



LEGEND

Street furniture & Services

Over Head Wires (UAS)	Pylon ESB	Road Sign	Phone Box
Flowerbed	Bus Stop	Bench Seat	Duct
Pipe	Roller	Kiosk	Gas Cover
LA	Beacon	Gully / Pit	P Box
Bin	Coastline Cover	ESB Sign	ESB Fire Risk
Pump	Water Meter	Water Meter	Water Meter
Bus/Tram Shelter	Substation Pole	Hydrant	Hydrant
Postbox	Substation Pole	ESB Box	ESB Box
Valve - General	CCTV Camera Pole	ESB Inspection Cover	ESB Inspection Cover
Water Valve	Lamp Post	Traffic Control Box	Traffic Control Box
Gas Valve	Food Machine	LIAS Technical Cabinet	LIAS Technical Cabinet
Shore Valve	Surface Water MH	Truck Weighing Machine	Truck Weighing Machine
Air Valve	Manhole	Water Meter Cover	Water Meter Cover
Sewer Cover	Gas Covering Valve	Traffic Inspection Cover	Traffic Inspection Cover
Manhole	Services Inspection Cover	Manhole / Tubing	Manhole / Tubing
Manhole	Services Inspection Cover	Tank Storage	Tank Storage
Manhole	Cable TV Inspection Cover	Basement, MH, Cover & Pipe	Basement, MH, Cover & Pipe
Manhole	ESAT Inspection Cover	Diagonal Aerial Mast	Diagonal Aerial Mast
Manhole	NITL Inspection Cover	Stay for pole	Stay for pole
Manhole	ESAT Inspection Cover	Pipe Protection	Pipe Protection
Manhole	ESAT Inspection Cover	Washout	Washout

Natural Features

Surface Change	MLV	Water Level	Fan Way
Land Drain	Green Level	Center	Center
Bottom of Slope	Green Level	Tree Box	Tree Box
Top of Slope	Red Level	Other	Other
Ditch	Spotheight	Survey Station	Survey Station
Water Edge / Lake / Pond	Spotheight	Photo point	Photo point
Hedge / Tree Dip Line / Imagination	Spotheight	Top of Tree	Top of Tree
Tree Contour	Spotheight		

Built Features

Roads & Road Markings

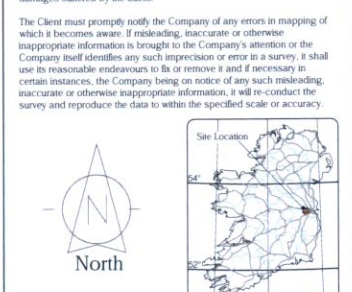
Building	Fence	Floor Level
Edge of Road	Gate	Apex Height
Kerb Bottom	Road Centreline	Evening Height
Kerb Top	Top of Wall	Parapet Height
Hedge Abandon	Hoarding	Soft Elevation
Hedge Deck	Property Line	Step Level
Hedge Parapet	Road Scar	Concrete Pad
Building Footprint	Top of Fence	Track
Footpath / Platform / Train & Tram	Wall / Hoarding Wall	
Demop Post / Course / Venge	Boundary / Train Rail / Cotting / Ramp	
Hedge Post / Wall & Gate Pile (LIAS Tracked)	Building Canopy / Roof / Overhang	
Cycleway / Private Landing Area		

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Map Sheet Layout

Map Scale 0:00

Supplied by	MSL	Date	MARCH 2020	Drawn	Mark Head
Drawn by	CE	Date	MARCH 2020	Grid System	Irish National Grid (ITM)
Checked by	MR	Date	09.03.2020	Revision	

No.	Date	Description
1	09.03.2020	Final Drawing
2	20.03.2020	Added in Chamber

murphy

 SURVEYS

 GLOBAL CONSULTING SURVEYORS

Kildare Cork Belfast Glasgow London

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

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

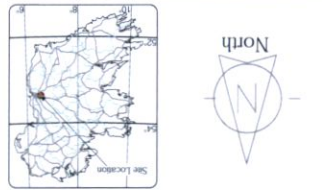
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Client: **IE Consulting Engineers**
 Project: **35588 Old Nangor Road, Clondalkin, Dublin 22**
 Date: **09.03.2020** Scale: **1:50@A1**
 Description: **Topographical Survey**
 Drawing: **MS13588_clondalkin_PLAN_02**
 Number: **MS13588_clondalkin_PLAN_02**

Head Office: **IE Consulting Engineers**
 Kildare Office: **Kildare, Co. Kildare**
 Dublin Office: **Dublin, Co. Dublin**
 London Office: **London, UK**



Rev	Date	Description
1	09.03.2020	Issue for Client
2	09.03.2020	Final Drawing



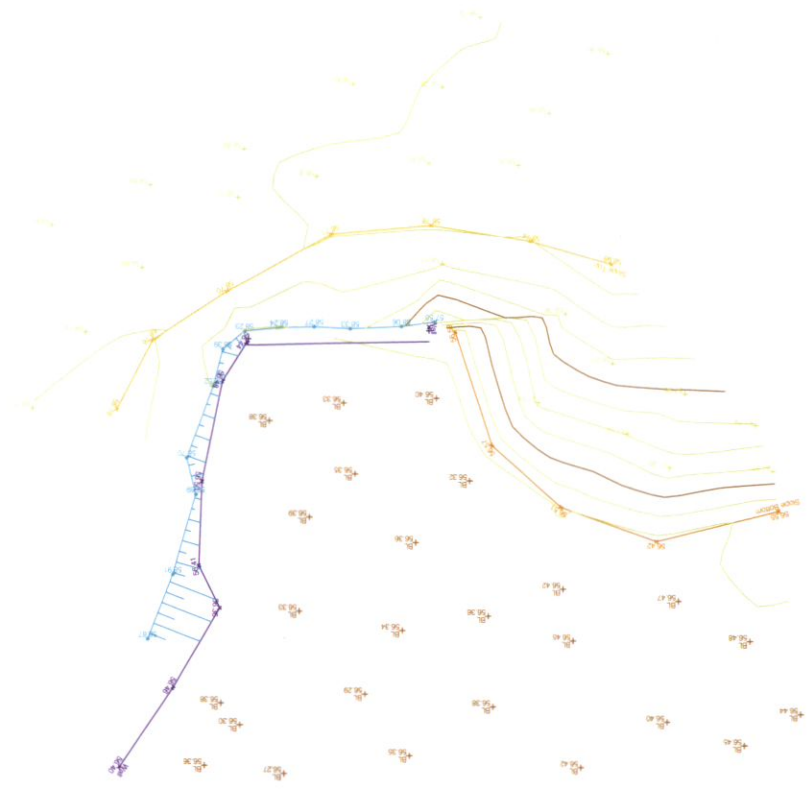
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Legend

Symbol	Description
Blue line	Water
Red line	Boundary
Green line	Vegetation
Yellow line	Contours
Black line	Other



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 3/27/2020 11:24 AM	Designed by Micro Drainage	
File IE1978 EX SW.mdx	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 ²)
-1	[]	2500	1500	90.0		1.839	3.295

IE Consulting		Page 2
Innovation Centre Green Road Carlow		
Date 3/27/2020 11:24 AM 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

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	20.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /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 Online Controls 0		Number of Time/Area Diagrams 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 3
Innovation Centre Green Road Carlow		
Date 3/27/2020 11:24 AM 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 * 10m ³ /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 (m ³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)	
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