



**LEGEND**

**Street furniture & Services**

Over Head Wires (LUAS)	Pole FSB	Road Sign	Phone Box
Flowerbed	Bus Stop	Bench Seat	Dust
Pipe	Motor	Kiosk	Gas Cover
Lift	Beacon	Gully	Gas P. Box
Barrier	Coatline Cover	US Car Park sign	
Pump	Bore Hole	Waste Bin	
Truck Pit	Electricity Pole	Hydrant	
Bus Train Shelter	Telephone pole	Fire Hydrant	
Postbox	OCIS Pole	ESB Box	
Valve - General	CCTV Camera Pole	ESB Inspection Cover	
Water Valve	Lamp Post	Traffic Control Box	
Gas Valve	Four Menhole	LUAS Technical Cubicle	
Surface Valve	Surface Water Mh	Ticket Vending Machine	
Air Valve	Manholes	Water Meter Cover	
Step Cover	Air Conditioning Unit	Resonator Inspection Cover	
Electricity Meter	Resonator Inspection Cover	Resonator Traps	
Manhole Post	Traps Inspection Cover	Tank Storage	
Traffic Light	Cable TV Inspection Cover	Basement Mh. Cover & Pipe	
Parking Meter	ESAT Inspection Cover	Detached Aerial Mast	
Plane Aerial Mast	Mh. Inspection Cover	Day for pole	
Smart Card Validator	Enson Inspection Cover	Pipe Protection	
Unknown Valve	Roofing Eye	Wastout	

**Natural Features**

Surface Change	Water Level	Fair Way	
Land Drain	Crown Level	Green	
Bottom of Slope	Inset Level	Tree Box	
Top of Slope	Bed Level	Other	
Ditch	Spotheight	Sunley Station	
Water Edge / Lake / Pond		Photo point	
Hedge / Trees Drip Line / Vegetation			
Tree Continuous			
Tree Deciduous			
Top of Tree			

**Built Features**

Building	Fence	Room Level	
Edge of Road	Gate	Apex Height	
Kerb Bottom	Road Centreline	Eaves Height	
Kerb Top	Top of Wall	Parapet Height	
Bridge Abutment	Hearding	Suffi Elevation	
Bridge Deck	Property Line	Step Level	
Bridge Pier	Road Scar	Concrete Pad	
Building Facade	Top of Fence	Track	
Footpath / Platform Train & Tram	Wall / Retaining Wall		
Damp Proof Course / Herg	Railway / Tram Rail / Draining / Rere		
Bridge Pier / Wall & Gate Pile (LUAS Tracked)	Building Canopy / Roof / Overhang		
Cycleway / Private Landing Area			

**Murphy Surveys Ltd. Disclaimer**

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**Map Sheet Layout**

**Surveyed by:** MSL  
**Drawn by:** CE  
**Checked by:** BR

**Date:** MARCH 2020  
**Date:** MARCH 2020  
**Date:** 09.03.2020

**Scale:** 1:500  
**Grid System:** Irish National Grid  
**Units:** Metres

No.	Date	Description
1	09.03.2020	First Drawing
1	20.03.2020	Asker in Chamber

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**RICS**  
**EUROPEAN GPR ASSOCIATION**

**murphy SURVEYS**  
GLOBAL CONSULTING SURVEYORS

Kildare Cork Belfast Glasgow London

Head Office: Kildare Business Campus, Kildare, Ireland  
Phone: (+353) 045 484040  
Fax: (+353) 045 484004  
Email: info@murphysurveys.ie

**Client:** IE Consulting Engineers

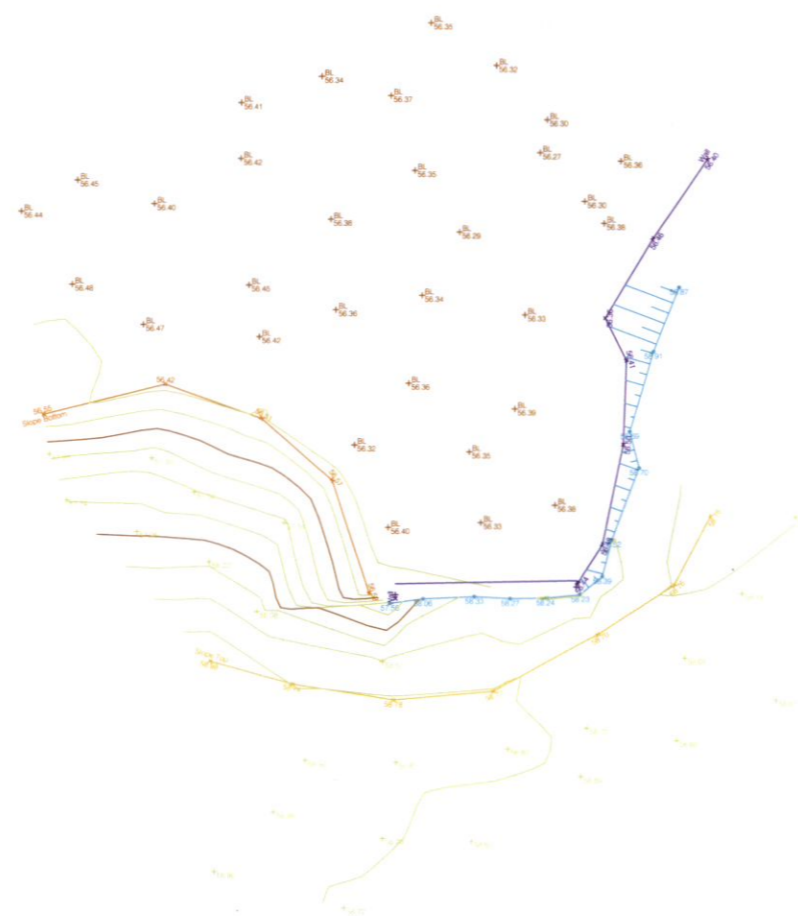
**Project:** 35588 Old Nangor Road, Clondalkin, Dublin 22

**Date:** 09.03.2020 **Scale:** 1:50@A1

**Description:** Topographical Survey

**Drawing Number:** MSL35588\_clondalkin\_PLAN\_01

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**LEGEND**

**Street furniture & Services**

Over Head Wires (L/LAS)	Bus Stop	Bench Seat	Phone Box
Pipe	Busker	Bin	Gas Cover
Light	Beacon	Bus Stop	C.P. Box
Barrier	Coastal Cover	UG Car Park Vent	
Pump	Bore Hole	Waste Bin	
Manhole	Electric Pole	Hydrant	
Sub-Station	Telephone Pole	Fire Hydrant	
Postbox	OCS Pole	ESB Box	
Valve - General	CCTV Camera Pole	ESB Inspection Cover	
Water Valve	Lamp Post	Traffic Control Box	
Gas Valve	Foul Manhole	LULAS Technical Cubicle	
Shunt Valve	Surface Water MH	Truck Vending Machine	
Air Valve	Manhole	Water Meter Cover	
Step Cover	Air Conditioning Unit	Beacon Inspection Cover	
Manhole Post	Traffic Inspection Cover	Manometer / Toilet	
Traffic Light	Cable TV Inspection Cover	Truck Storage	
Parking Meter	ESAT Inspection Cover	Statement MH Cover & Pipe	
Plane Aerial Mark	NTL Inspection Cover	Demarcation Mark	
Smart Card Validator	Encom Inspection Cover	Stay for pole	
Unknown Valve	Reading Eye	Pipe Protection	
		Washout	

**Natural Features**

Surface Change	Water Level	Fall Way
Land Drain	Clear Level	Green
Bottom of Slope	Invert level	Tree Box
Top of Slope	Bed Level	Other
Ditch	Spotheight	Survey Station
Water Edge / Lake / Pond		Photo point
Hedge / Trees Drip Line / Vegetation		
Tree Contour	Tree Deciduous	Top of Tree

**Built Features**

**Roads & Road Markings**

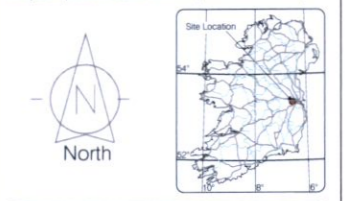
Building	Fence	Floor Level
Edge of Road	Gate	Apex Height
Area Bottom	Road Centreline	Edges Height
Area Top	Top of Wall	Parapet Height
Bridge Abutment	Hoarding	Soft Elevation
Bridge Deck	Property Line	Step Level
Bridge Pier	Road Scale	Concrete Pad
Building Footprint	Top of Fence	Track
Footpath / Platform / Train	Wall / Retaining Wall	
Damp Proof Course / Ingot	Relay / Train Pier / Gating / Ramp	
Bridge Pier / Wall & Gate Pier / LULAS Ticket	Building Canopy / Roof / Overhang	
Coverway / Private Landing Area		

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The Company shall not be liable for any inaccuracy of the data provided beyond the specified scale or accuracy, or for any matters resulting from their use for purposes other than that stated in the Contract. No liability shall attach to the Surveyor in respect of any consequential loss or damages suffered by the Client.

The Client must promptly notify the Company of any errors in mapping of which it becomes aware. If misleading, inaccurate or otherwise inappropriate information is brought to the Company's attention or the Company itself identifies any such impression or error in a survey, it shall use its reasonable endeavours to fix or remove it and if necessary in certain instances, the Company being on notice of any such misleading, inaccurate or otherwise inappropriate information, it will re-conduct the survey and reproduce the data to within the specified scale or accuracy.



**Map Sheet Layout**

Map Scale: 1:2000

Surveyed by: MSL	Date: MARCH 2020	Drawn: MSL	Main Head: MSL
Drawn by: CE	Date: MARCH 2020	Grid System: Irish National Grid	
Checked by: BR	Date: 09/03/2020		

Revisions

No.	Date	Description
0	09/03/2020	Final Drawing
1	20/03/2020	Added in Client

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Client: IE Consulting Engineers

Project: 35588 Old Nangor Road, Clondalkin, Dublin 22

Date: 09/03/2020 Scale: 1:50@A1

Description: Topographical Survey

Drawing Number: MSL35588\_clondalkin\_PLAN\_02

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## ***APPENDIX C***

### ***Drainage Records***




- Legend**
- ▲ Pump Stations
  - Irish Water
  - Private
  - Irish Water
  - Non IW
  - Gravity - Combined
  - Gravity - Foul
  - Gravity - Overflow
  - Gravity - Unknown
  - Pumping - Combined
  - Pumping - Foul
  - Pumping - Overflow
  - Pumping - Unknown
  - Syphon - Combined
  - Syphon - Foul
  - Syphon - Overflow
  - Overflow
  - Gravity - Combined
  - Gravity - Foul
  - Gravity - Overflow
  - Gravity - Unknown
  - Pumping - Combined
  - Pumping - Foul
  - Pumping - Overflow
  - Pumping - Unknown
  - Syphon - Combined
  - Syphon - Foul
  - Syphon - Overflow
  - Overflow
  - Surface Gravity Mains
  - Surface Gravity Mains Private
  - Surface Water Pressurised Mains
  - Surface Water Pressurised Mains Private

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## ***APPENDIX D***

### ***Micro Drainage Output***

IE Consulting		Page 1
Innovation Centre Green Road Carlow		
Date 5/19/2020 5:50 PM File IE1978 EX SW.mdx	Designed by Micro Drainage Checked by	
Innovyze	Network 2017.1.1	

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
S1.000	13.199	0.030	440.0	0.000	1.00	695.0	0.600	[]	-1	Pipe/Conduit
S1.001	54.036	0.122	442.9	0.198	3.00	0.0	0.600	[]	-1	Pipe/Conduit
S1.002	30.320	0.068	445.9	0.189	3.00	0.0	0.600	[]	-1	Pipe/Conduit
S1.003	27.047	0.063	429.3	0.000	0.00	0.0	0.600	[]	-1	Pipe/Conduit

Network Results Table


PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.000	56.699	0.000	695.0	2.31	7608.0
S1.001	56.669	0.198	695.0	2.30	7582.5
S1.002	56.547	0.387	695.0	2.29	7557.1
S1.003	56.479	0.387	695.0	2.34	7702.3

Conduit Sections for Storm

NOTE: Diameters less than 66 refer to section numbers of hydraulic conduits. These conduits are marked by the symbols:- [] box culvert, \ / open channel, oo dual pipe, ooo triple pipe, O egg.


Section numbers < 0 are taken from user conduit table

Section Number	Conduit Type	Major Dimn. (mm)	Minor Dimn. (mm)	Side Slope (Deg)	Corner Splay (mm)	4*Hyd Radius (m)	XSect Area (m <sup>2</sup> )
-1	[]	2500	1500	90.0		1.839	3.295

IE Consulting		Page 2
Innovation Centre Green Road Carlow		
Date 5/19/2020 5:50 PM File IE1978 EX SW.mdx	Designed by Micro Drainage Checked by	
Innovyze	Network 2017.1.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.198	0.198	0.198
1.002	-	-	100	0.189	0.189	0.189
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.387	0.387	0.387

IE Consulting		Page 3
Innovation Centre Green Road Carlow		
Date 5/19/2020 5:50 PM	Designed by Micro Drainage	
File IE1978 EX SW.mdx	Checked by	
Innovyze	Network 2017.1.1	

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	S1	-1	3.581	3.631	Unclassified	3000	0	3.631	Unclassified
S1.001	S2	-1	1.303	3.581	Unclassified	3000	0	3.581	Unclassified
S1.002	S3	-1	0.571	1.303	Unclassified	3000	0	1.303	Unclassified
S1.003	S4	-1	0.414	0.571	Unclassified	3000	0	0.571	Unclassified

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.003	SS5	58.330	56.416	0.000	0	0

Simulation Criteria for Storm


Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 0    Number of Storage Structures 0    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	16.400	Storm Duration (mins)	30
Ratio R	0.277		



IE Consulting		Page 4
Innovation Centre Green Road Carlow		
Date 5/19/2020 5:50 PM File IE1978 EX SW.mdx	Designed by Micro Drainage Checked by	
Innovyze	Network 2017.1.1	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor 1.000    Additional Flow - % of Total Flow 20.000  
Hot Start (mins) 0    MADD Factor \* 10m³/ha Storage 2.000  
Hot Start Level (mm) 0    Inlet Coefficient 0.800  
Manhole Headloss Coeff (Global) 0.500    Flow per Person per Day (l/per/day) 0.000  
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 0    Number of Storage Structures 0    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model    FSR    Ratio R 0.277  
Region Scotland and Ireland Cv (Summer) 0.750  
M5-60 (mm)    16.400 Cv (Winter) 0.840


Margin for Flood Risk Warning (mm) 300.0    DVD Status OFF  
Analysis Timestep    Fine Inertia Status OFF  
DTS Status    ON

Profile(s)

Profile(s)    Summer and Winter  
Duration(s) (mins) 15, 30, 60, 120, 180, 240, 360  
Return Period(s) (years)    5, 30, 100  
Climate Change (%)    20, 20, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Summer	100	+20%					57.128
S1.001	S2	15 Summer	100	+20%					57.090
S1.002	S3	15 Summer	100	+20%					56.976
S1.003	S4	15 Summer	100	+20%					56.888

PN	US/MH Name	Surcharged		Flooded	Pipe		Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Flow (l/s)	Status	
S1.000	S1	-1.071	0.000	0.31	834.9	OK	
S1.001	S2	-1.079	0.000	0.18	936.4	OK	
S1.002	S3	-1.071	0.000	0.23	1019.7	OK	
S1.003	S4	-1.091	0.000	0.24	1015.9	OK	


IE Consulting		Page 1
Innovation Centre Green Road Carlow		
Date 5/22/2020 9:55 AM File IE1978 PROP SW.mdx	Designed by Micro Drainage Checked by	
Innovyze	Network 2017.1.1	

Existing Network Details for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
S1.000	13.199	0.030	440.0	0.000	1.00	695.0	0.600	[]	-1	Pipe/Conduit
S1.001	54.036	0.122	442.9	0.198	3.00	0.0	0.600	[]	-1	Pipe/Conduit
S1.002	30.320	0.068	445.9	0.189	3.00	0.0	0.600	ooo	-11	Pipe/Conduit
S1.003	27.047	0.063	429.3	0.000	0.00	0.0	0.600	[]	-1	Pipe/Conduit


Network Results Table

PN	US/IL (m)	$\Sigma$ I.Area (ha)	$\Sigma$ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
S1.000	56.699	0.000	695.0	2.31	7608.0
S1.001	56.669	0.198	695.0	2.30	7582.5
S1.002	56.547	0.387	695.0	1.48	2818.5
S1.003	56.479	0.387	695.0	2.34	7702.3

IE Consulting		Page 2
Innovation Centre Green Road Carlow		
Date 5/22/2020 9:55 AM File IE1978 PROP SW.mdx	Designed by Micro Drainage Checked by	
Innovyze	Network 2017.1.1	

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.000	0.000	0.000
1.001	-	-	100	0.198	0.198	0.198
1.002	-	-	100	0.189	0.189	0.189
1.003	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.387	0.387	0.387

IE Consulting		Page 3
Innovation Centre Green Road Carlow		
Date 5/22/2020 9:55 AM File IE1978 PROP SW.mdx	Designed by Micro Drainage Checked by	
Innovyze	Network 2017.1.1	

Network Classifications for Storm

PN	USMH Name	Pipe Dia (mm)	Min Cover Depth (m)	Max Cover Depth (m)	Pipe Type	MH Dia (mm)	MH Width (mm)	MH Ring Depth (m)	MH Type
S1.000	S1	-1	3.581	3.631	Unclassified	3000	0	3.631	Unclassified
S1.001	S2	-1	1.303	3.581	Unclassified	3000	0	3.581	Unclassified
S1.002	S3	-11	1.171	1.903	Unclassified	3000	0	1.903	Unclassified
S1.003	S4	-1	0.414	0.571	Unclassified	3000	0	0.571	Unclassified

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
S1.003	S5	58.330	56.416	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m <sup>3</sup> /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 0    Number of Storage Structures 0    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	Scotland and Ireland	Cv (Winter)	0.840
M5-60 (mm)	16.400	Storm Duration (mins)	30
Ratio R	0.277		

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	20.000
Hot Start (mins)	0	MADD Factor * 10m <sup>3</sup> /ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coefficient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs 0    Number of Offline Controls 0    Number of Time/Area Diagrams 0  
Number of Online Controls 0    Number of Storage Structures 0    Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.277
Region	Scotland and Ireland	Cv (Summer)	0.750
M5-60 (mm)		Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep		Fine Inertia Status	OFF
DTS Status			ON

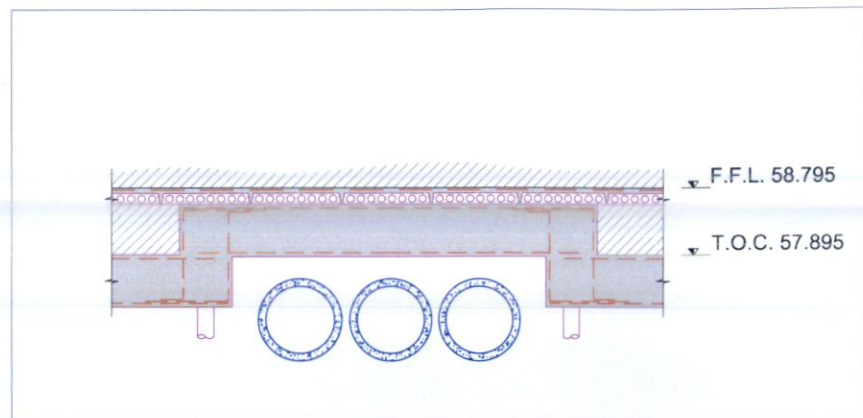
Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360
Return Period(s) (years)	5, 30, 100
Climate Change (%)	20, 20, 20

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Summer	100	+20%					57.138
S1.001	S2	15 Summer	100	+20%					57.101
S1.002	S3	15 Summer	100	+20%					56.993
S1.003	S4	15 Summer	100	+20%					56.890

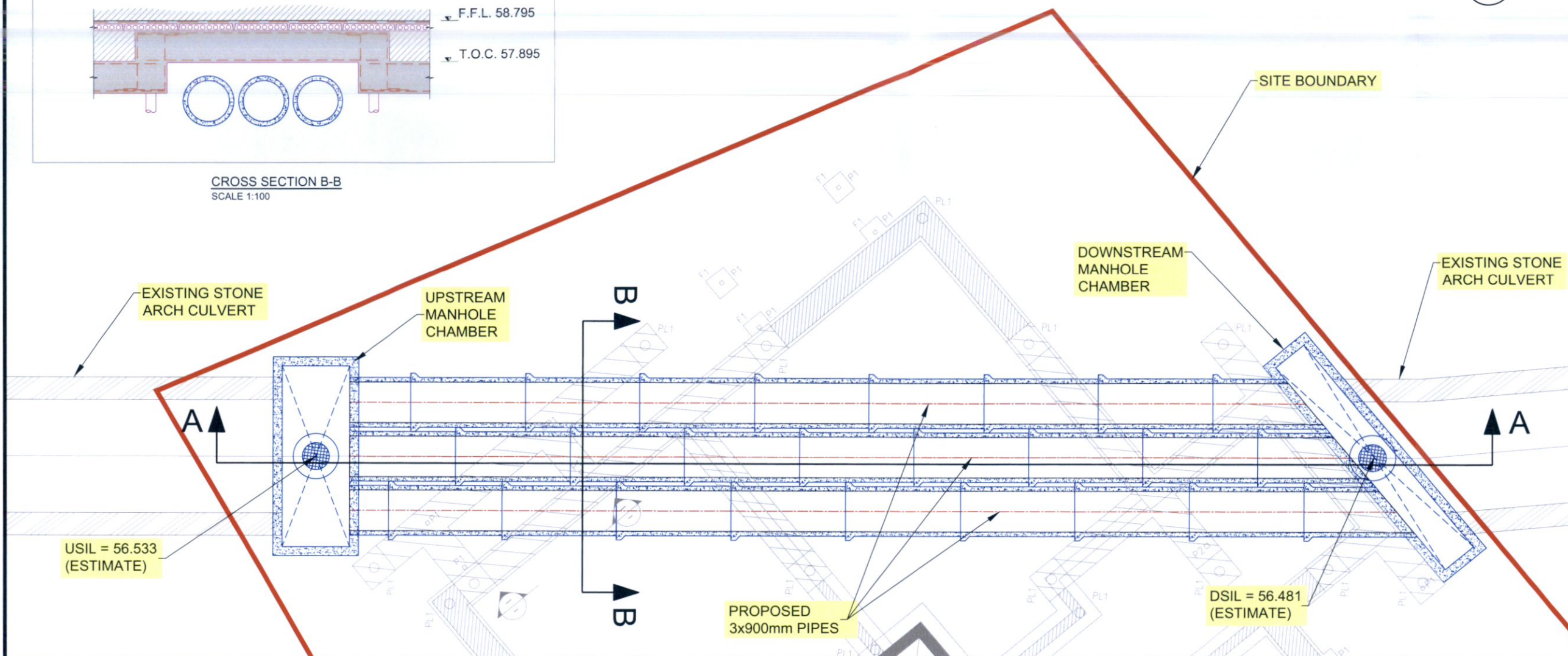
PN	US/MH Name	Surcharged		Flooded	Pipe		Level Exceeded
		Depth (m)	Volume (m <sup>3</sup> )	Flow / Cap. (l/s)	Flow (l/s)	Status	
S1.000	S1	-1.061	0.000	0.31	835.0	OK	
S1.001	S2	-1.068	0.000	0.18	937.1	OK	
S1.002	S3	-0.454	0.000	0.49	1024.4	OK	
S1.003	S4	-1.089	0.000	0.24	1022.1	OK	

## ***APPENDIX E***

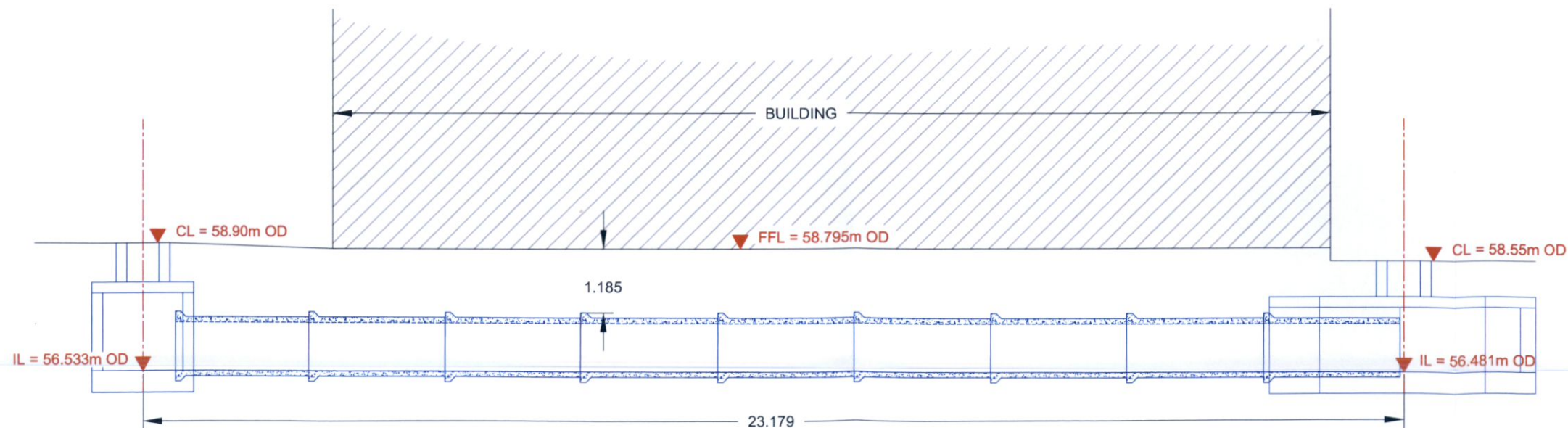
***Drawing Number IE1978-001-A Proposed Culverts  
Plan and Sections***



CROSS SECTION B-B  
SCALE 1:100



PLAN  
SCALE 1:100



LONG SECTION A-A  
SCALE 1:100

LEGEND

NOT TO BE USED FOR CONSTRUCTION

rev.	date	amendment	dm	ckd
A	22.05.20	DESIGN	NOM	PMS

DUBLIN SIMON COMMUNITY

10 UNITS AT OLD NANGOR ROAD  
DUBLIN 22

PROPOSED 3 x 900mm PIPE CULVERTS  
PLAN & SECTION DETAILS



CARLOW OFFICE: INNOVATION CENTRE GREEN ROAD CARLOW, R93 W248  
NEWRY OFFICE: 1 RDC HOUSE WIN BUSINESS PARK NEWRY, BT35 6PH

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