Client: **KILDARE COUNTY COUNCIL**

Project: **HOUSING DEVELOPMENT AT BARRACKS ROAD, BALLITORE, CO. KILDARE.**

Document Title: **SERVICES DESIGN REPORT**

Project No.: **24026**

Revision: **Rev 01 – 28.08.2024**

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Client:	KILDARE COUNTY COUNCIL
Project:	HOUSING DEVELOPMENT AT BARRACKS ROAD, BALLITORE, CO. KILDARE.
Project. No.	24026

DOCUMENT REF:
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Revision	Purpose / Description	Originated	Checked	Authorised	Date
01	*Issue to Client for planning submission*	*AT*	*CD*		*28/08/2024*

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1. CLIENT DETAILS

Kildare County Council

2. PROPERTY ADDRESS

Housing Development at Barracks Road, Ballitore, Co.Kildare

3. PROJECT DETAILS

Proposed Housing Development of 6 No. Dwellings, 4 No. new dwellings and 2 No. dwellings converted from existing barracks.

4. GROUND CONDITIONS/SUDS ASSESSMENT & PROVISION

Ground Conditions

The existing ground is comprised of 300-400mm of topsoil overlaid on a clay-based sub-soils, which overlay granular gravel dominant soils which begins at about 1.2m below ground level. Trial pit logs are attached in Appendix C of this report. As noted in the trial pit logs and borehole logs, no ground water was encountered in the boreholes or trial pits. Five infiltration tests to BRE365 were carried out to establish an infiltration rate for the subsoils present.

SUDS Assessment & Provision

As infiltration of surface water to existing sub-soils is possible on the site due to ground conditions, two SUDS features are proposed. All SUDS measures were evaluated, and the following SUDS features have been incorporated in the design.

- Permeable Surfaces – In-Curtilage Permeable Paving and Public Parking Areas.
    - Will provide permeable surface with voided stone sub-base which will accommodate surface water run-off from adjacent road surfaces and the permeable paving area.
    - All subbases to allow for infiltration back into the existing sub-soils.
- Infiltration Blanket
    - Surface water from each unit's roof will be transported to the infiltration blanket located in rear garden of each unit. All infiltration blankets to allow for infiltration back into the existing sub-soils.

5. SURFACE WATER

Existing Surface Water System

There is an existing dwelling within the site boundary that does not appear to be connected to the public surface water system in the area. All existing surface water infrastructure relating to the existing dwelling will be removed from the site. The rest of the site is a greenfield area. Surface water from this part of the site is infiltrated into the existing topsoil/subsoil and/or flows overland to the road that runs parallel to the southern site boundary.

Proposed Surface Water Collection System-Overview

A new surface water collection network will collect surface water run-off through roof gutters/downpipes and a network of gullies located around the site within the proposed roadways and hardstanding areas. The surface water is proposed to be collected in a new surface water pipework network (see drawing no. 24026-3021 for layout and details of the proposed collection network). The surface water network is to include the following features:

- In-Curtilage Parking with Permeable Paving Underlain with Voided Stone Sub-Bases.
- Roadside Gullies with Debris Screen and Silt Trap.
- Infiltration blanket to the rear of each dwelling.
- Diffuser box located in permeable parking areas to allow water to infiltrate into sub-base.

There will be no outflow from the site as all stormwater runoff will be infiltrated on site. The surface water collection network will be constructed in accordance with the following:

- IS EN 752:2008 – Drain & Sewer Systems Outside Buildings
- Building Regulations - TGD Part H – Drainage and Wastewater Disposal

Infiltration Blanket & Voided Areas Below Permeable Paving

The infiltration blanket and the voided areas below permeable paving areas have been designed to provide storage for the surface water generated during a 1 in 100-year rainfall. The rainfall generated by a 1 in 100-year rainfall will be increased by 30% for the predicted climate changes due to global warming. The required storage volume of the infiltration blankets (serving the roof areas) and voided stone areas (sering parking and roadways) has been calculated as 25m^3. 86.7 m^3 of storage is provided for the site. See Appendix A for surface water design calculations.

6. WASTEWATER

Existing Foul Sewer System

There is an existing dwelling within the site boundary that appears to be connected to the public foul water system in the area. All existing foul water infrastructure will be removed from the site and replaced with new infrastructure.

Proposed Foul Sewer System

All new foul water infrastructure will be gravity fed and will connect to the public foul system at the existing manhole located just outside the site boundary to the south of the site. Two manholes along with a 150mm diameter pipe located in the roadway of the site forms the mainline foul network. All six inspection chambers are to be connected to the manholes or pipeline located on site. A pre connection enquiry has been submitted to Uisce Eireann.

The new foul sewer system to be constructed within the site in accordance with the following:

- Uisce Eireann's "Code of Practice for Wastewater Infrastructure, Connections and Developer Services, Design & Construction Requirements for Self-Lay Developments, December 2017 (Revision 1)" Ref:IW-CDS-5030-03.
- IS EN 752:2008 – Drain & Sewer Systems Outside Buildings
- Building Regulations - TGD Part H – Drainage and Wastewater Disposal

The effluent generated by the proposed development is outlined in the following table:

Unit	Persons per Dwelling[1]	Loading[2] (l/day/ person)	No. Units	Flow (l/day)	Avg. Flow (l/s)[3]	Peak Flow[4] (l/s)
Dwelling	2.7	165	6	2,973	0.034	0.206

[1] See Appendix C of IW-CDS-5030-03 (Revision 2 – July 2020)

[2]Based on Appendix C&D of IW-CDS-5030-03 (Revision 2 – July 2020). DWF = 150 l/day. Infiltration = 10% of DWF = 15 l/day. Total=150 + 15 = 165 l/day.

[3] Average flow is spread over 24 hours.

[4] Peak flow = 6 times average flow.

The overall daily wastewater loading is 2,973 litres/day or 2.97m^3 day. See Appendix B for Foul Sewer design calculations.

7. WATERMAINS

The development will be connected to the existing public watermain along Barracks Road. Six new connections for each unit will be made to the existing public watermain. Each dwelling will be provided with a separate boundary box/water meter, in accordance with IW standards. The new overall development connection will allow for a water consumption of 150 l/day/person. This results in a requirement of 2.43m^3 of water per day. The proposed connections for the development will be made in accordance with Uisce Eireann Standard Details for □□sto□ er □onne□tion and □o□ndary □o□: Ref. STD-W-03-Rev 04. □he proposed fire hydrant to serve the site is □onne□ted to the e□isting water□ ain □b□ated in the p□□□□ footpath ad□a□ent to the site□Please refer to drawing 24026-3022 for the location and details of the proposed new watermain network and fire hydrants proposed for this new site layout.

8. EXISTING SERVICES

As described above any existing foul sewers, surface water sewers and watermains will be removed from site.

9. SUMMARY CONCLUSIONS

Surface Water: The proposed development will be served by a proposed surface water network, which will be served by an infiltration blanket for each unit, permeable paving and roadside gullies. All surface water for the proposed development area will be infiltrated into the existing sub-soils.

Foul Water: Any existing foul services within the site will be removed. All of the proposed foul water network will be gravity fed to an existing foul sewer. The wastewater loading from the proposed development will be 2.93m^3 day, with a peak flow of 0.206 l/s.

Watermains: The proposed watermain serving the site will be connected to the existing public watermain along Barracks Road at six different connection points for each unit. The volume of water required by the proposed development will be 2.43m^3 day.

10. APPENDIX A – SURFACE WATER DESIGN CALCULATIONS

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 5 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.088	0.088	11.2	5.9	O K
30 min Summer	0.094	0.094	11.2	6.4	O K
60 min Summer	0.077	0.077	11.2	5.2	O K
120 min Summer	0.049	0.049	11.1	3.3	O K
180 min Summer	0.040	0.040	8.9	2.7	O K
240 min Summer	0.033	0.033	7.5	2.3	O K
360 min Summer	0.026	0.026	5.8	1.7	O K
480 min Summer	0.021	0.021	4.8	1.4	O K
600 min Summer	0.018	0.018	4.1	1.2	O K
720 min Summer	0.016	0.016	3.5	1.1	O K
960 min Summer	0.013	0.013	2.9	0.9	O K
1440 min Summer	0.010	0.010	2.2	0.6	O K
2160 min Summer	0.007	0.007	1.6	0.5	O K
2880 min Summer	0.006	0.006	1.3	0.4	O K
4320 min Summer	0.004	0.004	1.0	0.3	O K
5760 min Summer	0.004	0.004	0.8	0.2	O K
7200 min Summer	0.003	0.003	0.7	0.2	O K
8640 min Summer	0.003	0.003	0.6	0.2	O K
10080 min Summer	0.002	0.002	0.5	0.2	O K
15 min Winter	0.102	0.102	11.2	6.9	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	109.639	0.0	16
30 min Summer	72.259	0.0	24
60 min Summer	44.978	0.0	40
120 min Summer	27.311	0.0	68
180 min Summer	20.234	0.0	98
240 min Summer	16.335	0.0	128
360 min Summer	12.045	0.0	188
480 min Summer	9.692	0.0	248
600 min Summer	8.183	0.0	306
720 min Summer	7.125	0.0	368
960 min Summer	5.724	0.0	490
1440 min Summer	4.202	0.0	736
2160 min Summer	3.084	0.0	1104
2880 min Summer	2.476	0.0	1436
4320 min Summer	1.815	0.0	2136
5760 min Summer	1.455	0.0	2896
7200 min Summer	1.226	0.0	3608
8640 min Summer	1.065	0.0	4376
10080 min Summer	0.946	0.0	5048
15 min Winter	109.639	0.0	16

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
30 min Winter	0.104	0.104	11.2	7.0	O K
60 min Winter	0.072	0.072	11.2	4.9	O K
120 min Winter	0.042	0.042	9.4	2.8	O K
180 min Winter	0.032	0.032	7.1	2.1	O K
240 min Winter	0.026	0.026	5.8	1.8	O K
360 min Winter	0.019	0.019	4.3	1.3	O K
480 min Winter	0.016	0.016	3.5	1.1	O K
600 min Winter	0.013	0.013	3.0	0.9	O K
720 min Winter	0.012	0.012	2.6	0.8	O K
960 min Winter	0.009	0.009	2.1	0.6	O K
1440 min Winter	0.007	0.007	1.6	0.5	O K
2160 min Winter	0.005	0.005	1.2	0.3	O K
2880 min Winter	0.004	0.004	1.0	0.3	O K
4320 min Winter	0.003	0.003	0.7	0.2	O K
5760 min Winter	0.003	0.003	0.6	0.2	O K
7200 min Winter	0.002	0.002	0.5	0.1	O K
8640 min Winter	0.002	0.002	0.4	0.1	O K
10080 min Winter	0.002	0.002	0.4	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
30 min Winter	72.259	0.0	25
60 min Winter	44.978	0.0	40
120 min Winter	27.311	0.0	68
180 min Winter	20.234	0.0	98
240 min Winter	16.335	0.0	130
360 min Winter	12.045	0.0	190
480 min Winter	9.692	0.0	252
600 min Winter	8.183	0.0	310
720 min Winter	7.125	0.0	370
960 min Winter	5.724	0.0	494
1440 min Winter	4.202	0.0	738
2160 min Winter	3.084	0.0	1104
2880 min Winter	2.476	0.0	1464
4320 min Winter	1.815	0.0	2248
5760 min Winter	1.455	0.0	2800
7200 min Winter	1.226	0.0	3792
8640 min Winter	1.065	0.0	4304
10080 min Winter	0.946	0.0	5064

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	17.700	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.062

Time (mins) From:	To:	Area (ha)	Time (mins) From:	To:	Area (ha)
0	4	0.031	4	8	0.031

Model Details

Storage is Online Cover Level (m) 0.750

Infiltration Blanket Structure

Infiltration Coefficient Base (m/hr)	0.35940	Diameter/Width (m)	9.0
Safety Factor	2.0	Length (m)	25.0
Porosity	0.30	Cap Volume Depth (m)	0.500
Invert Level (m)	0.000		

Summary of Results for 100 year Return Period (+30%)

Half Drain Time : 129 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
15 min Summer	0.183	0.183	0.2	1.7	O K
30 min Summer	0.234	0.234	0.2	2.1	O K
60 min Summer	0.270	0.270	0.2	2.5	O K
120 min Summer	0.283	0.283	0.2	2.6	O K
180 min Summer	0.279	0.279	0.2	2.5	O K
240 min Summer	0.272	0.272	0.2	2.5	O K
360 min Summer	0.254	0.254	0.2	2.3	O K
480 min Summer	0.234	0.234	0.2	2.1	O K
600 min Summer	0.215	0.215	0.2	2.0	O K
720 min Summer	0.196	0.196	0.2	1.8	O K
960 min Summer	0.161	0.161	0.2	1.5	O K
1440 min Summer	0.106	0.106	0.2	1.0	O K
2160 min Summer	0.058	0.058	0.2	0.5	O K
2880 min Summer	0.045	0.045	0.2	0.4	O K
4320 min Summer	0.034	0.034	0.1	0.3	O K
5760 min Summer	0.027	0.027	0.1	0.2	O K
7200 min Summer	0.023	0.023	0.1	0.2	O K
8640 min Summer	0.020	0.020	0.1	0.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
15 min Summer	109.639	0.0	21
30 min Summer	72.259	0.0	34
60 min Summer	44.978	0.0	62
120 min Summer	27.311	0.0	110
180 min Summer	20.234	0.0	140
240 min Summer	16.335	0.0	174
360 min Summer	12.045	0.0	242
480 min Summer	9.692	0.0	310
600 min Summer	8.183	0.0	376
720 min Summer	7.125	0.0	442
960 min Summer	5.724	0.0	568
1440 min Summer	4.202	0.0	806
2160 min Summer	3.084	0.0	1128
2880 min Summer	2.476	0.0	1472
4320 min Summer	1.815	0.0	2204
5760 min Summer	1.455	0.0	2936
7200 min Summer	1.226	0.0	3664
8640 min Summer	1.065	0.0	4400

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Summer	0.018	0.018	0.1	0.2	O K
15 min Winter	0.207	0.207	0.2	1.9	O K
30 min Winter	0.266	0.266	0.2	2.4	O K
60 min Winter	0.309	0.309	0.2	2.8	O K
120 min Winter	0.329	0.329	0.2	3.0	O K
180 min Winter	0.322	0.322	0.2	2.9	O K
240 min Winter	0.313	0.313	0.2	2.9	O K
360 min Winter	0.286	0.286	0.2	2.6	O K
480 min Winter	0.255	0.255	0.2	2.3	O K
600 min Winter	0.224	0.224	0.2	2.0	O K
720 min Winter	0.195	0.195	0.2	1.8	O K
960 min Winter	0.141	0.141	0.2	1.3	O K
1440 min Winter	0.066	0.066	0.2	0.6	O K
2160 min Winter	0.041	0.041	0.2	0.4	O K
2880 min Winter	0.033	0.033	0.1	0.3	O K
4320 min Winter	0.025	0.025	0.1	0.2	O K
5760 min Winter	0.020	0.020	0.1	0.2	O K
7200 min Winter	0.017	0.017	0.1	0.2	O K
8640 min Winter	0.015	0.015	0.1	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Summer	0.946	0.0	5024
15 min Winter	109.639	0.0	21
30 min Winter	72.259	0.0	34
60 min Winter	44.978	0.0	62
120 min Winter	27.311	0.0	118
180 min Winter	20.234	0.0	150
240 min Winter	16.335	0.0	188
360 min Winter	12.045	0.0	264
480 min Winter	9.692	0.0	336
600 min Winter	8.183	0.0	408
720 min Winter	7.125	0.0	474
960 min Winter	5.724	0.0	598
1440 min Winter	4.202	0.0	808
2160 min Winter	3.084	0.0	1112
2880 min Winter	2.476	0.0	1472
4320 min Winter	1.815	0.0	2200
5760 min Winter	1.455	0.0	2856
7200 min Winter	1.226	0.0	3632
8640 min Winter	1.065	0.0	4400

Summary of Results for 100 year Return Period (+30%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Volume (m³)	Status
10080 min Winter	0.013	0.013	0.0	0.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Time-Peak (mins)
10080 min Winter	0.946	0.0	5144

Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	17.700	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+30

Time Area Diagram

Total Area (ha) 0.009

Time From:	(mins) To:	Area (ha)	Time From:	(mins) To:	Area (ha)
0	4	0.005	4	8	0.004

Model Details

Storage is Online Cover Level (m) 0.750

Infiltration Blanket Structure

Infiltration Coefficient Base (m/hr)	0.14700	Diameter/Width (m)	2.4
Safety Factor	2.0	Length (m)	4.0
Porosity	0.95	Cap Volume Depth (m)	0.350
Invert Level (m)	0.000		

11. APPENDIX B – PROPOSED SERVICES DRAWINGS

A1

PROPOSED GRAF ECOBLOC INFILTRATION BLANKET TO THE REAR OF EACH UNIT. 9.6m² @ 0.35m DEEP. STORAGE CAPACITY =3.2m³.

Proposed residential units

Existing domestic garage

Proposed residential units

Existing building

Site Entrance

Site Exit

FW 2.0
CL 96.165
IL 94.990

150Ø 1:26 18.5m

150Ø 1:29 6.1m

FW 1.0
CL 97.050
IL 95.700

F3.0 EX
CL 96.238
IL 94.782

SURFACE WATER TO BE DISCHARGED THROUGH PERMAVOID DIFFUSER INTO VOIDED SUB-BASE BENEATH PERMEABLE PAVING.

225m³ OF PERMEABLE PAVING LOCATED THROUGHOUT THE SITE PROVIDING 67.5m³ OF STORAGE.

PROPOSED CONNECTION TO EXISTING FOUL WATER MANHOLE.

LEGEND -PROPOSED SITE SERVICES-DRAINAGE

PROPOSED FOUL SEWER PIPES 150mm Ø UPVC TO COMPLY WITH IW WASTEWATER CODE OF PRACTICE	
PRIVATE SIDE FOUL SEWER PIPES, 100MM Ø UPVC SN8, 1:60 MIN. FALL	
EXISTING WASTE WATER SEWER, SIZE T.B.C.	
PROPOSED SURFACE WATER PIPELINE 150mm Ø uPVC	
EXISTING SURFACE WATER PIPELINE, SIZE T.B.C.	
PROPOSED 1200mm Ø Manholes: FOUL (RED)	
EXISTING MANHOLES - LOCATION & SIZE T.B.C.: FOUL (PURPLE)	
ARMSTRONG JUNCTION BOX: FOUL (RED) & SURFACE (GREEN)	AJ AJ
FOUL INSPECTION CHAMBER	IC IC
PROPOSED ROAD GULLY TO BE HEAVY DUTY, SUITABLE FOR HGV LOADING (D400).	
PERMEABLE PAVING; VOIDED STONE BELOW PAVERS; 500mm DEEP; 30% VOIDS).	
PERMAVOID RAINWATER DIFFUSER UNIT; 354mm x 708mm.	
SITE BOUNDARY	
PROPOSED INFILTRATION BLANKET	

WATER/WASTEWATER INFRASTRUCTURE

ALL WASTEWATER INFRASTRUCTURE TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH:

- CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE, CONNECTIONS AND DEVELOPER SERVICES, DESIGN AND CONSTRUCTION REQUIREMENTS FOR SELF-LAY DEVELOPMENTS; JULY 2020 (REVISION 2); IW-CDS-5030-03
- WASTEWATER INFRASTRUCTURE STANDARD DETAILS, CONNECTIONS AND DEVELOPER SERVICES, CONSTRUCTION REQUIREMENTS FOR SELF-LAY DEVELOPMENTS; JULY 2020 (REVISION 04); IW-CDS-5030-01

ALL WATER INFRASTRUCTURE TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH:

- CODE OF PRACTICE FOR WATER INFRASTRUCTURE, CONNECTIONS AND DEVELOPER SERVICES, DESIGN AND CONSTRUCTION REQUIREMENTS FOR SELF-LAY DEVELOPMENTS; JULY 2020 (REVISION 2); IW-CDS-5020-03
- WATER INFRASTRUCTURE STANDARD DETAILS, CONNECTIONS AND DEVELOPER SERVICES, CONSTRUCTION REQUIREMENTS FOR SELF-LAY DEVELOPMENTS; JULY 2020 (REVISION 04); IW-CDS-5020-01

WHERE THE ABOVE DOCUMENTS ARE REVISED BY IW, THE LATEST REVISION OF THE RELEVANT DOCUMENT SHALL BE USED.

DRAINAGE NOTES (REFERENCE TGD PART H)

1. ALL WASH HAND BASINS ON THE FIRST FLOOR TO HAVE 'DEEP SEAL TRAPS'.
2. AN AIR ADMITTANCE VALVE (AAV) IS REQUIRED ON EACH BRANCH CONNECTION TO THE WC's ON THE FIRST FLOOR.
3. SOIL VENT PIPE REQUIRED AT THE HIGHEST END OF EACH CONTINUOS RUN. ANY BRANCH THAT IS GREATER THAN 10M WILL ALSO REQUIRE A SOIL VENT PIPE. THE SOIL VENT PIPE IS TO TERMINATE EXTERNALLY AT LEAST 900mm ABOVE ANY OPENING THAT IS WITHIN 3M. A CAGE OR COVER ON THE PIPE THAT DOES NOTE RESTRICT THE AIR FLOW.
4. ALL DRAINAGE PIPES TO HAVE A FULL CCTV SURVEY COMPLETED PRIOR SURFACING IS COMPLETE, AND ALL PIPES ARE TO BE AIR TESTED ALSO.

DRAINAGE NOTES (REFERENCE TGD PART H)

1. ALL GRADIENTS OF PIPES TO COMPLY WITH TGD PART H.
2. ALL PIPE WORK BEDDING TO FULLY COMPLY WITH TGD PART H.

ESB INFRASTRUCTURE

ALL ESB EXISTING AND PROPOSED LINES ARE FOR INFORMATION PURPOSES ONLY AND ARE INDICATIVE ONLY. FOR DETAILS OF WORKS TO ESB LINES, OVERHEAD AND UNDERGROUND, SEE M&E CONSULTANT DRAWINGS.

SITE LAYOUT- SERVICES: WASTEWATER & SURFACE WATER

SCALE = 1:250

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DRAWING NOTES:
1. This Drawing is to be read in conjunction with the relevant Specifications & other Architectural & Engineering Drawings. Engineers to be informed immediately of any discrepancies before work proceeds.
2. Do Not Scale from this Drawing; -Metric Figured Dimension only are to be used.
3. It is "The Contractors" responsibility to ensure that all works are carried out in accordance with the requirements of the current Building Regulations and all other statutory documents relevant to this project including the grant of planning permission, Fire Safety Certificate and Disability Access Certificate.
4. SDS (Structural Design Solutions) Ltd./ SDS-UK (Structural Design Solutions) Ltd. bear no liability for unilateral changes/modifications made during the course of construction based on the drawing prepared, without prior consultation and confirmation of acceptance of the revision by SDS (Structural Design Solutions) Ltd./ SDS-UK (Structural Design Solutions) Ltd.

REV.	DATE:	BY:	DESCRIPTION:
PL1	29.08.2024	AT	ISSUED FOR REVIEW

Client: KILDARE COUNTY COUNCIL

Project Title: PROPOSED HOUSING DEVELOPMENT AT BARRACKS ROAD, BALLITORE, Co. KILDARE

Drawing Title: SITE LAYOUT- SERVICES: WASTEWATER & SURFACE WATER

Scales	Paper Size	Status
1:250	A1	PLANNING
Drawn by	**Date**	**Checked**
AT	AUGUST 2024	CD

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Project No.	Drawing No.	Revision
24026	3021	PL1

A1

LEGEND -PROPOSED SITE SERVICES-WATERMAIN

WATERMAINS - EXISTING	
HYDRANT - EXISTING	
WATERMAINS - PROPOSED; MDPE-PE80 U.N.O.; 100mm Ø U.N.O.	
AIR VALVE - PROPOSED	AV
BOUNDARY BOX (25mm Ø) WITH STOPCOCK AND WATER METER - PROPOSED	BB
HYDRANT - PROPOSED	H
SLUICE VALVE - PROPOSED	SV
SCOUR VALVE - PROPOSED	SCV
THRUST BLOCK	TB
WATER METER (SINGLE UNIT) - PROPOSED	M
WATER METER (DEVELOPMENT) - PROPOSED (BYPASS FLOW METER AS PER IW DETAIL STD-W-26F)	BM

ALL WATER INFRASTRUCTURE TO BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH:

- CODE OF PRACTICE FOR WATER INFRASTRUCTURE, CONNECTIONS AND DEVELOPER SERVICES, DESIGN AND CONSTRUCTION REQUIREMENTS FOR SELF-LAY DEVELOPMENTS; JULY 2020 (REVISION 2); IW-CDS-5020-03
- WATER INFRASTRUCTURE STANDARD DETAILS, CONNECTIONS AND DEVELOPER SERVICES, CONSTRUCTION REQUIREMENTS FOR SELF-LAY DEVELOPMENTS; JULY 2020 (REVISION 04); IW-CDS-5020-01

WHERE THE ABOVE DOCUMENTS ARE REVISED BY IW, THE LATEST REVISION OF THE RELEVANT DOCUMENT SHALL BE USED.

NOTE:
ALL PIPE MATERIALS SHALL BE IN COMPLIANCE WITH SECTION 3.9 OF THE IRISH WATER CODE OF PRACTICE

Proposed residential units

1

2

Existing domestic garage

Existing building

3

4

Proposed residential units

5

6

Site Entrance

Site Exit

BOUNDARY BOXES FROM EACH UNIT TO BE CONNECTED TO EXISTING WATERMAIN.

NEW FIRE HYDRANT TO BE CONNECTED TO EXISTING WATERMIAN.

SITE LAYOUT- SERVICES: WATERMAIN

SCALE = 1:250

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SDS design engineers

DRAWING NOTES:
1. This Drawing is to be read in conjunction with the relevant Specifications & other Architectural & Engineering Drawings. Engineers to be informed immediately of any discrepancies before work proceeds.
2. Do Not Scale from this Drawing; -Metric Figured Dimension only are to be used.
3. It is "The Contractors" responsibility to ensure that all works are carried out in accordance with the requirements of the current Building Regulations and all other statutory documents relevant to this project including the grant of planning permission, Fire Safety Certificate and Disability Access Certificate.
4. SDS (Structural Design Solutions) Ltd./ SDS-UK (Structural Design Solutions) Ltd. bear no liability for unilateral changes/modifications made during the course of construction based on the drawing prepared, without prior consultation and confirmation of acceptance of the revision by SDS (Structural Design Solutions) Ltd./ SDS-UK (Structural Design Solutions) Ltd.

REV.	DATE:	BY:	DESCRIPTION:
PL1	29.08.2024	AT	ISSUED FOR REVIEW

Client: KILDARE COUNTY COUNCIL

Project Title: PROPOSED HOUSING DEVELOPMENT AT BARRACKS ROAD, BALLITORE, Co. KILDARE

Drawing Title: SITE LAYOUT- SERVICES: WATERMAIN

Scales	Paper Size:	Status
1:250	A1	PLANNING
Drawn by: AT	Date: AUGUST 2024	Checked: CD

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Project No.	Drawing No.	Revision
24026	3022	PL1

12. APPENDIX C – TRIAL PIT & BOREHOLE LOGS

Contract No: 6312	**Cable Percussion Borehole Log**				Borehole No: **BH01**
Contract:	Barrack Road	Easting:	679941.604	Date Started:	24/07/2024
Location:	Ballitore, Co. Kildare	Northing:	695962.931	Date Completed:	24/07/2024
Client:	Kildare County Council	Elevation:	97.22	Drilled By:	D. Clarke
Engineer:	SDS Design Engineers	Borehole Diameter:	200mm	Status:	FINAL

Depth m)		Stratum Description	Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth			Scale	Depth	Depth	Type	Result		
		TOPSOIL.		97.0						
	0.30				96.92					
0.5		Brown sandy slightly gravelly silty CLAY with low cobble content.		96.5						
1.0						1.00	B	DC07		
						1.00	C	N=26 (5,6/7,7,6,6)		
	1.20			96.0	96.02					
		Dense grey silty sandy GRAVEL with high cobble content.								
1.5				95.5						
2.0						2.00	B	DC08		
						2.00	C	50 (7,8/50 for 200mm)		
				95.0						
2.5										
				94.5						
3.0	3.00				94.22	3.00	B	DC09		
	3.10	Obstruction - possible boulders.			94.12	3.10	C	50 (25 for 5mm/50 for 5mm)		
		End of Borehole at 3.10m		94.0						
3.5										
				93.5						
4.0										
				93.0						
4.5										
				92.5						

Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:
From:	To:	Time:	Strike:	Rose:	Depth Sealed	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	
1.70	1.80	01:00				24/07	3.10	Dry				0.00	3.10	Arisings	Borehole terminated due to obstruction.
2.30	2.40	01:00													
3.00	3.10	01:30													

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 6312	**Cable Percussion Borehole Log**	Borehole No: **BH02**

Contract:	Barrack Road	Easting:	679924.503	Date Started:	22/07/2024
Location:	Ballitore, Co. Kildare	Northing:	695977.730	Date Completed:	22/07/2024
Client:	Kildare County Council	Elevation:	96.97	Drilled By:	D. Clarke
Engineer:	SDS Design Engineers	Borehole Diameter:	200mm	Status:	FINAL

Depth m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
	0.10	MADE GROUND: tarmacadam.			96.87					
		MADE GROUND: brown silty sandy gravel.		96.5						
0.5										
	0.60	Brown slightly sandy slightly gravelly silty CLAY with high cobble content.			96.37					
	0.90				96.07					
1.0		Dense brown silty gravelly SAND with high cobble content.		96.0		1.00 1.00	B C	DC01 50 (9,7/50 for 165mm)		
1.5				95.5						
	1.60	Dense brown silty sandy GRAVEL with high cobble content.			95.37					
2.0				95.0		2.00 2.00	B C	DC02 50 (8,10/50 for 100mm)		
2.5				94.5						
3.0				94.0		3.00 3.00	B C	DC03 50 (8,9/50 for 200mm)		
	3.40				93.57					
3.5		Obstruction - possible boulders.		93.5						
	3.60	End of Borehole at 3.60m			93.37	3.60	C	50 (25 for 5mm/50 for 5mm)		
4.0				93.0						
4.5				92.5						

Chiselling: From:	To:	Time:	Water Strikes: Strike:	Rose:	Depth Sealed	Water Details: Date:	Hole Depth:	Water Depth:	Installation: From:	To:	Pipe:	Backfill: From:	To:	Type:	Remarks:
1.30	1.40	01:00				22/07	3.60	Dry				0.00	3.60	Arisings	Borehole terminated due to obstruction.
2.20	2.30	01:00													
3.40	3.60	01:30													

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 6312	**Cable Percussion Borehole Log**				Borehole No: **BH03**
Contract:	Barrack Road	Easting:	679948.107	Date Started:	23/07/2024
Location:	Ballitore, Co. Kildare	Northing:	695983.414	Date Completed:	23/07/2024
Client:	Kildare County Council	Elevation:	96.78	Drilled By:	D. Clarke
Engineer:	SDS Design Engineers	Borehole Diameter:	200mm	Status:	FINAL

Depth m)		Stratum Description	Legend	Level (mOD)		Samples and Insitu Tests			Water Strike	Backfill
Scale	Depth			Scale	Depth	Depth	Type	Result		
		TOPSOIL.		96.5						
	0.40	Brown sandy slightly gravelly silty CLAY with low cobble content.			96.38					
0.5				96.0						
1.0						1.00	B	DC04		
	1.10	Dense grey silty sandy GRAVEL with high cobble content.			95.68	1.00	C	N=42 (7,8/9,9,12,12)		
1.5				95.5						
				95.0						
2.0						2.00	B	DC05		
						2.00	C	N=50 (9,9/10,12,14,14)		
2.5				94.5						
	2.80	Obstruction - possible boulders.		94.0	93.98					
3.0	3.00	End of Borehole at 3.00m			93.78	3.00	B	DC06		
						3.00	C	50 (25 for 5mm/50 for 5mm)		
3.5				93.5						
				93.0						
4.0										
				92.5						
4.5										
				92.0						

Chiselling:			Water Strikes:			Water Details:			Installation:			Backfill:			Remarks:
From:	To:	Time:	Strike:	Rose:	Depth Sealed	Date:	Hole Depth:	Water Depth:	From:	To:	Pipe:	From:	To:	Type:	
1.60	1.80	01:00				23/07	3.00	Dry				0.00	3.00	Arisings	Borehole terminated due to obstruction.
2.80	3.00	01:30													

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 6312	**Trial Pit Log**				Trial Pit No: **TP01**
Contract:	Barrack Road	Easting:	679917.536	Date:	09/07/2024
Location:	Ballitore, Co. Kildare	Northing:	695993.215	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	95.90	Logged By:	D. Monaghan
Engineer:	SDS Design Engineers	Dimensions (LxWxD) m):	3.50 x 0.60 x 2.50	Status:	FINAL

Level mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.							
	0.30				95.60				
0.5		Firm brown sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.		95.5		0.50	ES	DM01	
	0.90			95.0	95.00				
1.0		Brown grey silty very sandy fine to coarse, angular to subrounded GRAVEL of limestone with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subrounded of limestone.				1.00	B	DM02	
1.5				94.5					
				94.0					
2.0						2.00	B	DM03	
				93.5					
2.5	2.50	**Pit terminated at 2.50m**			93.40				
3.0				93.0					
				92.5					
3.5									
				92.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B Bulk disturbed D Small disturbed CBR Undisturbed CBR ES Environmental

Contract No: 6312	**Trial Pit Log**				Trial Pit No: **TP02**
Contract:	Barrack Road	Easting:	679950.006	Date:	09/07/2024
Location:	Ballitore, Co. Kildare	Northing:	695975.807	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	96.85	Logged By:	D. Monaghan
Engineer:	SDS Design Engineers	Dimensions (LxWxD) m):	3.50 x 0.60 x 2.50	Status:	FINAL

Level mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		TOPSOIL.							
	0.30			96.5	96.55				
0.5		Firm brown sandy gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone. Cobbles are angular to subrounded of limestone.				0.50	ES	DM04	
				96.0					
1.0						1.00	B	DM05	
				95.5					
1.5	1.50				95.35				
		Brown grey silty very sandy fine to coarse, angular to subrounded GRAVEL of limestone with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subrounded of limestone.		95.0					
2.0						2.00	B	DM06	
				94.5					
2.5	2.50	**Pit terminated at 2.50m**			94.35				
				94.0					
3.0									
				93.5					
3.5									
				93.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B Bulk disturbed D Small disturbed CBR Undisturbed CBR ES Environmental

Contract No: 6312	**Trial Pit Log**				Trial Pit No: **TP03**
Contract:	Barrack Road	Easting:	679910.330	Date:	09/07/2024
Location:	Ballitore, Co. Kildare	Northing:	695970.802	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	96.15	Logged By:	D. Monaghan
Engineer:	SDS Design Engineers	Dimensions (LxWxD) m):	3.50 x 0.60 x 2.50	Status:	FINAL

Level mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
	0.05	MADE GROUND: grey silty sandy gravel. TOPSOIL.		96.0	96.10				
	0.20	Firm brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone.			95.95				
0.5				95.5					
1.0						1.00	B	DM07	
	1.20	Brown grey silty very sandy fine to coarse, angular to subrounded GRAVEL of limestone with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subrounded of limestone.		95.0	94.95				
1.5				94.5					
2.0						2.00	B	DM08	
2.5	2.50	**Pit terminated at 2.50m**		94.0	93.65				
				93.5					
3.0				93.0					
3.5				92.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B Bulk disturbed D Small disturbed CBR Undisturbed CBR ES Environmental

Contract No: 6312	**Trial Pit Log**				Trial Pit No: **TP04**
Contract:	Barrack Road	Easting:	679922.650	Date:	09/07/2024
Location:	Ballitore, Co. Kildare	Northing:	695983.404	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	96.62	Logged By:	D. Monaghan
Engineer:	SDS Design Engineers	Dimensions (LxWxD) m):	3.50 x 0.60 x 2.50	Status:	FINAL

Level mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
		MADE GROUND: dark brown slightly sandy gravelly silty clay.		96.5					
	0.40				96.22				
0.5		Firm brown sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone.		96.0		0.50	ES	DM09	
	0.80				95.82				
1.0		Brown grey silty very sandy fine to coarse, angular to subrounded GRAVEL of limestone with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subrounded of limestone.		95.5		1.00	B	DM10	
1.5				95.0					
2.0						2.00	B	DM11	
				94.5					
2.5	2.50	**Pit terminated at 2.50m**			94.12				
				94.0					
3.0				93.5					
3.5				93.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B Bulk disturbed D Small disturbed CBR Undisturbed CBR ES Environmental

Contract No: 6312	**Trial Pit Log**				Trial Pit No: **TP05**
Contract:	Barrack Road	Easting:	679944.812	Date:	09/07/2024
Location:	Ballitore, Co. Kildare	Northing:	695969.955	Excavator:	JCB 3CX
Client:	Kildare County Council	Elevation:	97.18	Logged By:	D. Monaghan
Engineer:	SDS Design Engineers	Dimensions (LxWxD) m):	3.50 x 0.60 x 2.50	Status:	FINAL

Level mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples / Field Tests Depth	Type	Result	Water Strike
	0.00	TOPSOIL.		97.0	96.98				
	0.20	Firm brown slightly sandy slightly gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, angular to subrounded of limestone.		96.5	96.38				
0.5									
	0.80	Brown grey silty very sandy fine to coarse, angular to subrounded GRAVEL of limestone with medium cobble and boulder content. Sand is fine to coarse. Cobbles and boulders are angular to subrounded of limestone.		96.0		1.00	B	DM12	
1.0									
1.5				95.5					
2.0						2.00	B	DM13	
				95.0					
2.5	2.50	**Pit terminated at 2.50m**			94.68				
				94.5					
3.0									
				94.0					
3.5									
				93.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B Bulk disturbed D Small disturbed CBR Undisturbed CBR ES Environmental