MTW Consultants Ltd.

Consulting Civil and
Structural Engineers

Unit 4, MTW House
Broomfield Business Park
Malahide, Co. Dublin
Tel: 846 3505
Fax: 846 3515
info@mtw.ie

Engineering Report

On

Drainage & Water Supply Issues

For

Development

At

Rathinree Esker Lane Lucan K78 X2C4

Client	Eoin and Nora Hickey			
Project Title	Rathinree Esker Lane Lucan K78 X2C4.			
Project Number	3898			
Document Number	153743			
Rev	Issue Date	By	Approved By	Status
-	08/07/2022	GF	BW	Issued to Architect

Contents

Drawing List

Proposed Foul and SW Plan 1:500	3898 PL 600
Proposed Foul and SW Plan 1:250	3898 PL 601
Proposed Foul Section	3898 PL 602
Proposed SW Section PS5 to PS4	3898 PL 603
Proposed SW Section PS1 to Soakaway	3898 PL 604

Introduction

MTW Consultants Ltd, Consulting Civil and Structural Engineers, MTW House, Broomfield Business Park, Malahide, Co. Dublin have been retained by the Applicants as Consulting Engineers for this proposed development.

Description of Existing Site and Development

The existing property is a two-storey house with a roof area of 288 m^2. The site is relatively level and has an area of approximately 0.49 Ha.

The development will consist of a 2-storey, 3-bedroom, Ancillary Dwelling Unit (ADU) with dovecote loft, solar panels, porch, deck, terrace and associated site works, utilities, landscaping, facilities and services on the site of and adjacent to existing single-storey family bungalow residence which will be retained. The new ADU will share existing entrance gateway and is accessed via a new private driveway along existing tree-lined avenue to private court with parking for 2 cars.

Foul Sewer

Foul water drainage for the proposed development is designed in accordance with the Technical Guidance Document Part H and to comply with the requirements of the Irish Water's Code of Practice for Code of Practice for Wastewater Infrastructure Connections and Developer Services Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2).

The existing house is connected to a 225mm diameter sewer to the west in Esker Pines.

It is proposed that the ADU will be connected to the main sewer on Esker Lane.

Surface Water

Surface water drainage for the proposed development is designed in accordance with Technical Guidance Document Part H, and to comply with the requirements of the Water Services Department. It includes a storm water management system following the principles of Sustainable Urban Drainage in compliance with GDSDS (Greater Dublin Strategic Drainage Study).

Existing

The existing house discharges rainwater into soakaways.

Proposed

Runoff from impermeable areas will be directed to an soakaway in the garden, the soakaway is located 3m from boundaries and 5m from the house. The soakaway was designed using a conservative infiltration value, it is proposed to test the soil prior to construction to confirm the results. An infiltration rate of 5.3E-06 m/sec and a factor of safety of 1.5 was used in the calculations. The soakaway as designed will not surcharge during a 100 year event including a 20% allowance for climate change.

Calculations are shown in annex A and the surface water layout may be seen on Drawing 3898-PL-600 with longitudinal sections also shown on Drawing 3898-PL-601.

Self-cleaning velocities

All drainage runs have been designed to achieve a minimum self-cleansing velocity of 0.75m/s.

Pipe Sizes

Pipe sizes for individual house connections are 100mm diameter at a fall of 1:60.

Water Supply

It is intended to connect to the existing 100mm upvc water main on Esker Lane. The connection will be separate to the existing dwelling with its own water meter box

Water supply for the proposed development is designed in accordance with the requirements of the Code of Practice for Water Infrastructure Connections and Developer Services Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2). See Drawing 3898-PL-600 for full layout.

Flood Risk Assessment

The Site is located in flood zone C (low probability of flooding) and therefore a flood risk assessment is not required.

Glen Faherty
BSc (Eng), Dip Eng, CEng MIEI
Chartered Engineer
For and on behalf of MTW Consultants Ltd

Annex A Surface Water Calculations

Design Settings

Rainfall Methodology	FSR	Maximum Time of Concentration (mins)	30.00
Return Period (years)	1	Maximum Rainfall (mm/hr)	50.0
Additional Flow (%)	0	Minimum Velocity (m/s)	0.75
FSR Region	Scotland and Ireland	Connection Type	Level Soffits
M5-60 (mm)	17.000	Minimum Backdrop Height (m)	0.200
Ratio-R	0.300	Preferred Cover Depth (m)	0.400
CV	0.750	Include Intermediate Ground	✓
Time of Entry (mins)	5.00	Enforce best practice design rules	✓

Nodes

Name	Area (ha)
PS1	0.011
PS2	
PS3	
PS4	
PS5	
PS6	
PS7	

Links

Name	US Node	DS Node	US IL (m)	DS IL (m)	Slope (1:X)	Dia (mm)
PS1-PS2	PS1	PS2	46.856	46.750	59.2	100
PS2-PS7	PS2	PS7	46.750	46.675	98.0	100
PS7-PS3	PS7	PS3	46.675	46.381	14.3	100
PS5-PS6	PS5	PS6	46.549	46.469	100.5	100
PS6-PS3	PS6	PS3	46.469	46.381	99.3	100
PS3-PS4	PS3	PS4	46.381	46.280	90.9	100

Name	Vel (m/s)	Cap (l/s)	Flow (l/s)	US Depth (m)	DS Depth (m)	Σ Area (ha)	Σ Add Inflow (l/s)	Pro Depth (mm)	Pro Velocity (m/s)
PS1-PS2	1.003	7.9	1.3	0.900	0.900	0.011	0.0	28	0.744
PS2-PS7	0.776	6.1	1.3	0.900	0.932	0.011	0.0	31	0.611
PS7-PS3	2.054	16.1	1.3	0.932	1.141	0.011	0.0	19	1.226
PS5-PS6	0.767	6.0	0.0	0.900	0.950	0.000	0.0	0	0.000
PS6-PS3	0.771	6.1	0.0	0.950	1.141	0.000	0.0	0	0.000
PS3-PS4	**0.807**	**6.3**	**1.3**	**1.141**	**1.231**	**0.011**	**0.0**	**30**	**0.626**

Simulation Settings

Rainfall Methodology	FSR	Analysis Speed	Normal
FSR Region	**Scotland and Ireland**	**Skip Steady State**	x
M5-60 (mm)	17.000	Drain Down Time (mins)	60
Ratio-R	0.300	Additional Storage (m^3/ha)	1.0
Summer CV	0.750	Check Discharge Rate(s)	x
Winter CV	0.840	Check Discharge Volume	x

Storm Durations

15	30	60	120	180	240	360	480	600	720	960	1440

Return Period (years)	Climate Change (CC %)	Additional Area (A %)	Additional Flow (Q %)
1	1	0	0
30	0	0	0
100	20	0	0

Node PS4 Soakaway Storage Structure

Base Inf Coefficient (m/hr)	0.00000	Invert Level (m)	45.500	Depth (m)	1.000
Side Inf Coefficient (m/hr)	0.01900	Time to half empty (mins)	1137	Inf Depth (m)	
Safety Factor	**2.0**	**Pit Width (m)**	**3.000**	**Number Required**	**1**
Porosity	0.30	Pit Length (m)	2.000		

Results for 1 year +1% CC Critical Storm Duration. Lowest mass balance: 45.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
15 minute winter	PS1	10	46.884	0.028	1.3	0.0038	0.0000	OK
15 minute winter	PS2	11	46.784	0.034	1.3	0.0043	0.0000	OK
1440 minute winter	PS3	960	46.494	0.113	0.1	0.0143	0.0000	SURCHARGED
1440 minute winter	PS4	960	46.495	0.215	0.1	1.8172	0.0000	OK
15 minute summer	PS5	1	46.549	0.000	0.0	0.0000	0.0000	OK
1440 minute winter	PS6	960	46.494	0.025	0.0	0.0032	0.0000	OK
15 minute winter	**PS7**	**11**	**46.694**	**0.019**	**1.3**	**0.0024**	**0.0000**	**OK**

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
15 minute winter	PS1	PS1-PS2	PS2	1.3	0.638	0.165	0.0129
15 minute winter	PS2	PS2-PS7	PS7	1.3	0.779	0.213	0.0125
1440 minute winter	PS3	PS3-PS4	PS4	0.1	0.298	0.016	0.0719
1440 minute winter	PS4	Infiltration		0.0			
15 minute summer	PS5	PS5-PS6	PS6	0.0	0.000	0.000	0.0000
1440 minute winter	**PS6**	**PS6-PS3**	**PS3**	**0.0**	**0.008**	**0.005**	**0.0409**
15 minute winter	PS7	PS7-PS3	PS3	1.3	0.940	0.081	0.0066

Results for 30 year Critical Storm Duration. Lowest mass balance: 45.74%

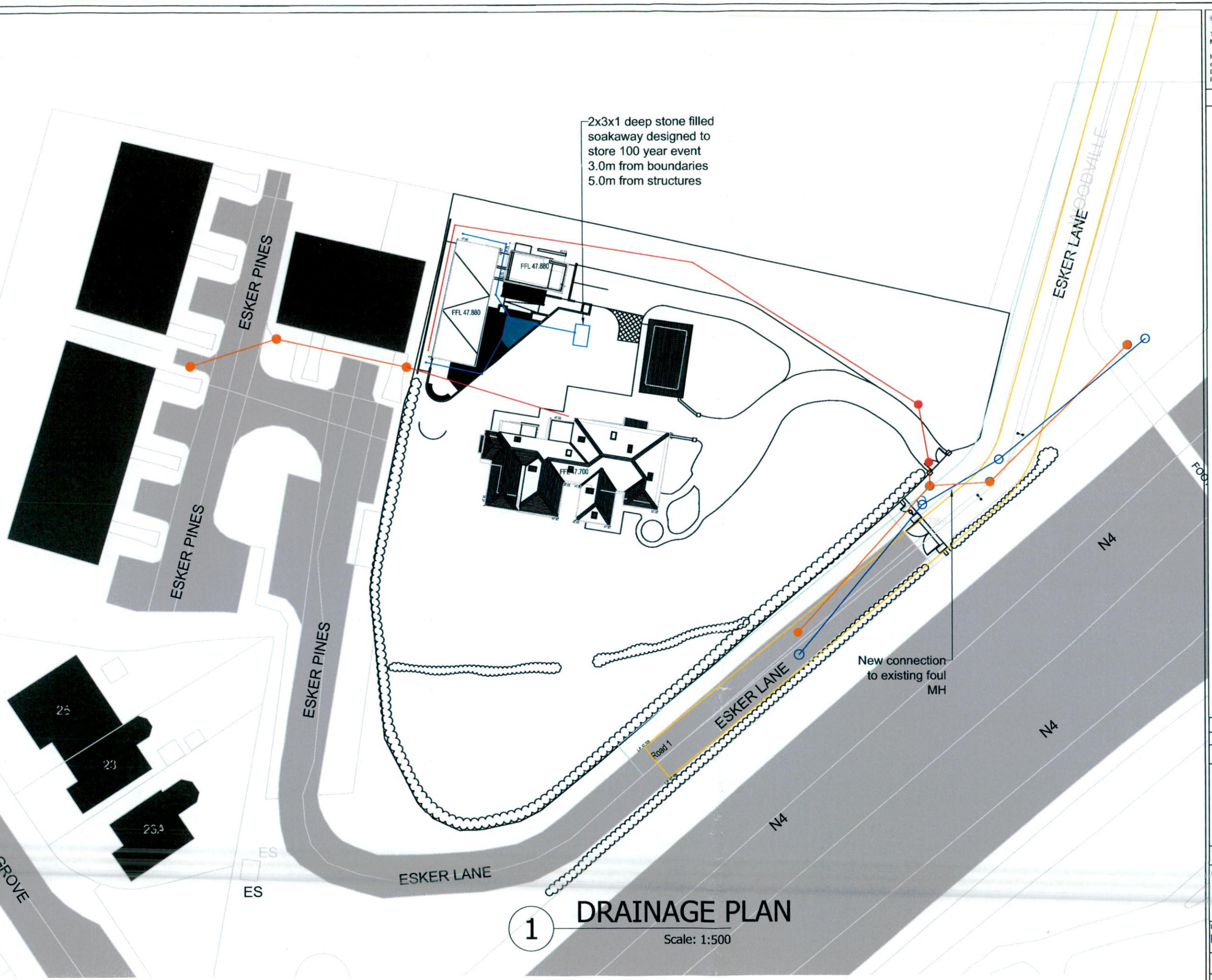
Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
720 minute winter	PS1	675	46.972	0.116	0.3	0.0159	0.0000	SURCHARGED
720 minute winter	PS2	675	46.972	0.222	0.3	0.0280	0.0000	SURCHARGED
720 minute winter	PS3	675	46.973	0.592	0.3	0.0745	0.0000	SURCHARGED
720 minute winter	PS4	675	46.973	0.693	0.2	1.8883	0.0000	OK
720 minute winter	PS5	675	46.973	0.424	0.1	0.0534	0.0000	SURCHARGED
720 minute winter	PS6	675	46.973	0.504	0.2	0.0635	0.0000	SURCHARGED
720 minute winter	**PS7**	**675**	**46.973**	**0.298**	**0.3**	**0.0375**	**0.0000**	**SURCHARGED**

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
720 minute winter	PS1	PS1-PS2	PS2	0.3	0.441	0.038	0.0491
720 minute winter	PS2	PS2-PS7	PS7	0.3	0.508	0.049	0.0575
720 minute winter	PS3	PS3-PS4	PS4	0.2	0.365	0.032	0.0719
720 minute winter	PS4	Infiltration		0.0			
720 minute winter	PS5	PS5-PS6	PS6	-0.1	-0.020	-0.013	0.0629
720 minute winter	**PS6**	**PS6-PS3**	**PS3**	**-0.2**	**-0.021**	**-0.027**	**0.0684**
720 minute winter	PS7	PS7-PS3	PS3	0.3	0.490	0.019	0.0329

Results for 100 year +20% CC Critical Storm Duration. Lowest mass balance: 45.74%

Node Event	US Node	Peak (mins)	Level (m)	Depth (m)	Inflow (l/s)	Node Vol (m³)	Flood (m³)	Status
960 minute winter	PS1	930	47.404	0.548	0.4	0.0751	0.0000	SURCHARGED
960 minute winter	PS2	930	47.404	0.654	0.4	0.0824	0.0000	SURCHARGED
960 minute winter	PS3	930	47.404	1.023	0.3	0.1289	0.0000	FLOOD RISK
960 minute winter	PS4	930	47.404	1.124	0.2	1.9426	0.0000	OK
960 minute winter	PS5	930	47.404	0.855	0.1	0.1078	0.0000	FLOOD RISK
960 minute winter	PS6	930	47.404	0.935	0.2	0.1178	0.0000	FLOOD RISK
960 minute winter	**PS7**	**930**	**47.404**	**0.729**	**0.3**	**0.0919**	**0.0000**	**SURCHARGED**

Link Event (Upstream Depth)	US Node	Link	DS Node	Outflow (l/s)	Velocity (m/s)	Flow/Cap	Link Vol (m³)
960 minute winter	PS1	PS1-PS2	PS2	0.4	0.441	0.051	0.0491
960 minute winter	PS2	PS2-PS7	PS7	0.3	0.508	0.052	0.0575
960 minute winter	PS3	PS3-PS4	PS4	0.2	0.354	0.032	0.0719
960 minute winter	PS4	Infiltration		0.0			
960 minute winter	PS5	PS5-PS6	PS6	-0.1	-0.013	-0.014	0.0629
960 minute winter	**PS6**	**PS6-PS3**	**PS3**	**-0.2**	**-0.019**	**-0.025**	**0.0684**
960 minute winter	PS7	PS7-PS3	PS3	0.3	0.490	0.019	0.0329



1 DRAINAGE PLAN

Scale: 1:500

Notes:

REV:	DESCRIPTION:	BY:	DATE:
-	-	-	-

STATUS: PLANNING STAGE

MTW Consultants Limited
Consulting Civil and Structural Engineers
Unit 4, MTW House,
Broomfield Business Park,
Malahide, Co. Dublin.
T: (01) 8463505
E: info@mtw.ie

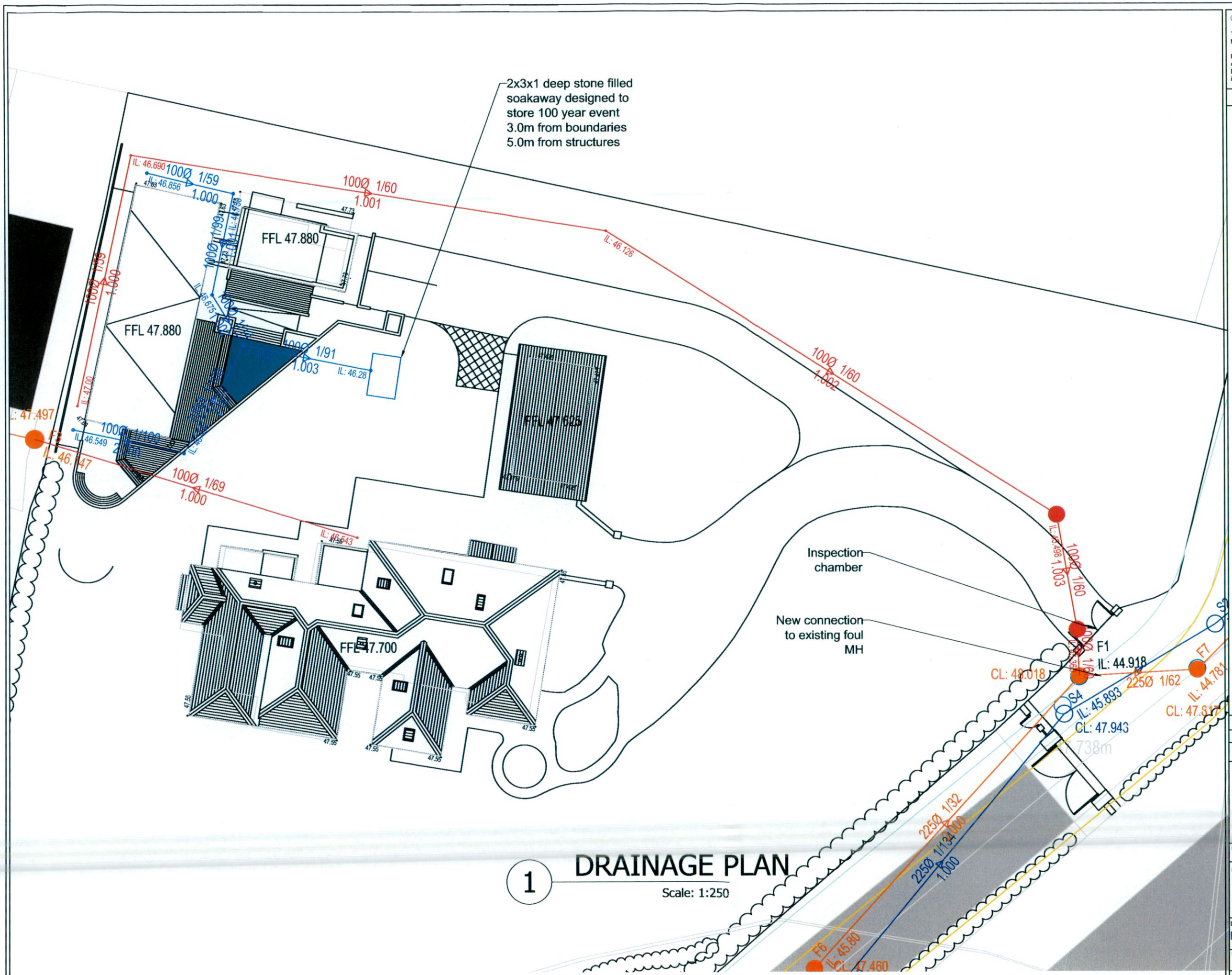
CLIENT: Eoin and Nora Hickey

PROJECT SITE:
Rathinree
Esker Lane Lucan
K78 X2C4

DRAWING TITLE:
Proposed Foul and Surface Drainage Plan

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:500	8 July 2022	GF	BW

PROJECT NO:	DRAWING NO:	REVISION:
3898	PL-600	-



1 DRAINAGE PLAN

Scale: 1:250

Notes:

REV:	DESCRIPTION:	BY:	DATE:
-	-	-	-

STATUS: PLANNING STAGE

MTW Consultants Limited
Consulting Civil and Structural Engineers
Unit 4, MTW House,
Broomfield Business Park,
Malahide, Co. Dublin.
T: (01) 8463505
E: info@mtw.ie

CLIENT: Eoin and Nora Hickey

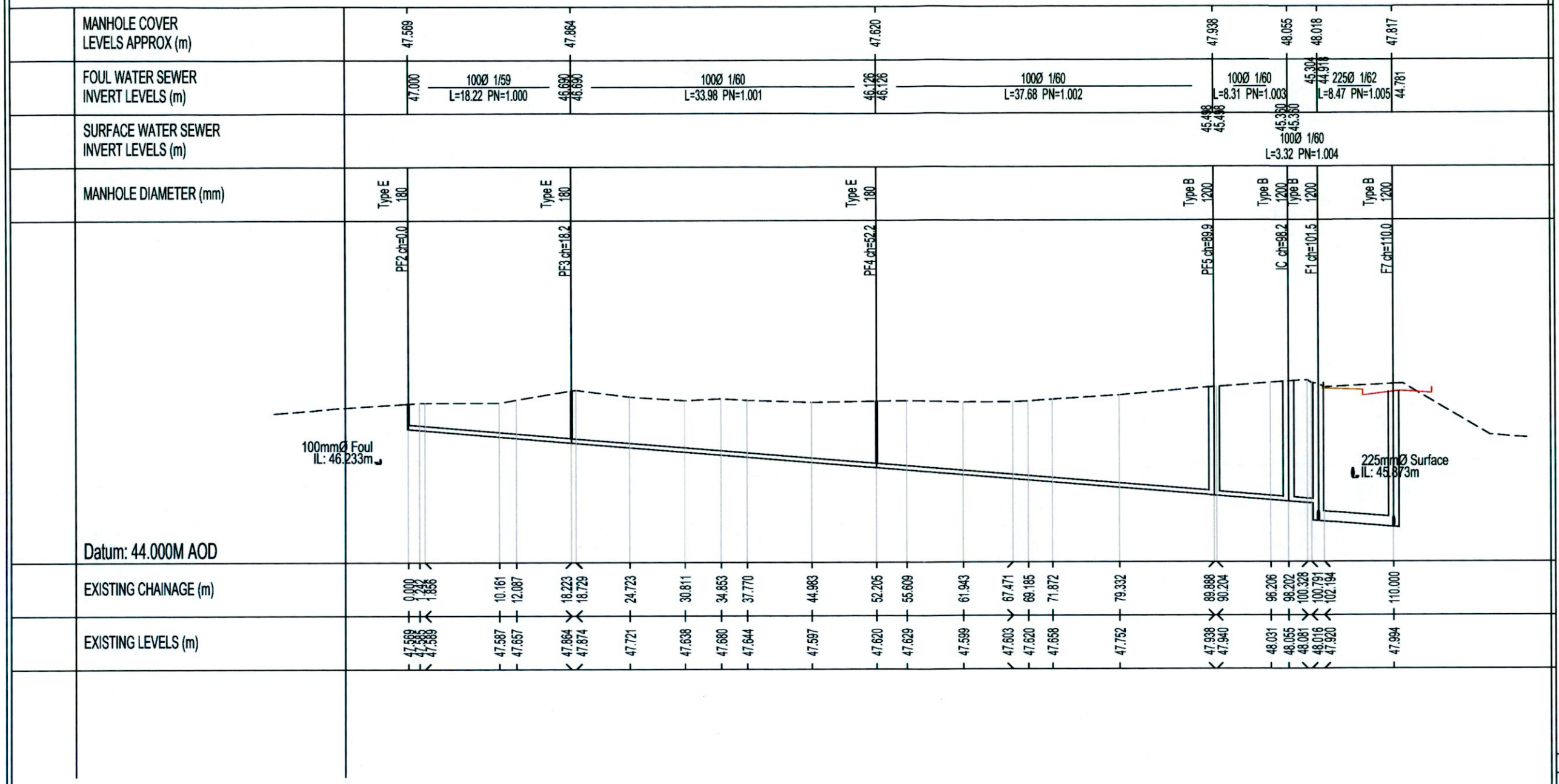
PROJECT SITE:
Rathinree
Esker Lane Lucan
K78 X2C4

DRAWING TITLE:
Proposed Foul and Surface Drainage Plan

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:250	8 July 2022	GF	BW

PROJECT NO:	DRAWING NO:	REVISION:
3898	PL-601	-

Notes:



1 FOUL DRAINAGE SECTION

Scale: Horz 1:500 Vert 1:100

REV:	DESCRIPTION:	BY:	DATE:
-	-	-	-

STATUS: PLANNING STAGE

MTW Consultants Limited
Consulting Civil and Structural Engineers

Unit 4, MTW House,
Broomfield Business Park,
Malahide, Co. Dublin.

T: (01) 8463505
E: info@mtw.ie

CLIENT: Eoin and Nora Hickey

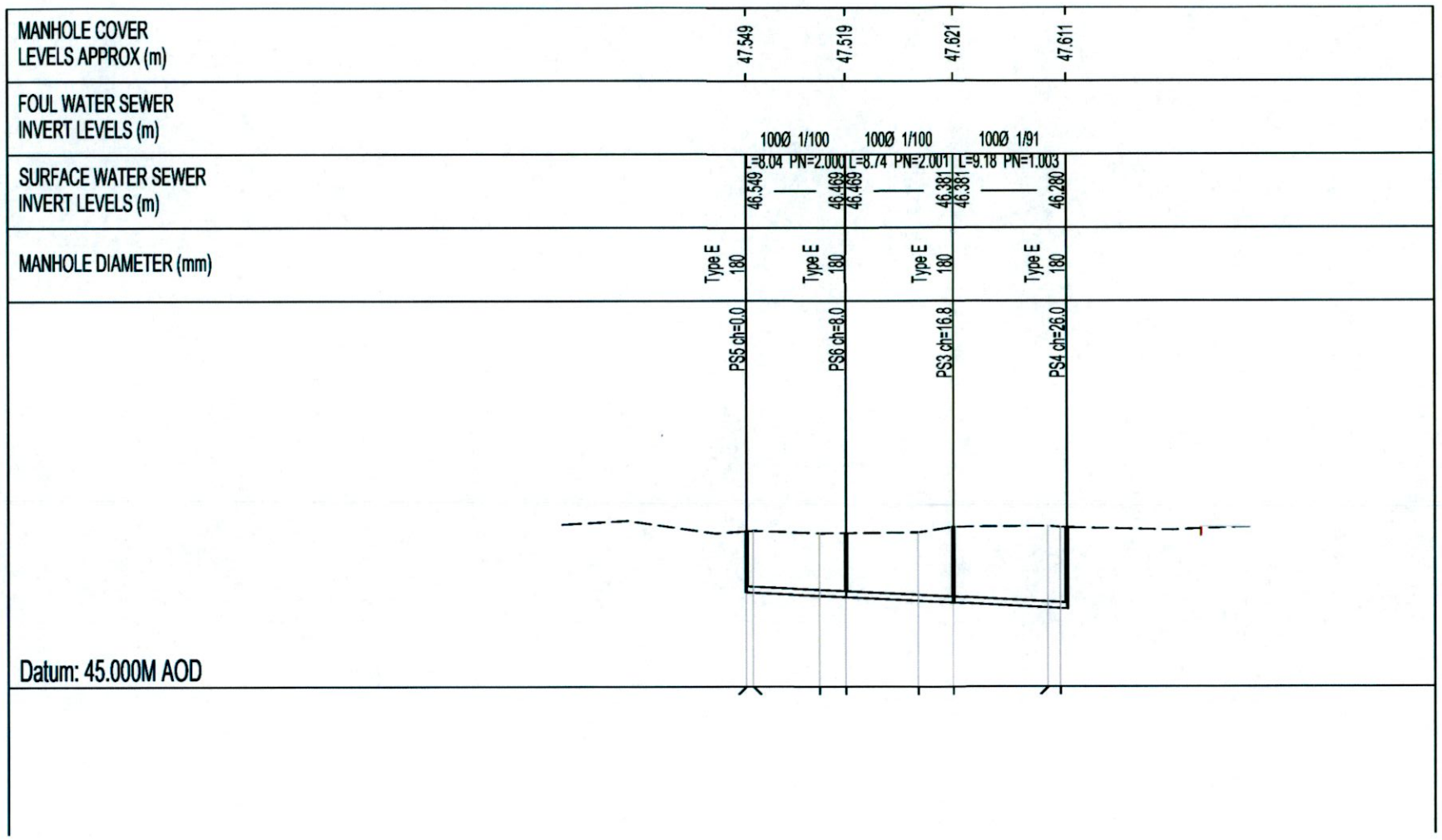
PROJECT SITE:
Rathinree
Esker Lane Lucan
K78 X2C4

N

DRAWING TITLE:
Proposed Foul Section

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:250	8 July 2022	GF	BW

PROJECT NO:	DRAWING NO:	REVISION:
3898	PL-602	-



1 SW DRAINAGE SECTION

Scale: Horz 1:500 Vert 1:100

Notes:

REV:	DESCRIPTION:	BY:	DATE:
-	-	-	-

STATUS: PLANNING STAGE

MTW Consultants Limited
Consulting Civil and Structural Engineers
Unit 4, MTW House,
Broomfield Business Park,
Malahide, Co. Dublin.
T: (01) 8463505
E: info@mtw.ie

CLIENT: Eoin and Nora Hickey

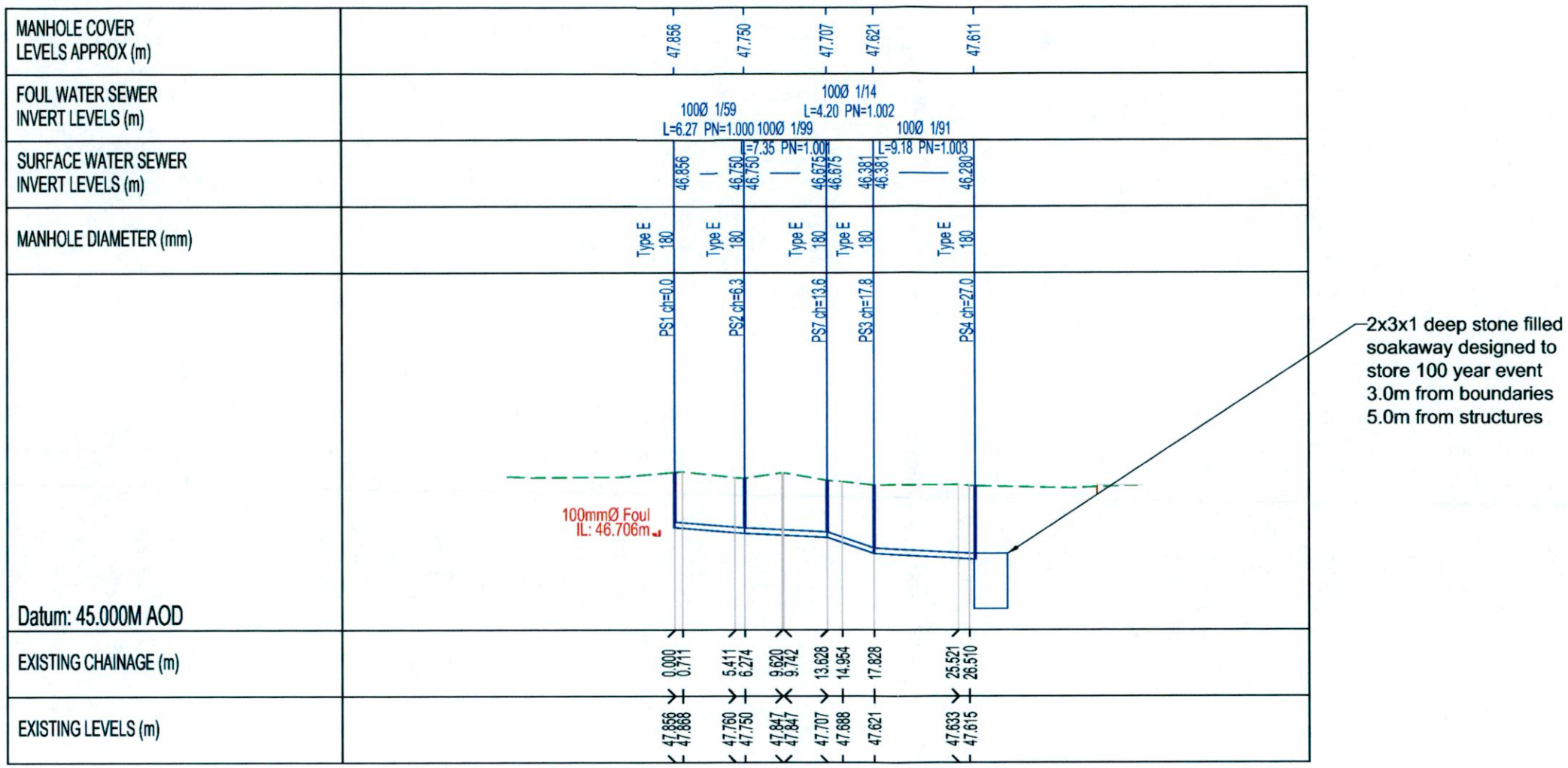
PROJECT SITE:
Rathinree
Esker Lane Lucan
K78 X2C4

N

DRAWING TITLE:
Proposed SW Section PS5 to PS4

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:250	8 July 2022	GF	BW

PROJECT NO:	DRAWING NO:	REVISION:
3898	PL-603	-



1 SW DRAINAGE SECTION

Scale: Horz 1:500 Vert 1:100

It is the responsibility of the Contractor to check all levels and dimensions on site. Any discrepancies are to be notified to the Engineer or Architect. Do not scale off this drawing. Use only figured dimensions. Proprietary items to be fixed strictly in accordance with manufacturer's instructions.

Notes:

REV:	DESCRIPTION:	BY:	DATE:
-	-	-	-

STATUS: PLANNING STAGE

MTW Consultants Limited
Consulting Civil and Structural Engineers
Unit 4, MTW House,
Broomfield Business Park,
Malahide, Co. Dublin.
T: (01) 8463505
E: info@mtw.ie

CLIENT: Eoin and Nora Hickey

PROJECT SITE:
Rathinree
Esker Lane Lucan
K78 X2C4

N

DRAWING TITLE:
Proposed SW Section PS1 to Soakaway

SCALE AT A3:	DATE:	DRAWN:	CHECKED:
1:250	8 July 2022	GF	BW

PROJECT NO:	DRAWING NO:	REVISION:
3898	PL-604	-