IS LESS THAN 1.200m UNDER ROADS, VERGES AND FOOTPATHS.

BACKFILL FOR ALL uPVC PIPES TO BE FREE FROM STONE EXCEEDING 50mm FOR 300mm ABOVE GRANULAR SURROUND.

ALL REINSTATEMENT WORKS TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY.

ALL MANHOLES COVERS AND FRAME ARE TO BE CLASS D400 TO BS EN 124 U.N.O.

SEWER PIPE LINES TO BE uPVC PIPES UP TO AND INCLUDING 300Ø TO IS 123 ON GRANULAR BED AND SURROUND LAID STRICTLY TO MANUFACTURERS INSTRUCTIONS.

ALL VERTICAL STACK CONNECTIONS TO FOUL SEWER CHAMBERS TO INCORPORATE LONG RADIUS BENDS AND MUST JOIN MAIN SEWER LINE AT 45° TO DIRECTION OF FLOW.

Rev	Date	Drn	Chk'd	Description
P1	08/03/2022	E.V	G.P	Issued for Stage 3 SHD Planning.
P	28/05/2021	E.V	G.P	Issued for Stage 2 SHD Planning.

UISCE ÉIREANN : IRISH WATER APPROVED

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Green Vale Greenhills

Project:	Residential Development at Greenhills Road, Walkinstown, Dublin 12
Drawing:	Drainage Sections & Details (1 of 2)
Model Reference:	20189-LDE-ZZ-ZZ-M2-SC-0001
Drawing Reference:	20189-LDE-07-00-DR-SC-4C02

Project No.	20189
Drg. No.	C02
Scale	@A1
Date	Apr. 2021
Drawn	E.V
Rev.	P1
Model Rev:	P01
Suitability:	S01