

Kildare Market Square


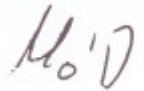

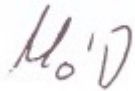
Drainage & Watermains Planning Report

Kildare County Council

Project number: 60701274
60594179-ACM-XX-XX-RP-CE-10-0001

January 2024

Quality information

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Revision	Revision date	Details	Authorized	Name	Position
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1. Introduction

1.1 Background

AECOM have been appointed on behalf of Kildare County Council (KCC) to prepare a drainage and watermain planning report in support of a Part 8 planning application to KCC for the proposed public realm upgrade of Kildare Market Square, located along Dublin St., Kildare Town, County Kildare. This report will detail the existing and proposed surface and foul water infrastructure, existing and proposed water supply network, and the Sustainable Urban Drainage Systems (SuDS) measures for the proposed development.

The following documents have been reviewed in support of this report:

- Kildare County Development Plan 2023 – 2029 (KCDP)
- Kildare Town Local Area Plan 2023 – 2029 (LAP)
- Risk Management Plan for the Liffey & Dublin Bay River Basin (UOM09)

Section 2 and 3 of the report will outline the design intent for the proposed surface water and foul water drainage system

Section 4 of the report outlines the proposed sustainable urban drainage systems (SuDS) that are to be incorporated into the drainage design. The proposed development has been assessed in relation to Sustainable Urban Drainage Systems (SuDS) in accordance with the guidelines of the Kildare County Development Plan and the SuDS CIRIA Manual C753.

Section 5 of the report outlines the design for the proposed water supply system for the proposed development. The proposed water supply network has been designed in accordance with the relevant Irish Water requirements contained, more specifically, in relation to the Code-of-Practice for water design. A Pre-Connection Enquiry (PCE) application has been submitted by AECOM as part of the part 8 planning pack.

1.2 Existing Site

The subject site area is approximately 6,541 square meters (approximately 0.654 ha) and is located within the heart of Kildare Town centre and host weekly market days. The market is considered to be an area of high pedestrian activity and holds regular markets. The existing market square is divided by Bride St. (R415) into two separate blocks, one which is comprised of the existing Kildare Town Heritage Centre, bus shelter and soft landscaping, and the other which is a shared pedestrian/ vehicle space with several adjacent parking bays and soft landscaping. The existing brownfield site is bounded on all sides by existing commercial properties and residential dwellings.

During the Covid-19 pandemic, the car park located at the north west of Market Square was pedestrianised and turned into a space where people can socialise, eat outside or attend a regular weekend market. The closure of the Bride Street section of Market Square would allow for the pedestrianised space to be extended to Kildare Town Heritage Centre, which would create a plaza in the centre of the town that could be used for a larger market, outdoor dining and cultural events. This plaza would enhance the public realm of the town centre and strengthen the appeal of visiting Kildare town for retail, social or tourism activities. Refer to Figure 1.1 for the site location map.

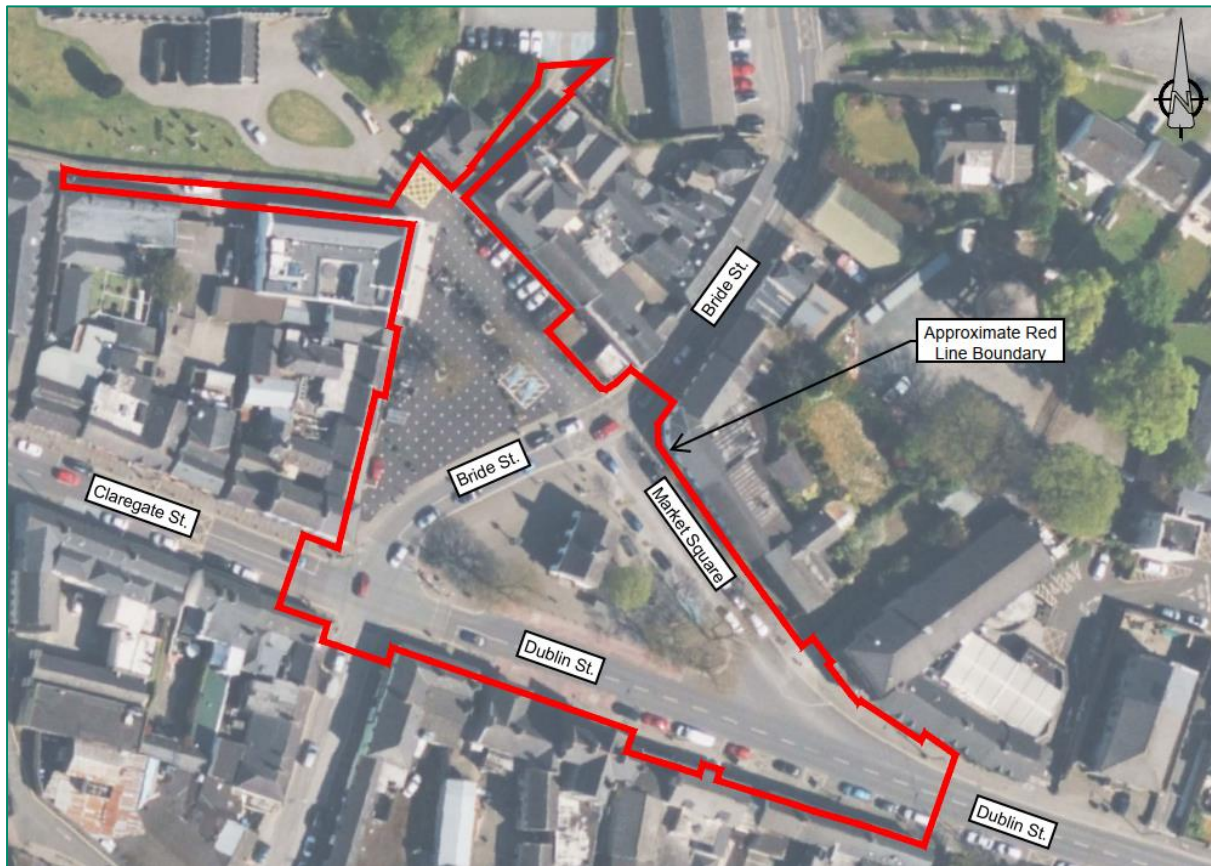


Figure 1.1 Site Location Map (Source: Bing Maps)

1.2.1 Site Topography

AECOM have been provided with a topographical survey carried out by Apex Surveys dated the 30th of September 2022.

Based on the topographic survey, levels range from approximately 107 mOD at the south-west to 110 mOD at the north. The existing levels within the site show a falling trend from north to south, which provides a natural drainage route for surface water runoff.

Refer to Appendix A for existing site topographic survey as provided by Apex Surveys.

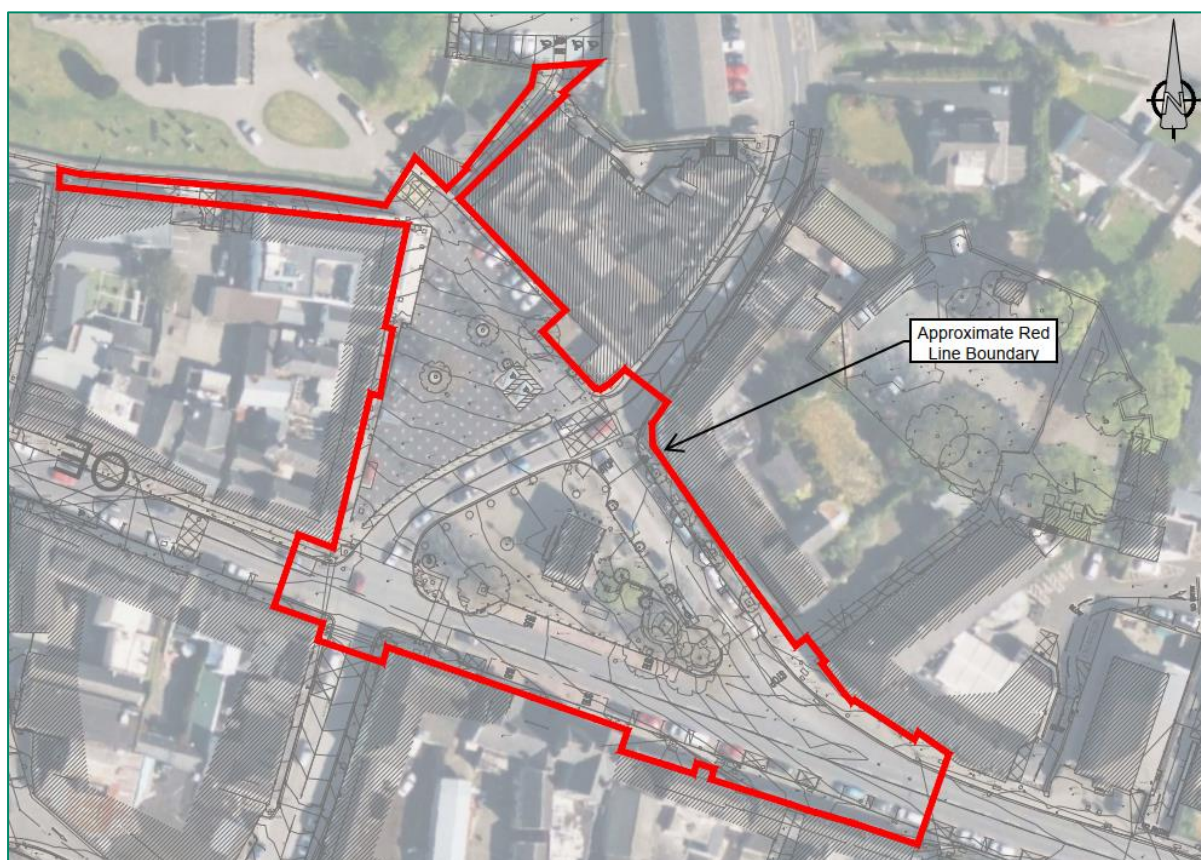


Figure 1.2 Topographic Survey (Source: Apex Surveys)

1.3 Proposed Development

Significant improvements to the public realm of Market Square, Kildare Town are proposed using high-quality materials and craftsmanship, comprising natural stone paving, additional tree planting and integrated soft landscaping, bespoke fixed street furniture and street lighting to encourage a range of outdoor day and evening time activity and to provide a visually attractive setting for the buildings and attractions within the historic core of the town focusing on pedestrian connectivity, safety and accessibility and an enhanced user experience within Market Square.

The extent of the subject site at Kildare Market Square is approx. 6540m² / 70,395sqft encompassing areas both North and South of Bride Street (R415), whose boundary is defined by buildings along Dublin Street (R445), buildings along Market Square's Eastern roadway extending from Dublin Street (R445) Northward to St. Brigid's Cathedral Gates and buildings along Market Square's Western boundary from the Bride Street (R415) / Dublin Road (R445) junction Northward to St. Brigid's Cathedral gates. The area also includes Church Lane (known as Firecastle Lane) extending westward to Heffernan's Lane and the pedestrian laneway to Nugent Street car park (rear of Top Nolans) boundary.

The proposed design of the Market Square redresses the balance from what was previously a vehicular dominated area to a civic space that puts people and pedestrians first, creating a flexible, attractive area capable of accommodating a range of social spaces and community events. The proposal seeks to formalise the pedestrianisation of the North side of the Square, an outcome of the accelerated measures that took place in response to Covid 19. The proposed improvements will involve an adjustment to the road network and parking arrangements including:

- Re-grading the area of Market Square North of Bride Street, Bride Street and Market Square's Eastern roadway whereby kerbs are removed to bring the surface of the public realm to the top of existing kerb levels. The entrance area to Market House is proposed to be regraded to provide level access to Market House. Footpath widening along Dublin Street is proposed. Footpath surface upgrade is proposed throughout, using high quality natural stone.

- Introducing bollards to manage vehicle access, repositioning the bus shelter on the North side of Dublin Street to improve pedestrian movement and access around the Market House and consolidation of wayfinding and signage are proposed.
- Incorporation of hard and soft landscaping (including 8 No. additional street trees) throughout the space and introduce bespoke street furniture, lighting and bicycle parking.
- Provision of 6 No. pedestrian crossings (1 No. controlled and 5 No. uncontrolled) and widening of existing 3 No. controlled crossings.
- Undergrounding of overhead services.
- Upgrade of carriageways, signage, road marking and drainage including Sustainable Urban Drainage.
- All necessary services and utility provision and associated site works.

Refer to the Traffic and Transport Analysis produced by AECOM for additional information on Kildare Market Square public realm upgrade.

Refer to Figure 1.3 for an extract of the architectural layout issued by Networks for the proposed development which is found under Appendix B of this report.



Figure 1.3 Extract of the Proposed Development (Source: Metropolitan Workshop)

2. Surface Water Drainage

2.1 Existing Surface Water Drainage Network

AECOM has received a Ground Penetrating Radar (GPR) utilities survey conducted by Apex Surveys on August 8th, 2021. This survey has been examined as part of the assessment, revealing the existence of surface water infrastructure currently serving the site and its surrounding areas. Refer to Appendix C of this report for the full survey extents provided by Apex Surveys.

From the available data, all of the existing surface water drains within the market square are shown to outfall to wastewater sewers. There is an existing 225 mm surface water pipe which runs along Dublin St. which runs from east to west. The existing surface drainage system on site appears to discharge by gravity through existing drainage outfalls to the existing foul water manhole located at the junction intersection between Dublin St. and Bride St, south of the public realm.

There is an additional existing 150 mm PVC surface water pipe which runs in a north-south direction, where it outfalls to the same existing foul water manhole. It is noted that several surface water road gullies are located along Dublin St. and appear to discharge into the existing surface water network.

Refer to AECOM drawing 60594179-ACM-XX-XX-DR-CE-10-0501 for the existing and proposed drainage network. Refer to Figure 2.1 for the existing drainage network.

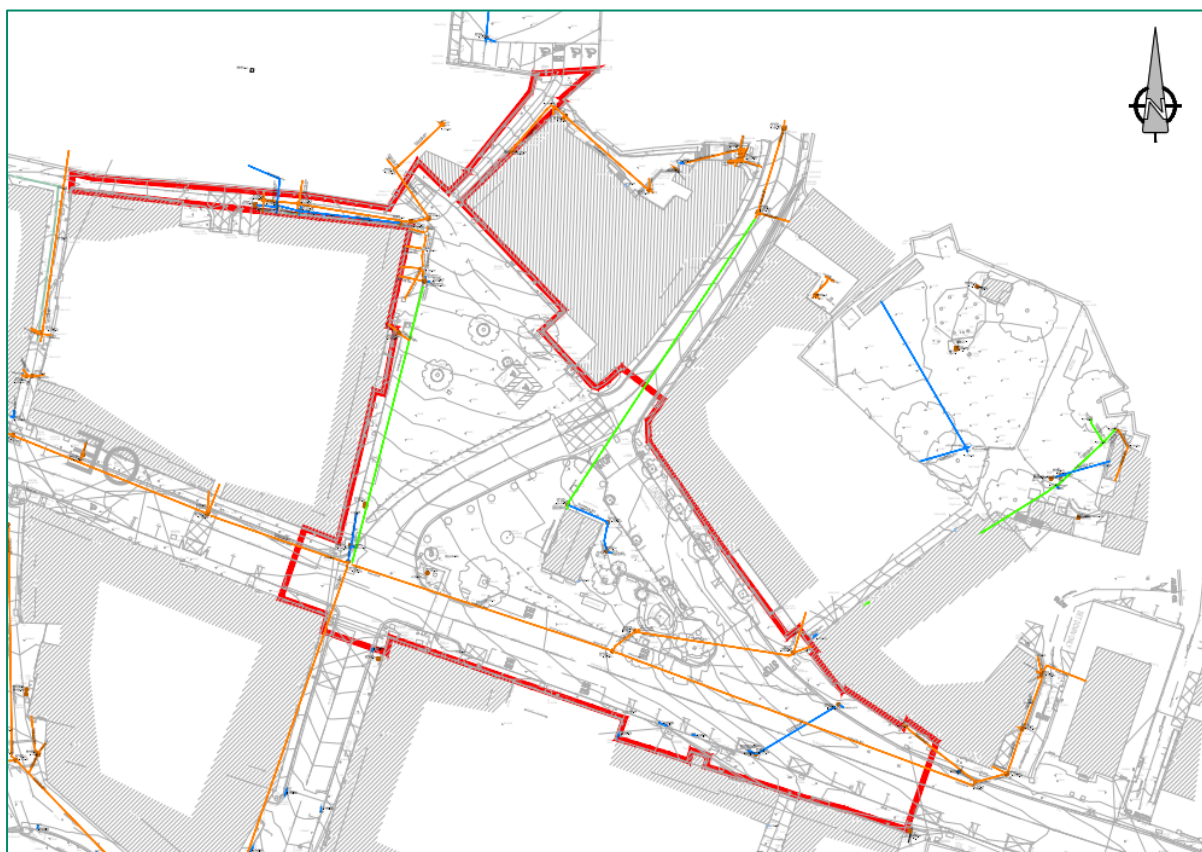


Figure 2.1 Existing Surface Water Drainage (Source: AECOM Sketch based on Networks GPR)

2.2 Proposed Surface Water Drainage Network

It is proposed to maintain the current flow paths from the site and drain surface water runoff from the market square (impermeable roads and surfaces within the square, together with any additional runoff from landscaped areas which does not percolate to ground) into the existing network via gravity.

It is proposed to provide new 225mm dia. surface water drains within both Bride Street and Market Square East which new gullies can outfall to. The current proposals for both Bride Street and Market Square East is to provide

flush surfacing between the footpaths and carriageway. The drainage proposed in these areas is for new dished channels to be provided along the road kerblines complete with dished gullies at regular intervals. Refer to Figure 2 and Figure 3. The proposed new surface water carrier drains have been designed and sized using MicroDrainage and these have also been simulated with a 100-year return period storm including 20% climate change factor to ensure no flooding occurs.

On Dublin Street it is proposed to maintain full height kerbs and therefore in this location it is proposed to provide a number of standard road gullies at the kerbline. The proposed gullies have been positioned at locations which will represent low points in the kerbline and the proposed outfalls from the new gullies will use existing gully outfall connections where possible.

The spacing of road gullies will be subject to the final footway road levels design, however, in general, one gully will be provided for every 200 m² of paved area (where possible), and low points on a roadway will require additional gullies. Additional gullies shall also be provided at junctions, crossing points and at low points and there shall be a requirement for two gullies side by side at the lowest point in the street on both sides.

In some locations, it is necessary to incorporate drainage channels at the low point in the within the footway, in order to provide adequate falls for drainage. Where this occurs, it is necessary to install a dished drainage channel kerb with a dished gully grating (see Figure 2 below from Grafton Street) at regular intervals to discharge water to the combined sewer. Figure 3 is another example of gully gratings, used in Wexford.



Figure 2. Dished Gully Grating, Channel and Detail (Grafton Street)



Figure 3. Dished Gully Grating and Channel (Wexford)

Refer to AECOM drawing 60594179-ACM-XX-XX-DR-CE-10-0501 for the proposed drainage drawing.

3. Foul Water Drainage

3.1 Existing Foul Water Drainage Network

In addition to the GPR survey received from Apex Surveys, AECOM have received GIS records from Irish Water to assist in determining the surrounding foul water network buildup for Kildare Market Square. From the available data, the GPR survey and records confirm the presence of existing foul water sewers located within the vicinity of Kildare Market Square.

There is an existing 150 mm and 225 mm foul water pipe which runs along Dublin St., which runs from east to west. Additionally, a 150 mm foul water pipe runs north-south along the western site boundary. These two existing foul drainage networks appear to discharge by gravity to the existing foul water manhole located at the junction intersection between Dublin St. and Bride St, south of the public realm, where existing 225 mm foul water sewers continue further downstream along Bride. St. and Claregate Street.

There is an additional existing 150 mm foul water pipe that appears to service the Kildare Town Heritage Centre, which discharges north of Kildare Market Square.

Refer to AECOM drawing 60594179-ACM-XX-XX-DR-CE-10-0501 for the existing and proposed drainage network. Refer to Figure 2.1 under Section 2.1 for the existing drainage network.

3.2 Proposed Foul Water Drainage Network

There is no additional foul water drainage infrastructure proposed within the subject site. This is subject to approval following submission of a Pre-Connection Enquiry (PCE) which is outstanding with Uisce Eireann at the time of this report being prepared.

4. Sustainable Urban Drainage Systems (SuDS)

The proposed development has been assessed in relation to Sustainable Urban Drainage Systems (SuDS) in accordance with the guidelines of the GSDS and the SuDS CIRIA Manual C753. The aim of the proposed drainage system is to replicate the natural characteristics of rainfall run-off, minimising the environmental impact from rainfall events by reducing the run-off leaving the site for small rainfall events.

SuDS are designed to manage water quantity reducing/preventing the likelihood of flooding from the proposed development and to maximise the opportunities and benefits from surface water management.

Based on the existing site topography and the proposed site layout, the following SuDS measures have been provided to treat the surface water runoff, to replicate the natural characteristics of the greenfield runoff and minimise the environmental impact.

- Bioretention system/ Tree Pits

Refer to AECOM drawing 60594179-ACM-XX-XX-DR-CE-10-0501 for the locations of proposed SuDS features.

4.1 Bioretention System/ Tree Pits

Bioretention systems are engineered to capture, manage, and treat stormwater runoff by incorporating natural processes. These systems typically consist of shallow depressions planted with vegetation and filled with permeable soil or aggregate.

The SuDS Manual emphasizes the importance of bioretention in enhancing water quality, reducing peak flows, and promoting groundwater recharge. By allowing stormwater to be temporarily attenuated and treated through the natural filtration and biological processes within the rainwater garden, bioretention systems contribute to the overall resilience and sustainability of urban drainage systems. Refer to Figure 4.1 and for tree pit and rain gardens.

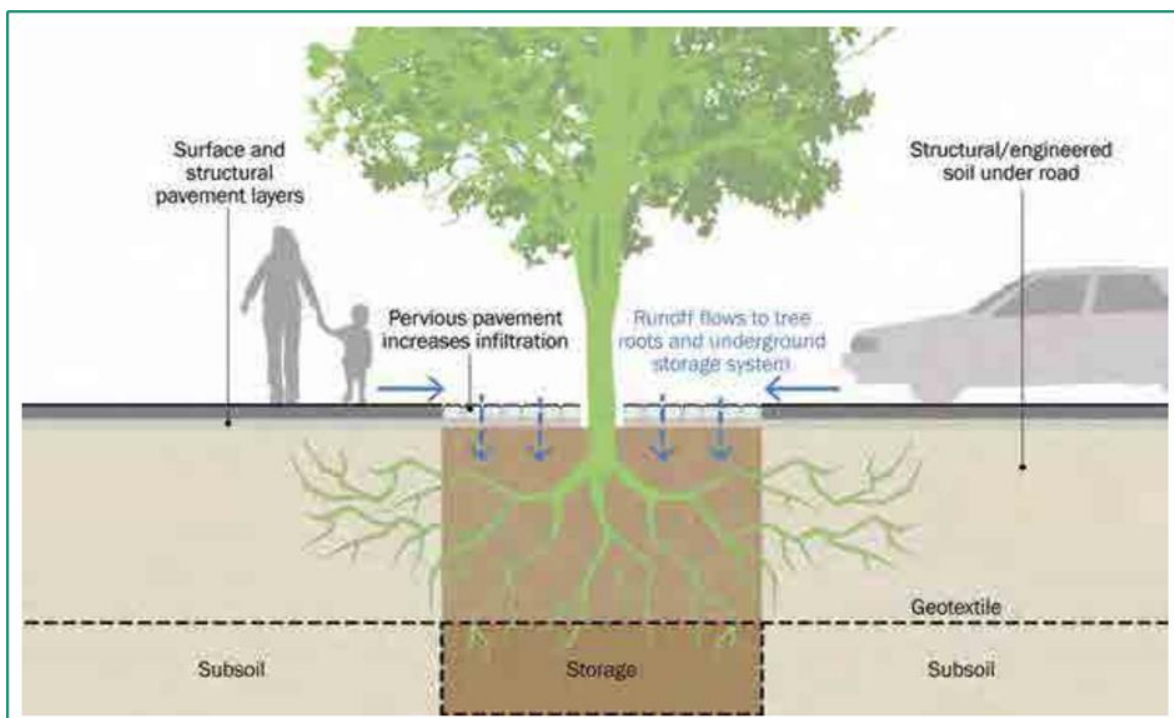


Figure 4.1 Collection of Surface Water Runoff via Tree Pit (Source: Ciria C753 The SuDS Manual)

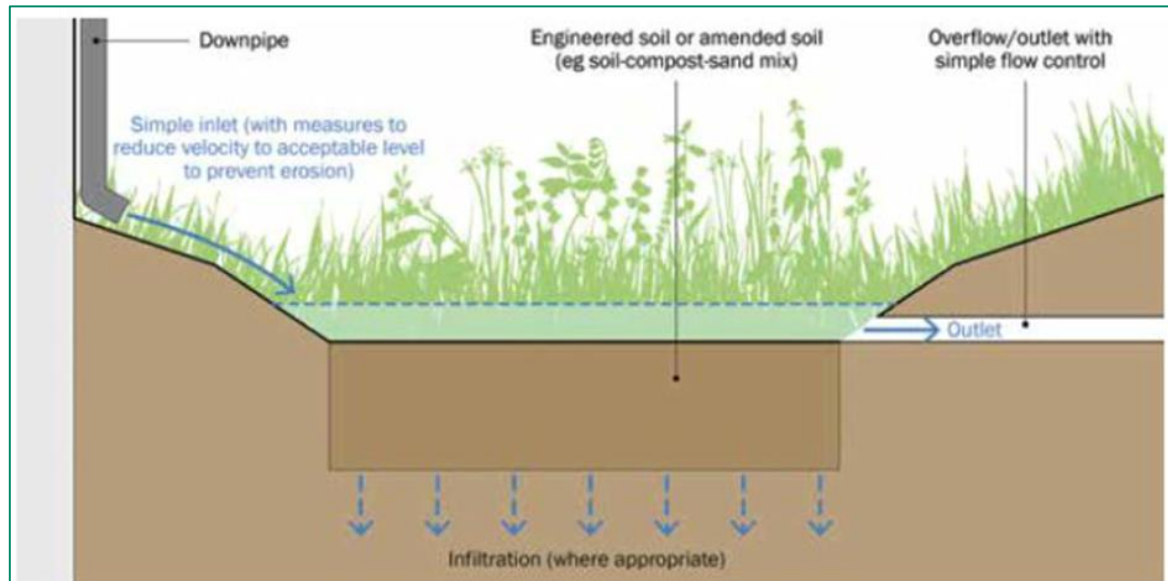


Figure 4.2 Typical Bio-Retention Section (Source: Ciria C753 The SuDS Manual)

5. Water Supply

5.1 Existing Water Supply Network

Available records and GPR survey indicate the presence of existing watermain services within Kildare Market Square. GPR indicates the presence of an existing 3" Cast Iron and 5" uPVC watermain located along Dublin St.. There are several 3" Cast Iron and 10" uPVC watermain pipe located within the market square. This was picked up on the GPR survey and it was also noted on this survey that is a water meters identified within the existing market square which appears to indicate that the current supply feeds the Kildare Town Heritage Centre.

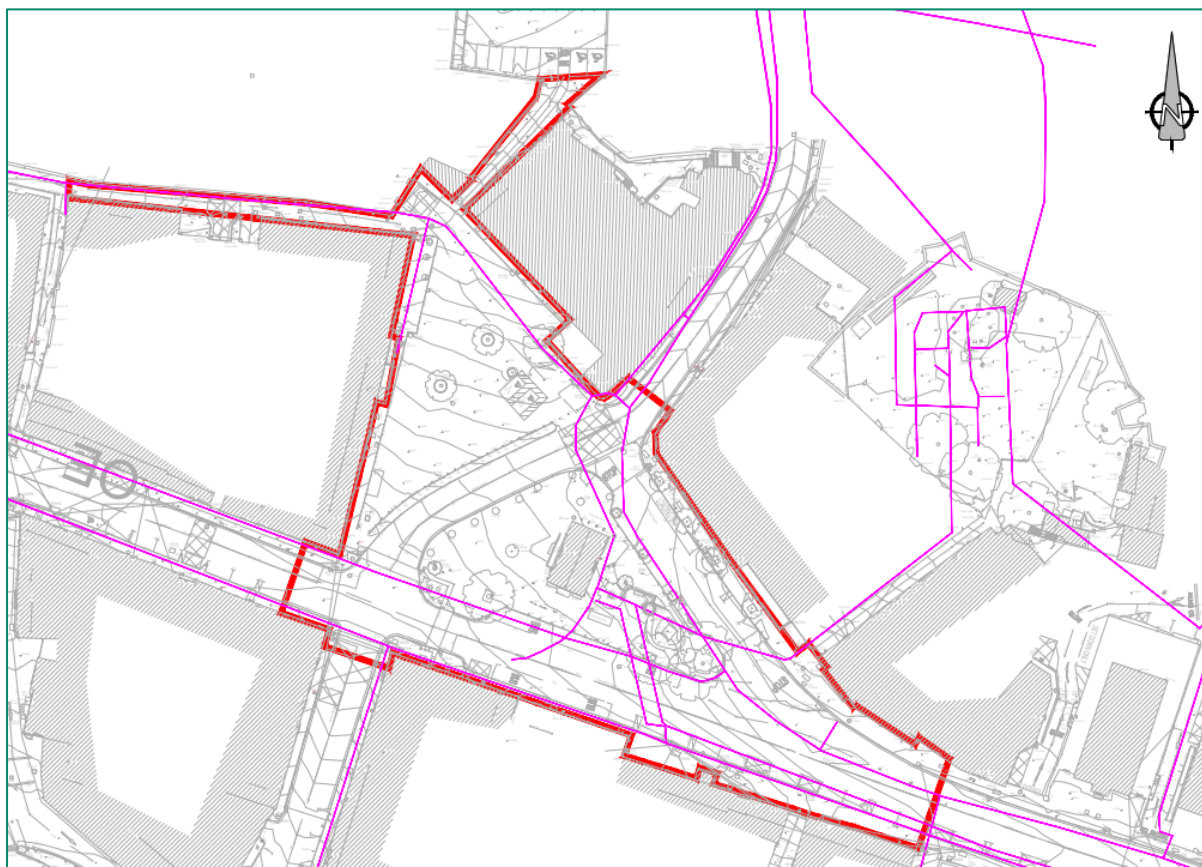


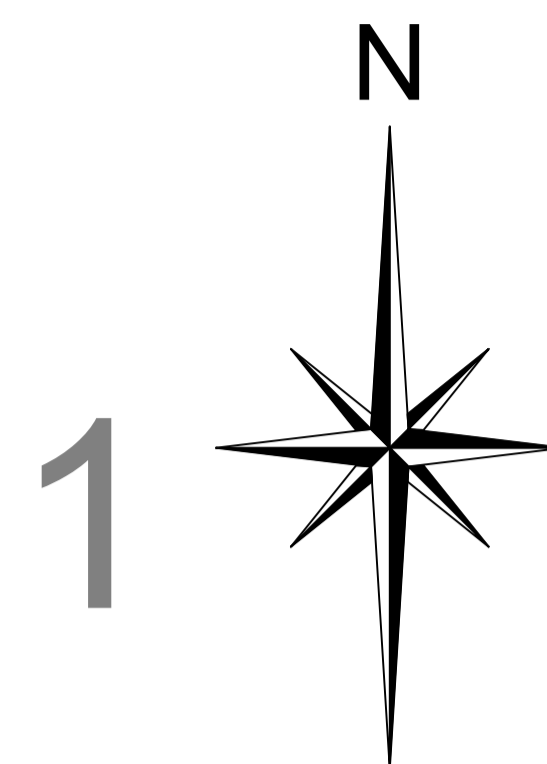
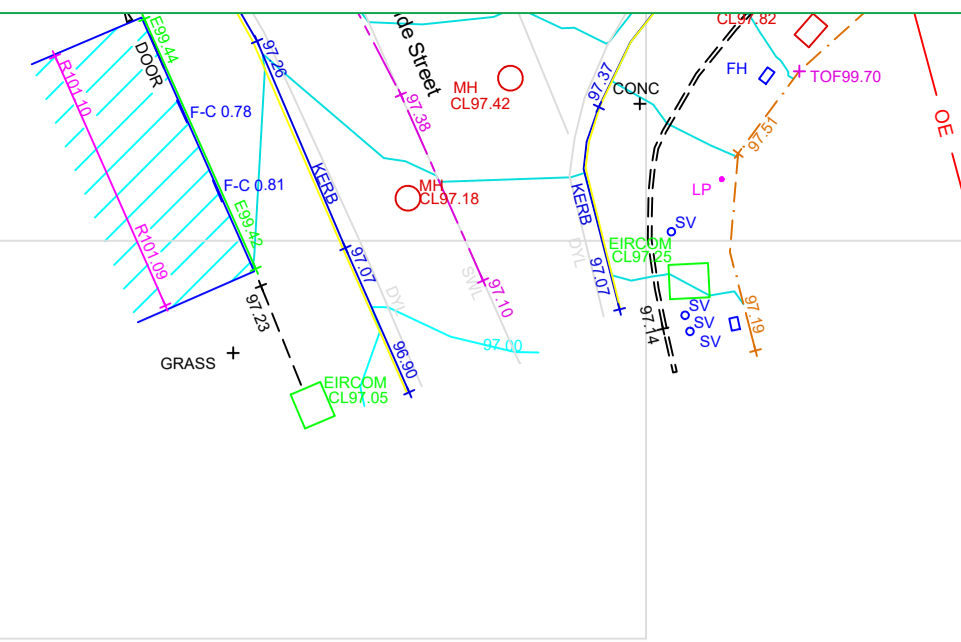
Figure 5.1 Existing Watermain (Source: AECOM sketch based on Irish Water records)

5.2 Proposed Water Supply Network

There are water pop-up's proposed to be provided as part of the current proposals, which will be used during market events. A Pre-Connection Enquiry (PCE) has been submitted to Irish Water for the proposals and this is outstanding as of the date of this report.

Refer to AECOM drawing 60594179-ACM-XX-XX-DR-CE-10-2701 for the locations of potable water connections.

Appendix A – Topographical Survey



APEX SURVEYS

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RURAL/NATURAL FEATURES :

- BUSH
- SAPLING
- TREE
- HEDGE
- TROUGH
- CATTLE GRID
- LINEWORK:
- EMBANKMENT TOP +101.50
- DRAIN +101.50
- BREAKLINE +101.50
- BUILDING +101.50
- KERB BOTTOM +101.50
- WALL +101.50
- PATH/CHANGE SURFACE +101.50
- OHEAD ELECTRICITY +101.50
- OHEAD TELECOM +101.50

STREET FURNITURE :

- BOLLARDS
- BORE HOLE
- BUS STOP
- CRASH BARRIER
- ELECTRICITY POLE
- EARTHING ROD
- GATE
- GROUND LIGHT
- ILLUMINATED BOLLARD
- LAMP POST
- MARKER POST
- POST
- POST BOX
- ROADSIGN
- SIGN POST
- TELEPHONE BOX
- TELEPHONE POLE
- TRAFFIC LIGHT
- TRIAL PIT

SERVICES :

- AIR VALVE
- ARMSTRONG JUNCTION
- CABLE TV IC
- COVER LEVEL
- EIRCOM COVER
- EIRCOM JUNCTION BOX
- ELECTRICAL CABLE PIT
- ESAT COVER
- ESB COVER
- ESB JUNCTION BOX
- FIRE HYDRANT
- GAS VALVE
- GULLY
- INSPECTION COVER
- MANHOLE
- SEPTIC TANK
- SLUICE VALVE
- STOPCOCK

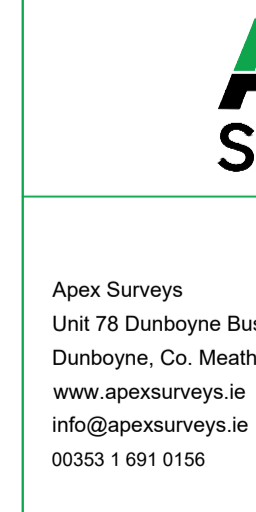
SERVICES :

- SERVICE BOX (UNKNOWN)
- TRAFFIC COVER
- VENT
- WATER METER
- UNABLE TO LIFT

LEVELS :

- BED LEVEL +BED101.50
- EAVE LEVEL +E101.50
- FLOOR LEVEL +FL101.50
- INVERT LEVEL +IL101.50
- ROAD LEVEL +R101.50
- RIDGE LEVEL +R101.50
- SOFFIT LEVEL +SL101.50
- SPOT LEVEL +S101.50
- TOP OF FENCE LEVEL +TOP101.50
- TOP OF WALL LEVEL +TOW101.50
- WINDOW +W101.50
- SURVEY CONTROL STATION

SHEET LAYOUT :



PLAN PRODUCED BY:

APEX SURVEYS

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Dunboyne, Co. Meath, Ireland
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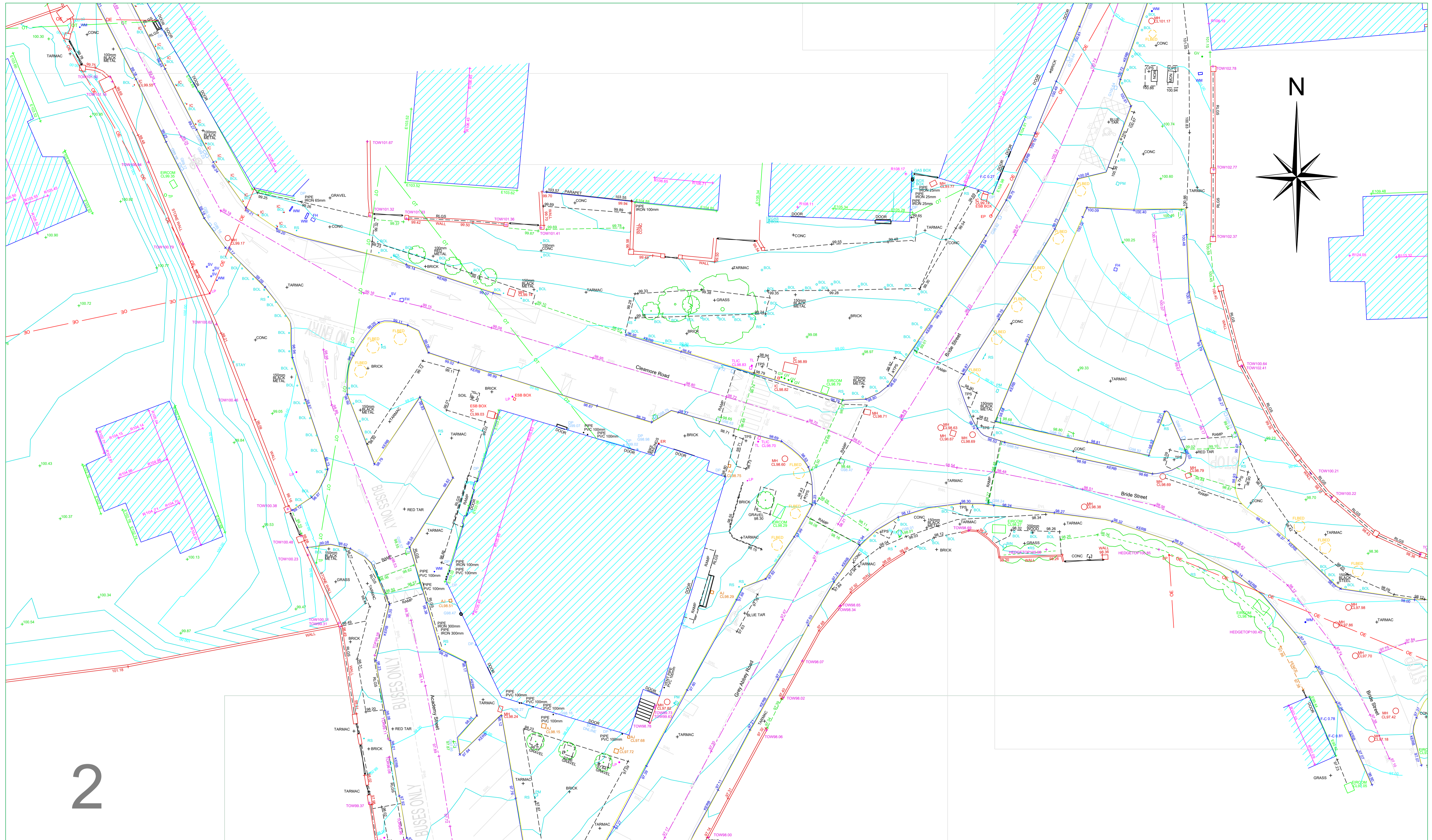
PROJECT:

Market Square Renewal
Kildare Town

GRID SYSTEM: Irish Transverse Mercator
DATUM: Main Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:		
No.	Date	Description
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003	01/09/21	Additional information added
004	16/09/21	Additional information added
005	30/09/21	Additional information added

SCALE :	1/200 A1	DATE :	09/07/2021
DRG No:	4612	DESCRIPTION :	2D Topographical
SHEET:	1 of 15	SURVEYED BY :	L.H. & C.M.
		PROCESSED BY :	Cristina Butur
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2

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SIGN POST	
TELEPHONE BOX	
TELEPHONE POLE	
TRAFFIC LIGHT	
TRIAL PIT	

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AIR VALVE	
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ESAT COVER	
ESB COVER	
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FIRE HYDRANT	
GAS VALVE	
GULLY	
INSPECTION COVER	
MANHOLE	
SEPTIC TANK	
SLUICE VALVE	
STOPCOCK	

SERVICES :

AV+	
AJ	
CATV	
CL	
EIRCOM	
EIRCOM BOX	
ECP	
ESAT	
ESB	
ESB BOX	
FH+	
GV	
G	
IC	
MH	
SEPTIC	
SV	
ST	

SERVICES :

SERVICE BOX (UNKNOWN)	
TRAFFIC COVER	
VENT	
WATER METER	
UNABLE TO LIFT	

LEVELS :

BED LEVEL	
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SPOT LEVEL	
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SHEET LAYOUT :

PLAN PRODUCED BY:
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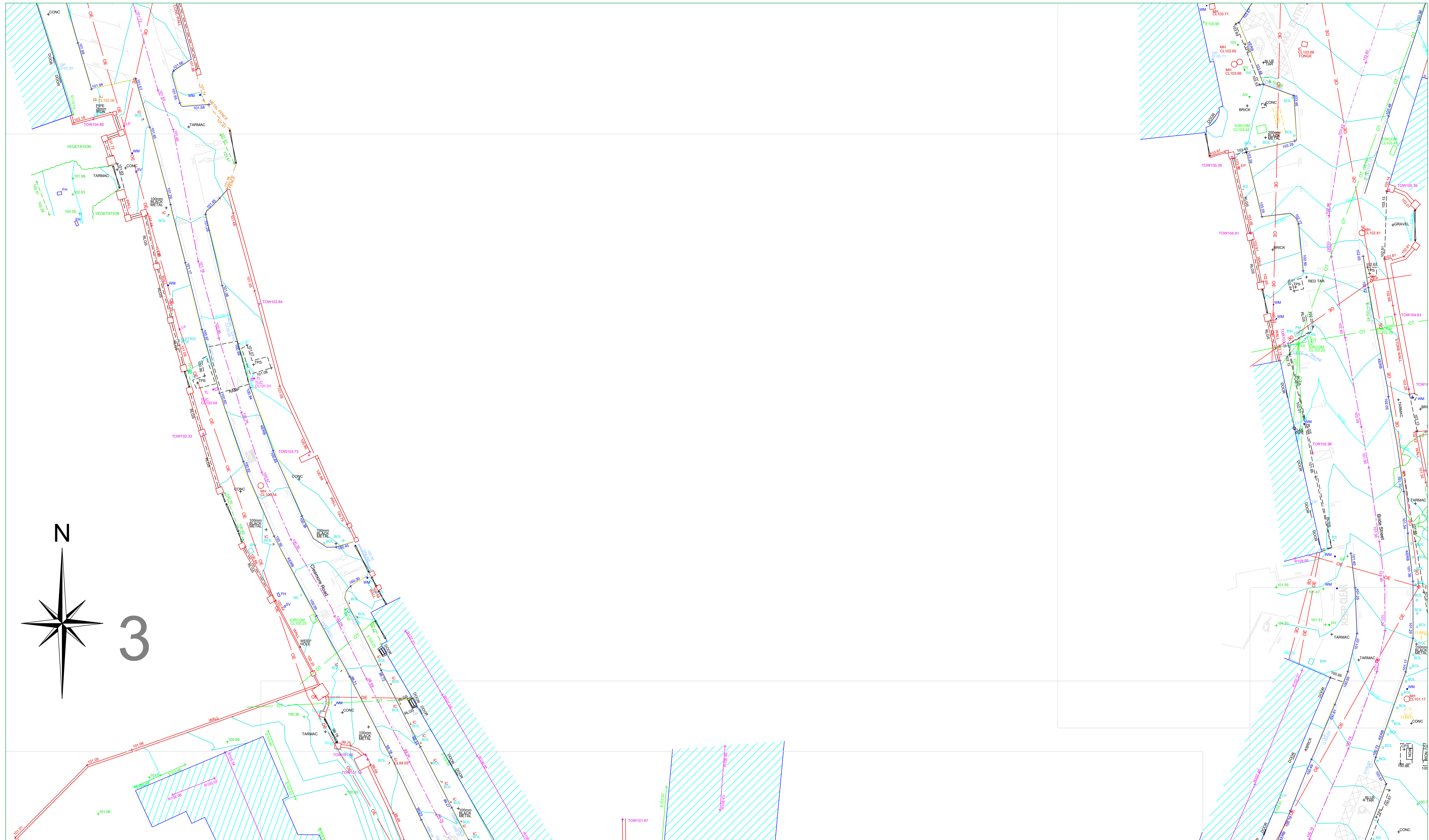
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DATE : 09/07/2021

DRG No: 4612

SHEET: 2 of 15

DESCRIPTION : 2D Topographical
 SURVEYED BY : L.H. & C.M.
 PROCESSED BY : Cristina Butur
 CHECKED BY : Alan Brady



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- GAS VALVE
- GULLY
- INSPECTION COVER
- MANHOLE
- SEPTIC TANK
- SLUICE VALVE
- STOPCOCK

SERVICES :

- AV+
- AJ
- CATV
- CL
- EIRCOM
- EIRCOM BOX
- ECP
- ESAT
- ESB
- ESB BOX
- FH+
- GV
- G
- IC
- MH
- SEPTIC
- SV
- ST

SERVICES :

- SERVICE BOX (UNKNOWN)
- TRAFFIC COVER
- VENT
- WATER METER
- UNABLE TO LIFT
- BOX
- TLIC
- VENT+
- WM+
- UTO

LEVELS :

- BED LEVEL
- EAVE LEVEL
- FLOOR LEVEL
- ROAD LEVEL
- RIDGE LEVEL
- SOFFIT LEVEL
- SPOT LEVEL
- TOP OF FENCE LEVEL
- TOP OF WALL LEVEL
- WINDOW
- SURVEY CONTROL STATION

SHEET LAYOUT :



PLAN PRODUCED BY:

APEX SURVEYS

CONTACT INFORMATION:

Apex Surveys
Unit 78 Dunboyne Business Park
Dunboyne, Co. Meath, Ireland
www.apexsurveys.ie
info@apexsurveys.ie
00353 1 691 0156

CLIENT:

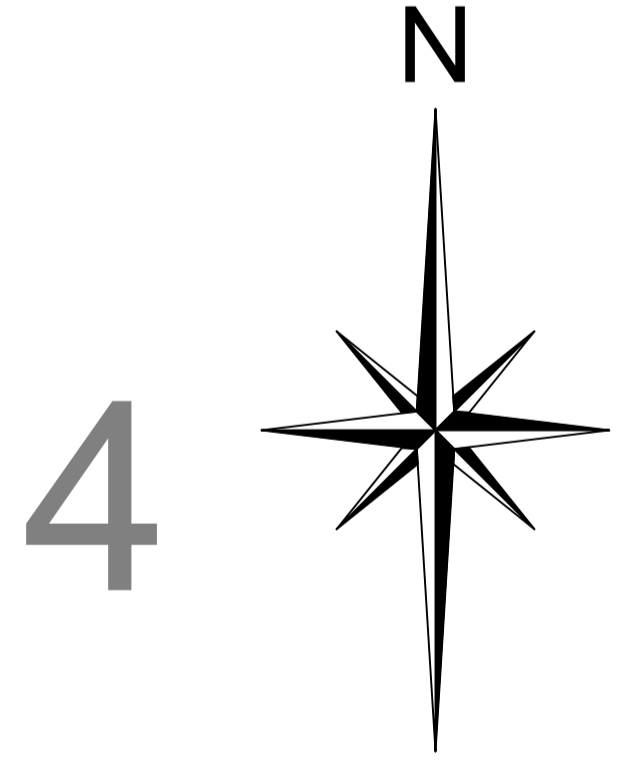
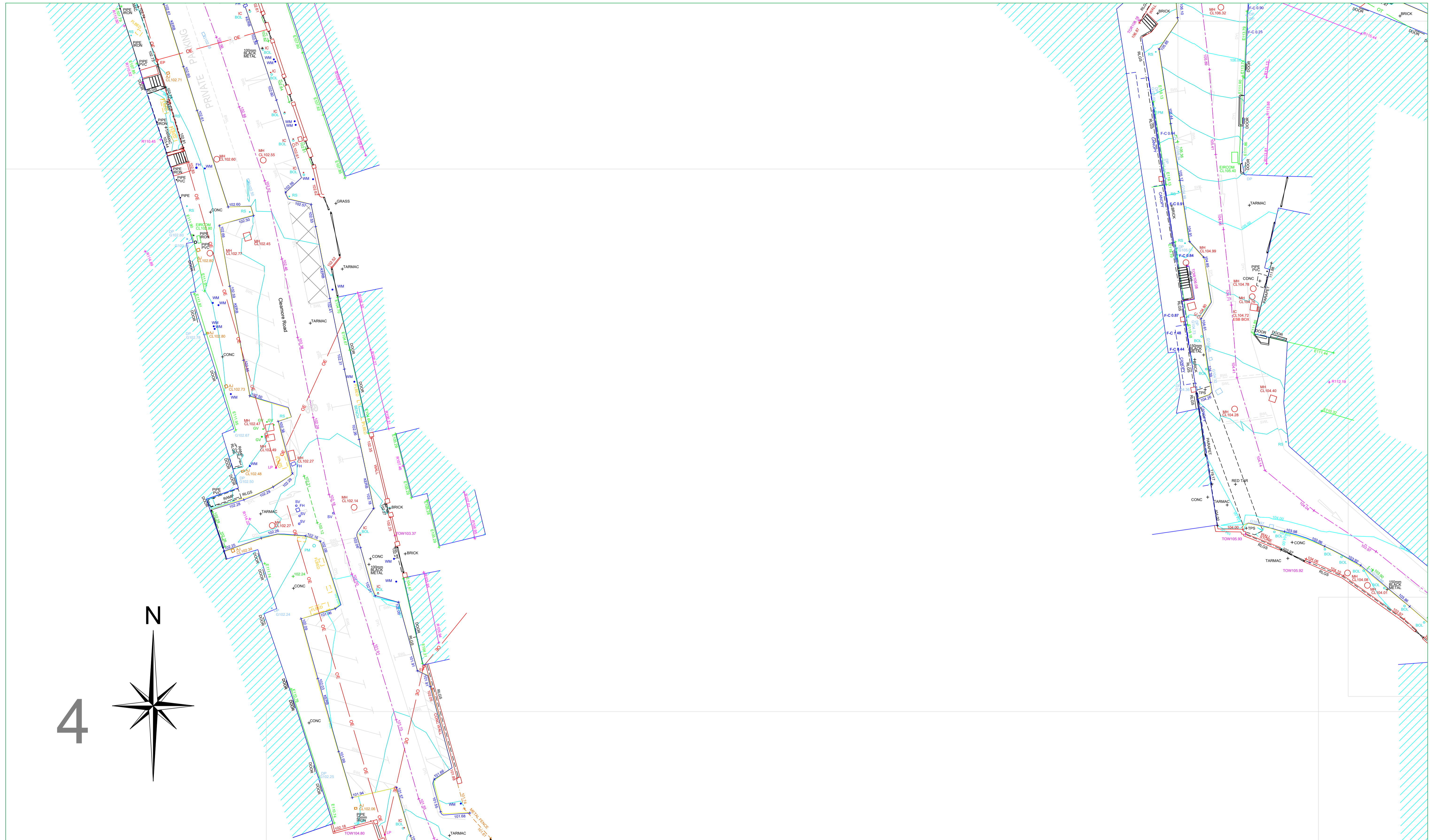
Aecom

PROJECT:

Market Square Renewal
Kildare Town

SCALE :	1/200 A1	DATE :	09/07/2021
DRG No:	4612	DESCRIPTION :	2D Topographical
SHEET:	3 of 15	SURVEYED BY :	L.H. & C.M.
		PROCESSED BY :	Cristina Butur
		CHECKED BY :	Alan Brady

GRID SYSTEM:	Irish Transverse Mercator		
DATUM:	Main Head (OSGM15)		
NOTES:	Drawing Contains Scale Factor		
REVISIONS:	No.	Date	Description
	002	09/07/21	Additional information added
	003	01/09/21	Additional information added
	004	16/09/21	Additional information added
	005	30/09/21	Additional information added



APEX SURVEYS

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RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
LINEWORK:	
EMBANKMENT TOP	+101.50
DRAIN	+101.50
BREAKLINE	+101.50
BUILDING	+101.50
KERB BOTTOM	+101.50
WALL	+101.50
PATHCHANGE SURFACE	+101.50
OHEAD ELECTRICITY	OE
OHEAD TELECOM	OT

STREET FURNITURE :

BOLLARDS	BD
BORE HOLE	BH+
BUS STOP	BS
CRASH BARRIER	CB
ELECTRICITY POLE	EP
EARTHING ROD	ER+
GATE	LT
GROUND LIGHT	GL
ILLUMINATED BOLLARD	IB
LAMP POST	LP
MARKER POST	MKR
POST	POST
POST BOX	POST BOX+
ROADSIGN	RS
SIGN POST	SIGN
TELEPHONE BOX	TB
TELEPHONE POLE	TP
TRAFFIC LIGHT	TL
TRIAL PIT	TPIT+

SERVICES :

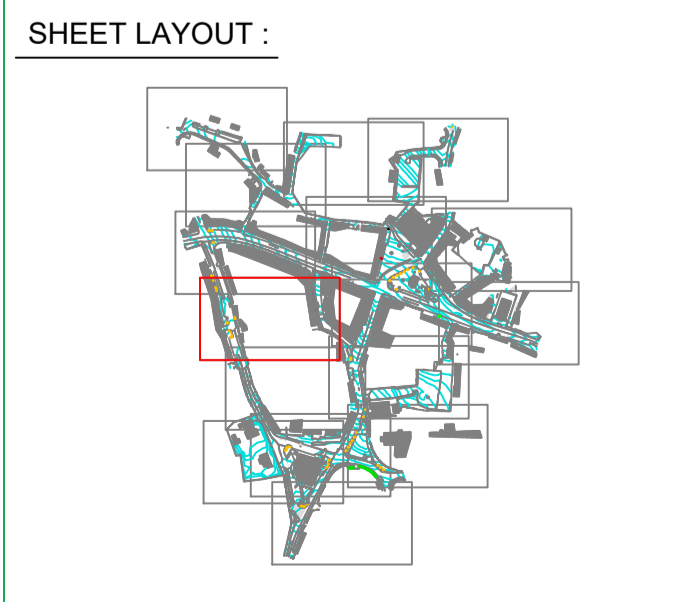
AIR VALVE	AV+
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH+
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT
WATER METER	WM+
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+BED101.50
EAVE LEVEL	+E101.50
FLOOR LEVEL	+FL101.50
GRID	+IL101.50
ROAD LEVEL	+101.50
RIDGE LEVEL	+R101.50
SOFFIT LEVEL	+SL101.50
SPOT LEVEL	+101.50
TOP OF FENCE LEVEL	+TOP101.50
TOP OF WALL LEVEL	+TOW101.50
SURVEY CONTROL STATION	+101.50



PLAN PRODUCED BY:

APEX SURVEYS

CONTACT INFORMATION:

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 00353 1 691 0156

CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
 DATUM: Main Head (OSGM15)
 NOTES: Drawing Contains Scale Factor

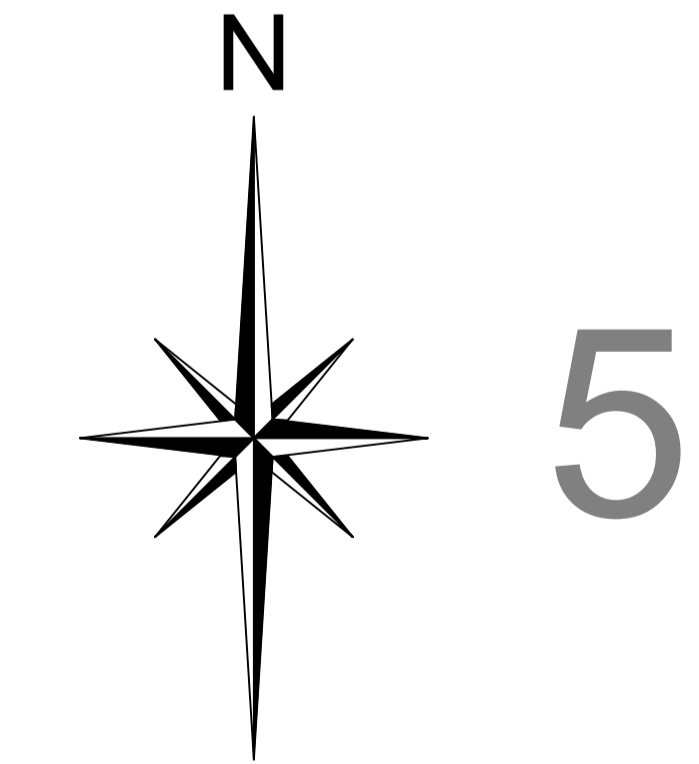
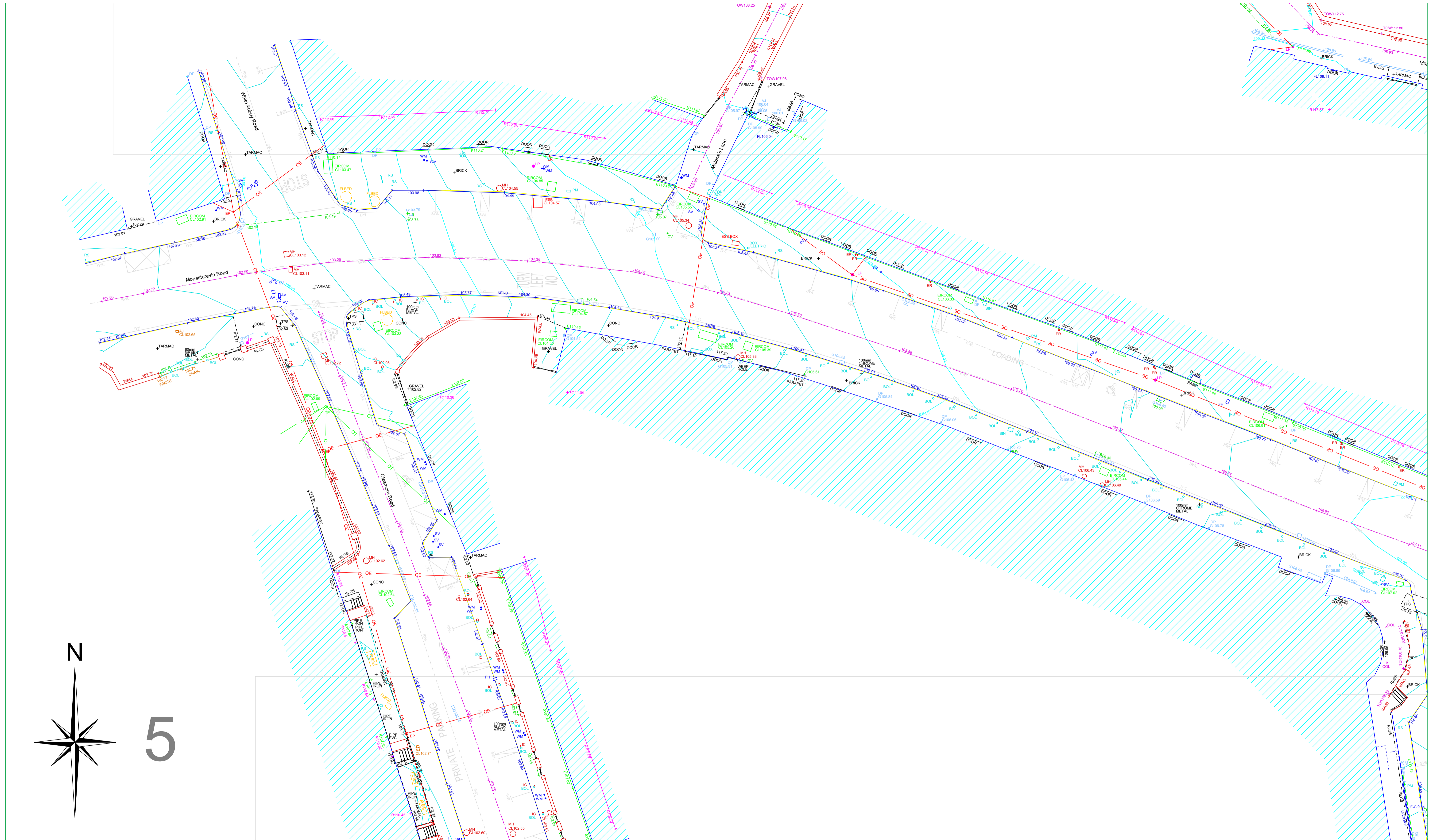
REVISIONS:

No.	Date	Description
002	09/07/21	Additional information added
003	01/09/21	Additional information added
004	16/09/21	Additional information added
005	30/09/21	Additional information added

PROJECT:

**Market Square Renewal
 Kildare Town**

SCALE :	1/200 A1	DATE :	09/07/2021
DRG No:	4612	DESCRIPTION :	2D Topographical
SHEET:	4 of 15	SURVEYED BY :	L.H. & C.M.
		PROCESSED BY :	Cristina Butur
		CHECKED BY :	Alan Brady



APEX SURVEYS

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RURAL/NATURAL FEATURES :

- BUSH
- SAPLING
- TREE
- HEDGE
- TROUGH
- CATTLE GRID
- LINEWORK:
- EMBANKMENT TOP
- DRAIN
- BREAKLINE
- BUILDING
- KERB BOTTOM
- WALL
- PATHCHANGE SURFACE
- OHEAD ELECTRICITY
- OHEAD TELECOM

STREET FURNITURE :

- BOLLARDS
- BORE HOLE
- BUS STOP
- CRASH BARRIER
- ELECTRICITY POLE
- EARTHING ROD
- GATE
- GROUND LIGHT
- ILLUMINATED BOLLARD
- LAMP POST
- MARKER POST
- POST
- POST BOX
- ROADSIGN
- SIGN POST
- TELEPHONE BOX
- TELEPHONE POLE
- TRAFFIC LIGHT
- TRIAL PIT

SERVICES :

- AIR VALVE
- ARMSTRONG JUNCTION
- CABLE TV IC
- COVER LEVEL
- EIRCOM COVER
- EIRCOM JUNCTION BOX
- ELECTRICAL CABLE PIT
- ESAT COVER
- ESB COVER
- ESB JUNCTION BOX
- FIRE HYDRANT
- GAS VALVE
- GULLY
- INSPECTION COVER
- MANHOLE
- SEPTIC TANK
- SLUICE VALVE
- STOPCOCK

SERVICES (UNKNOWN) :

- BOX
- TLIC
- VENT
- WATER METER
- UNABLE TO LIFT
- LEVELS :
- BED LEVEL
- EAVE LEVEL
- FLOOR LEVEL
- INVERT LEVEL
- ROAD LEVEL
- RIDGE LEVEL
- SOFFIT LEVEL
- SPOT LEVEL
- TOP OF FENCE LEVEL
- TOP OF WALL LEVEL
- WINDOW
- SURVEY CONTROL STATION

SHEET LAYOUT :



PLAN PRODUCED BY:
APEX SURVEYS

CONTACT INFORMATION:
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CLIENT:
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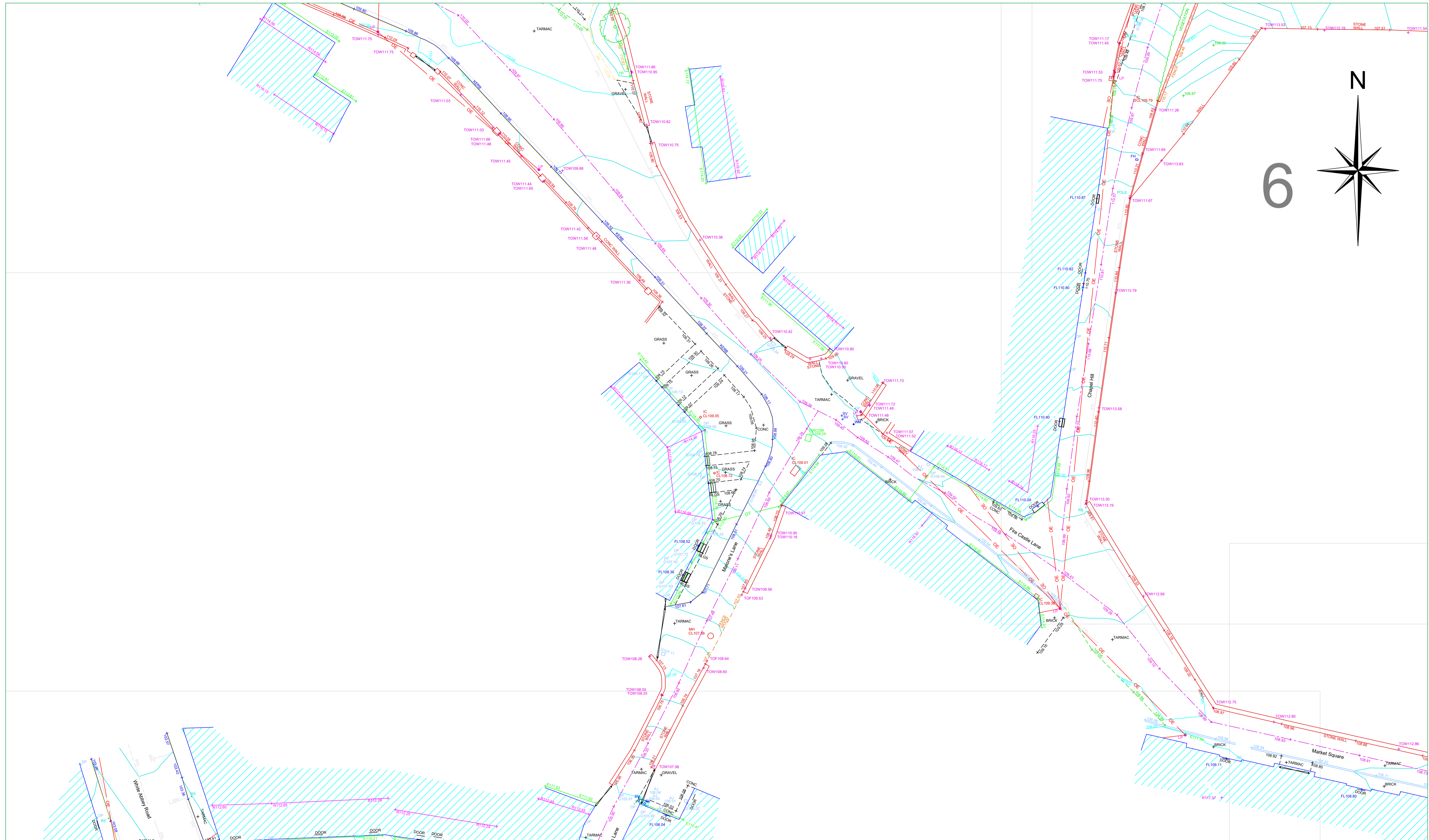
PROJECT:
**Market Square Renewal
Kildare Town**

SCALE : 1/200 A1
DATE : 09/07/2021
DRG No: 4612
SHEET: 5 of 15
DESCRIPTION : 2D Topographical
SURVEYED BY : L.H. & C.M.
PROCESSED BY : Cristina Butur
CHECKED BY : Alan Brady

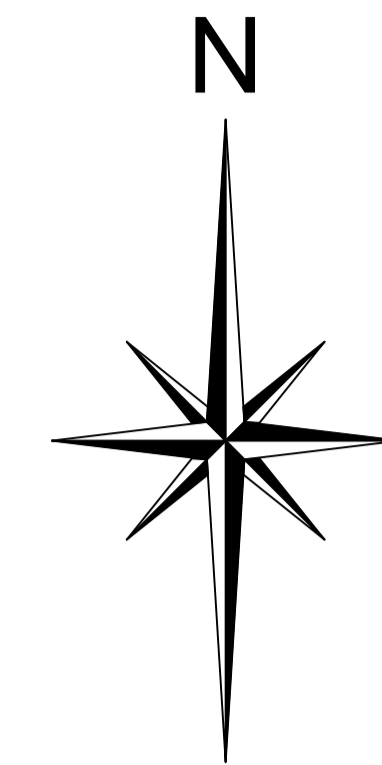
GRID SYSTEM: Irish Transverse Mercator
DATUM: Main Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
002	09/07/21	Additional information added
003	01/09/21	Additional information added
004	16/09/21	Additional information added
005	30/09/21	Additional information added



6



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RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
GRID	

LINEWORK:

EMBANKMENT TOP	+101.50
DRAIN	+101.50
BREAKLINE	+101.50
BUILDING	+101.50
KERB BOTTOM	+101.50
WALL	+101.50
PATH/CHANGE SURFACE	+101.50
OHEAD ELECTRICITY	+101.50
OHEAD TELECOM	+101.50

STREET FURNITURE :

BOLLARDS	BD+
BORE HOLE	BH+
BUS STOP	BS+
CRASH BARRIER	CB
ELECTRICITY POLE	EP+
EARTHING ROD	ER+
GATE	LT+
GROUND LIGHT	BOL
ILLUMINATED BOLLARD	IP+
LAMP POST	MKR
MARKER POST	POST
POST BOX	POST BOX+
ROADSIGN	RS
SIGN POST	RS
TELEPHONE BOX	TB
TELEPHONE POLE	TP+
TRAFFIC LIGHT	TL+
TRIAL PIT	TPIT+

SERVICES :

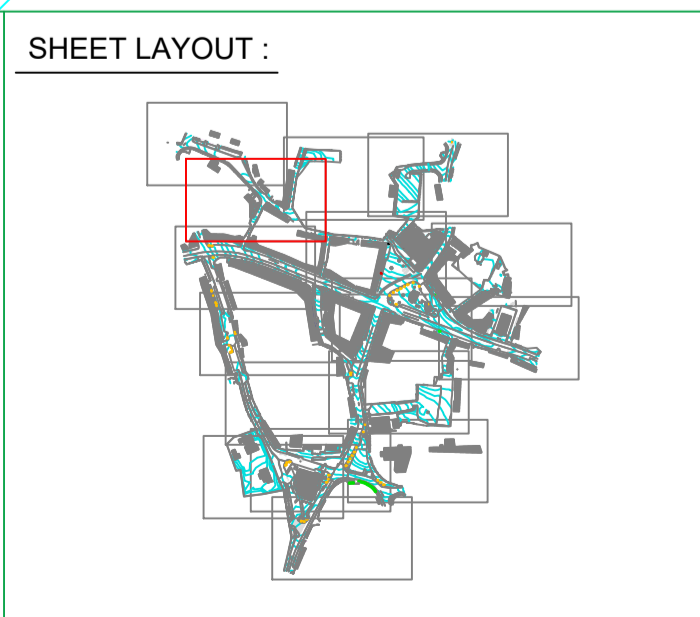
AIR VALVE	AV+
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH+
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT+
WATER METER	WM+
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+BED101.50
EAVE LEVEL	+E101.50
FLOOR LEVEL	+FL101.50
ROAD LEVEL	+R101.50
RIDGE LEVEL	+R101.50
SOFFIT LEVEL	+S101.50
SPOT LEVEL	+101.50
TOP OF FENCE LEVEL	+TOP101.50
TOP OF WALL LEVEL	+TOW101.50
WINDOW	+W101.50
SURVEY CONTROL STATION	SCS



PLAN PRODUCED BY:

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CONTACT INFORMATION:

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00353 1 691 0156

CLIENT:

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GRID SYSTEM: Irish Transverse Mercator
DATUM: Main Head (OSGM15)
NOTES: Drawing Contains Scale Factor

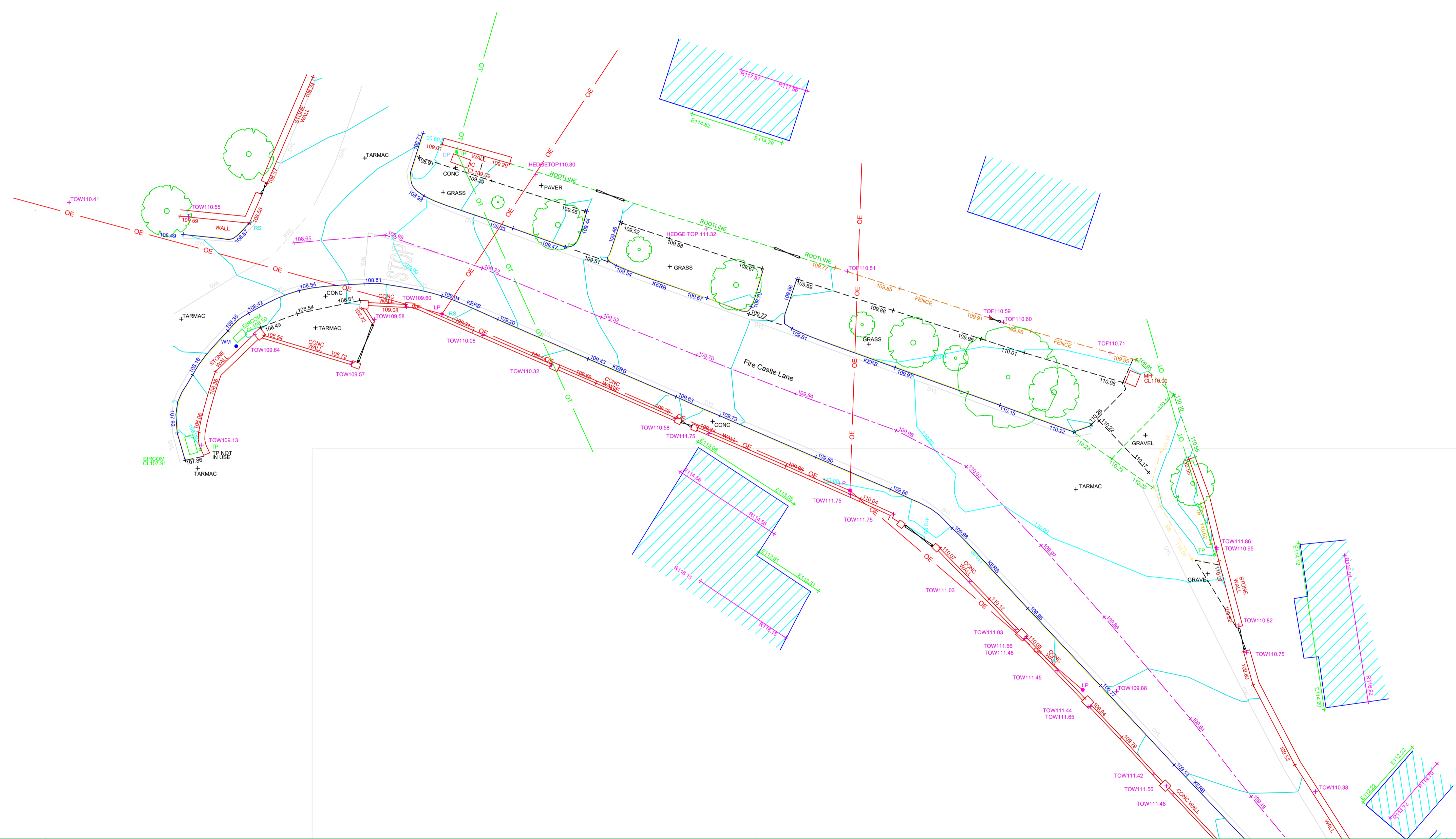
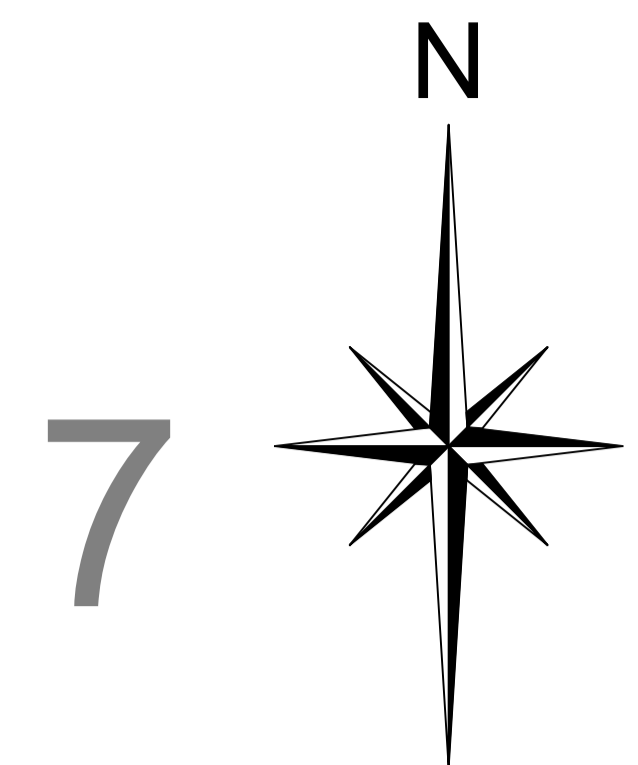
REVISIONS:

No.	Date	Description
002	09/07/21	Additional information added
003	01/09/21	Additional information added
004	16/09/21	Additional information added
005	30/09/21	Additional information added

PROJECT:

**Market Square Renewal
Kildare Town**

SCALE :	1/200 A1	DATE :	09/07/2021
DRG No:	4612	DESCRIPTION :	2D Topographical
SHEET:	6 of 15	SURVEYED BY :	L.H. & C.M.
		PROCESSED BY :	Cristina Butur
		CHECKED BY :	Alan Brady



RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
LINEWORK:	
EMBANKMENT TOP	+101.50
DRAIN	+101.50
BREAKLINE	+101.50
BUILDING	+101.50
KERB BOTTOM	+101.50
WALL	+101.50
PATHCHANGE SURFACE	+101.50
OHEAD ELECTRICITY	OE
OHEAD TELECOM	OT

STREET FURNITURE :

BOLLARDS	BD+
BORE HOLE	BH+
BUS STOP	BS+
CRASH BARRIER	CB
ELECTRICITY POLE	EP+
EARTHING ROD	ER+
GATE	LT+
GROUND LIGHT	BOL
ILLUMINATED BOLLARD	LP
LAMP POST	MKR
MARKER POST	POST BOX +
POST	RS
POST SIGN	RS
SIGN POST	RS
TELEPHONE BOX	TB
TELEPHONE POLE	TP
TRAFFIC LIGHT	TL+
TRIAL PIT	TPIT+

SERVICES :

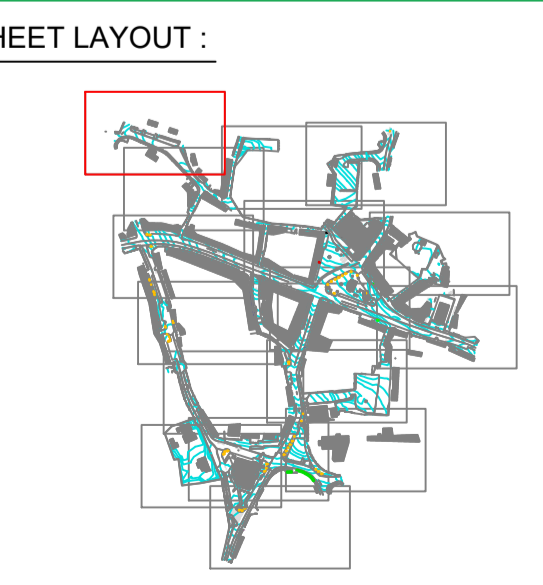
AIR VALVE	AV+
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH+
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT
WATER METER	WM
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+BED101.50
EAVE LEVEL	+E101.50
FLOOR LEVEL	+FL101.50
INVERT LEVEL	+IL101.50
ROAD LEVEL	+101.50
RIDGE LEVEL	+R101.50
SOFFIT LEVEL	+SL101.50
SPOT LEVEL	+101.50
TOP OF FENCE LEVEL	+TOP101.50
TOP OF WALL LEVEL	+TOW101.50
WINDOW	+101.50
SURVEY CONTROL STATION	+



PLAN PRODUCED BY:

APEX SURVEYS

CONTACT INFORMATION:

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info@apexsurveys.ie
00353 1 691 0156

CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
DATUM: Main Head (OSGM15)
NOTES: Drawing Contains Scale Factor

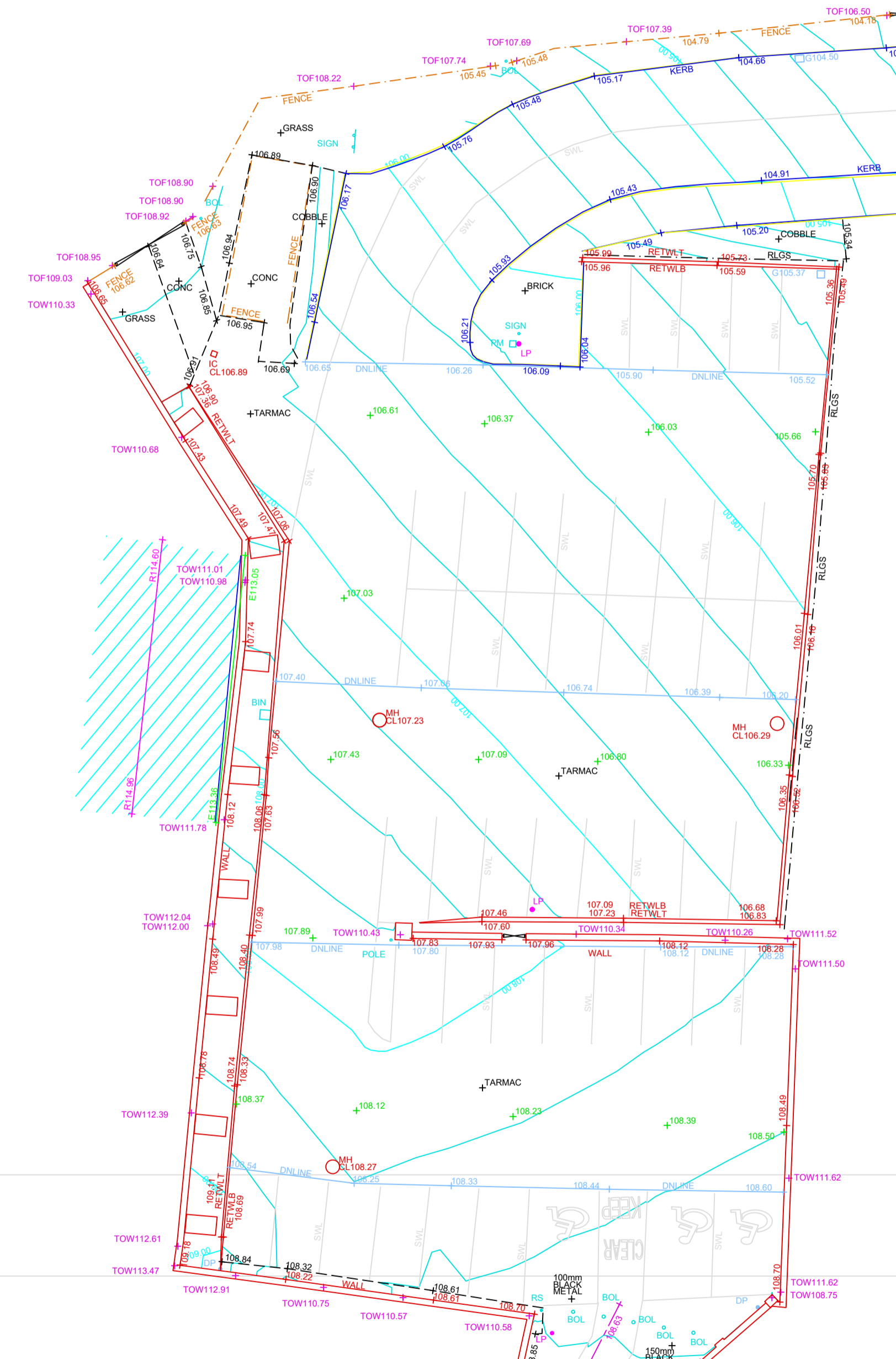
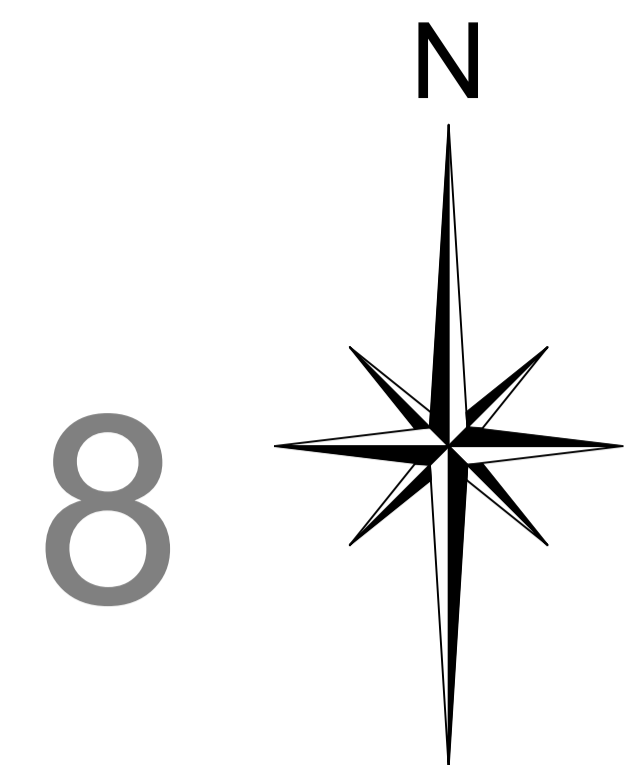
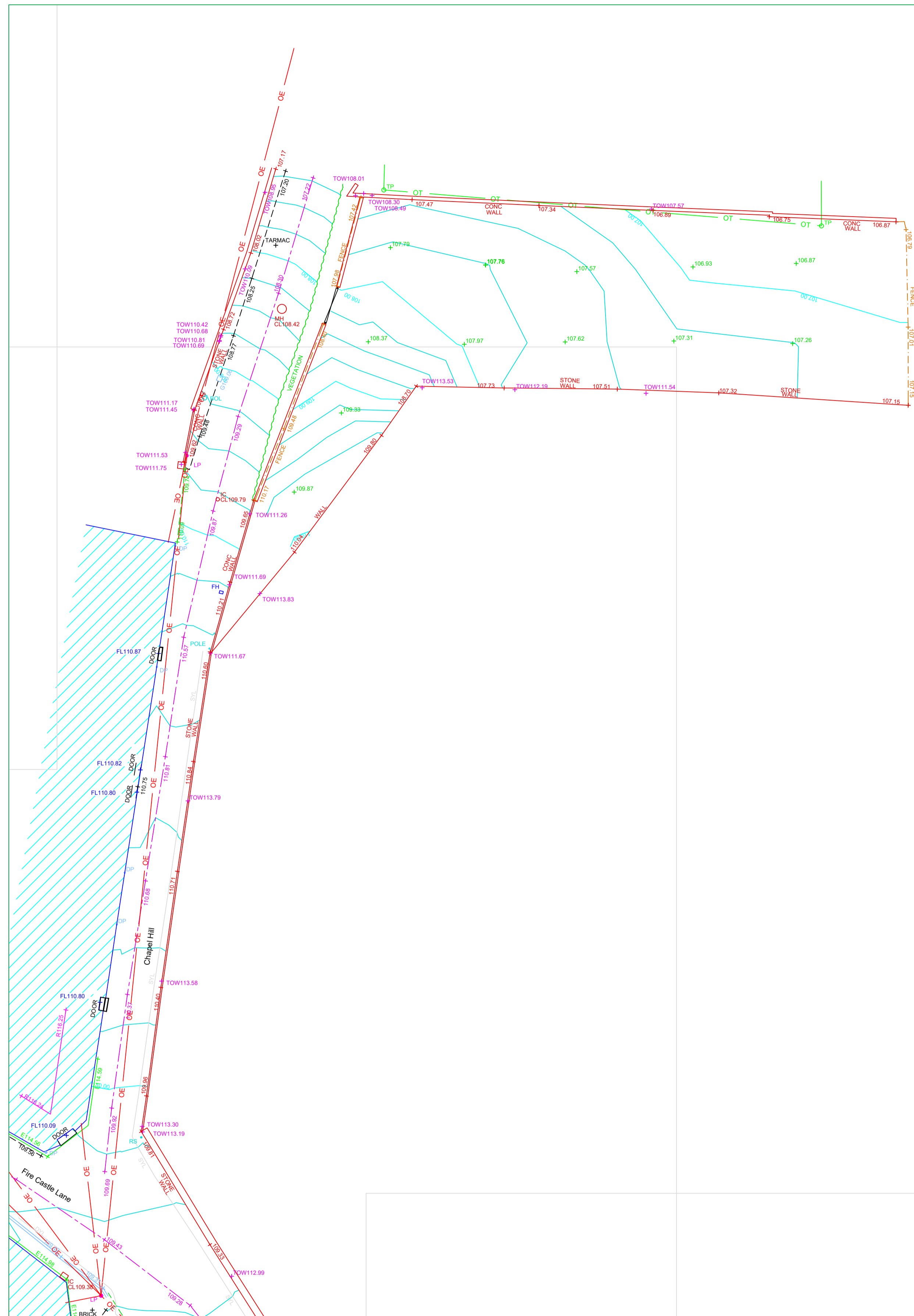
REVISIONS:

No.	Date	Description
002	09/07/21	Additional information added
003	01/09/21	Additional information added
004	16/09/21	Additional information added
005	30/09/21	Additional information added

PROJECT:

**Market Square Renewal
Kildare Town**

SCALE :	1/200 A1	DATE :	09/07/2021
DRG No:	4612	DESCRIPTION :	2D Topographical
SHEET:	7 of 15	SURVEYED BY :	L.H. & C.M.
		PROCESSED BY :	Cristina Butur
		CHECKED BY :	Alan Brady



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RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
LINEWORK:	
EMBANKMENT TOP	+101.50
DRAIN	+101.50
BREAKLINE	+101.50
BUILDING	+101.50
KERB BOTTOM	+101.50
WALL	+101.50
PATH/CHANGE SURFACE	+101.50
OHEAD ELECTRICITY	+101.50
OHEAD TELECOM	+101.50

STREET FURNITURE :

BOLLARDS	RD+
BORE HOLE	BH+
BUS STOP	BS+
CRASH BARRIER	CB
ELECTRICITY POLE	EP+
EARTHING ROD	ER+
GATE	LT+
GROUND LIGHT	BOL
ILLUMINATED BOLLARD	LP
LAMP POST	
MARKER POST	MKR
POST	POST
POST BOX	POST BOX+
ROADSIGN	RS
SIGN POST	SIGN
TELEPHONE BOX	TB
TELEPHONE POLE	TP
TRAFFIC LIGHT	TL
TRIAL PIT	TPIT+

SERVICES :

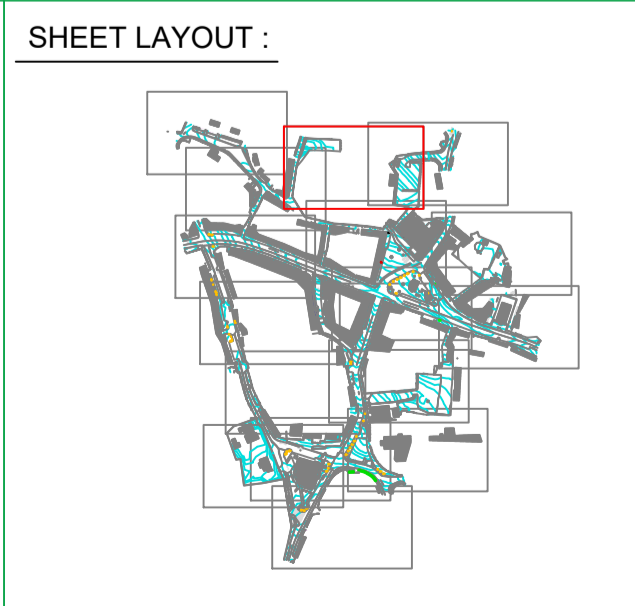
AIR VALVE	AV+
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH+
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT
WATER METER	WM
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+BED101.50
EAVE LEVEL	+E101.50
FLOOR LEVEL	+FL101.50
INVERT LEVEL	+IL101.50
ROAD LEVEL	+R101.50
RIDGE LEVEL	+R101.50
SOFFIT LEVEL	+SL101.50
SPOT LEVEL	+101.50
TOP OF FENCE LEVEL	+TOP101.50
TOP OF WALL LEVEL	+TOW101.50
WINDOW	+101.50
SURVEY CONTROL STATION	+101.50



PLAN PRODUCED BY:

CONTACT INFORMATION:

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info@apexsurveys.ie
00353 1 691 0156

CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
DATUM: Main Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
002	09/07/21	Additional information added
003	01/09/21	Additional information added
004	16/09/21	Additional information added
005	30/09/21	Additional information added

PROJECT:

**Market Square Renewal
Kildare Town**

SCALE : 1/200 A1

DATE : 09/07/2021

DRG No: 4612

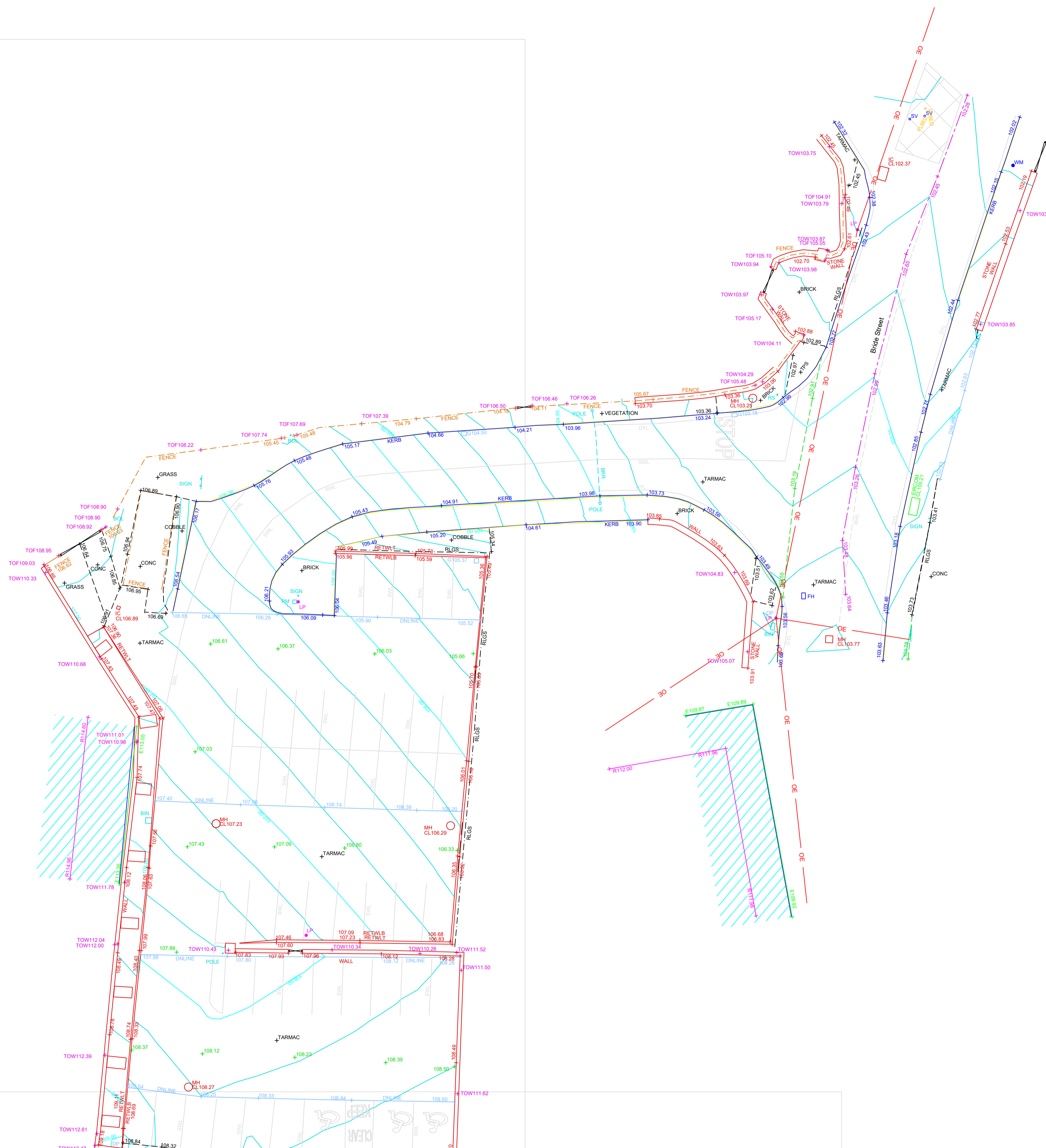
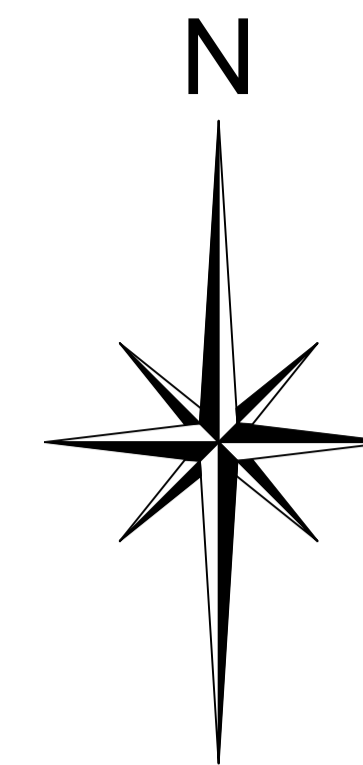
SHEET: 8 of 15

DESCRIPTION : 2D Topographical

SURVEYED BY : L.H. & C.M.

PROCESSED BY : Cristina Butur

CHECKED BY : Alan Brady



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RURAL/NATURAL FEATURES :

- BUSH
- SAPLING
- TREE
- HEDGE
- TROUGH
- CATTLE GRID
- LINEWORK:
- EMBANKMENT TOP +101.50
- DRAIN +101.50
- BREAKLINE +101.50
- BUILDING +101.50
- KERB BOTTOM +101.50
- WALL +101.50
- PATH/CHANGE SURFACE +101.50
- OHEAD ELECTRICITY +101.50
- OHEAD TELECOM +101.50

STREET FURNITURE :

- BOLLARDS
- BORE HOLE
- BUS STOP
- CRASH BARRIER
- ELECTRICITY POLE
- EARTHING ROD
- GATE
- GROUND LIGHT
- ILLUMINATED BOLLARD
- LAMP POST
- MARKER POST
- POST
- POST BOX
- ROADSIGN
- SIGN POST
- TELEPHONE BOX
- TELEPHONE POLE
- TRAFFIC LIGHT
- TRIAL PIT

SERVICES :

- AIR VALVE
- ARMSTRONG JUNCTION
- CABLE TV IC
- COVER LEVEL
- EIRCOM COVER
- EIRCOM JUNCTION BOX
- ELECTRICAL CABLE PIT
- ESAT COVER
- ESB COVER
- ESB JUNCTION BOX
- FIRE HYDRANT
- GAS VALVE
- GULLY
- INSPECTION COVER
- MANHOLE
- SEPTIC TANK
- SLUICE VALVE
- STOPCOCK

SERVICES :

- AV+
- AJ
- CL
- CATV
- EIRCOM
- EIRCOM BOX
- ESAT
- ESB
- ESB BOX
- FH+
- GV
- G
- IC
- MH
- SEPTIC
- SV
- ST

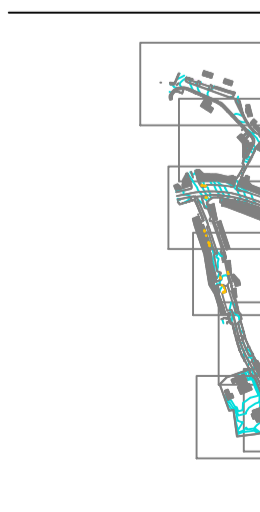
SERVICES :

- SERVICE BOX (UNKNOWN)
- TRAFFIC COVER
- VENT
- WATER METER
- UNABLE TO LIFT

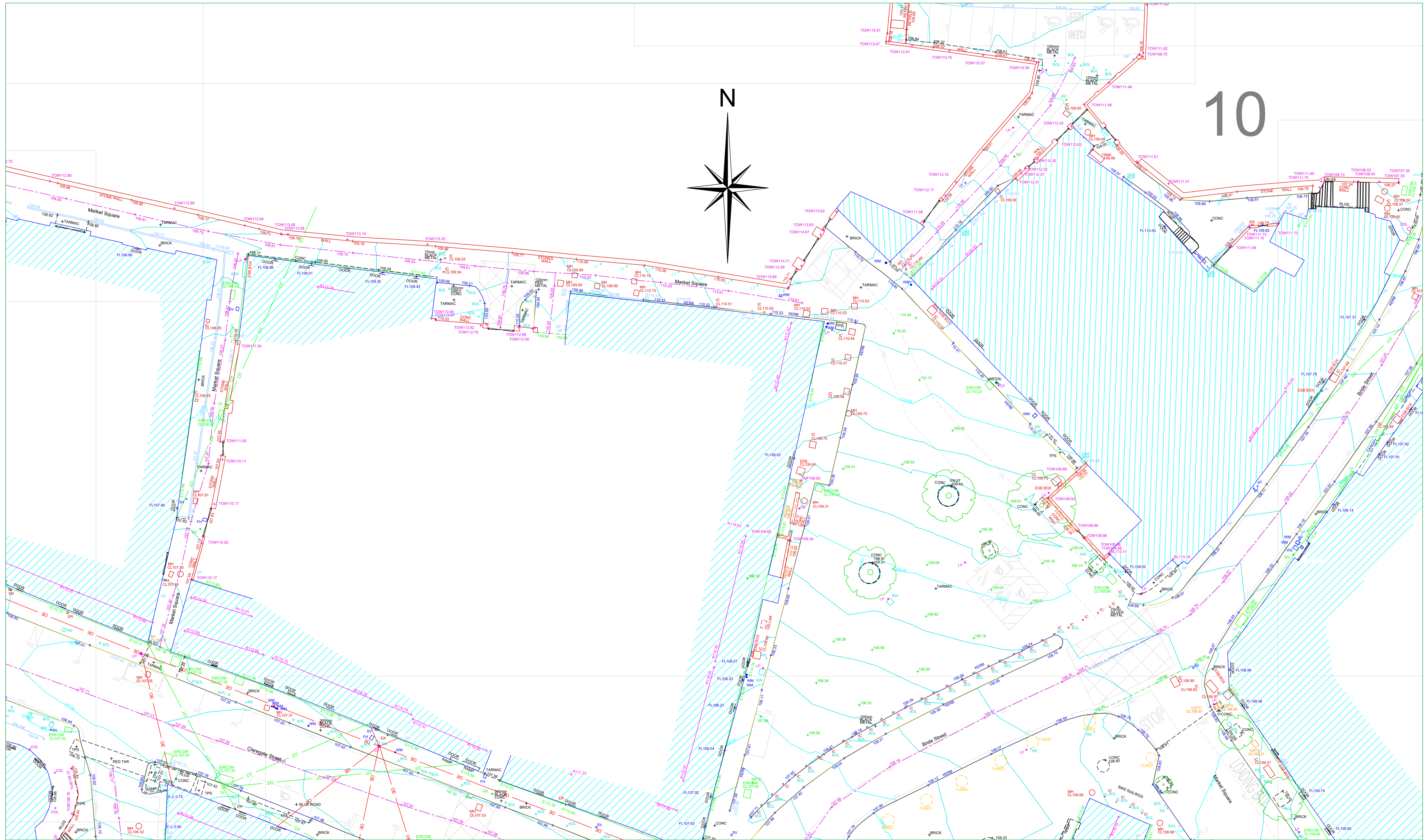
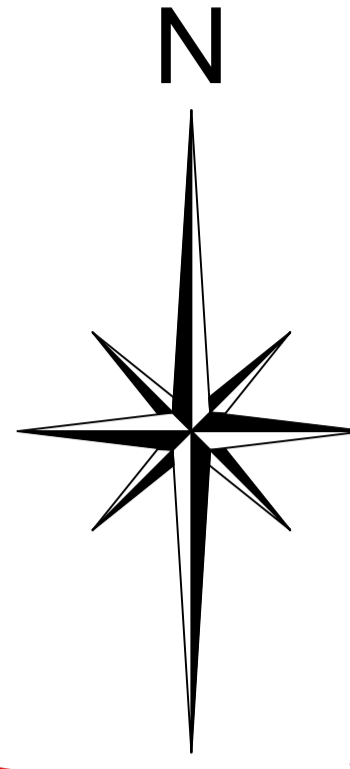
LEVELS :

- BED LEVEL +BED101.50
- EAVE LEVEL +E101.50
- FLOOR LEVEL +FL101.50
- INVERT LEVEL +IL101.50
- ROAD LEVEL +R101.50
- RIDGE LEVEL +R101.50
- SOFFIT LEVEL +SL101.50
- SPOT LEVEL +101.50
- TOP OF FENCE LEVEL +TOP101.50
- TOP OF WALL LEVEL +TOW101.50
- SURVEY CONTROL STATION +101.50

SHEET LAYOUT :



<p>PLAN PRODUCED BY:</p> <p>APEX SURVEYS</p> <p>CONTACT INFORMATION:</p> <p>Apex Surveys Unit 78 Dunboyne Business Park Dunboyne, Co. Meath, Ireland www.apexsurveys.ie info@apexsurveys.ie 00353 1 691 0156</p>	<p>CLIENT:</p> <p>Aecom</p>	<p>PROJECT:</p> <p>Market Square Renewal Kildare Town</p>															
	<p>GRID SYSTEM: Irish Transverse Mercator</p> <p>DATUM: Main Head (OSGM15)</p> <p>NOTES: Drawing Contains Scale Factor</p>	<p>SCALE : 1/200 A1</p> <p>DATE : 09/07/2021</p>															
<p>REVISIONS:</p> <table border="1"> <thead> <tr> <th>No.</th> <th>Date</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>002</td> <td>09/07/21</td> <td>Additional information added</td> </tr> <tr> <td>003</td> <td>01/09/21</td> <td>Additional information added</td> </tr> <tr> <td>004</td> <td>16/09/21</td> <td>Additional information added</td> </tr> <tr> <td>005</td> <td>30/09/21</td> <td>Additional information added</td> </tr> </tbody> </table>	No.	Date	Description	002	09/07/21	Additional information added	003	01/09/21	Additional information added	004	16/09/21	Additional information added	005	30/09/21	Additional information added	<p>DRG No: 4612</p> <p>SHEET: 9 of 15</p>	<p>DESCRIPTION : 2D Topographical</p> <p>SURVEYED BY : L.H. & C.M.</p> <p>PROCESSED BY : Cristina Butur</p> <p>CHECKED BY : Alan Brady</p>
No.	Date	Description															
002	09/07/21	Additional information added															
003	01/09/21	Additional information added															
004	16/09/21	Additional information added															
005	30/09/21	Additional information added															



RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
LINEWORK:	
EMBANKMENT TOP	
DRAIN	
BREAKLINE	
BUILDING	
KERB BOTTOM	
WALL	
PATHCHANGE SURFACE	
OHEAD ELECTRICITY	
OHEAD TELECOM	

STREET FURNITURE :

BOLLARDS	
BORE HOLE	
BUS STOP	
CRASH BARRIER	
ELECTRICITY POLE	
EARTHING ROD	
GATE	
GROUND LIGHT	
ILLUMINATED BOLLARD	
LAMP POST	
MARKER POST	
POST	
POST BOX	
ROADSIGN	
SIGN POST	
TELEPHONE BOX	
TRAFFIC POLE	
TRIAL PIT	

SERVICES :

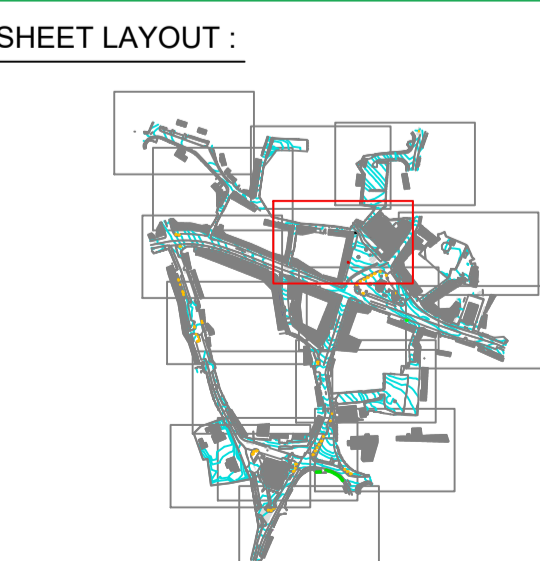
AIR VALVE	
ARMSTRONG JUNCTION	
CABLE TV IC	
COVER LEVEL	
EIRCOM COVER	
EIRCOM JUNCTION BOX	
ELECTRICAL CABLE PIT	
ESAT COVER	
ESB COVER	
ESB JUNCTION BOX	
FIRE HYDRANT	
GAS VALVE	
GULLY	
INSPECTION COVER	
MANHOLE	
SEPTIC TANK	
SLUICE VALVE	
STOPCOCK	

SERVICES :

SERVICE BOX (UNKNOWN)	
TRAFFIC COVER	
VENT	
WATER METER	
UNABLE TO LIFT	

LEVELS :

BED LEVEL	
EAVE LEVEL	
FLOOR LEVEL	
INVERT LEVEL	
ROAD LEVEL	
RIDGE LEVEL	
SOFFIT LEVEL	
SPOT LEVEL	
TOP OF FENCE LEVEL	
TOP OF WALL LEVEL	
WINDOW	
SURVEY CONTROL STATION	



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CLIENT:

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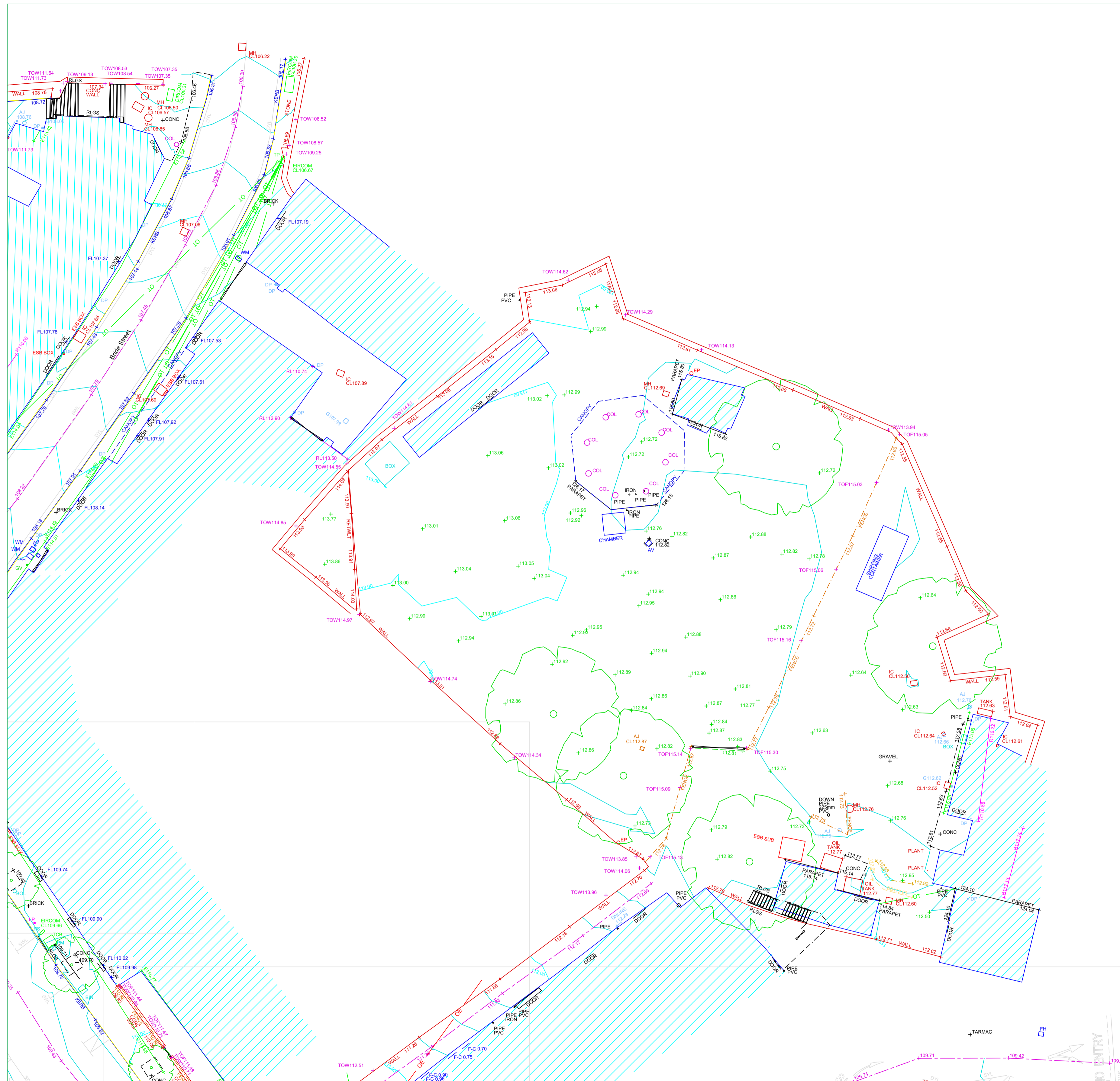
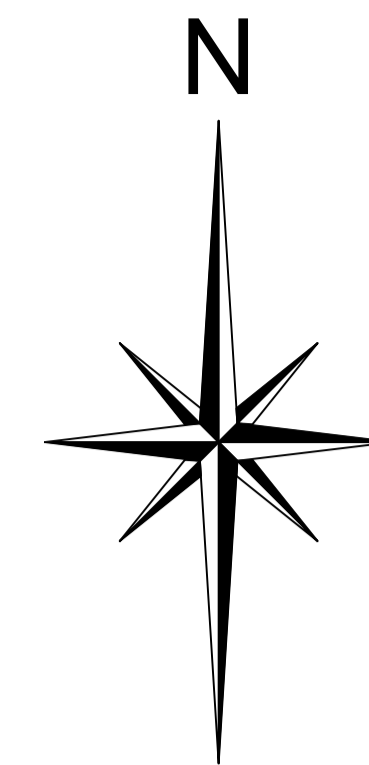
GRID SYSTEM: Irish Transverse Mercator
DATUM: Main Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:		
No.	Date	Description
003	01/09/21	Additional information added
004	16/09/21	Additional information added
005	30/09/21	Additional information added

PROJECT:

Market Square Renewal Kildare Town

SCALE :	1/200 A1	DATE :	09/07/2021
DRG No:	4612	SURVEYED BY :	L.H. & C.M.
SHEET:	10 of 15	PROCESSED BY :	Cristina Butur
		CHECKED BY :	Alan Brady



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RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
GRID	

LINEWORK:

EMBANKMENT TOP	+101.50
DRAIN	+101.50
BREAKLINE	+101.50
BUILDING	+101.50
KERB BOTTOM	+101.50
WALL	+101.50
PATH/CHANGE SURFACE	+101.50
OHEAD ELECTRICITY	+101.50
OHEAD TELECOM	+101.50

STREET FURNITURE :

BOLLARDS	BD+
BORE HOLE	BH+
BUS STOP	BS+
CRASH BARRIER	CB
ELECTRICITY POLE	EP+
EARTHING ROD	ER+
GATE	LT+
GROUND LIGHT	BOL
ILLUMINATED BOLLARD	LP+
LAMP POST	MKR
MARKER POST	POST+
POST BOX	POST BOX+
ROADSIGN	RS
SIGN POST	RS
TELEPHONE BOX	TB
TELEPHONE POLE	TP+
TRAFFIC LIGHT	TL+
TRIAL PIT	TPIT+

SERVICES :

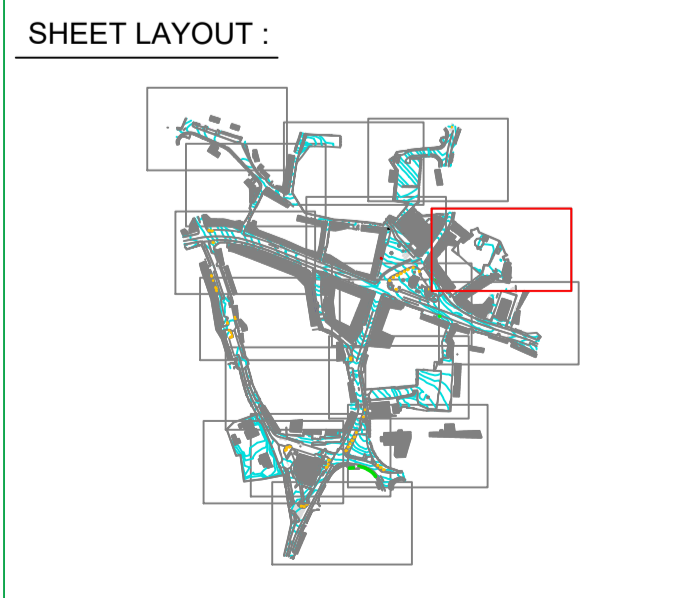
AIR VALVE	AV+
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH+
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	ST
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT+
WATER METER	WM
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+BED101.50
EAVE LEVEL	+E101.50
FLOOR LEVEL	+FL101.50
INVERT LEVEL	+IL101.50
ROAD LEVEL	+101.50
RIDGE LEVEL	+R101.50
SOFFIT LEVEL	+SL101.50
SPOT LEVEL	+101.50
TOP OF FENCE LEVEL	+TOP101.50
TOP OF WALL LEVEL	+TOW101.50
SURVEY CONTROL STATION	+101.50



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CLIENT:

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GRID SYSTEM: Irish Transverse Mercator
DATUM: Main Head (OSGM15)
NOTES: Drawing Contains Scale Factor

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004	16/09/21	Additional information added
005	30/09/21	Additional information added

PROJECT:

**Market Square Renewal
Kildare Town**

SCALE : 1/200 A1

DATE : 09/07/2021

DRG No: 4612

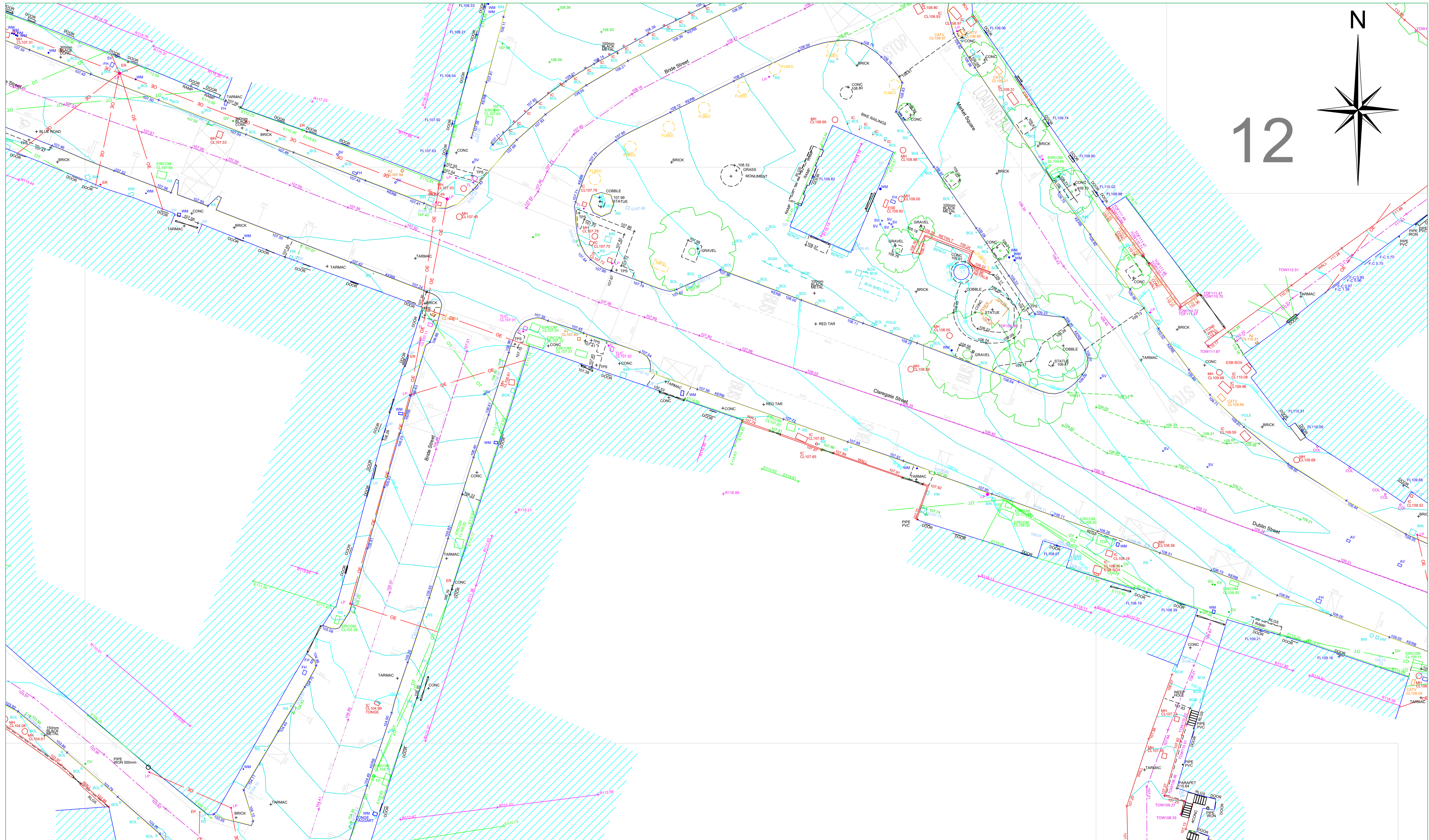
SHEET: 11 of 15

DESCRIPTION : 2D Topographical

SURVEYED BY : L.H. & C.M.

PROCESSED BY : Cristina Butur

CHECKED BY : Alan Brady



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RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
GRID	

LINEWORK:

EMBANKMENT TOP	+101.50
DRAIN	+101.50
BREAKLINE	+101.50
BUILDING	+101.50
KERB BOTTOM	+101.50
WALL	+101.50
PATH/CHANGE SURFACE	+101.50
OHEAD ELECTRICITY	+101.50
OHEAD TELECOM	+101.50

STREET FURNITURE :

BOLLARDS	BD+
BORE HOLE	BH+
BUS STOP	BS+
CRASH BARRIER	CB
ELECTRICITY POLE	EP+
EARTHING ROD	ER+
GATE	LT+
GROUND LIGHT	GL+
ILLUMINATED BOLLARD	LB+
LAMP POST	LP+
MARKER POST	MKR
POST	POST+
POST BOX	POST BOX+
ROADSIGN	RS+ RS-
SIGN POST	SP+
TELEPHONE BOX	TB
TELEPHONE POLE	TP+
TRAFFIC LIGHT	TL+
TRIAL PIT	TPIT+

SERVICES :

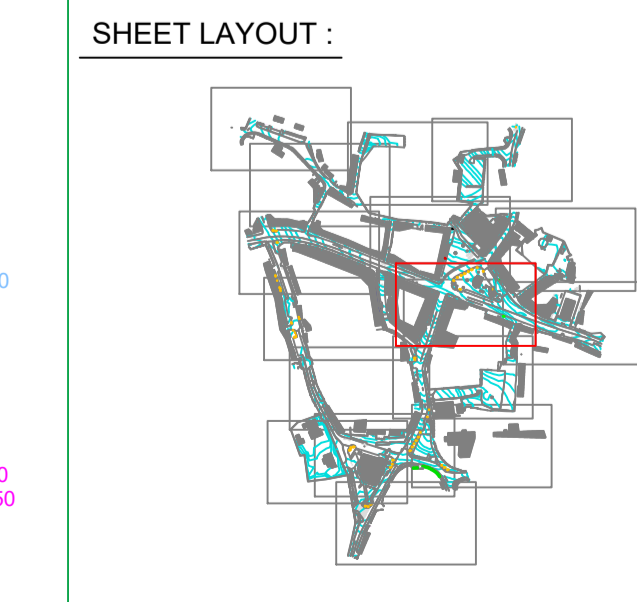
AIR VALVE	AV+
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH+
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLC
VENT	VENT
WATER METER	WM+
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+BED101.50
EAVE LEVEL	+E101.50
FLOOR LEVEL	+FL101.50
INVERT LEVEL	+IL101.50
ROAD LEVEL	+R101.50
RIDGE LEVEL	+R101.50
SOFFIT LEVEL	+SL101.50
SPOT LEVEL	+S101.50
TOP OF FENCE LEVEL	+TOP101.50
TOP OF WALL LEVEL	+TOW101.50
SURVEY CONTROL STATION	+SCS101.50



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CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
 DATUM: Main Head (OSGM15)
 NOTES: Drawing Contains Scale Factor

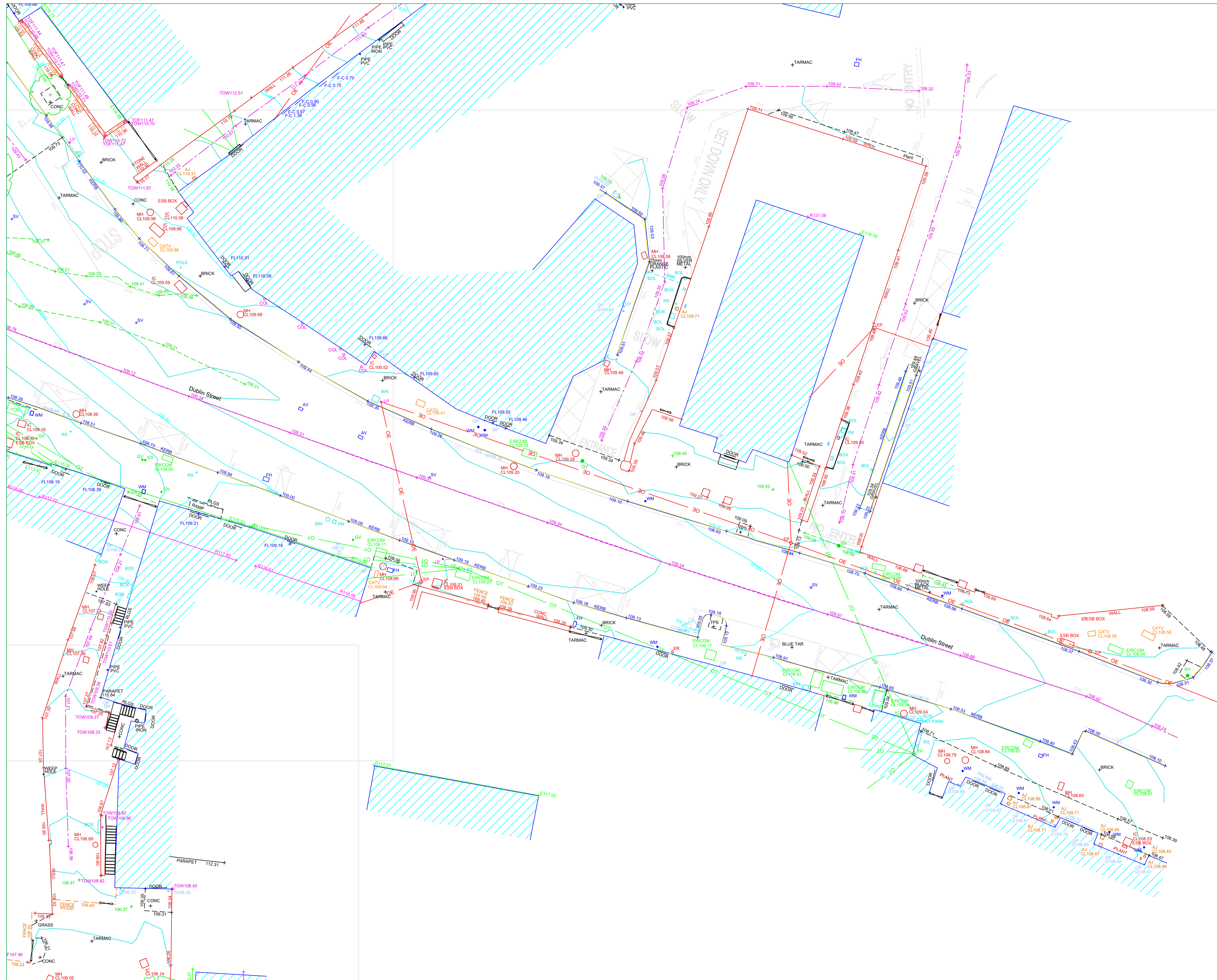
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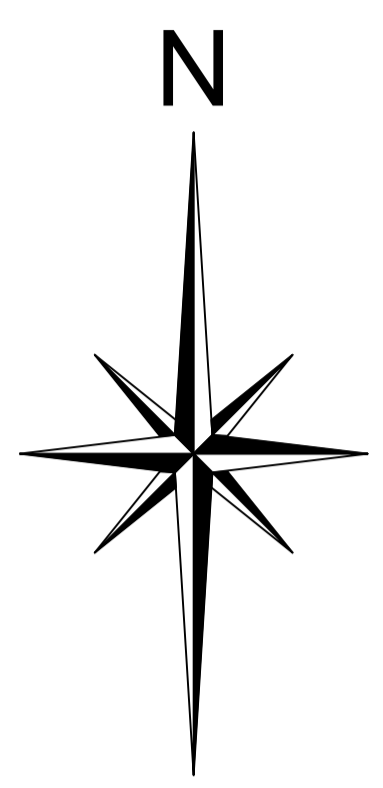
PROJECT:

**Market Square Renewal
 Kildare Town**

SCALE :	1/200 A1	DATE :	09/07/2021
DRG No:	4612	DESCRIPTION :	2D Topographical
SHEET:	12 of 15	SURVEYED BY :	L.H. & C.M.
		PROCESSED BY :	Cristina Butur
		CHECKED BY :	Alan Brady



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RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
LINEWORK:	
EMBANKMENT TOP	+101.50
DRAIN	+101.50
BREAKLINE	+101.50
BUILDING	+101.50
KERB BOTTOM	+101.50
WALL	+101.50
PATHCHANGE SURFACE	+101.50
OHEAD ELECTRICITY	+101.50
OHEAD TELECOM	+101.50

STREET FURNITURE :

BOLLARDS	BD+
BORE HOLE	BH+
BUS STOP	BS+
CRASH BARRIER	CB
ELECTRICITY POLE	EP+
EARTHING ROD	ER+
GATE	LT+
GROUND LIGHT	BOL
ILLUMINATED BOLLARD	IP
LAMP POST	MKR
MARKER POST	POST+
POST BOX	POST BOX+
ROADSIGN	RS
SIGN POST	RS
TELEPHONE BOX	TB
TELEPHONE POLE	TP
TRIAL PIT	TL+
	TPIT+

SERVICES :

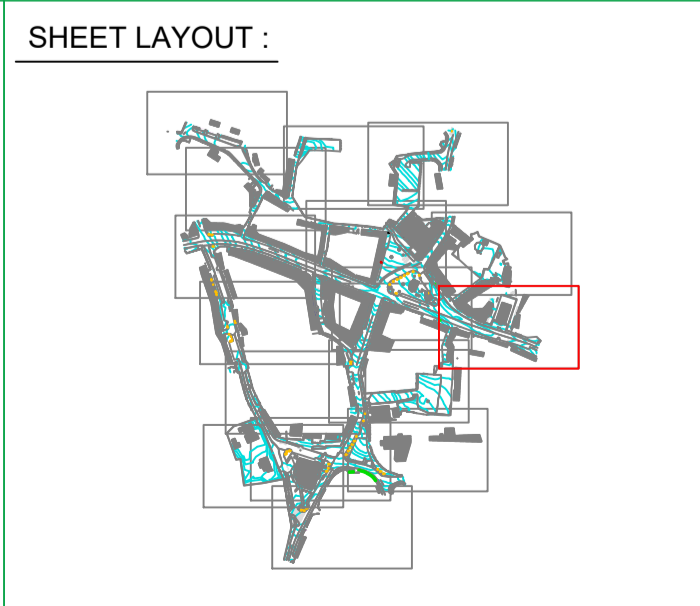
AIR VALVE	AV+
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH+
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT+
WATER METER	WM+
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+BED101.50
EAVE LEVEL	+E101.50
FLOOR LEVEL	+FL101.50
INVERT LEVEL	+IL101.50
ROAD LEVEL	+R101.50
RIDGE LEVEL	+R101.50
SOFFIT LEVEL	+SL101.50
SPOT LEVEL	+101.50
TOP OF FENCE LEVEL	+TOP101.50
TOP OF WALL LEVEL	+TOW101.50
WINDOW	+101.50
SURVEY CONTROL STATION	+



PLAN PRODUCED BY:

CONTACT INFORMATION:

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info@apexsurveys.ie
00353 1 691 0156

CLIENT:

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GRID SYSTEM: Irish Transverse Mercator
DATUM: Main Head (OSGM15)
NOTES: Drawing Contains Scale Factor

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PROJECT:

Market Square Renewal
Kildare Town

SCALE : 1/200 A1

DATE : 09/07/2021

DRG No: 4612

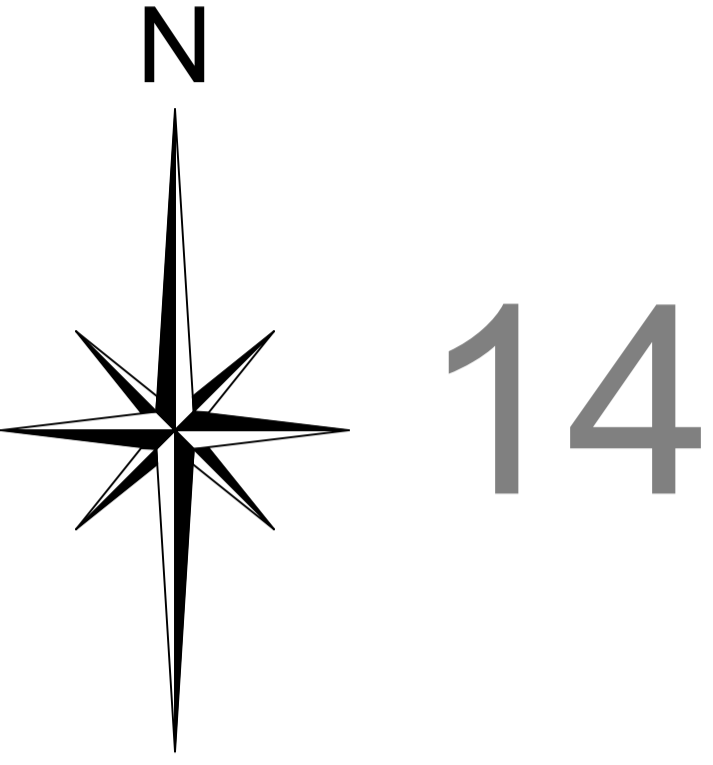
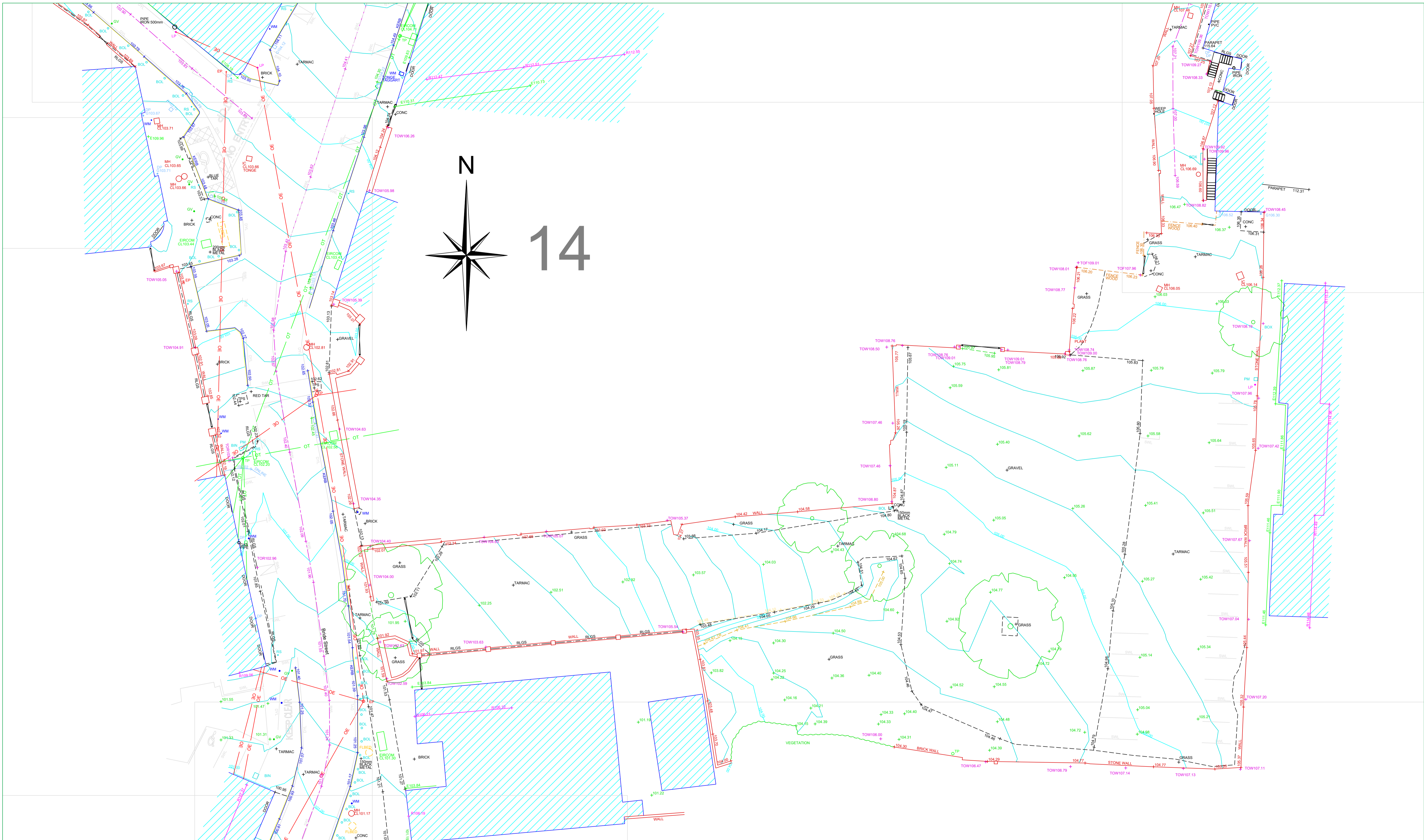
SHEET: 13 of 15

DESCRIPTION : 2D Topographical

SURVEYED BY : L.H. & C.M.

PROCESSED BY : Cristina Butur

CHECKED BY : Alan Brady



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RURAL/NATURAL FEATURES :

- BUSH
- SAPLING
- TREE
- HEDGE
- TROUGH
- CATTLE GRID
- LINEWORK:
- EMBANKMENT TOP
- DRAIN
- BREAKLINE
- BUILDING
- KERB BOTTOM
- WALL
- PATHCHANGE SURFACE
- OHEAD ELECTRICITY
- OHEAD TELECOM

STREET FURNITURE :

- BOLLARDS
- BORE HOLE
- BUS STOP
- CRASH BARRIER
- ELECTRICITY POLE
- EARTHING ROD
- GATE
- GROUND LIGHT
- ILLUMINATED BOLLARD
- LAMP POST
- MARKER POST
- POST
- POST BOX
- ROADSIGN
- SIGN POST
- TELEPHONE BOX
- TELEPHONE POLE
- TRAFFIC LIGHT
- TRIAL PIT

SERVICES :

- AIR VALVE
- ARMSTRONG JUNCTION
- CABLE TV IC
- COVER LEVEL
- EIRCOM COVER
- EIRCOM JUNCTION BOX
- ELECTRICAL CABLE PIT
- ESAT COVER
- ESB COVER
- ESB JUNCTION BOX
- FIRE HYDRANT
- GAS VALVE
- GULLY
- INSPECTION COVER
- MANHOLE
- SEPTIC TANK
- SLUICE VALVE
- STOPCOCK

SERVICES :

- AV+
- AJ
- CL
- CATV
- CL
- EIRCOM BOX
- EIRCOM BOX
- ECP
- ESAT
- ESB
- ESB BOX
- FH+
- GV
- G
- IC
- IC
- MH
- SEPTIC
- SV
- ST

SERVICES :

- SERVICE BOX (UNKNOWN)
- TRAFFIC COVER
- VENT
- WATER METER
- UNABLE TO LIFT

LEVELS :

- BED LEVEL
- EAVE LEVEL
- FLOOR LEVEL
- INVERT LEVEL
- ROAD LEVEL
- RIDGE LEVEL
- SOFFIT LEVEL
- SPOT LEVEL
- TOP OF FENCE LEVEL
- TOP OF WALL LEVEL
- WINDOW
- SURVEY CONTROL STATION

SHEET LAYOUT :



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PROJECT:

Market Square Renewal Kildare Town

SCALE : 1/200 A1

DATE : 09/07/2021

DRG No: 4612

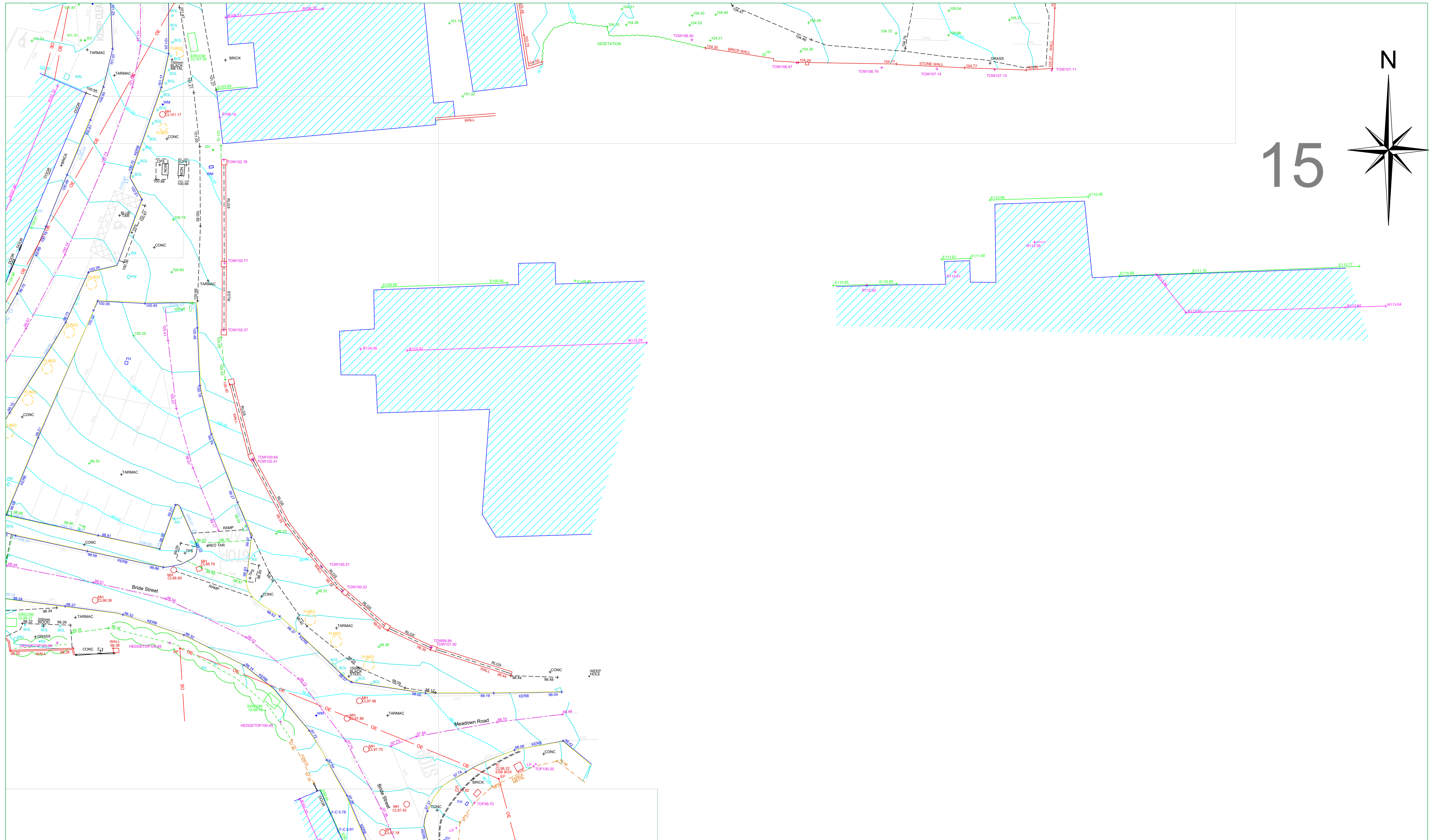
SHEET: 14 of 15

DESCRIPTION : 2D Topographical

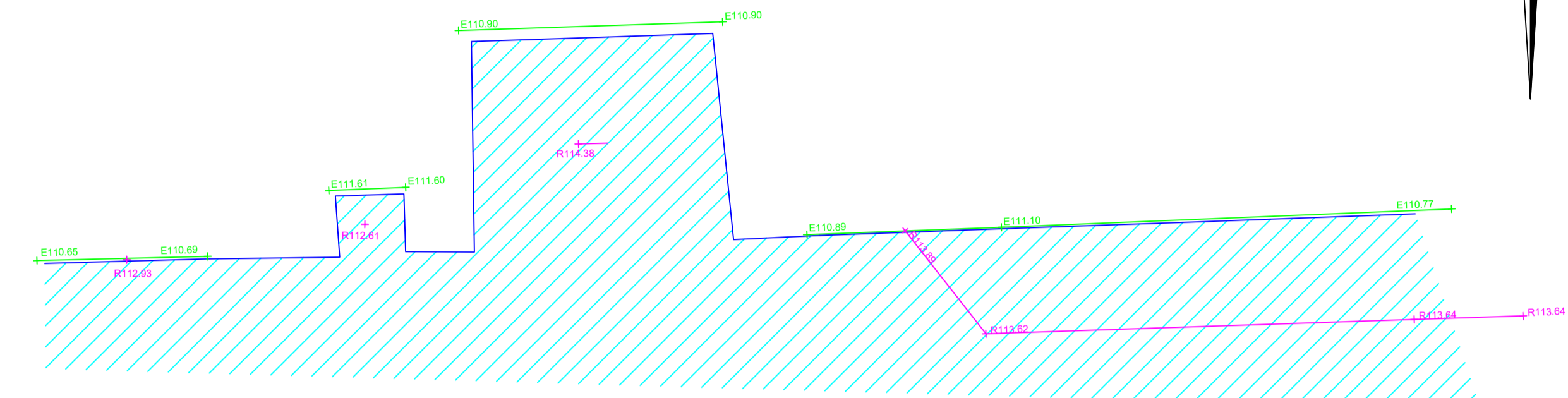
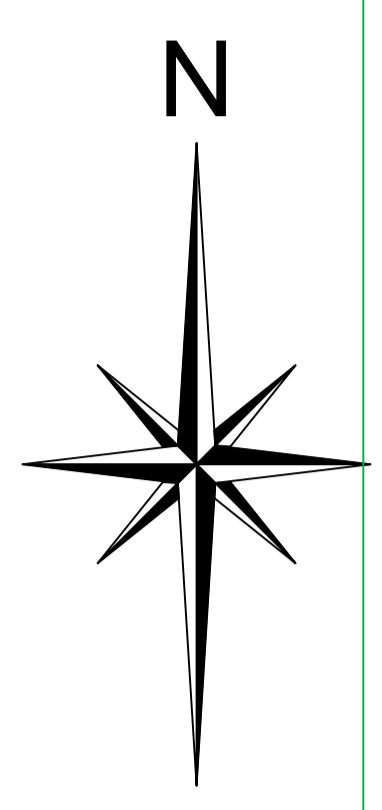
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PROCESSED BY : Cristina Butur

CHECKED BY : Alan Brady



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RURAL/NATURAL FEATURES :

BUSH	
SAPLING	
TREE	
HEDGE	
TROUGH	
CATTLE GRID	
GRID	

LINEWORK:

EMBANKMENT TOP	+101.50
DRAIN	+101.50
BREAKLINE	+101.50
BUILDING	+101.50
KERB BOTTOM	+101.50
WALL	+101.50
PATH/CHANGE SURFACE	+101.50
OHEAD ELECTRICITY	+101.50
OHEAD TELECOM	+101.50

STREET FURNITURE :

BOLLARDS	BD+
BORE HOLE	BH+
BUS STOP	BS+
CRASH BARRIER	CB
ELECTRICITY POLE	EP+
EARTHING ROD	ER+
GATE	LT+
GROUND LIGHT	BOL
ILLUMINATED BOLLARD	LP
LAMP POST	MKR
MARKER POST	POST
POST	POST BOX+
POST BOX	RS
ROADSIGN	RS
SIGN POST	SI
TELEPHONE BOX	TB
TELEPHONE POLE	TP
TRAFFIC LIGHT	TL
TRIAL PIT	TPIT+

SERVICES :

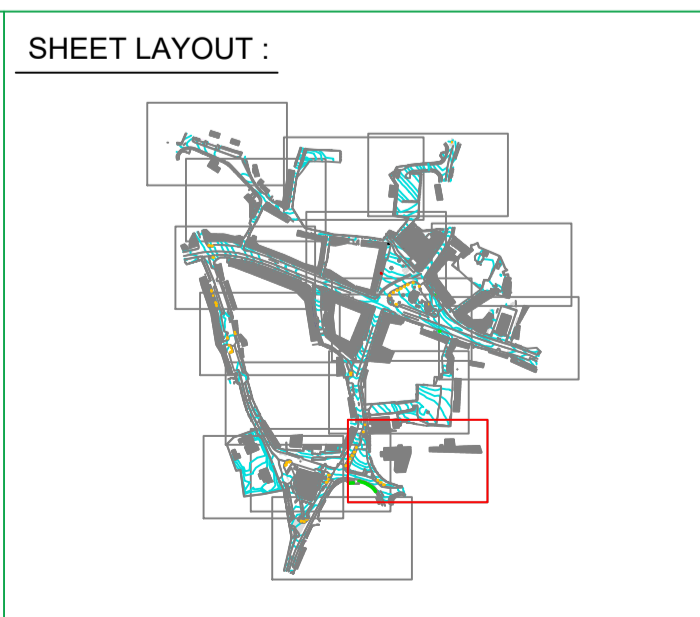
AIR VALVE	AV+
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
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ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH+
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	ST
SLUICE VALVE	SV
STOPCOCK	ST

SERVICES :

SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT
WATER METER	WM+
UNABLE TO LIFT	UTO

LEVELS :

BED LEVEL	+BED101.50
EAVE LEVEL	+E101.50
FLOOR LEVEL	+FL101.50
ROAD LEVEL	+R101.50
RIDGE LEVEL	+R101.50
SOFFIT LEVEL	+SL101.50
SPOT LEVEL	+101.50
TOP OF FENCE LEVEL	+TOP101.50
TOP OF WALL LEVEL	+TOW101.50
WINDOW	+101.50
SURVEY CONTROL STATION	+



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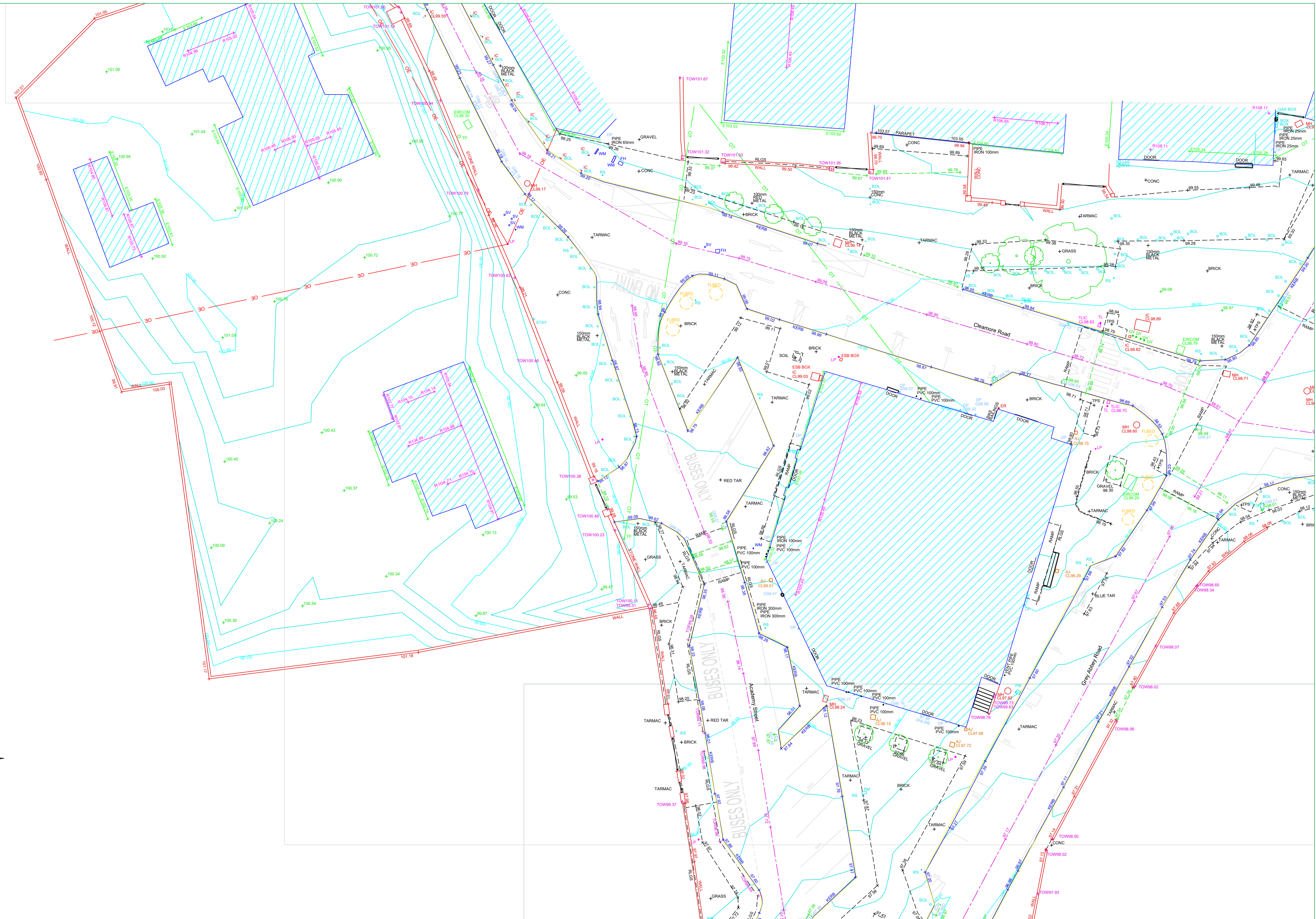
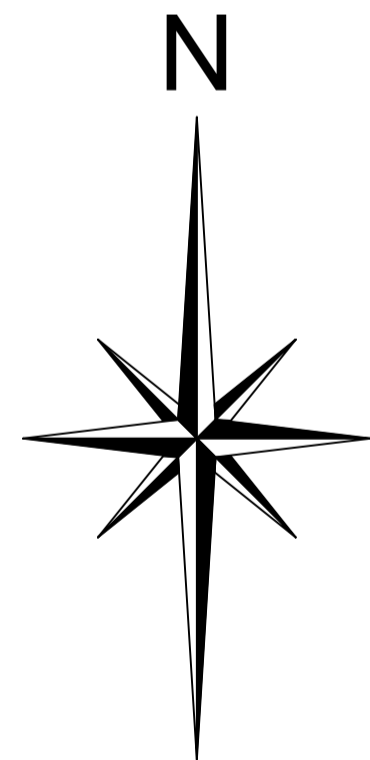
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PROJECT:

Market Square Renewal
Kildare Town

SCALE :	1/200 A1	DATE :	09/07/2021
DRG No:	4612	DESCRIPTION :	2D Topographical
SHEET:	15 of 15	SURVEYED BY :	L.H. & C.M.
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		CHECKED BY :	Alan Brady

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APEX SURVEYS

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RURAL/NATURAL FEATURES :

- BUSH
- SAPLING
- TREE
- HEDGE
- TROUGH
- CATTLE GRID
- LINEWORK:
- EMBANKMENT TOP
- DRAIN
- BREAKLINE
- BUILDING
- KERB BOTTOM
- WALL
- PATH/CHANGE SURFACE
- OHEAD ELECTRICITY
- OHEAD TELECOM

STREET FURNITURE :

- BOLLARDS
- BORE HOLE
- BUS STOP
- CRASH BARRIER
- ELECTRICITY POLE
- EARTHING ROD
- GATE
- GROUND LIGHT
- ILLUMINATED BOLLARD
- LAMP POST
- MARKER POST
- POST
- POST BOX
- ROADSIGN
- SIGN POST
- TELEPHONE BOX
- TELEPHONE POLE
- TRIAL PIT

SERVICES :

- AIR VALVE
- ARMSTRONG JUNCTION
- CABLE TV IC
- COVER LEVEL
- EIRCOM COVER
- EIRCOM JUNCTION BOX
- ELECTRICAL CABLE PIT
- ESAT COVER
- ESB COVER
- ESB JUNCTION BOX
- FIRE HYDRANT
- GAS VALVE
- GULLY
- INSPECTION COVER
- MANHOLE
- SEPTIC TANK
- SLUICE VALVE
- STOPCOCK

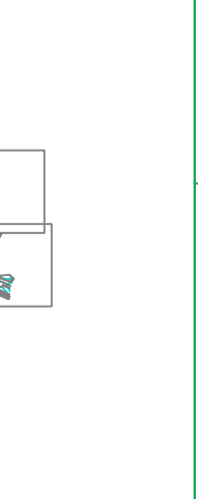
SERVICES :

- AV+ (AIR VALVE)
- AJ (ARMSTRONG JUNCTION)
- CATV (CABLE TV IC)
- CL (COVER LEVEL)
- EIRCOM BOX (EIRCOM COVER)
- EIRCOM BOX (EIRCOM JUNCTION BOX)
- ECP (ELECTRICAL CABLE PIT)
- ESAT (ESAT COVER)
- ESB (ESB COVER)
- ESB BOX (ESB JUNCTION BOX)
- FH (FIRE HYDRANT)
- GV (GAS VALVE)
- G (GULLY)
- IC (INSPECTION COVER)
- MH (MANHOLE)
- SEPTIC (SEPTIC TANK)
- SV (SLUICE VALVE)
- ST (STOPCOCK)

SERVICES :

- SERVICE BOX (UNKNOWN)
- TRAFFIC COVER
- VENT
- WATER METER
- UNABLE TO LIFT
- LEVELS :
- BED LEVEL
- EAVE LEVEL
- FLOOR LEVEL
- INVERT LEVEL
- ROAD LEVEL
- RIDGE LEVEL
- SOFFIT LEVEL
- SPOT LEVEL
- TOP OF FENCE LEVEL
- TOP OF WALL LEVEL
- WINDOW
- SURVEY CONTROL STATION

SHEET LAYOUT :



PLAN PRODUCED BY:

APEX SURVEYS

CONTACT INFORMATION:

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Dunboyne, Co. Meath, Ireland
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info@apexsurveys.ie
00353 1 691 0156

CLIENT:

Aecom

PROJECT:

Market Square Renewal
Kildare Town

SCALE : 1/200 A1

DATE : 09/07/2021

DRG No: 4612

DESCRIPTION : 2D Topographical

SHEET: 16 of 15

SURVEYED BY : L.H. & C.M.

PROCESSED BY : Cristina Butur

CHECKED BY : Alan Brady

REVISIONS:

No.	Date	Description
002	09/07/21	Additional information added
003	01/09/21	Additional information added
004	16/09/21	Additional information added
005	30/09/21	Additional information added

GRID SYSTEM:

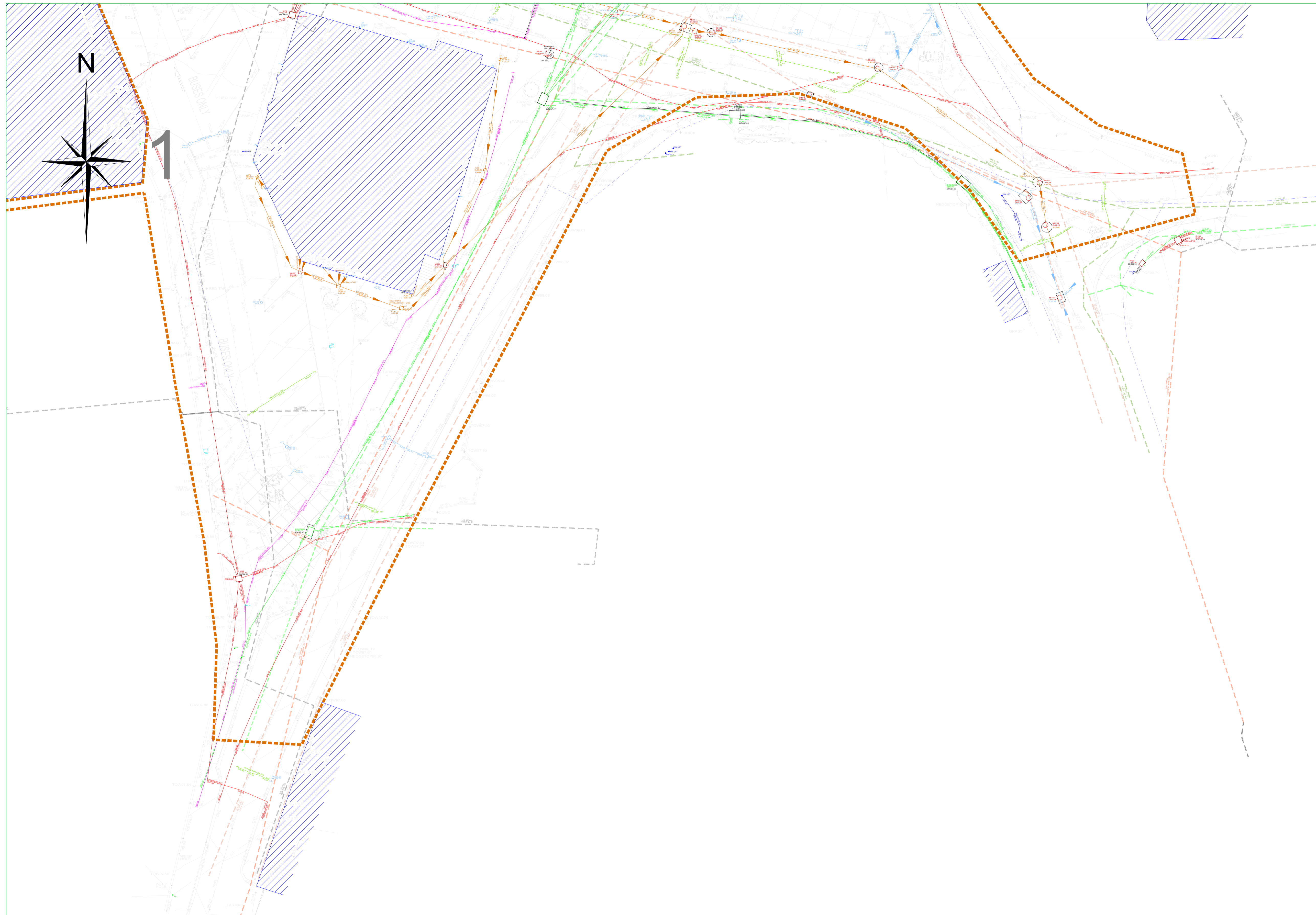
Irish Transverse Mercator

Main Head (OSGM15)

Drawing Contains Scale Factor

NOTES:

Appendix B – GPR Survey



PAS 128: 2014 (Quality of Survey Level Outputs):

DESKTOP UTILITY RECORDS SEARCH QL-D Drafted from utility records
SITE RECONNAISSANCE QL-C Location Demonstrated by visual reference to street furniture or evidence of previous streetworks, ie - reinstatement scars
DETECTION
QL-B4 A segment of utility suspected to exist but has not been detected by a geophysical technique
QL-B3 Horizontal location only of the utility detected by one of the geophysical techniques used
QL-B2 Horizontal and vertical location of the utility detected by one of the geophysical techniques used
QL-B1 Horizontal and vertical location of the utility detected by multiple geophysical techniques
VERIFICATION
QL-A Horizontal and vertical location of the top and/or bottom of the utility

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- The following is a non-exhaustive list of the limitations of utility surveys:
- The Survey aims to map existing utilities subsurface utilities and provide information with respect to pipe size, material type and drainage connectivity. However utility surveying is limited by the following guidelines and it may not be possible to accurately survey, define and locate all services and sub-surface features.
 - Depth of Utility: The depth and size of a utility affect the signal response and the degree with which a utility can be located. Due to attenuation of the radar signal with depth, resolution is restricted, hence making identification of utilities more difficult with increasing depth.
 - Size of Utility: The smaller the diameter of a utility the more difficult it is to locate. This difficulty increases with depth.
 - Ground Conditions: The depth penetration and quality of the data depends on the ground conditions of the site. GPR Surveying works best within high resistivity material. Clay overburden can impair GPR Surveying. Poor data may be a result of areas with high conductivity.
 - Utility Congestion: Where different utilities converge together into a service corridor or cross paths it becomes difficult to isolate a specific utility and to map its route. The reflected signal will display a single response to multiple utilities. Therefore multiple utilities may appear to be a single utility. Where similar services run on close proximity, separation may be impossible.
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 - Acute bends in pipework: It may not be possible to trace a pipe past an acute bend.
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 - Locational accuracy is determined by referring to the manufacturers guidelines for the detector used.
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 - Plan accuracies of + or - 150mm may be achieved but this figure will depend on the depth of service below ground level. However variations within the subsurface, depth below the ground, close proximity of other services and local magnetic, atmospheric or ground conditions, bends, lateral service connections and any of the other limitations listed in this disclaimer may alter this estimated accuracy.
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www.apexsurveys.ie
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00353 1 691 0156

STREET FURNITURE :

BOLLARDS	BD +
BUS STOP	BS +
CRASH BARRIER	CB
GATE	GP +
ELECTRICITY POLE	EP +
TELEPHONE POLE	TP +
EARTHING ROD	ER +
LAMP POST	LP +
MARKER POST	MKR +
SIGN POST	SIGN
TRAFFIC LIGHT	TL +
TELEPHONE BOX	TB
POST	POST
POST BOX	POST BOX
RS / RB	RS / RB
BH +	BH +
BORE HOLE	BORE HOLE
TRIAL PIT	TRIP +
BOTTOM OF CHAMBER	BOC
CAST-IRON	CI
CONCRETE	CONC
DIAMETER	DIA

SERVICES :

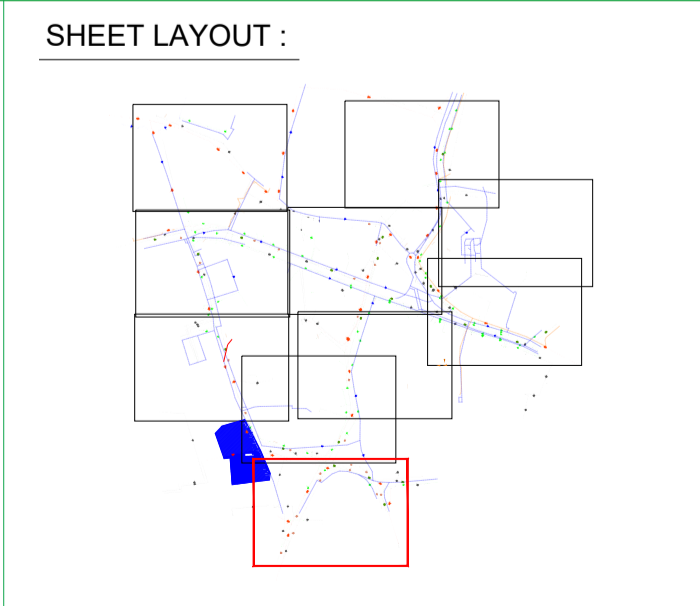
AIR VALVE	AV
ARMSTRONGS JUNCTION	AJ
CABLE TV / IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
DOWNSPIPE	DP
EARTHENWARE	EW
NO FURTHER TRACE	NFT
OFFSITE	O/S

LEVELS :

STOPCOCK	ST -
SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	VENT
WATER METER	WM / TT
BED LEVEL	+ BED 101.50
FLOOR LEVEL	+ FL 101.50
INVERT LEVEL	+ IL 101.50
ROAD LEVEL	+ 101.50
SOFFIT LEVEL	+ SL 101.50
SPOT LEVEL	+ 101.50
TOP OF WALL LEVEL	+ TOMW 101.50
WATER LEVEL	+ WL 101.50
SURVEY CONTROL STATION	SCS
START OF RUN	SOR
UNABLE TO OPEN	UTO
UNABLE TO TRACE	UTT

UNDERGROUND LEGEND :

WATER MAIN	WATER
GAS MAIN	GAS
STORM DRAIN	STORM
FOUL SEWER	FOUL
COMBINED SEWER	COMB
ELECTRIC CABLE	POWER
ELECTRIC LIGHTING	LIGHTING
EIRCOM	EIRCOM
FIBRE OPTIC CABLE	F.OPTIC
BROADBAND	BROADBAND
CABLE TV	TV
TRAFFIC AND SIGNAL CABLE	TRAFFIC
CCTV	CCTV
IRRIGATION PIPE	IRRIGATION
EMPTY DUCT	EMPTY
GPR ANOMALY	ANOMALY
UNKNOWN CABLE	CABLE
OHEAD ELECTRICITY	HE
OHEAD TELECOM	HT



PLAN PRODUCED BY:

CONTACT INFORMATION:

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00353 1 691 0156

CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
DATUM: Malin Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

**Kildare Market Square
Renewal Project**

SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

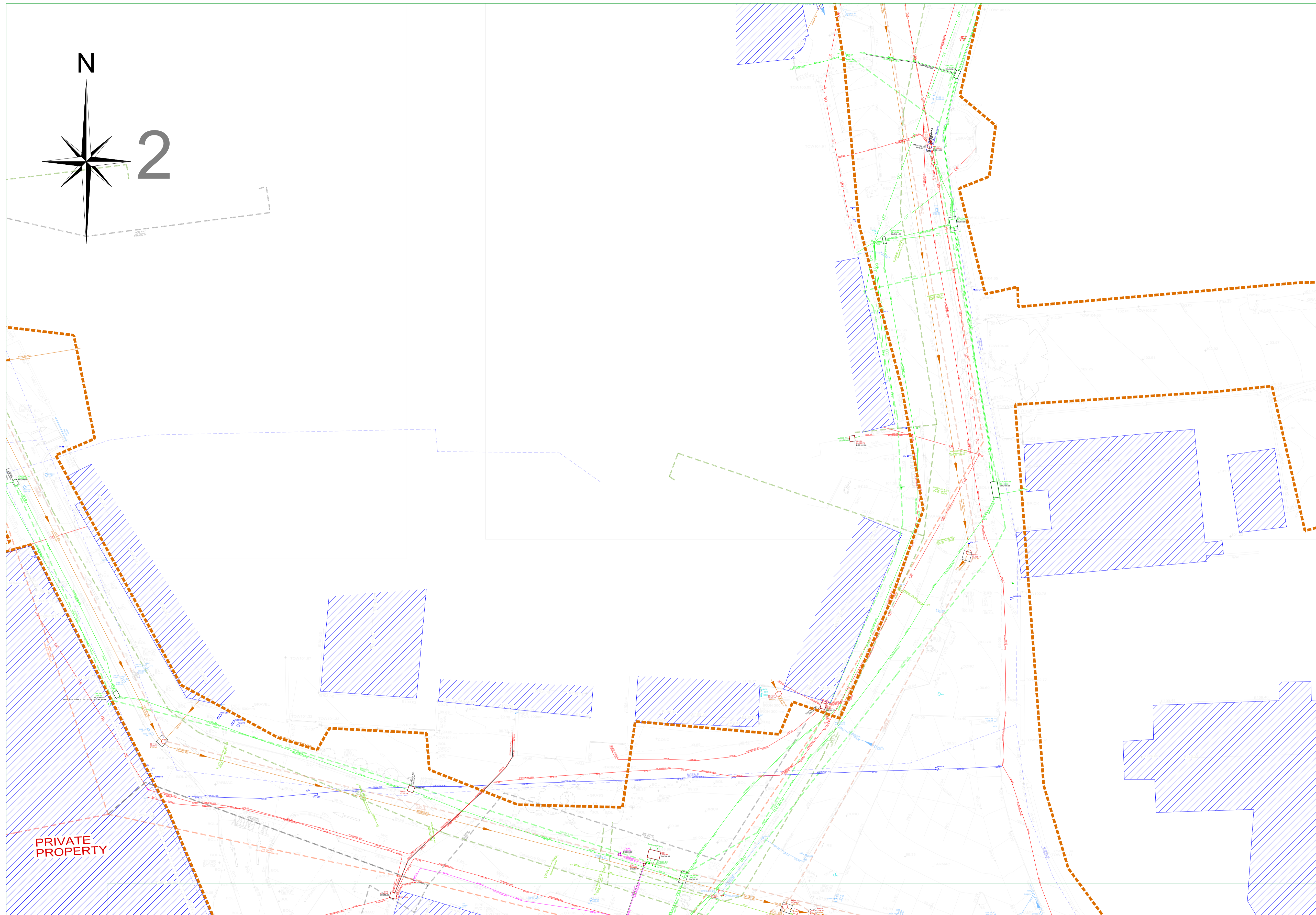
SHEET: 1 of 10

DESCRIPTION : 2D Utilities

SURVEYED BY : K. K. A. K.

PROCESSED BY : Eilana Reilly

CHECKED BY : Alan Brady



PAS 128: 2014 (Quality of Survey Level Outputs):

DESKTOP UTILITY RECORDS SEARCH QL-D	Drafted from utility records
SITE RECONNAISSANCE QL-C	Location Demonstrated by visual reference to street furniture or evidence of previous streetworks, ie - reinstatement scars
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STREET FURNITURE :

BOLLARDS	BD
BUS STOP	BS
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GATE	GP
ELECTRICITY POLE	EP
TELEPHONE POLE	TP
EARTHING ROD	ER
LAMP POST	LP
MARKER POST	MKR
SIGN POST	SP
TRAFFIC LIGHT	TL
TELEPHONE BOX	TB
POST	POST
POST BOX	POST BOX
ROAD SIGN	RS
BORE HOLE	BH
TRIAL PIT	TPIT
BOTTOM OF CHAMBER	BOC
CAST-IRON	CI
CONCRETE	CONC
DIAMETER	DIA

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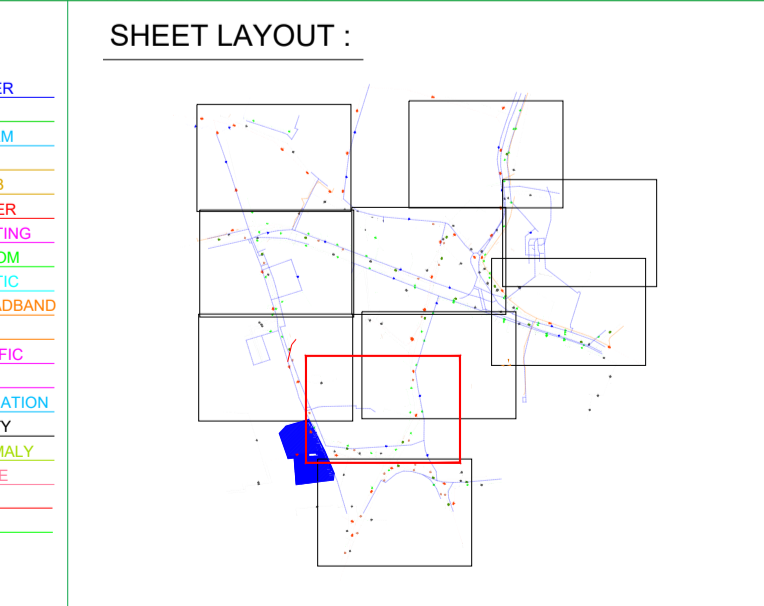
STOPCOCK
SERVICE BOX (UNKNOWN)
TRAFFIC COVER
VENT
WATER METER

LEVELS :

BED LEVEL	+ BED 101.50
FLOOR LEVEL	+ FL 101.50
INVERT LEVEL	+ IL 101.50
ROAD LEVEL	+ RL 101.50
SOFFIT LEVEL	+ SL 101.50
SPOT LEVEL	+ SL 101.50
TOP OF WALL LEVEL	+ TOW 101.50
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O/H/EAD ELECTRICITY	O/H/EAD ELECTRICITY
O/H/EAD TELECOM	O/H/EAD TELECOM



PLAN PRODUCED BY:

CONTACT INFORMATION:

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REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

**Kildare Market Square
Renewal Project**

SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

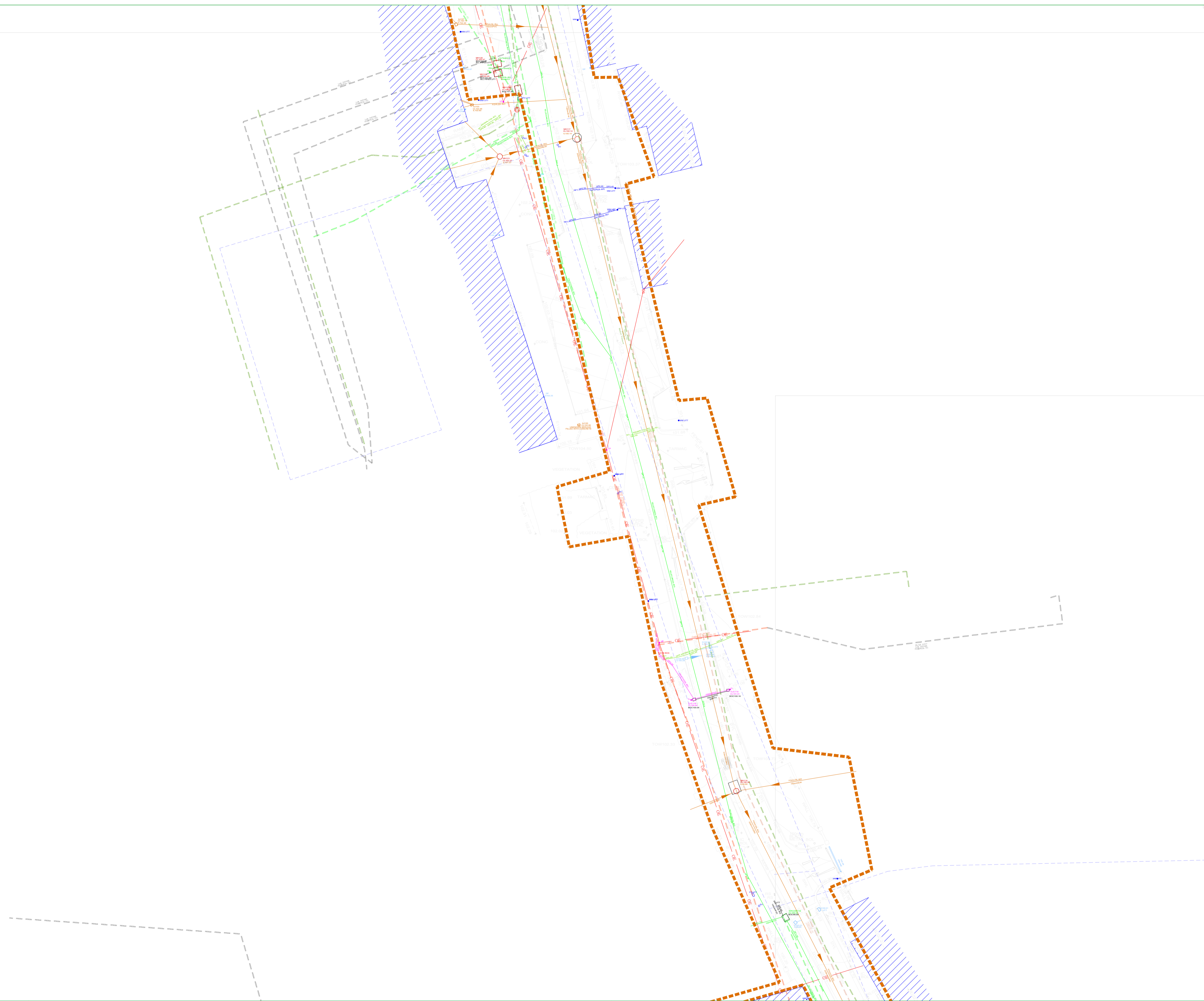
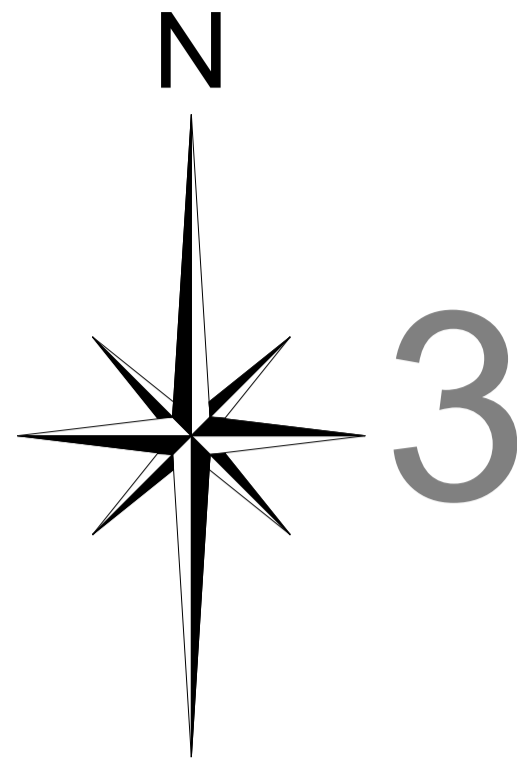
SHEET: 2 of 10

DESCRIPTION : 2D Utilities

SURVEYED BY : K. K. A. K.

PROCESSED BY : Eilana Reilly

CHECKED BY : Alan Brady



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00353 1 691 0156

STREET FURNITURE :

BOLLARDS	BD +
BUS STOP	BS +
CRASH BARRIER	CB
GATE	GP
ELECTRICITY POLE	EP +
TELEPHONE POLE	TP +
EARTHING ROD	ER +
LAMP POST	LP +
MARKER POST	MKR +
SIGN POST	SIGN +
TRAFFIC LIGHT	TL +
TELEPHONE BOX	TB
POST	POST
POST BOX	POST BOX
ROADSIGN	RS - RS
BORE HOLE	BH +
TRIAL PIT	TPIT +
BOTTOM OF CHAMBER	BOC
CAST-IRON	CI
CONCRETE	CONC
DIAMETER	DIA

SERVICES :

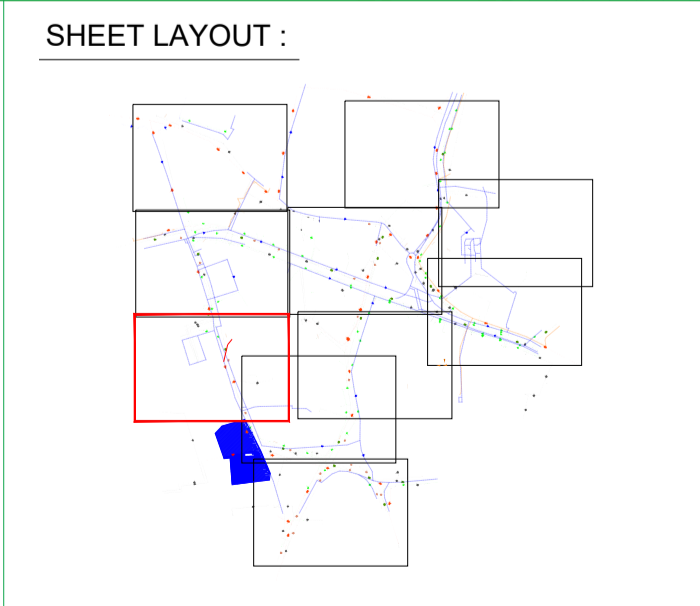
AIR VALVE	AV
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
DOWNPIPE	DP
EARTHENWARE	EW
NO FURTHER TRACE	NFT
OFFSITE	O/S

LEVELS :

STOPCOCK	ST -
SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	WM WTT
WATER METER	WM WTT
BED LEVEL	+ BED 101.50
FLOOR LEVEL	+ FL 101.50
INVERT LEVEL	+ IL 101.50
ROAD LEVEL	+ 101.50
SOFFIT LEVEL	+ SL 101.50
SPOT LEVEL	+ 101.50
TOP OF WALL LEVEL	+ TOM 101.50
WATER LEVEL	+ WL 101.50
SURVEY CONTROL STATION	SOR
UNABLE TO OPEN	UTO
UNABLE TO TRACE	UTT

UNDERGROUND LEGEND :

WATER MAIN	WATER
GAS MAIN	GAS
STORM DRAIN	STORM
FOUL SEWER	FOUL
COMBINED SEWER	COMB
ELECTRIC CABLE	ELECTRIC
ELECTRIC LIGHTING	LIGHTING
EIRCOM	EIRCOM
FIBRE OPTIC CABLE	F.OPTIC
BROADBAND	BROADBAND
CABLE TV	TV
TRAFFIC AND SIGNAL CABLE	TRAFFIC
CCTV	CCTV
IRRIGATION PIPE	IRRIGATION
EMPTY DUCT	EMPTY
GPR ANOMALY	ANOMALY
UNKNOWN CABLE	CABLE
O/H ELECTRICITY	HE
O/H ELECTRICITY	HT



PLAN PRODUCED BY:

CONTACT INFORMATION:

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00353 1 691 0156

CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
DATUM: Malin Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

**Kildare Market Square
Renewal Project**

SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

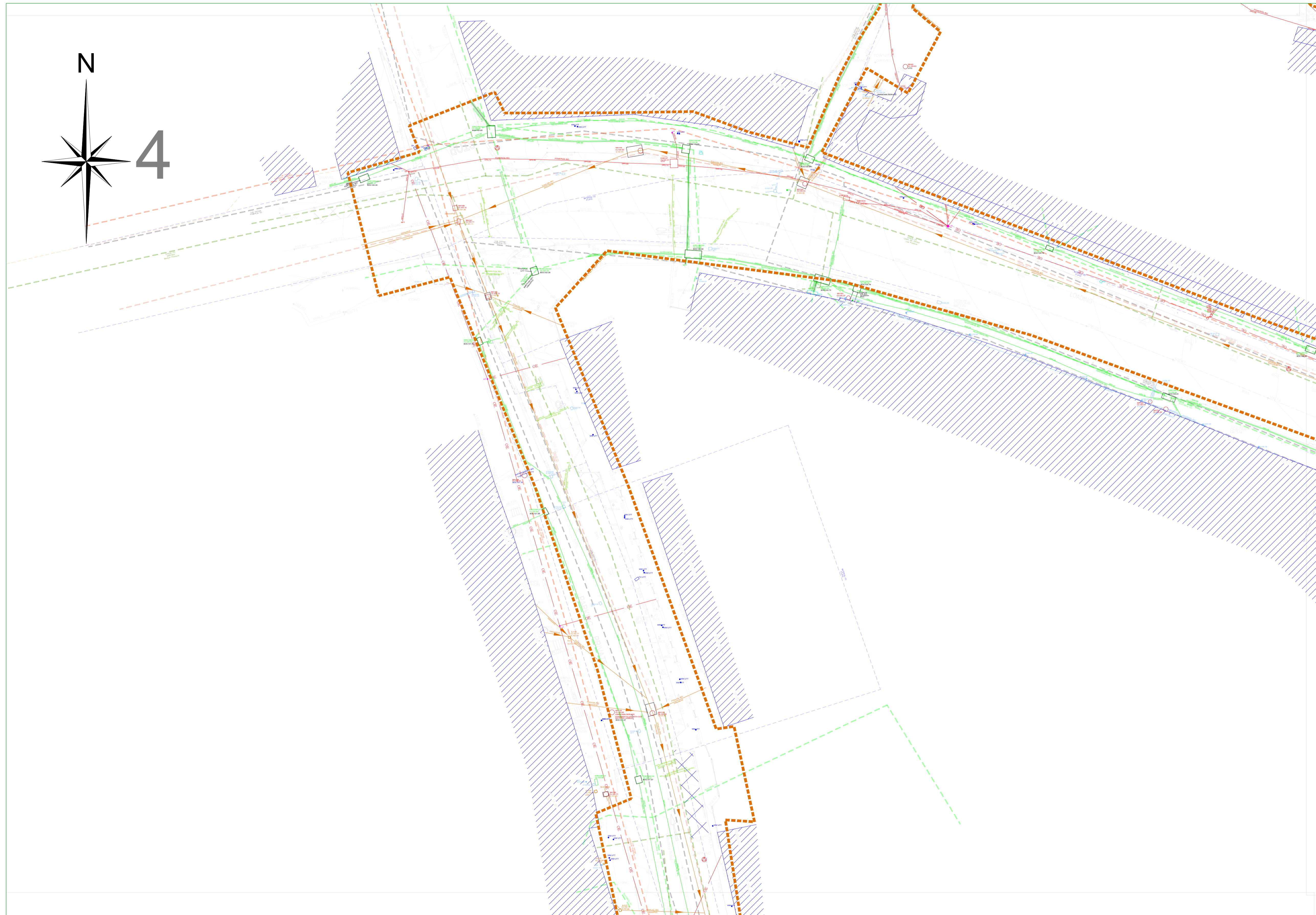
SHEET: 3 of 10

DESCRIPTION : 2D Utilities

SURVEYED BY : K. K. A. K.

PROCESSED BY : Eilana Reilly

CHECKED BY : Alan Brady



PAS 128: 2014 (Quality of Survey Level Outputs):

DESKTOP UTILITY RECORDS SEARCH QL-D	Drafted from utility records
SITE RECONNAISSANCE QL-C	Location Demonstrated by visual reference to street furniture or evidence of previous streetworks, ie - reinstatement scars
DETECTION	
QL-B4	A segment of utility suspected to exist but has not been detected by a geophysical technique
QL-B3	Horizontal location only of the utility detected by one of the geophysical techniques used
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QL-B1	Horizontal and vertical location of the utility detected by multiple geophysical techniques
VERIFICATION QL-A	Horizontal and vertical location of the top and/or bottom of the utility

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- The following is a non-exhaustive list of the limitations of utility surveys:
- The Survey aims to map existing utilities subsurface utilities and provide information with respect to pipe size, material type and drainage connectivity. However utility surveying is limited by the following guidelines and it may not be possible to accurately survey, define and locate all services and sub-surface features.**
 - Depth of Utility:** The depth and size of a utility affect the signal response and the degree with which a utility can be located. Due to attenuation of the radar signal with depth, resolution is restricted, hence making identification of utilities more difficult with increasing depth.
 - Size of Utility:** The smaller the diameter of a utility the more difficult it is to locate. This difficulty increases with depth.
 - Ground Conditions:** The depth penetration and quality of the data depends on the ground conditions of the site. GPR Surveying works best within high resistivity material. Clay overburden can impair GPR Surveying. Poor data may be a result of areas with high conductivity.
 - Utility Congestion:** Where different utilities converge together into a service corridor or cross paths it becomes difficult to isolate a specific utility and to map its route. The reflected signal will display a single response to multiple utilities. Therefore multiple utilities may appear to be a single utility. Where similar services run on close proximity, separation may be impossible.
 - Signal Jumping:** Signal from surrounding services may 'jump' to a highly conductive line masking its true identity.
 - Shadowing:** (of deeper utilities by shallower objects) Shallow utilities will mask the existence of deeper utilities where they are in close proximity. Also, high reflective materials close to the surface i.e. rebar may hide deeper anomalies.
 - Surface Obstructions:** The GPR system relies on a relatively flat and even surface on which to perform radar passes. If ground obstructions such as vehicles, organic material (long grass, scrub) or undulating ground surface are present then the acquired data will be of lower resolution and in some cases not viable.
 - Loss of signal:** It is not always possible to trace the entire length of each underground service.
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GATE	GP
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TELEPHONE POLE	TP +
EARTHING ROD	ER +
LAMP POST	LP +
MARKER POST	MKR +
SIGN POST	SIGN
TRAFFIC LIGHT	TL +
TELEPHONE BOX	TB
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ROADSIGN	RS - RS
BORE HOLE	BH +
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BOTTOM OF CHAMBER	BOC
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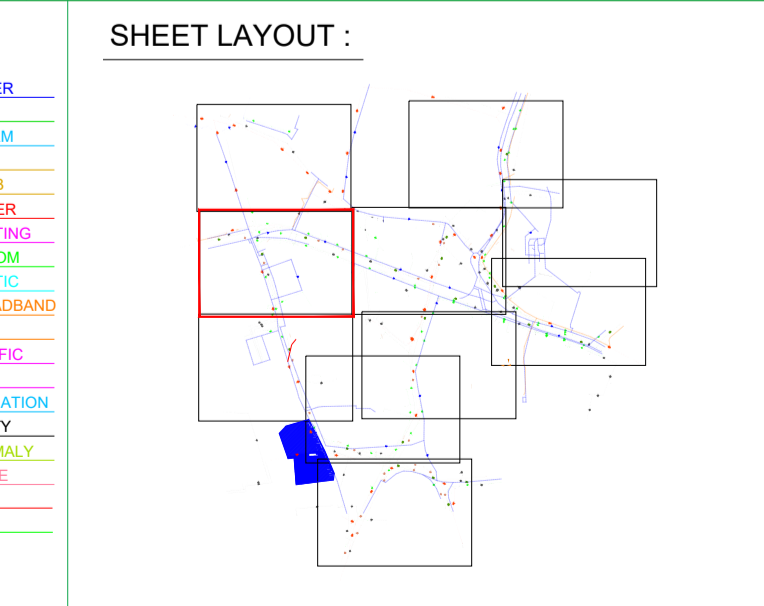
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SLUICE VALVE	SV
DOWNPIPE	DP
EARTHENWARE	EW
NO FURTHER TRACE	NFT
OFFSITE	O/S

LEVELS :

STOPCOCK	ST
SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLC
VENT	VENT
WATER METER	WM / TT
BED LEVEL	+ BED 101.50
FLOOR LEVEL	+ FL 101.50
INVERT LEVEL	+ IL 101.50
ROAD LEVEL	+ 101.50
SOFFIT LEVEL	+ SL 101.50
SPOT LEVEL	+ 101.50
TOP OF WALL LEVEL	+ TOW 101.50
WATER LEVEL	+ WL 101.50
SURVEY CONTROL STATION	SCS
START OF RUN	SOR
UNABLE TO OPEN	UTO
UNABLE TO TRACE	UTT

UNDERGROUND LEGEND :

WATER MAIN	WATER
GAS MAIN	GAS
STORM DRAIN	STORM
FULL SEWER	FULL
COMBINED SEWER	COMB
ELECTRIC CABLE	POWER
ELECTRIC LIGHTING	LIGHTING
EIRCOM	EIRCOM
FIBRE OPTIC CABLE	F.OPTIC
BROADBAND	BROADBAND
CABLE TV	TV
TRAFFIC AND SIGNAL CABLE	TRAFFIC
CCTV	CCTV
IRRIGATION PIPE	IRRIGATION
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UNKNOWN CABLE	CABLE
O'HEAD ELECTRICITY	O'HEAD
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GRID SYSTEM: Irish Transverse Mercator
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NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

**Kildare Market Square
Renewal Project**

SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

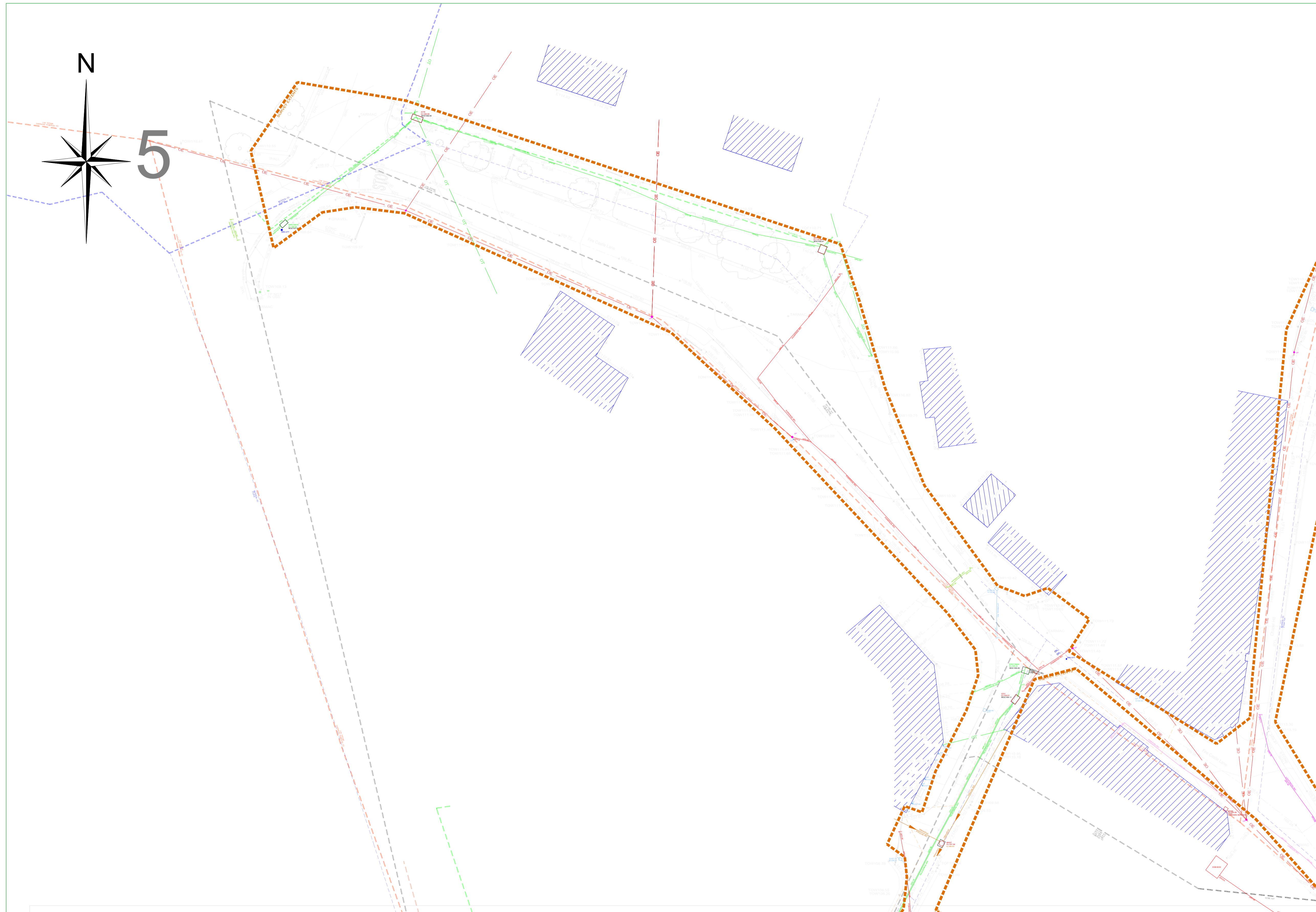
SHEET: 4 of 10

DESCRIPTION : 2D Utilities

SURVEYED BY : K. K. A. K.

PROCESSED BY : Eilana Reilly

CHECKED BY : Alan Brady



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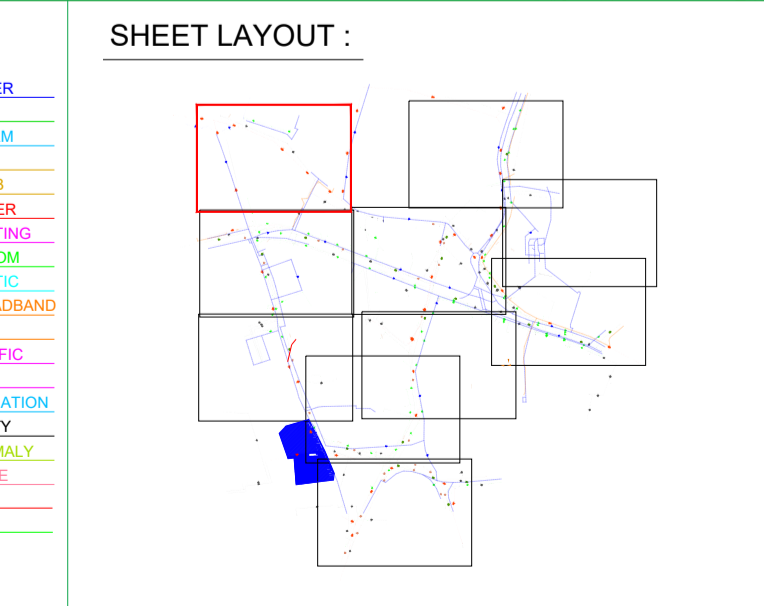
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O/H ELEC TRICITY	O/H ELEC TRICITY
O/H ELEC COM	O/H ELEC COM



PLAN PRODUCED BY:

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REVISIONS:

No.	Date	Description
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PROJECT:

**Kildare Market Square
Renewal Project**

SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

SHEET: 5 of 10

DESCRIPTION : 2D Utilities

SURVEYED BY : K. K. A. K.

PROCESSED BY : Elana Reilly

CHECKED BY : Alan Brady



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- Acute bends in pipework:** It may not be possible to trace a pipe past an acute bend.

Accuracy estimates:

- Locational accuracy is determined by referring to the manufacturers guidelines for the detector used.
- In ideal conditions the spatial accuracies for the underground utilities may be +/- 5% for Radiodetection and +/- 10% of depth for the GPR to 2.5m deep. However variations within the subsurface, depth below the ground, close proximity of other services and local magnetic, atmospheric or ground conditions, bends, lateral service connections and any of the other limitations listed in this disclaimer may alter this estimated accuracy.
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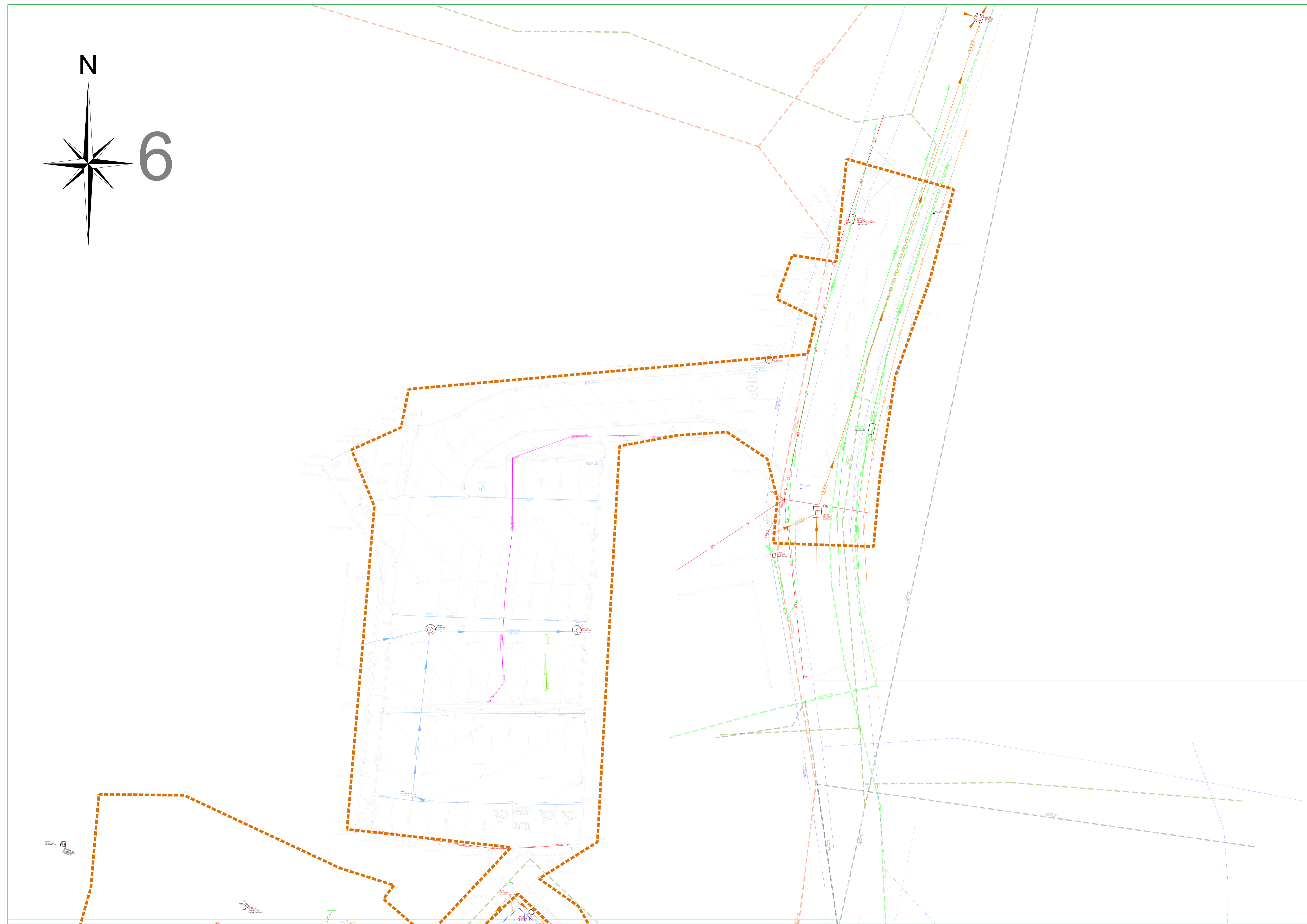
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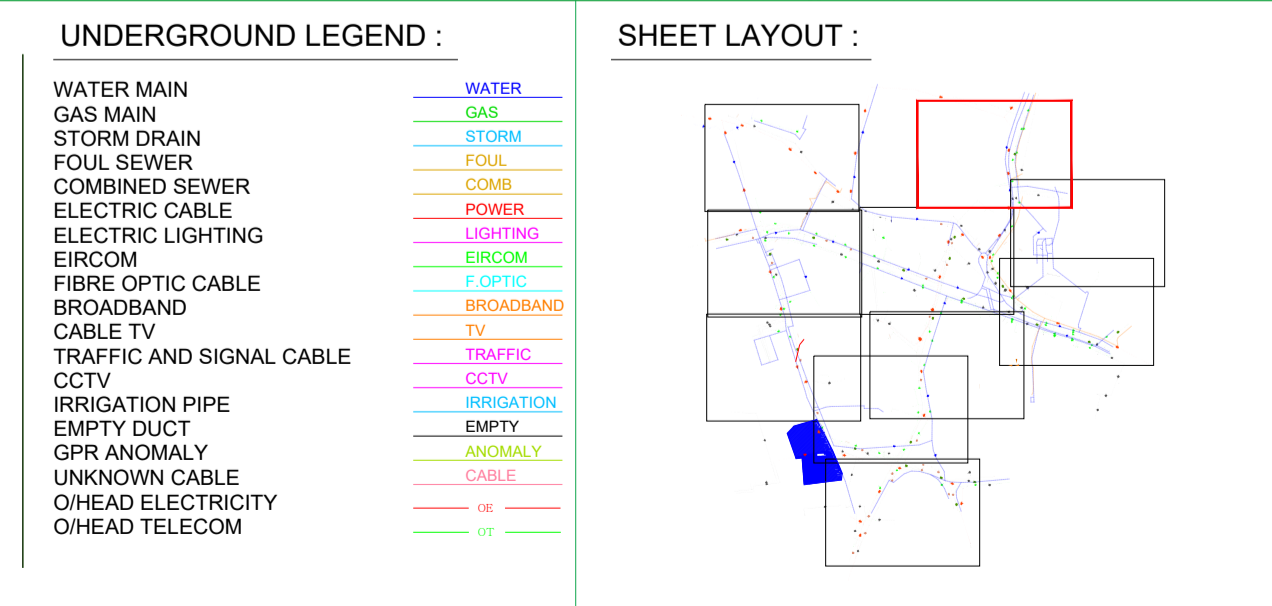
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- Small diameter cables less than 20mm diameter or pipes less than 40mm diameter.
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STREET FURNITURE :	SERVICES :	UNDERGROUND LEGEND :
BOLLARDS BD + BUS STOP BS + CRASH BARRIER CB GATE EP + ELECTRICITY POLE TP + TELEPHONE POLE ER + EARTHING ROD LP + LAMP POST MKR + MARKER POST SIGN POST TL + TRAFFIC LIGHT TB TELEPHONE BOX POST POST POST BOX RS - RS ROAD SIGN BH + BORE HOLE TPIT + TRIAL PIT	AIR VALVE AV ARMSTRONGS JUNCTION AJ CABLE TV IC COVER LEVEL CATV EIRCOM COVER QL EIRCOM JUNCTION BOX EIRCOM BOX ELECTRICAL CABLE PIT ECP ESAT COVER ESAT ESB COVER ESB ESB JUNCTION BOX ESB BOX FIRE HYDRANT FH GAS VALVE GV GULLY G INSPECTION COVER IC MANHOLE MH SEPTIC TANK SEPTIC SLUICE VALVE SV	WATER MAIN WATER GAS MAIN GAS STORM DRAIN STORM FOUL SEWER FOUL COMBINED SEWER COMB ELECTRIC CABLE ELECTRIC ELECTRIC LIGHTING LIGHTING EIRCOM EIRCOM FIBRE OPTIC CABLE F.OPTIC BROADBAND BROADBAND CABLE TV TV TRAFFIC AND SIGNAL CABLE TRAFFIC CCTV CCTV IRRIGATION PIPE IRRIGATION EMPTY DUCT EMPTY GPR ANOMALY ANOMALY UNKNOWN CABLE CABLE OHEAD ELECTRICITY OHEAD TELECOM TELECOM



PLAN PRODUCED BY:

CONTACT INFORMATION:

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CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
 DATUM: Malin Head (OSGM15)
 NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

**Kildare Market Square
Renewal Project**

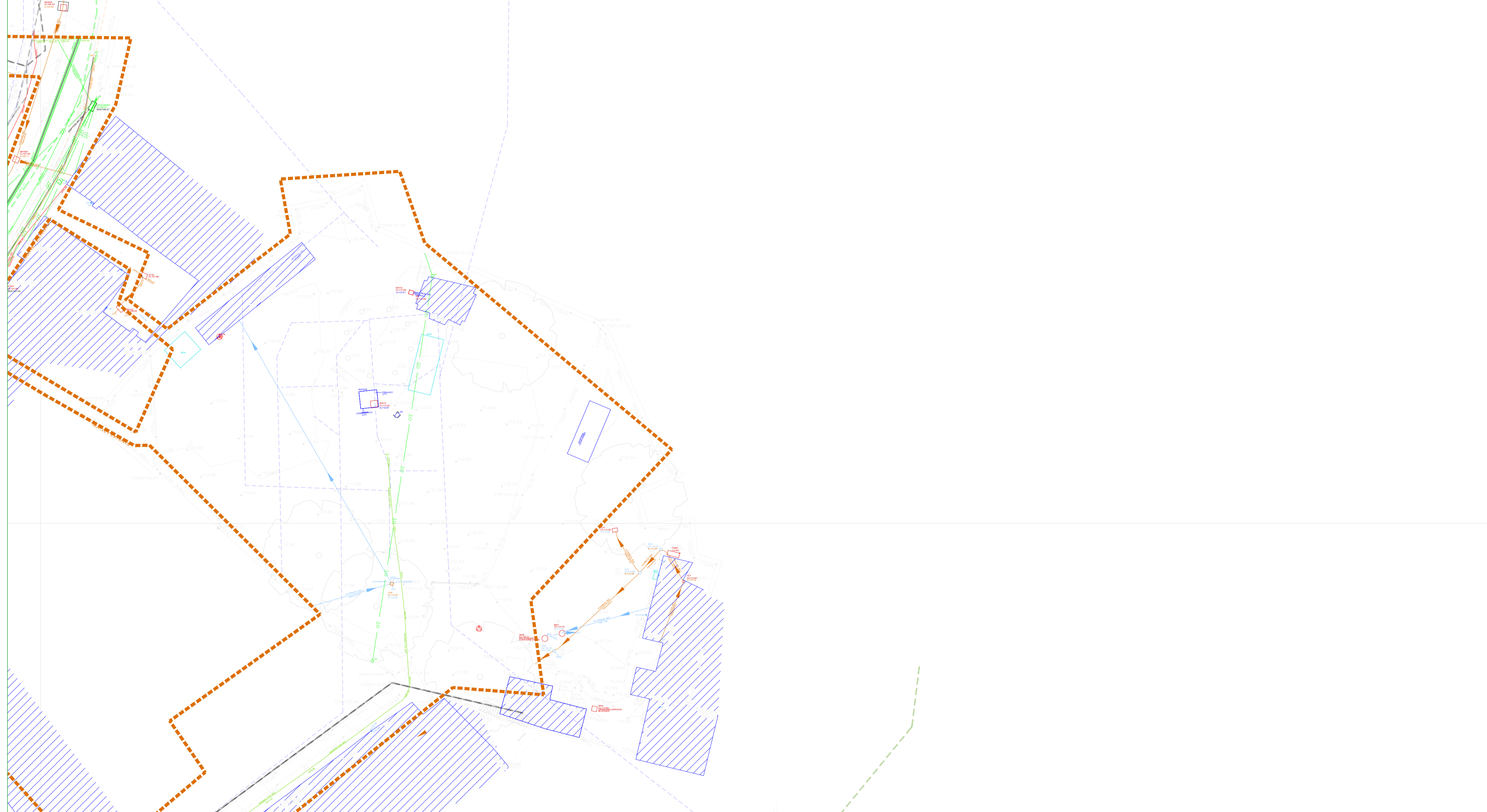
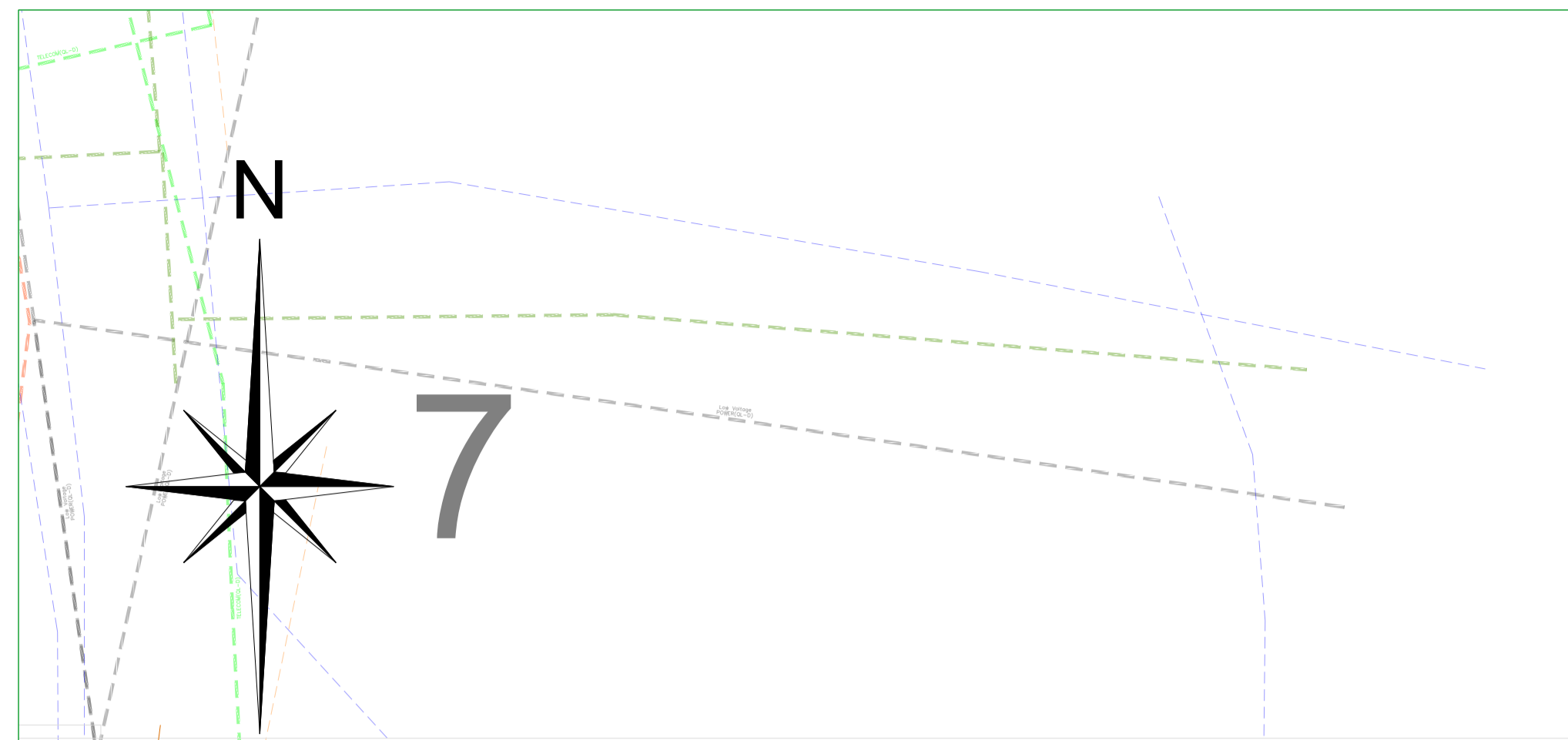
SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

SHEET: 6 of 10

DESCRIPTION :	2D Utilities
SURVEYED BY :	K. K. A. K.
PROCESSED BY :	Elana Reilly
CHECKED BY :	Alan Brady



PAS 128: 2014 (Quality of Survey Level Outputs):

DESKTOP UTILITY RECORDS SEARCH QL-D	Drafted from utility records
SITE RECONNAISSANCE QL-C	Location Demonstrated by visual reference to street furniture or evidence of previous streetworks, ie - reinstatement scars
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VERIFICATION QL-A	Horizontal and vertical location of the top and/or bottom of the utility

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The following is a non-exhaustive list of the limitations of utility surveys:

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 - Size of Utility: The smaller the diameter of a utility the more difficult it is to locate. This difficulty increases with depth.
 - Ground Conditions: The depth penetration and quality of the data depends on the ground conditions of the site. GPR Surveying works best within high resistivity material. Clay overburden can impair GPR Surveying. Poor data may be a result of areas with high conductivity.
 - Utility Congestion: Where different utilities converge together into a service corridor or cross paths it becomes difficult to isolate a specific utility and to map its route. The reflected signal will display a single response to multiple utilities. Therefore multiple utilities may appear to be a single utility. Where similar services run on close proximity, separation may be impossible.
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STREET FURNITURE :

BOLLARDS	BD +	BUS STOP	BS +	CRASH BARRIER	CB	GATE	GP	ELECTRICITY POLE	EP +	TELEPHONE POLE	TP +	EARTHING ROD	ER +	LAMP POST	LP +	MARKER POST	MKR +	SIGN POST	SP +	TRAFFIC LIGHT	TL	TELEPHONE BOX	TB	POST	POST	POST BOX	POST BOX	ROAD SIGN	RS	BORE HOLE	BH +	TRIAL PIT	TPIT +
BOTTOM OF CHAMBER	BOC	CAST-IRON	CI	CONCRETE	CONC	DIAMETER	DIA																										

SERVICES :

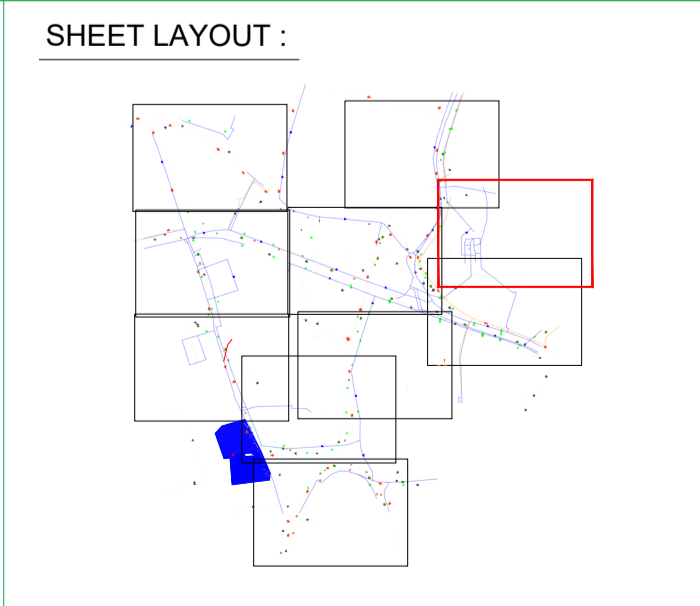
AIR VALVE	AV	ARMSTRONG JUNCTION	AJ	CABLE TV IC	CATV	COVER LEVEL	CL	EIRCOM COVER	EIRCOM	EIRCOM JUNCTION BOX	EIRCOM BOX	ELECTRICAL CABLE PIT	ECP	ESAT COVER	ESAT	ESB COVER	ESB	ESB JUNCTION BOX	ESB BOX	FIRE HYDRANT	FH	GAS VALVE	GV	GULLY	G	INSPECTION COVER	IC	MANHOLE	MH	SEPTIC TANK	SEPTIC	SLUICE VALVE	SV
AIR VALVE	AV	ARMSTRONG JUNCTION	AJ	CABLE TV IC	CATV	COVER LEVEL	CL	EIRCOM COVER	EIRCOM	EIRCOM JUNCTION BOX	EIRCOM BOX	ELECTRICAL CABLE PIT	ECP	ESAT COVER	ESAT	ESB COVER	ESB	ESB JUNCTION BOX	ESB BOX	FIRE HYDRANT	FH	GAS VALVE	GV	GULLY	G	INSPECTION COVER	IC	MANHOLE	MH	SEPTIC TANK	SEPTIC	SLUICE VALVE	SV

LEVELS :

STOPCOCK	ST	SERVICE BOX (UNKNOWN)	BOX	TRAFFIC COVER	TLIC	WATER METER	WM	WTT									
BED LEVEL	+ BED 101.50	FLOOR LEVEL	+ FL 101.50	INVERT LEVEL	+ IL 101.50	ROAD LEVEL	+ RL 101.50	SOFFIT LEVEL	+ SL 101.50	SPOT LEVEL	+ SPL 101.50	TOP OF WALL LEVEL	+ TOWL 101.50	WATER LEVEL	+ WL 101.50	SURVEY CONTROL STATION	SCS
START OF RUN	SOR	UNABLE TO OPEN	UTO	UNABLE TO TRACE	UTT												

UNDERGROUND LEGEND :

WATER MAIN	WATER	GAS MAIN	GAS	STORM DRAIN	STORM	FULL SEWER	FULL	COMBINED SEWER	COMB	ELECTRIC CABLE	POWER	ELECTRIC LIGHTING	LIGHTING	EIRCOM	EIRCOM	FIBRE OPTIC CABLE	F.OPTIC	BROADBAND	BROADBAND	CABLE TV	TV	TRAFFIC AND SIGNAL CABLE	TRAFFIC	CCTV	CCTV	IRRIGATION PIPE	IRRIGATION	EMPTY DUCT	EMPTY	GPR ANOMALY	ANOMALY	UNKNOWN CABLE	CABLE	O'HEAD ELECTRICITY	HE	O'HEAD TELECOM	HT
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PLAN PRODUCED BY:

CONTACT INFORMATION:

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00353 1 691 0156

CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
DATUM: Malin Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

**Kildare Market Square
Renewal Project**

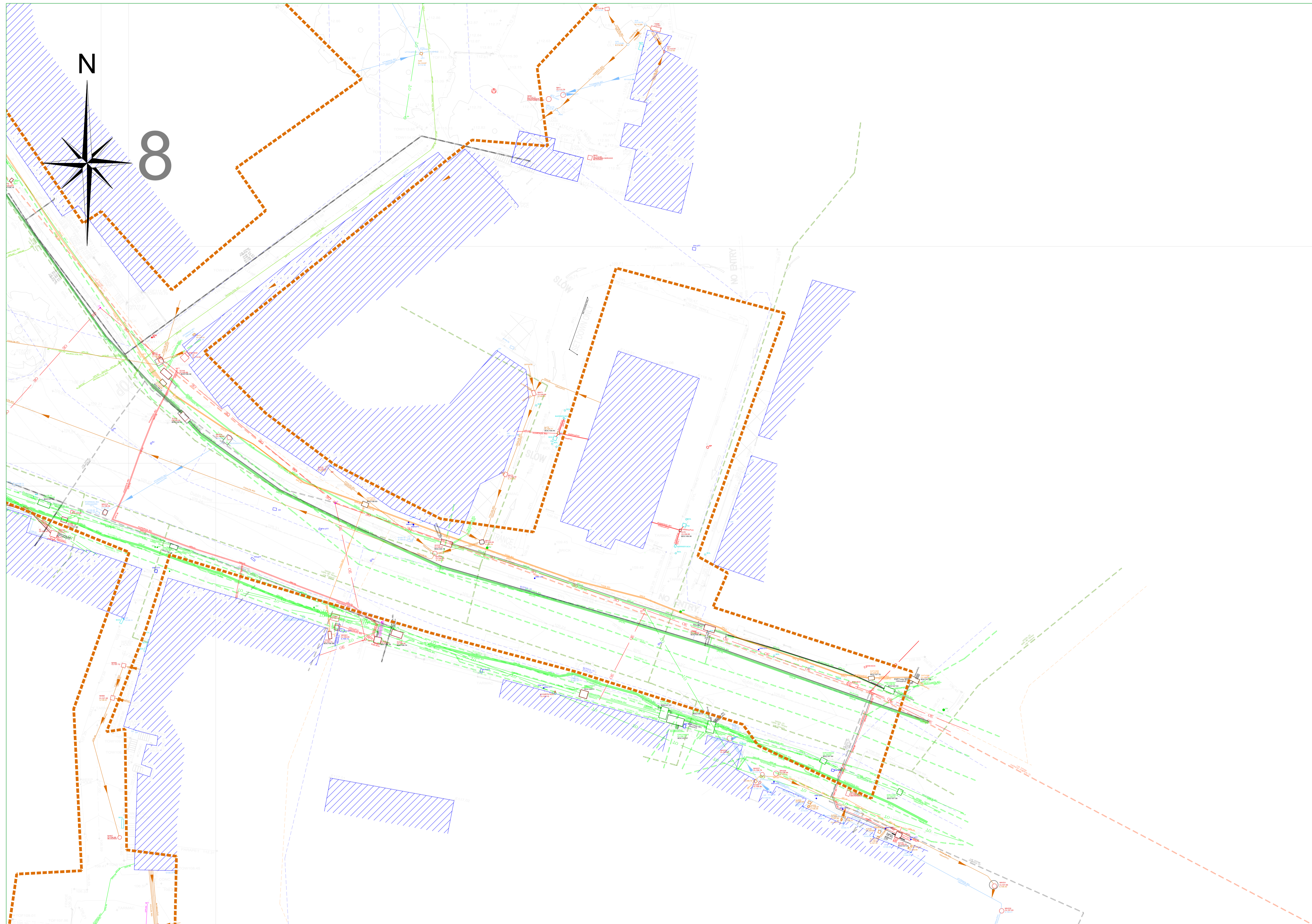
SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

SHEET: 7 of 10

DESCRIPTION :	2D Utilities
SURVEYED BY :	K. K. A. K.
PROCESSED BY :	Elana Reilly
CHECKED BY :	Alan Brady



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STREET FURNITURE :

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EARTHING ROD	ER +
LAMP POST	LP +
MARKER POST	MKR +
SIGN POST	SIGN
TRAFFIC LIGHT	TL +
TELEPHONE BOX	TB
POST	POST
POST BOX	POST BOX
ROADSIGN	RS - RS
BORE HOLE	BH +
TRIAL PIT	TPIT +
BOTTOM OF CHAMBER	BOC
CAST-IRON	CI
CONCRETE	CONC
DIAMETER	DIA

SERVICES :

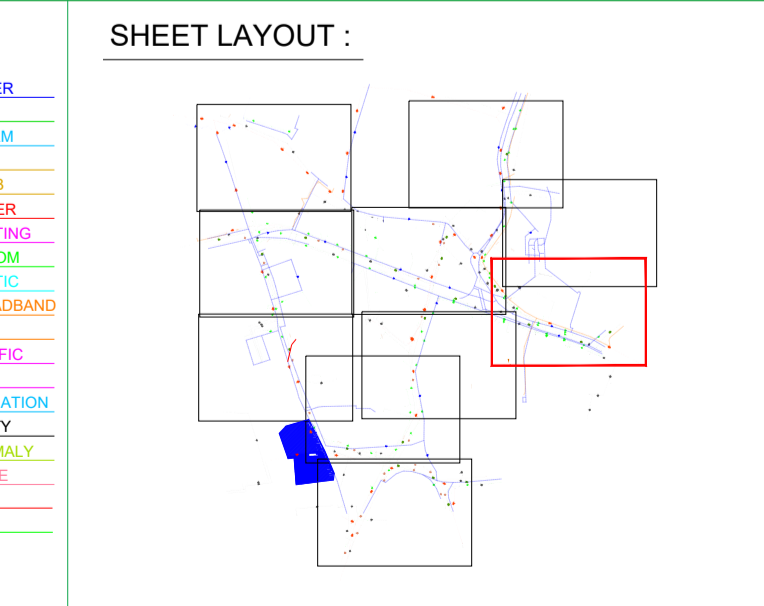
AIR VALVE	AV
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CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
DOWNSPIPE	DP
EARTHENWARE	EW
NO FURTHER TRACE	NFT
OFFSITE	O/S

LEVELS :

BED LEVEL	+ BED 101.50
FLOOR LEVEL	+ FL 101.50
INVERT LEVEL	+ IL 101.50
ROAD LEVEL	+ 101.50
SOFFIT LEVEL	+ SL 101.50
SPOT LEVEL	+ 101.50
TOP OF WALL LEVEL	+ TOW 101.50
WATER LEVEL	+ WL 101.50
SURVEY CONTROL STATION	SCS
STOPCOCK	ST
SERVICE BOX (UNKNOWN)	SBX
TRAFFIC COVER	TLIC
VENT	VM
WATER METER	WM
UNABLE TO OPEN	UTO
UNABLE TO TRACE	UTT

UNDERGROUND LEGEND :

WATER MAIN	WATER
GAS MAIN	GAS
STORM DRAIN	STORM
FOUL SEWER	FOUL
COMBINED SEWER	COMB
ELECTRIC CABLE	POWER
ELECTRIC LIGHTING	LIGHTING
EIRCOM	EIRCOM
FIBRE OPTIC CABLE	F.OPTIC
BROADBAND	BROADBAND
CABLE TV	TV
TRAFFIC AND SIGNAL CABLE	TRAFFIC
CCTV	CCTV
IRRIGATION PIPE	IRRIGATION
EMPTY DUCT	EMPTY
GPR ANOMALY	ANOMALY
UNKNOWN CABLE	CABLE
OHEAD ELECTRICITY	HE
OHEAD TELECOM	HT



PLAN PRODUCED BY:

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PROJECT:

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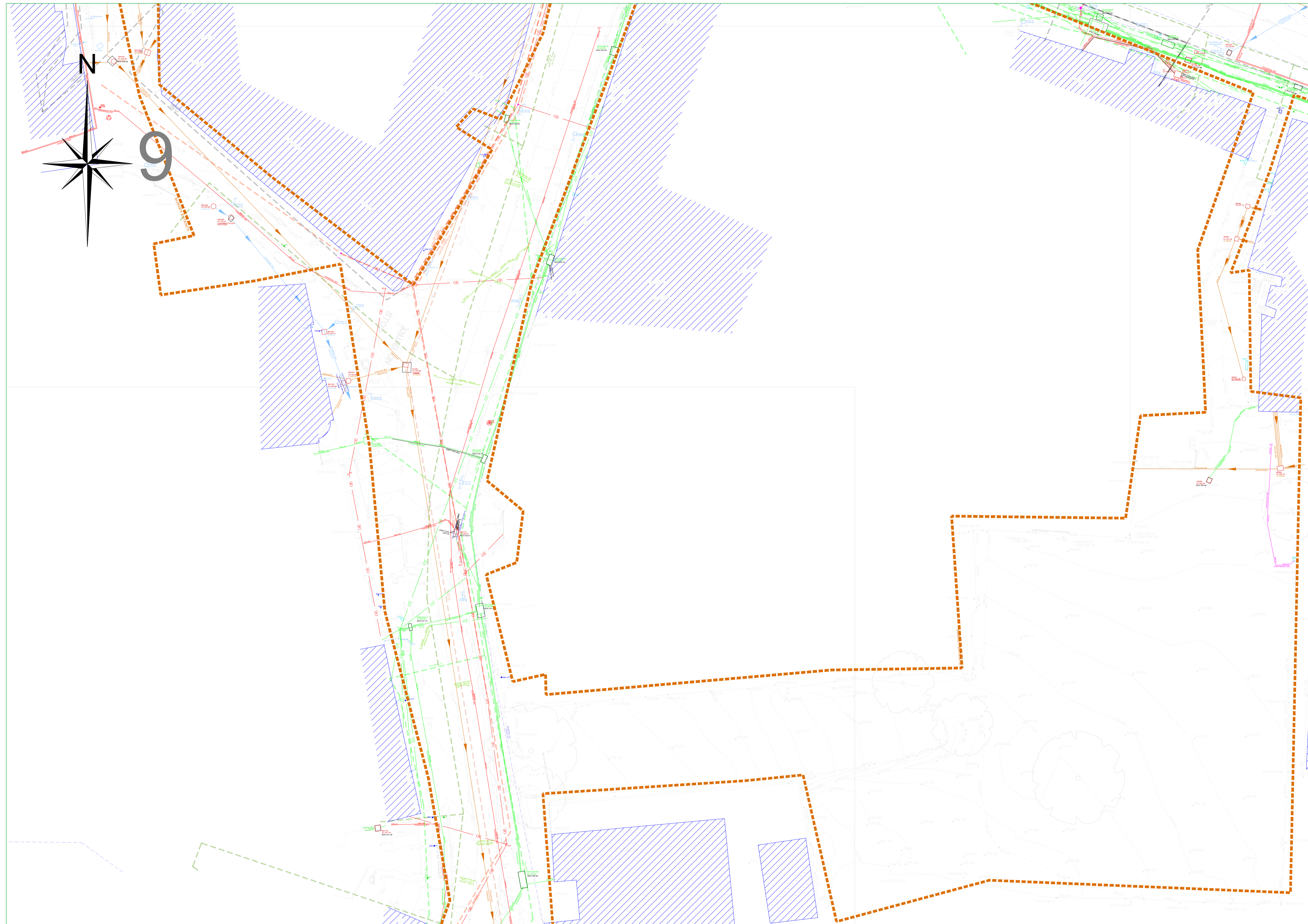
SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

SHEET: 8 of 10

DESCRIPTION :	2D Utilities
SURVEYED BY :	K. K. A. K.
PROCESSED BY :	Eilana Reilly
CHECKED BY :	Alan Brady



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STREET FURNITURE :

BOLLARDS	BD +
BUS STOP	BS +
CRASH BARRIER	CB
GATE	—
ELECTRICITY POLE	EP +
TELEPHONE POLE	TP +
EARTHING ROD	ER +
LAMP POST	LP +
MARKER POST	MKR +
SIGN POST	SIGN +
TRAFFIC LIGHT	TL +
TELEPHONE BOX	TB
POST	POST
POST BOX	POST BOX
ROADSIGN	RS - RS
BORE HOLE	BH +
TRIAL PIT	TPIT +
BOTTOM OF CHAMBER	BOC
CAST-IRON	CI
CONCRETE	CONC
DIAMETER	DIA

SERVICES :

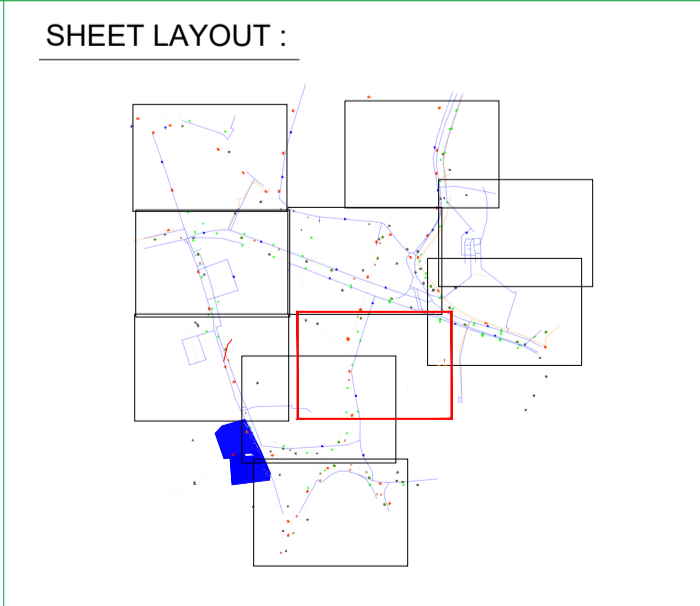
AIR VALVE	AV
ARMSTRONG JUNCTION	AJ
CABLE TV IC	CATV
COVER LEVEL	CL
EIRCOM COVER	EIRCOM
EIRCOM JUNCTION BOX	EIRCOM BOX
ELECTRICAL CABLE PIT	ECP
ESAT COVER	ESAT
ESB COVER	ESB
ESB JUNCTION BOX	ESB BOX
FIRE HYDRANT	FH
GAS VALVE	GV
GULLY	G
INSPECTION COVER	IC
MANHOLE	MH
SEPTIC TANK	SEPTIC
SLUICE VALVE	SV
DOWNSPIPE	DP
EARTHENWARE	EW
NO FURTHER TRACE	NFT
OFFSITE	O/S

LEVELS :

STOPCOCK	ST -
SERVICE BOX (UNKNOWN)	BOX
TRAFFIC COVER	TLIC
VENT	WM WTT
WATER METER	—
BED LEVEL	+ BED 101.50
FLOOR LEVEL	+ FL 101.50
INVERT LEVEL	+ IL 101.50
ROAD LEVEL	+ 101.50
SOFFIT LEVEL	+ SL 101.50
SPOT LEVEL	+ 101.50
TOP OF WALL LEVEL	+ TOW 101.50
WATER LEVEL	+ WL 101.50
SURVEY CONTROL STATION	—
START OF RUN	SOR
UNABLE TO OPEN	UTO
UNABLE TO TRACE	UTT

UNDERGROUND LEGEND :

WATER MAIN	— WATER
GAS MAIN	— GAS
STORM DRAIN	— STORM
FOUL SEWER	— FOUL
COMBINED SEWER	— COMB
ELECTRIC CABLE	— POWER
ELECTRIC LIGHTING	— LIGHTING
EIRCOM	— EIRCOM
FIBRE OPTIC CABLE	— F.OPTIC
BROADBAND	— BROADBAND
CABLE TV	— TV
TRAFFIC AND SIGNAL CABLE	— TRAFFIC
CCTV	— CCTV
IRRIGATION PIPE	— IRRIGATION
EMPTY DUCT	— EMPTY
GPR ANOMALY	— ANOMALY
UNKNOWN CABLE	— CABLE
O'HEAD ELECTRICITY	— O'HEAD
O'HEAD TELECOM	— TELECOM



PLAN PRODUCED BY:

CONTACT INFORMATION:

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CLIENT:

Aecom

GRID SYSTEM: Irish Transverse Mercator
DATUM: Malin Head (OSGM15)
NOTES: Drawing Contains Scale Factor

REVISIONS:

No.	Date	Description
001	N/A	Original Drawing

PROJECT:

**Kildare Market Square
Renewal Project**

SCALE : 1/200 A1

DATE : 05/08/2021

DRG No: 4612

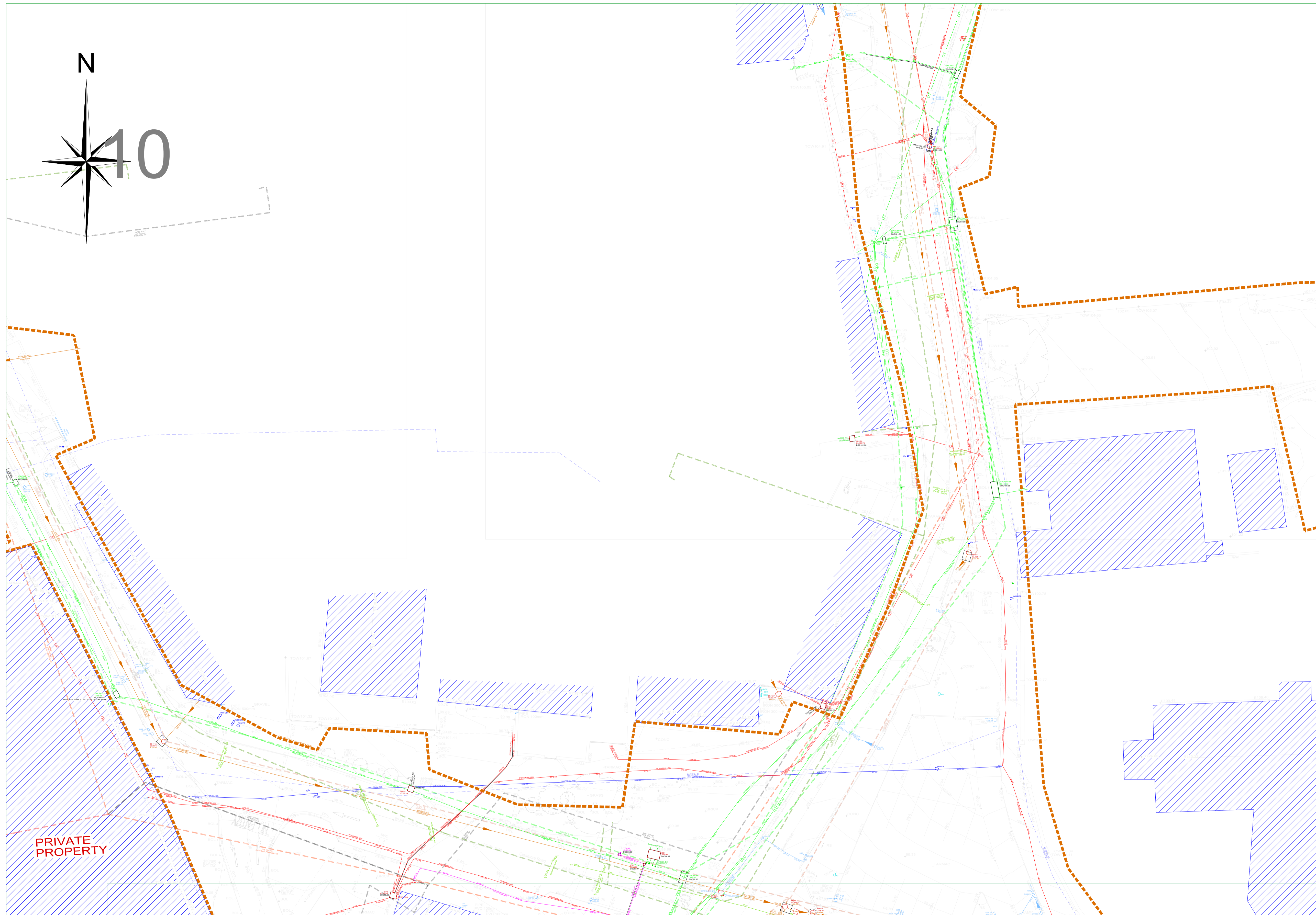
SHEET: 9 of 10

DESCRIPTION : 2D Utilities

SURVEYED BY : K. K. A. K.

PROCESSED BY : Eilana Reilly

CHECKED BY : Alan Brady



PAS 128: 2014 (Quality of Survey Level Outputs):

DESKTOP UTILITY RECORDS SEARCH QL-D	Drafted from utility records
SITE RECONNAISSANCE QL-C	Location Demonstrated by visual reference to street furniture or evidence of previous streetworks, ie - reinstatement scars
DETECTION	
QL-B4	A segment of utility suspected to exist but has not been detected by a geophysical technique
QL-B3	Horizontal location only of the utility detected by one of the geophysical techniques used
QL-B2	Horizontal and vertical location of the utility detected by one of the geophysical techniques used
QL-B1	Horizontal and vertical location of the utility detected by multiple geophysical techniques
VERIFICATION QL-A	Horizontal and vertical location of the top and/or bottom of the utility

Apex Surveys Ltd. Disclaimer - Utility Survey

The interpretative nature and the non-intrusive, indirect and non-destructive survey methods must be taken into account when considering the results of the surveys. Therefore Apex Surveys, while using appropriate practice to execute, interpret and present the data, gives no guarantees that all underground utilities and underground structures will be located and mapped. Furthermore, Apex Surveys cannot guarantee the accuracy of the utility depths annotated on the survey drawings. Apex Survey shall not be liable for any omissions or inaccuracies in the survey which arise due to the limitations of the service. No liability shall attach to Apex Surveys, in any circumstances, howsoever arising, in respect of any consequential loss or damages suffered by the Client.

- The following is a non-exhaustive list of the limitations of utility surveys:
- The Survey aims to map existing utilities subsurface utilities and provide information with respect to pipe size, material type and drainage connectivity. However utility surveying is limited by the following guidelines and it may not be possible to accurately survey, define and locate all services and sub-surface features.
 - Depth of Utility: The depth and size of a utility affect the signal response and the degree with which a utility can be located.
 - Due to attenuation of the radar signal with depth, resolution is restricted, hence making identification of utilities more difficult with increasing depth.
 - Size of Utility: The smaller the diameter of a utility the more difficult it is to locate. This difficulty increases with depth.
 - Ground Conditions: The depth penetration and quality of the data depends on the ground conditions of the site. GPR Surveying works best within high resistivity material. Clay overburden can impair GPR Surveying. Poor data may be a result of areas with high conductivity.
 - Utility Congestion: Where different utilities converge together into a service corridor or cross paths it becomes difficult to isolate a specific utility and to map its route. The reflected signal will display a single response to multiple utilities. Therefore multiple utilities may appear to be a single utility. Where similar services run on close proximity, separation may be impossible.
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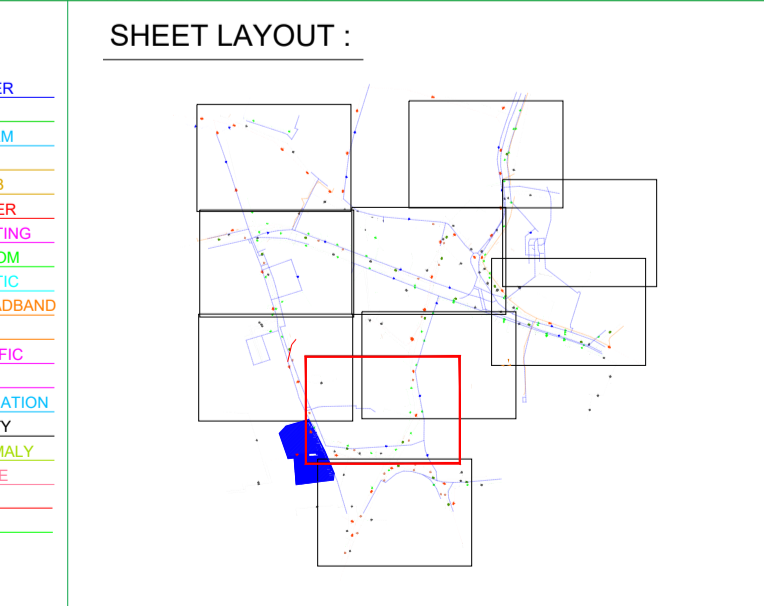
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