Civic Offices
Infirmary Hill,
Roosky,
Monaghan Town,
Co. Monaghan.

Engineering Services Report

Project Ref: 2223

November 2023

Issue No. 3

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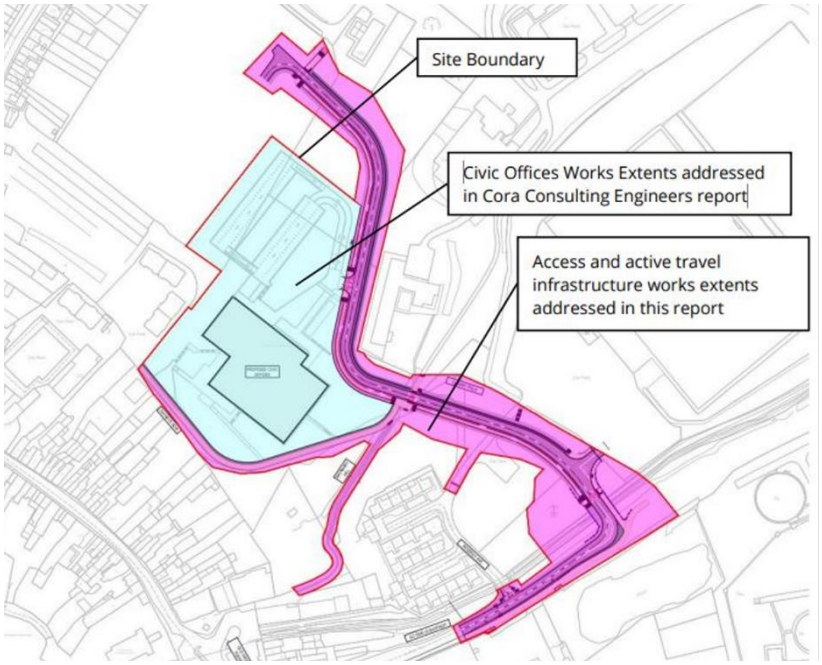
Table of Contents

1 Introduction

The existing site is located in Roosky Lands, north of the existing Ulster Canal Greenway route and is surrounded by Monaghan Harps GAA Club to the east, residential area to the south with various business on Dublin St. & Glaslough St. backing on to the site to the west & north. The site is currently a sloping greenfield site with no access by road. The River Shambles is to the south of the site.

CORA Consulting Engineers are responsible for the design of the Foul & Surface Water Drainage for the Office and Carpark area of the site while DBFL Consulting Engineers are responsibility for the roads elements. This Report specifically refers to the Office & Carpark areas which are defined in light blue in the figure below.



2 Summary of Design

The following is proposed for the site.

(i) a new road will be constructed, initially as a construction access road for the site during construction and, upon completion of the site, an access road for the civic offices & any future development in the area;

(ii) a new 3 storey building for Monaghan County Council Civic Offices with a gross floor area of 5601m² incorporating an entrance foyer, office space, meeting rooms, staff restaurant, council chamber, public counter, reception desk, welfare facilities, internal landscaped courtyards and supporting spaces;

(iii) provision of 112 no. vehicular parking spaces (including 4 no. mobility parking spaces, and 12 no. electric charging spaces);

(iv) provision of 80 no. bicycle parking spaces;

(v) all ancillary works including, landscaping, boundary treatments, internal footpaths, bin storage, services enclosure, foul and surface water drainage, ESB substation and all site services, site infrastructure and associated site development works necessary to facilitate the development.

The civic offices consist of a grey roof with a drainage barrier collected via rainwater pipes and carried to the attenuation tank to the south-east of the site. The outflow from here is limited by a HydroBrake® to 4.3 l/s/ha towards the new surface water pipe under the road. From here is flow to a new attenuation basin at the bottom of Quarry Walk. The attenuation tank also has a high-level overflow to the public sewer. Car parks consist of permeable paving with storage below that infiltrates into the ground. Podiums have storage below that drains to the attenuation tank. All internal drainage devices have overflows to the attenuation tank. The entrance area adjacent to St. Davnet's Row flows into a soakaway which infiltrates into the ground.

3 Design Assumptions

1. SOIL type

The SOIL type was calculated using GDSDS providing a SOIL type 3. This value was used in the surface water calculations. The calculation is included in the surface water calculations in Appendix B.

2. QBAR

QBAR was calculated using the www.uksuds.com website. Using the SOIL type 3, a value of 4.3 l/s/ha was calculated. The total site area is inclusive of any large parkland areas and public open space as per the HR Wallingford website (uksuds.com). The allowable runoff for specific catchment areas is calculated on a catchment area basis. The findings of the soil testing was that the soil was reasonably suitable in certain areas for infiltration with soakaway tests generally passing.

3. Storm Events Analysed

The following Storm events have been considered:

- 1 year return period plus 20% for climate change
- 5 year return period plus 20% for climate change
- 30 year return period plus 20% for climate change
- 100 year return period plus 20% for climate change

4. Runoff Coefficients

The following runoff coefficients have been used:

Grey Roof (Selected Stone Ballast):	1.0
Hardstanding Areas (Paving, etc.):	1.0
Landscaped Areas (Grassed, etc.):	0.3

4 SuDS Measures Considered

The following is a list of the SuDS measures considered for the site.

Swales/Filter Drains/Infiltration Basin

Swales/Infiltration Basins are not being proposed for the site. There is a Filter Drain running along St. Davnet's Row. This is taking the rainwater from St. Davnet's Row only.

Permeable Paving

Permeable paving is provided for the overground car parks. The car parking spaces will have a permeable surface whereas the circulation areas will have a more traditional hard wearing impermeable surface with storage below. There are overflow pipes from each car park to a surface water pipe system to the attenuation tank.

Surface Water Attenuation

An attenuation tank is provided to the south-east of the site collecting rainwater from the building and overflows from the remainder of the site. There is also attenuation over the podium in the form of 85mm deep drainage board (such as permavoid cells or similar approved).

Rainwater Harvesting

Rainwater harvesting is not being proposed for the site.

Detention Basins, Retention Ponds, Stormwater Wetlands, etc.

Not proposed for this development.

5 Storm Network Details

The civic offices consist of a grey roof made up of selected stone. There is a drainage barrier below the stone removing the rainwater of any debris. The roof areas drain to the edges where they are collected via rainwater pipes and carried to the attenuation tank. The outflow from the attenuation tank is limited by a HydroBrake ®, limiting the flow to 4.3 l/s/ha. This attenuated flow is discharged into the new public sewer under Infirmary Hill/Quarry Walk where it flows into a new attenuation basin and the bottom of Quarry Walk. There is also a high-level overflow pipe from the attenuation tank into the public sewer in the event of a major rainfall event or an unforeseen blockage.

The car parking areas have a permeable surface with storage underneath taking rainwater from the area of the car park & a percentage of the soft landscaping uphill from it. The rainwater is infiltrated into the ground and there is an overflow pipe that drains to the Attenuation Tank in the event of a major rainfall event.

The podium area is an impermeable surface. The rainfall is collected through channels and stored under the podium where it flows to the attenuation tank.

The entrance area adjacent to St. Davnet's Row is drained to a soakaway which infiltrates into the ground.

The storm network is designed based on the Modified Rational Method where:

Q (l/s) = Cv*Cr*(2.78*I (mm/hr)*A (ha))

Cv = 0.75 and Cr = 1.3 (as recommended by the Wallingford Procedure)

The M5-60 and ratio R values were obtained from Met Eireann data for the site and can be found in Appendix B (16.1mm & 0.271 respectively).

Details of the proposed surface water drainage are detailed on CORA Drawing no. MCC-CORA-ZZ-ZZ-DR-C-0004.

6 Foul Drainage Details

We have calculated the total foul discharge from the site using the Irish Water Codes of Practice for Waste Water based on an office with a canteen (100 l/person/activity/day.)

Post Development Wastewater Loading:

Proposed number of people in the office = 210

For an Office with a canteen:

Wastewater Loading = 100 l/person/day (Irish Water Code of Practice - Appendix D).

Average = 210 x 100 = 21000 l/day

Average Discharge = 21000/(24x60x60) = 0.24 l/s (Average) DWF

Peak Discharge = 6 DWF = 6 x 0.24 = 1.44 l/s

• Emergency Wastewater Storage:

Emergency storage is based on the Average DWF for 24 hours.

21000 l/day = 21.00m³/day => Storage Required = 21.00m³ min.

Storage Tanks will be provided.

The foul sewer falls by gravity within the site to a final manhole where it then enters the new public sewer under Infirmary Hill/Quarry Walk. From here it flows down to Slí Ógie Uí Dhufaigh where it ties into the existing public sewer.

The connection point to the public sewer has been confirmed as feasible subject to upgades (including new foul sewer under proposed new road) by Uisce Eireann following a review of the pre-connection enquiry process. See Appendix D for copy of correspondence from Irish Water.

Details of the proposed foul drainage are detailed on CORA Drawing no. MCC-CORA-ZZ-ZZ-DR-C-0003.

7 Water Main

There is an existing watermain running through the site (through the proposed location of the civic offices). This will be diverted along St. Davnet's Row and Infirmary Hill. The proposed new water supply will be connected into this diverted line along Infirmary Hill.

Post Development Wastewater Loading:

It is generally accepted that design loading for foul drainage can be used to evaluate an

approximation of the water demand:

From wastewater discharge (Section 6)

Average Discharge = 0.24 l/s (DWF)

Water main demand is designed with a peak flow of 1.25 x DWF (Irish Water CoP - Cl. 3.7.2).

Peak Water Demand = 1.25 DWF = 1.25 x 0.24 = 0.3 l/s

Fire hydrants are provided throughout the site.

Details of the proposed water main are detailed on CORA Drawing no. MCC-CORA-ZZ-ZZ-DR-C-0005.

8 Flood Risk Assessment

At an early stage of the project it was decided that a detailed Flood Risk Assessment was not required due to the location & topography of the proposed site. A flood map, extracted from https://www.floodinfo.ie/map/floodmaps/, can be found in Appendix F.

9 Maintenance

The required maintenance for each of the SuDS measures on the site is outlined in the various tables below.

9.1 Attenuation Storage Tanks

Operation and maintenance requirements for attenuation storage tanks

Maintenance schedule	Required action	Typical frequency
	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly

Regular maintenance	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of the tank for sediment build-up and remove if necessary	Every 5 years or as required

9.2 Soakaways

Operation and maintenance requirements for soakaways

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect for sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	Annually
	Cleaning of gutters and any filters on downpipes	Annually (or as required based on inspections)
	Trimming any roots that may be causing blockages	Annually (or as required)
Occasional maintenance	Remove sediment and debris in pre-treatment components and floor of inspection tube or chamber and inside of concrete manhole rings	As required, based on inspections
Remedial actions	Reconstruct soakaway and/or replace or clean void fill, if performance deteriorates or failure occurs	As required
	Replacement of clogged geotextile (will require reconstruction of soakaway)	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year and then annually
	Check soakaway to ensure emptying is occurring	Annually

9.3 Permeable Pavements

Operation and maintenance requirements for permeable pavements

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Brushing and vacuuming (standard cosmetic sweep over whole surface)	Once a year after autumn leaf fall, or reduced frequency as required, based on site-specific observations of clogging or manufacturer's recommendations – pay particular attention to areas where water runs onto permeable surface from adjacent impermeable areas as this area is most likely to collect the most sediment
Occasional maintenance	Stabilise and mow contributing and adjacent areas	As required
	Removal of weeds or management using glyphospate applied directly into the weeds by an applicator rather than spraying	As required – once per year on less frequently used pavements
Remedial actions	Remediate any landscaping which, through vegetation maintenance or soil slip, has been raised to within 50mm of the level of the paving	As required
	Remedial work to any depressions, rutting and cracked or broken blocks considered detrimental to the structural performance or a hazard to users, and replace lost jointing material	As required
	Rehabilitation of structure and upper substructure by remedial sweeping	Every 10 to 15 years or as required (if infiltration performance is reduced due to significant clogging)
Monitoring	Initial inspection	Monthly for three months after installation
	Inspect for evidence of poor operation and/or weed growth – if required, take remedial action	Three monthly, 48hrs after large storms in first six months
	Inspect silt accumulation rates and establish appropriate brushing frequencies	Annually
	Monitor inspection chambers	Annually

Appendix A – CORA Drainage Drawings

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REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
IW1	IRISH WATER PRE-CONNECTION ENQUIRY	22/03/2023	JPC	JFC
IW2	IRISH WATER PRE-CONNECTION ENQUIRY	30/05/2023	JPC	JFC
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

Drawing Stage:

PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	FEB '23

Project Name: CIVIC OFFICES

Scale: 1:1000 @ A1

Project Number: 2223

Drawing Title: SITE LOCATION PLAN

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0001		PL2

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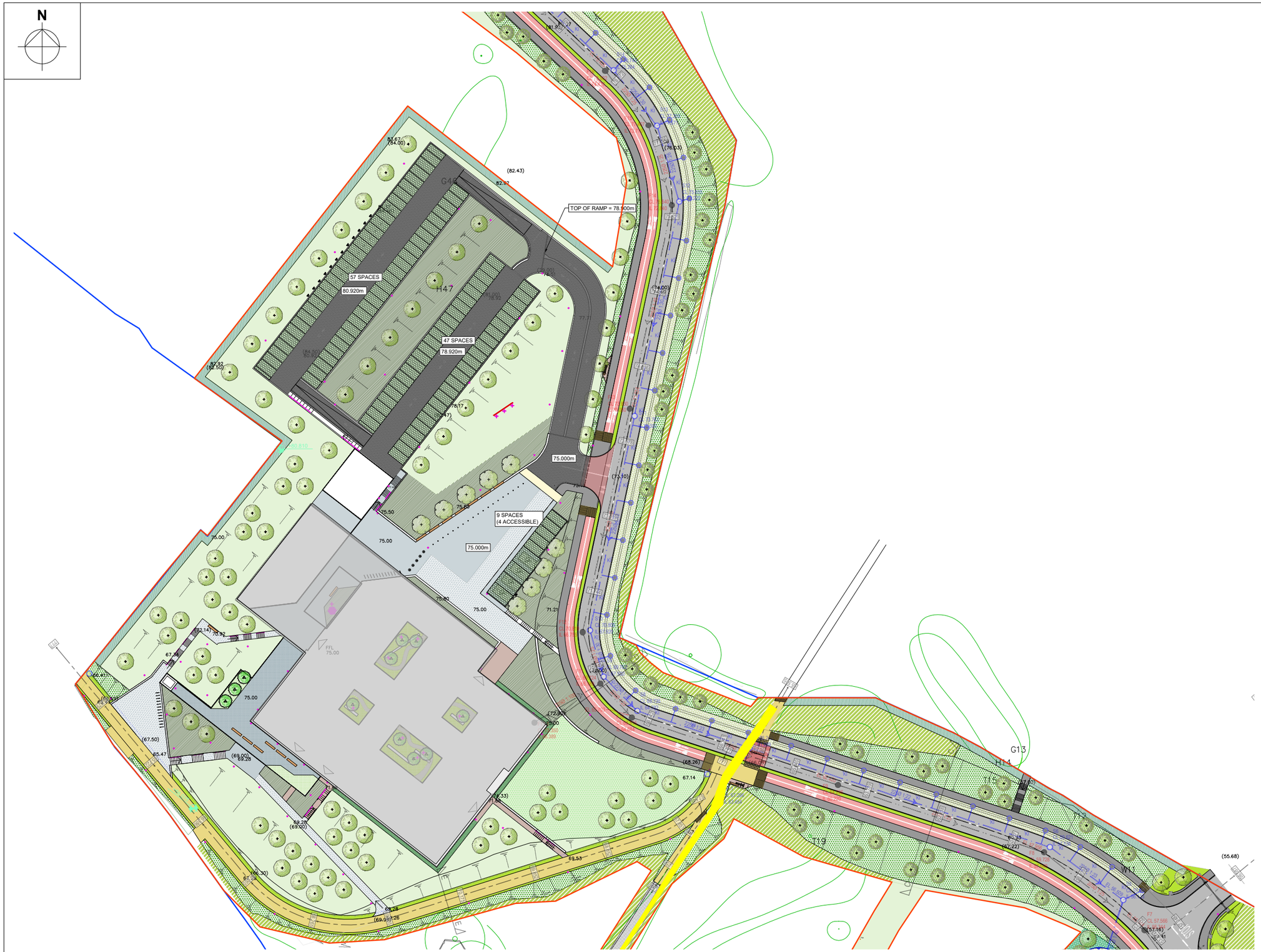
REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

TOTAL NO. OF CAR PARK SPACES =112



Drawing Stage:	Project Details:		Notes	Drawn by:	Checked by:	Approved by:	Date:	CORA CONSULTING ENGINEERS	Behan House, 10 Lower Mount Street, Dublin 2. D02 HT71 Tel: +353 1 661 1100 e-mail: info@cora.ie Web: www.cora.ie				
PRE-PLANNING	Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN		JPC	KO'M	JFC	FEB '23						
	Client:	MONAGHAN COUNTY COUNCIL		Project Name: CIVIC OFFICES			Scale: 1:500 @ A1	Project Number: 2223					
	Architect:	HENRY J LYONS ARCHITECTS		Drawing Title: OVERALL SITE PLAN			Project: MCC	Originator: CORA	Zone: ZZ	Level: ZZ	Type: DR	Discipline: C	Drawing No: 0002	Stage:	Revision: PL2
	M&E Designer:												
	Contractor:												

PROPOSED FOUL SEWER MANHOLE SCHEDULE

MANHOLE REF.	MANHOLE DETAILS	EASTING (m)	NORTHING (m)
FSMH 01	CL = 75.000 IL = 74.220 F 1.001 : IL = 74.220	667434.537	833811.477
FSMH 02	CL = 75.000 IL = 73.897 F 1.001 : IL = 73.897 F 1.002 : IL = 73.897	667454.879	833795.497
FSMH 03	CL = 74.755 IL = 73.578 F 1.002 : IL = 73.578 F 1.003 : IL = 73.578	667474.964	833779.718
FSMH 04	CL = 74.807 IL = 73.488 F 2.001 : IL = 73.920 F 1.003 : IL = 73.488 F 1.004 : IL = 73.488	667479.398	833785.375
FSMH 05	CL = 74.012 IL = 71.839 F 1.004 : IL = 73.327 F 1.005 : IL = 71.839	667487.333	833795.498
FSMH 06	CL = 75.000 IL = 74.170 F 2.001 : IL = 74.170	667459.403	833801.088
FSMH OUTFALL	CL = 72.356 IL = 71.758 F 1.005 : IL = 71.758	667492.925	833798.804

PROPOSED FOUL SEWER PIPE DETAILS

PIPE NAME	SIZE (mm)	PLAN LENGTH (m)	SLOPE	START IL (m)	END IL (m)
F 1.001	110Ø : uPVC	25.868	1:80	74.220	73.897
F 1.002	110Ø : uPVC	25.542	1:80	73.897	73.578
F 1.003	150Ø : uPVC	7.188	1:80	73.578	73.488
F 1.004	150Ø : uPVC	12.862	1:80	73.488	73.327
F 1.005	150Ø : uPVC	6.497	1:80	71.839	71.758
F 2.001	110Ø : uPVC	25.431	1:102	74.170	73.920

REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
IW1	IRISH WATER PRE-CONNECTION ENQUIRY	22/03/2023	JPC	JFC
IW2	IRISH WATER PRE-CONNECTION ENQUIRY	30/05/2023	JPC	JFC
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

FOUL SEWER DRAINAGE LEGEND

- FOUL SEWER (EXISTING)
- FOUL SEWER (NEW)
- FOUL SEWER (SLUNG FROM GROUND FLOOR SLAB)
- FOUL SEWER RISING MAIN
- EXISTING SEWER TO BE DECOMISSIONED
- EX. FSMH (EXISTING FOUL SEWER MANHOLE)
- FSMH (NEW FOUL SEWER MANHOLE)
- MH (EXISTING MANHOLE TO BE DEMOLISHED)
- P.U. POP UP
- SVP SOIL VENT PIPE
- F.S.I.C. F.S.I.C. (FOUL SEWER INSPECTION CHAMBER)
- ACO ACO DRAINAGE CHANNEL
- F.G. FLOOR GULLY

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	FEB '23

Project Name: CIVIC OFFICES
Scale: 1:500 @ A1
Project Number: 2223

Drawing Title: OVERALL SITE DRAINAGE PLAN FOUL SEWER

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0003		PL2

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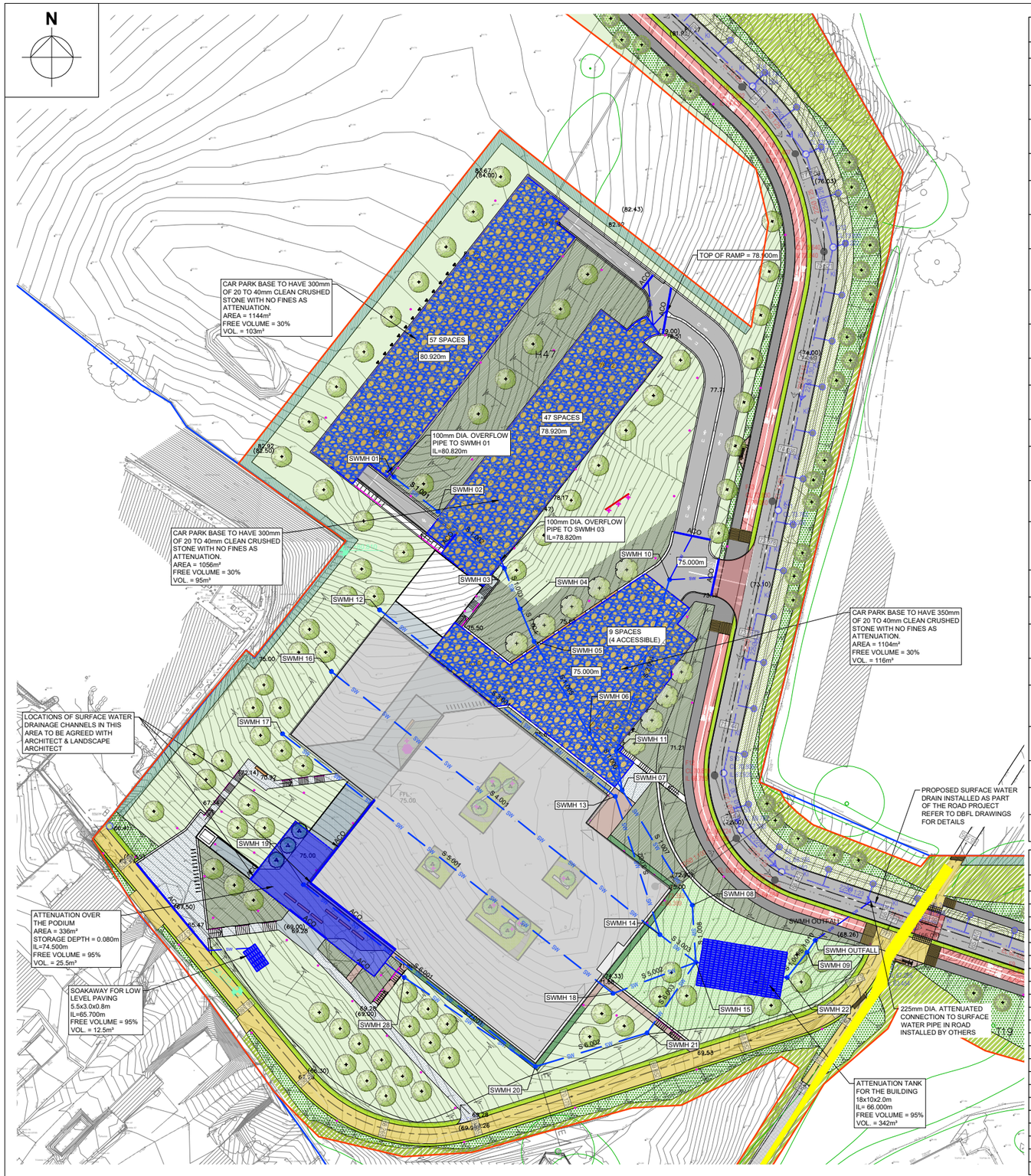

PROPOSED SURFACE WATER MANHOLE SCHEDULE

MANHOLE REF.	MANHOLE DETAILS	EASTING (m)	NORTHING (m)
SWMH 01	CL = 80.878 IL = 80.420 S 1.001 : IL = 80.420	667428.764	833886.801
SWMH 02	CL = 79.157 IL = 78.420 S 1.001 : IL = 78.632 S 1.002 : IL = 78.420	667438.147	833879.447
SWMH 03	CL = 78.854 IL = 76.530 S 1.002 : IL = 78.327 S 1.003 : IL = 76.530	667452.257	833867.375
SWMH 04	CL = 77.350 IL = 75.000 S 1.004 : IL = 75.000	667455.625	833858.736
SWMH 05	CL = 75.673 IL = 74.500 S 1.004 : IL = 74.962 S 1.005 : IL = 74.500	667458.582	833851.800
SWMH 06	CL = 75.000 IL = 73.610 S 1.005 : IL = 74.385 S 1.006 : IL = 73.610	667470.399	833832.144
SWMH 07	CL = 75.000 IL = 71.779 S 1.006 : IL = 73.541 S 2.002 : IL = 73.646 S 1.007 : IL = 71.779	667477.353	833820.135
SWMH 08	CL = 72.332 IL = 68.208 S 1.007 : IL = 71.477 S 1.008 : IL = 68.208	667492.288	833795.653
SWMH 09	CL = 68.845 IL = 65.986 S 1.009 : IL = 65.986 S 1.010 : IL = 65.986	667516.696	833785.580
SWMH 10	CL = 75.000 IL = 74.400 S 2.001 : IL = 74.400	667487.433	833864.941
SWMH 11	CL = 75.000 IL = 73.732 S 2.001 : IL = 74.209 S 2.002 : IL = 73.732	667476.112	833828.482
SWMH 12	CL = 75.945 IL = 70.449 S 3.001 : IL = 70.449	667425.701	833858.513
SWMH 13	CL = 75.000 IL = 70.304 S 3.001 : IL = 70.324 S 3.002 : IL = 70.304	667475.879	833818.785
SWMH 14	CL = 73.130 IL = 70.220 S 3.002 : IL = 70.240 S 4.001 : IL = 73.188 S 3.003 : IL = 70.220	667485.383	833789.370
SWMH 15	CL = 71.657 IL = 67.963 S 3.003 : IL = 70.211 S 5.002 : IL = 71.212 S 6.003 : IL = 69.561 S 1.008 : IL = 67.963	667493.053	833783.459
SWMH 16	CL = 75.931 IL = 74.093 S 4.001 : IL = 74.093	667415.435	833845.415
SWMH 17	CL = 74.303 IL = 73.390 S 5.001 : IL = 73.390	667405.017	833832.123
SWMH 18	CL = 73.880 IL = 71.250 S 5.001 : IL = 73.211 S 5.002 : IL = 71.250	667475.395	833776.836
SWMH 19	CL = 75.000 IL = 69.815 S 6.001 : IL = 69.815	667409.479	833800.005
SWMH 20	CL = 75.000 IL = 69.669 S 6.001 : IL = 69.690 S 7.001 : IL = 74.920 S 6.002 : IL = 69.669	667458.885	833761.279
SWMH 21	CL = 72.483 IL = 69.603 S 6.002 : IL = 69.623 S 6.003 : IL = 69.603	667482.648	833768.420
SWMH 22	CL = 68.830 IL = 66.000 S 1.009 : IL = 66.000	667512.479	833780.240
SWMH 28	CL = 72.345 IL = -0.075 S 7.001 : IL = -0.075	667430.956	833780.233
SWMH OUTFALL	CL = 68.824 IL = 65.980 S 1.010 : IL = 65.980	667518.449	833788.135

PROPOSED SURFACE WATER PIPE DETAILS

PIPE NAME	SIZE (mm)	PLAN LENGTH (m)	SLOPE	START IL (m)	END IL (m)
S 1.001	100⌀ : uPVC	11.921	1:7	80.420	78.632
S 1.002	100⌀ : uPVC	18.570	1:200	78.420	78.327
S 1.003	100⌀ : uPVC	9.272	1:200	76.530	76.483
S 1.004	100⌀ : uPVC	7.539	1:200	75.000	74.962
S 1.005	100⌀ : uPVC	22.935	1:200	74.500	74.385
S 1.006	100⌀ : uPVC	13.877	1:200	73.610	73.541
S 1.007	225⌀ : uPVC	28.678	1:95	71.779	71.477
S 1.008	225⌀ : uPVC	12.218	1:50	68.208	67.963
S 1.009	225⌀ : uPVC	6.805	1:500	66.000	65.986
S 1.010	225⌀ : uPVC	3.098	1:500	65.986	65.980
S 2.001	225⌀ : uPVC	38.176	1:200	74.400	74.209
S 2.002	225⌀ : uPVC	8.439	1:98	73.732	73.646
S 3.001	225⌀ : uPVC	64.001	1:513	70.449	70.324
S 3.002	225⌀ : uPVC	30.913	1:482	70.304	70.240
S 3.003	225⌀ : uPVC	9.683	1:1038	70.220	70.211
S 4.001	225⌀ : uPVC	89.632	1:99	74.093	73.188
S 5.001	225⌀ : uPVC	89.497	1:500	73.390	73.211
S 5.002	225⌀ : uPVC	18.859	1:500	71.250	71.212
S 6.001	225⌀ : uPVC	62.774	1:500	69.815	69.690
S 6.002	225⌀ : uPVC	24.812	1:548	69.669	69.623
S 6.003	225⌀ : uPVC	18.288	1:428	69.603	69.561
S 7.001	150⌀ : uPVC	33.754	1:0	-0.075	74.920

REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

SURFACE WATER DRAINAGE LEGEND

- SURFACE WATER SEWER (EXISTING)
- SURFACE WATER SEWER (NEW)
- SURFACE WATER (SLUNG FROM GROUND FLOOR SLAB)
- SURFACE WATER RISING MAIN
- EXISTING SEWER TO BE DECOMISSIONED
- EX. SWMH (EXISTING SURFACE WATER MANHOLE)
- SWMH (NEW SURFACE WATER MANHOLE)
- MH (EXISTING MANHOLE TO BE DEMOLISHED)
- RWP — RAIN WATER DOWN PIPE
- S.W.I.C. — S.W.I.C. (SURFACE WATER INSPECTION CHAMBER)
- F.G. — FLOOR GULLY
- ACO — ACO / SLOT DRAINAGE CHANNEL

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	FEB '23

Project Name: CIVIC OFFICES

Scale: 1:500 @ A1

Project Number: 2223

Drawing Title: OVERALL SITE DRAINAGE PLAN SURFACE WATER

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0004		PL2

CORA CONSULTING ENGINEERS
Behan House,
10 Lower Mount Street,
Dublin 2. D02 HT71
Tel: +353 1 661 1100
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N

REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

WATERMAIN LEGEND

- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- EXISTING SEWER TO BE DECOMMISSIONED
- NEW FIRE HYDRANT
- NEW SLUICE VALVE
- NEW AIR VALVE
- NEW SCOUR VALVE
- NEW WASHOUT HYDRANT
- NEW METER
- NEW BULK METER

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	FEB '23

Project Name: CIVIC OFFICES

Scale: 1:1000 @ A1

Project Number: 2223

Drawing Title: OVERALL SITE WATERMAIN PLAN

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0005		PL2

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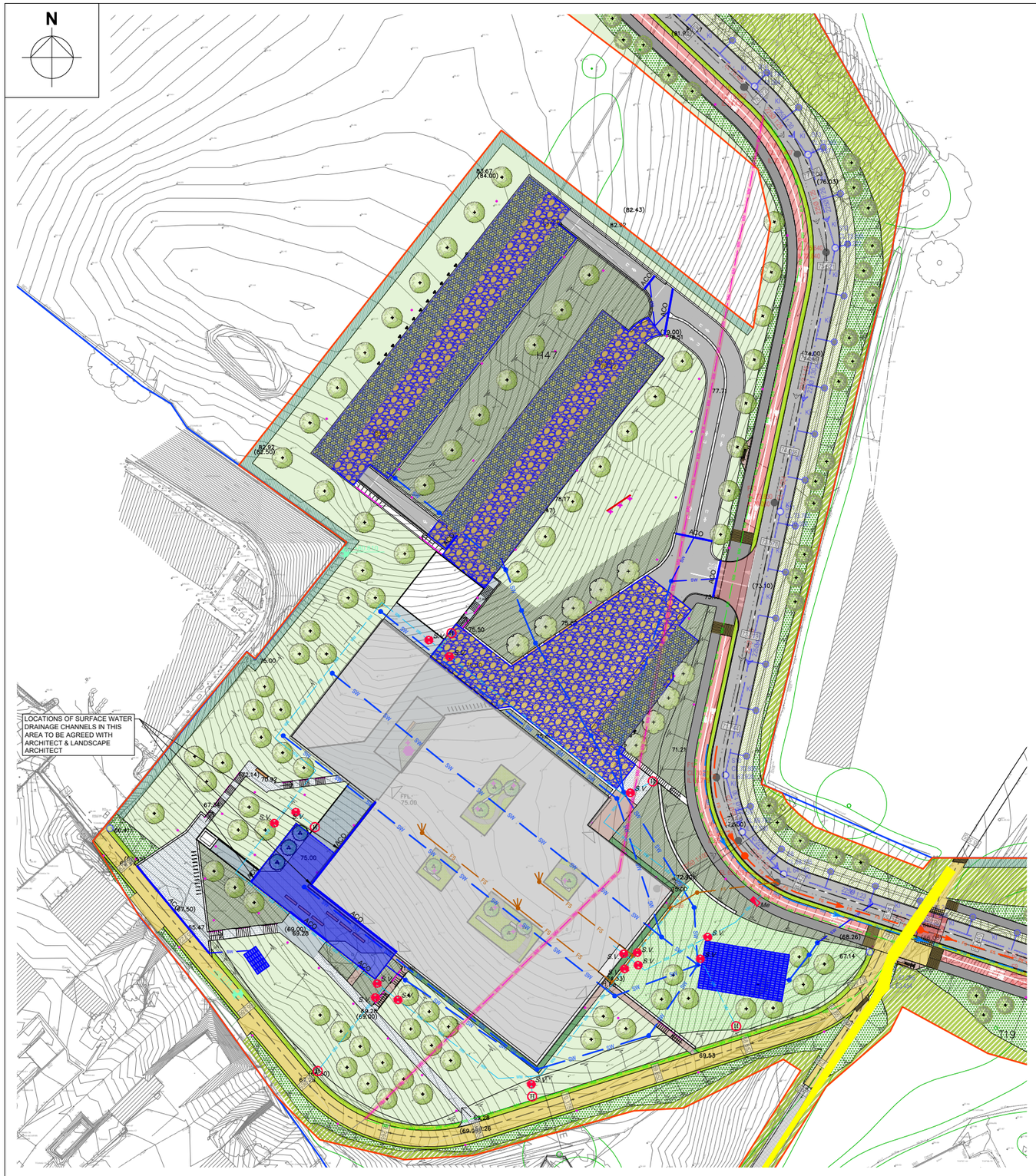

REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

DRAINAGE LEGEND:

- SW — EXISTING SURFACE WATER MANHOLE & PIPE
- FS — EXISTING FOUL SEWER MANHOLE & PIPE
- CS — EXISTING COMBINED SEWER MANHOLE & PIPE
- SW — PROPOSED SURFACE WATER MANHOLE & PIPE
- FS — PROPOSED FOUL SEWER MANHOLE & PIPE
- WM — EXISTING WATER MAIN TO BE RETAINED
- EXISTING WATER MAIN TO BE DEMOLISHED
- WM — PROPOSED DIVERTED WATER MAIN (BY DBFL)
- WM — PROPOSED BUILDING WATER MAIN
- P.U. — FOUL SEWER POP-UP
- F.S.A.J. — FOUL SEWER ADJACENT JUNCTION
- F.G. — FLOOR GULLY
- FS — FOUL SEWER RISING MAIN
- ACO CHANNEL / SLOT DRAIN
- PROPOSED SURFACE WATER ATTENUATION TANK
- PROPOSED RAINWATER HARVESTING TANK (RWHT)
- PROPOSED GREASE TRAP

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	FEB '23

Project Name: CIVIC OFFICES

Scale: 1:500 @ A1

Project Number: 2223

Drawing Title: OVERALL SITE PLAN COMBINED SERVICES

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0006		PL2

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N

EXISTING 150mm DIA. WATERMAIN

EXISTING 150mm DIA. WATERMAIN

150mm DIA. CONNECTION TO FOUL DRAINAGE PIPE IN ROAD

NEW 225mmØ FOUL PIPE IN ROAD

BACKDROP IL=67.865

FSMH CL=69.065 IL=65.755

BACKDROP IL=64.925

FSMH CL=66.125 IL=62.365

BACKDROP IL=61.890

FSMH CL=63.090 IL=60.135

BACKDROP IL=59.800

FSMH CL=61.000 IL=57.750

BACKDROP IL=57.365

FSMH CL=58.565 IL=56.370

FSMH CL=56.945 IL=55.670

FSMH CL=56.780 IL=55.545

FSMH CL=56.115 IL=54.955

FSMH CL=56.145 IL=54.690

SMH0110571 CL=57.13 IL=54.25 (Estimated)

REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
IW1	IRISH WATER PRE-CONNECTION ENQUIRY	29/05/2023	JPC	JFC
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

DRAINAGE LEGEND:

- EXISTING SURFACE WATER MANHOLE & PIPE
- EXISTING FOUL SEWER MANHOLE & PIPE
- EXISTING COMBINED SEWER MANHOLE & PIPE
- PROPOSED SURFACE WATER MANHOLE & PIPE
- PROPOSED FOUL SEWER MANHOLE & PIPE
- EXISTING WATER MAIN TO BE RETAINED
- EXISTING WATER MAIN TO BE DEMOLISHED
- PROPOSED DIVERTED WATER MAIN (BY DBFL)
- PROPOSED BUILDING WATER MAIN
- P.U. FOUL SEWER POP-UP
- F.S.A.J. FOUL SEWER ADJACENT JUNCTION
- F.G. FLOOR GULLY
- FOUL SEWER RISING MAIN
- ACO CHANNEL / SLOT DRAIN
- PROPOSED SURFACE WATER ATTENUATION TANK
- PROPOSED RAINWATER HARVESTING TANK (RWHT)
- PROPOSED GREASE TRAP

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	FEB '23

Project Name: CIVIC OFFICES

Scale: 1:1000 @ A1

Project Number: 2223

Drawing Title: OVERALL SITE FOUL SEWER PLAN

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0007		PL2

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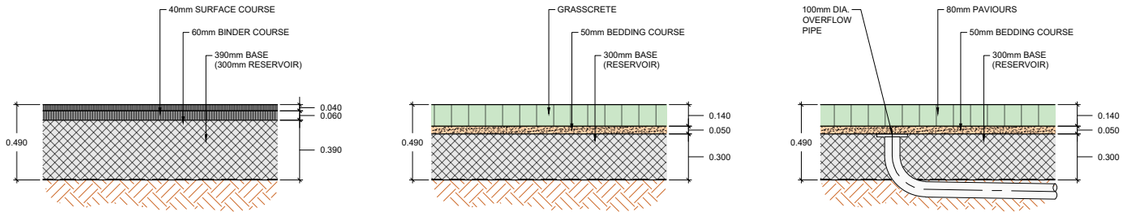
REVISION SCHEDULE				
REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

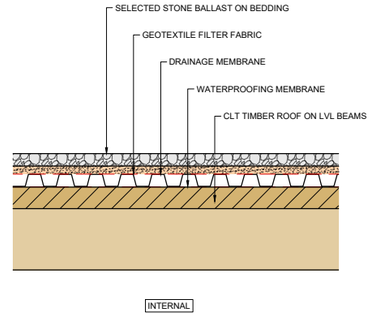


ASPHALT AREAS

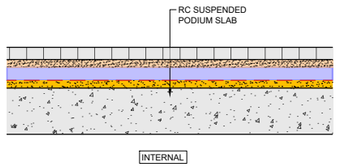
PERMEABLE PAVING AREAS

OVERFLOW PIPE IN PERMEABLE PAVING

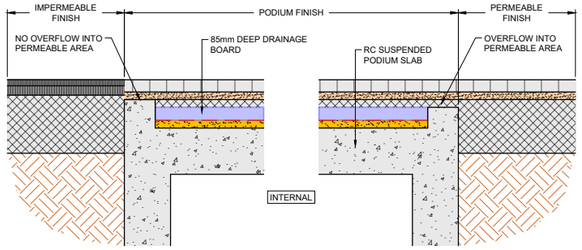
1 - TYPICAL DETAILS OF CAR PARK
SCALE 1:20



2 - TYPICAL SECTION AT ROOF LEVEL
SCALE 1:20



3 - TYPICAL SECTION OVER PODIUM
SCALE 1:20



4 - TYPICAL SECTION THROUGH EDGE OF PODIUM
SCALE 1:20

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	AUG '23

Project Name: CIVIC OFFICES
Scale: 1:20 @ A1
Project Number: 2223
Drawing Title: SITE SECTIONS & DETAILS SHEET 1

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0008		PL2

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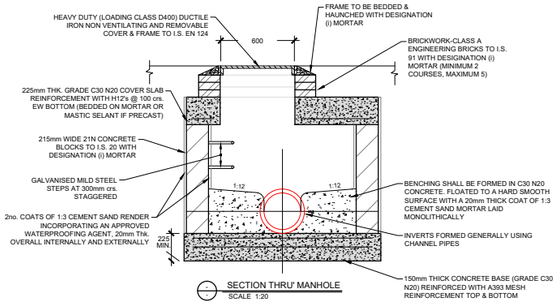
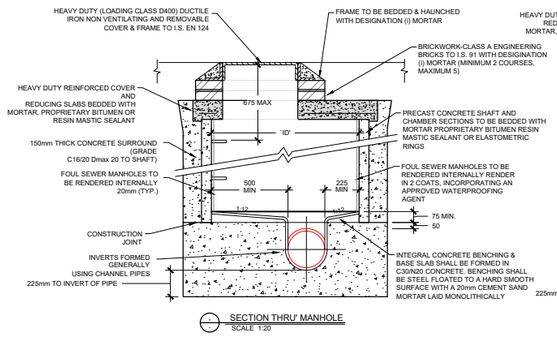
REVISION SCHEDULE

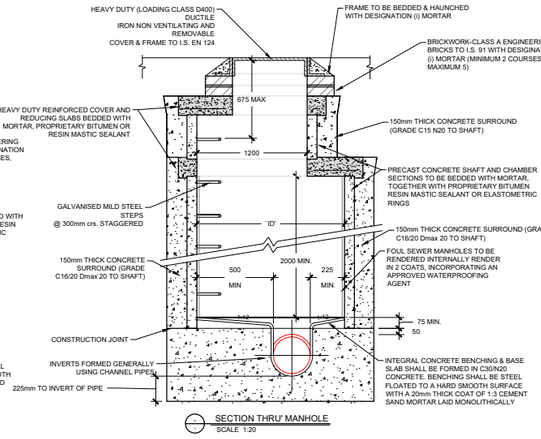
REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC



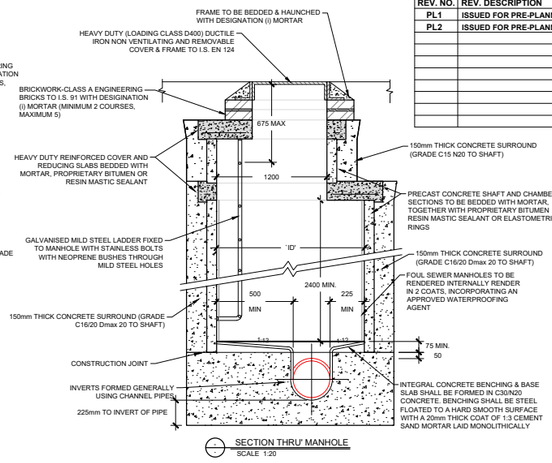
SECTION THRU' MANHOLE
SCALE 1:20



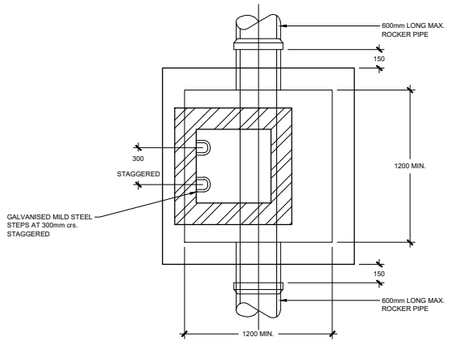
SECTION THRU' MANHOLE
SCALE 1:20



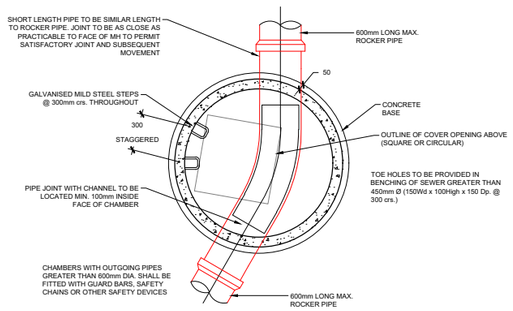
SECTION THRU' MANHOLE
SCALE 1:20



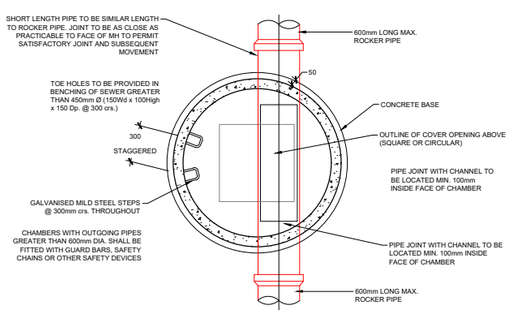
SECTION THRU' MANHOLE
SCALE 1:20



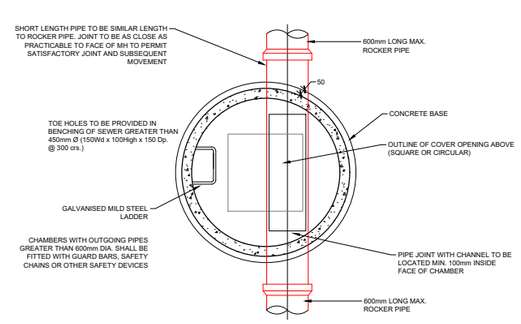
PLAN ON MANHOLE (TYPE A)
SCALE 1:20
(1m DEEP, COVER LEVEL TO PIPE SOFFIT)



PLAN ON MANHOLE (TYPE C)
SCALE 1:20
(1m TO 3m DEEP, COVER LEVEL TO PIPE SOFFIT) (FOR INTERNAL DIAMETER OF MANHOLE (I.D.) REFER TO SCHEDULE.)



PLAN ON MANHOLE (TYPE D)
SCALE 1:20
(3 TO 5m DEEP, COVER LEVEL TO PIPE SOFFIT) (FOR INTERNAL DIAMETER OF MANHOLE (I.D.) REFER TO SCHEDULE)



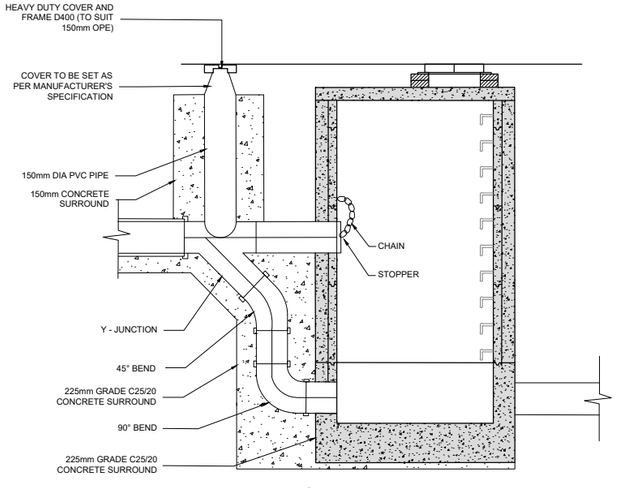
PLAN ON MANHOLE (TYPE E)
SCALE 1:20
(5 TO 6m DEEP, COVER LEVEL TO PIPE SOFFIT) (FOR INTERNAL DIAMETER OF MANHOLE (I.D.) REFER TO SCHEDULE.)

MANHOLE - INTERNAL DIMENSIONS

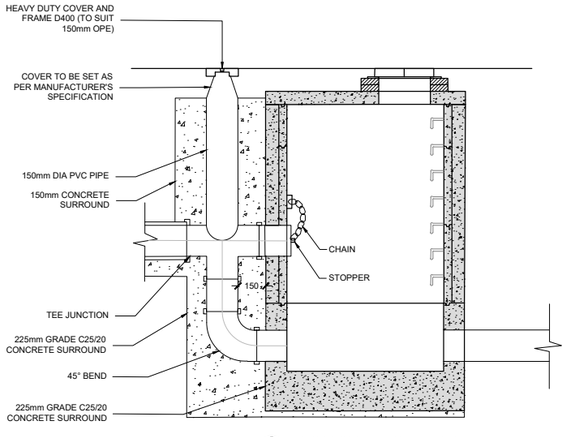
PIPE Ø (mm)	MANHOLE TYPE			
	A	C	D	E
UP TO 225	1200 x 1200	1200Ø		
300	1200 x 1200	1200Ø	1200Ø	1200Ø
375	1200 x 1200	1350Ø	1350Ø	1350Ø
450	1200 x 1200	1350Ø	1350Ø	1350Ø
525	1200 x 1200	1500Ø	1500Ø	1500Ø
600		1500Ø	1500Ø	1500Ø
675		1500Ø	1500Ø	1500Ø
750		1500Ø	1500Ø	1500Ø
900		1500Ø	1500Ø	1500Ø

NOTES

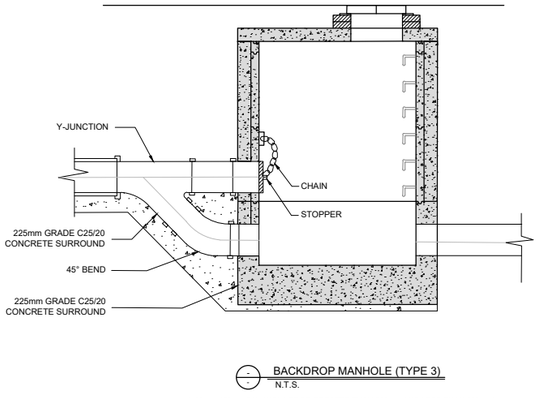
1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. RODDING EYE CHAMBER SHALL BE COVERED WITH APPROVED HEAVY DUTY METAL COVERS TO IS 261 AND BS 5834. COVER AND FRAME SHALL BE SUITABLE FOR ROAD AND TRAFFIC CONDITIONS AND IS SUBJECT TO THE APPROVAL OF IRISH WATER.
3. ALL CHAMBERS TO BE CHECKED FOR UPLIFT BY THE DEVELOPER BASED ON GROUND CONDITIONS WITHIN THE SITE. SHOULD ANTI FLOATATION MEASURES BE REQUIRED THEY SHALL BE SUBJECT TO APPROVAL FROM IRISH WATER.
4. ALL CONCRETE TO BE IN ACCORDANCE WITH IS EN 206.
5. MANHOLE DETAILS TO BE IN ACCORDANCE WITH IRISH WATER STANDARDS.



BACKDROP MANHOLE (TYPE 1)
N.T.S.
(150mm-450mm DIA (INCL.) DROP GREATER THAN 1700mm)
(500mm-900mm DIA (INCL.) DROP GREATER THAN 2300mm)



BACKDROP MANHOLE (TYPE 2)
N.T.S.
(150mm-450mm DIA (INCL.) DROP GREATER THAN 900mm AND LESS THAN 1700mm)
(500mm-900mm DIA (INCL.) DROP GREATER THAN 1300mm AND LESS THAN 2300mm)



BACKDROP MANHOLE (TYPE 3)
N.T.S.
(150mm-450mm DIA (INCL.) DROP GREATER THAN 600mm AND LESS THAN 900mm)
(500mm-900mm DIA (INCL.) DROP GREATER THAN 600mm AND LESS THAN 1300mm)

Drawing Stage:

PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

1. ALL ENGINEERS DRAWINGS TO BE READ IN CONJUNCTION WITH RELEVANT DRAWINGS AND SPECIFICATIONS.
2. ALL SETTING OUT TO ARCHITECTS DRAWINGS.
3. DO NOT SCALE FROM ENGINEERS DRAWINGS.
4. ANY DISCREPANCIES BETWEEN DRAWINGS, SKETCHES, VERBAL INSTRUCTIONS AND SITE CONDITIONS TO BE REFERRED TO THE DESIGN TEAM BEFORE WORK COMMENCES.
5. ALL LEVELS ARE STRUCTURAL UNLESS NOTED OTHERWISE.

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	MAR '23

Project Name: CIVIC OFFICES — Scale: A.S. @ A1 — Project Number: 2223

Drawing Title: STANDARD DRAINAGE DETAILS SHEET 1

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0011		PL2

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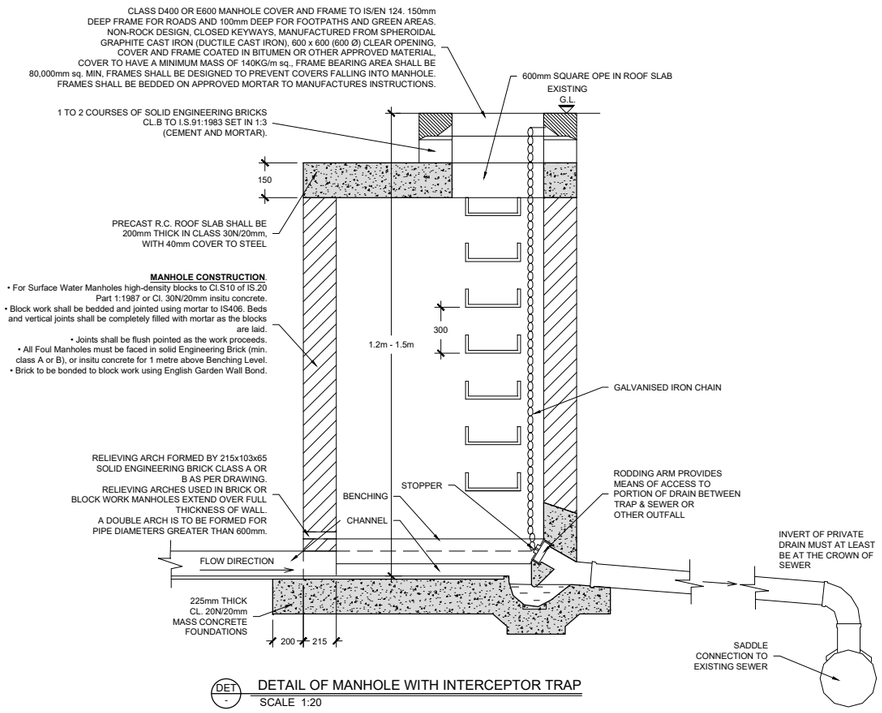
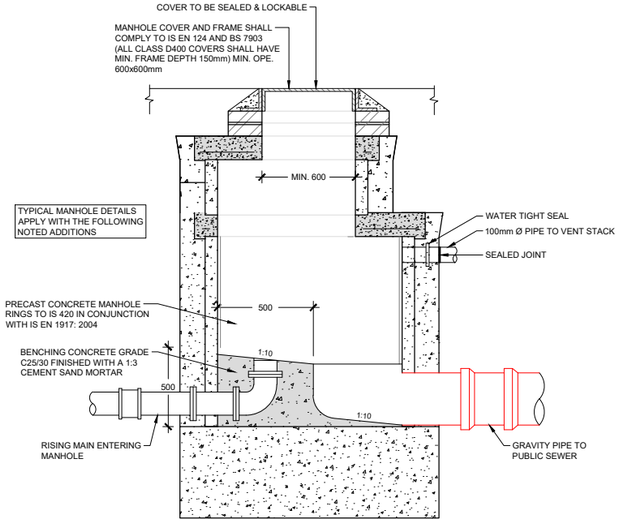
REVISION SCHEDULE

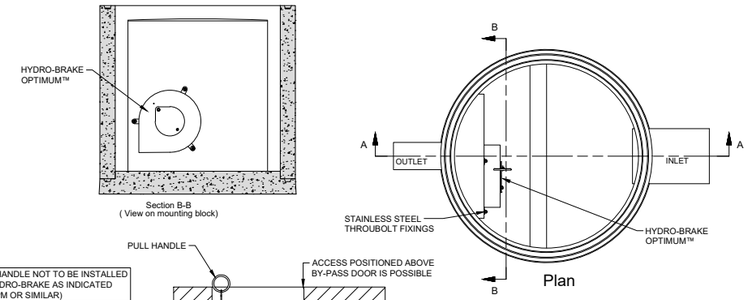
REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC



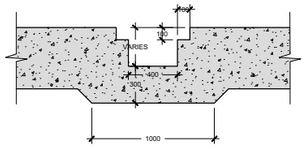
DET — DETAIL OF MANHOLE WITH INTERCEPTOR TRAP
SCALE 1:20



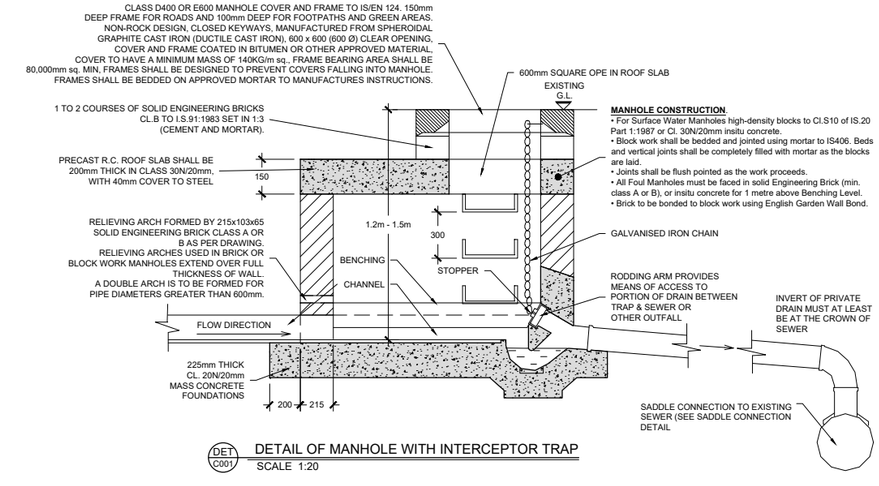
SECTION THRU' RISING MAIN DISCHARGE MANHOLE
SCALE 1:20



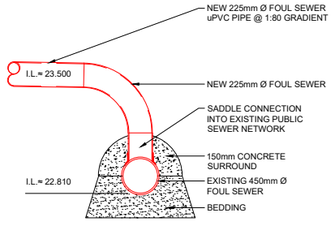
TYPICAL HYDRO-BRAKE DETAILS FOR FINAL SURFACE WATER MANHOLE
SCALE 1:20
(FOR HYDRO-BRAKE MANHOLE REFERENCES REFER TO DRG. C001 & C002.)



TYPICAL INSPECTION CHAMBER DETAIL
SCALE 1:20



DET C001 — DETAIL OF MANHOLE WITH INTERCEPTOR TRAP
SCALE 1:20



SADDLE CONNECTION
SCALE 1:20

VIEW OF HYDRO-BRAKE & PENSTOCK VALVE AS SUPPLIED BY CPM
SCALE N.T.S.

Drawing Stage:	Project Details:	
PRE-PLANNING	Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
	Client:	MONAGHAN COUNTY COUNCIL
	Architect:	HENRY J LYONS ARCHITECTS
	M&E Designer:	
	Contractor:	

Notes

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6. ALL LEVELS ARE STRUCTURAL UNLESS NOTED OTHERWISE.

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	MAR '23

Project Name: CIVIC OFFICES — Scale: 1:20 @ A1 — Project Number: 2223

Drawing Title: STANDARD DRAINAGE DETAILS SHEET 2

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0012		PL2

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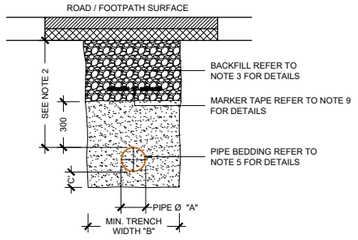
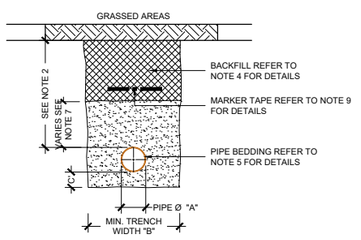
NOTES

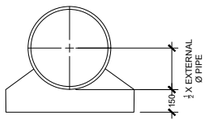
1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. THE MINIMUM DEPTH OF COVER FROM THE FINISHED SURFACE TO THE CROWN OF GRAVITY PIPES WITHOUT PROTECTION SHOULD BE AS FOLLOWS:
   A) GARDENS AND PATHWAYS WITHOUT ANY POSSIBILITY OF VEHICULAR ACCESS -DEPTH NOT LESS THAN 0.5m (THIS WOULD NORMALLY RELATE TO DRAINS IN PRIVATE PROPERTY, SHALLOW PIPES OF THIS NATURE ARE UNDESIRABLE AND SHOULD BE INSTALLED IN ACCORDANCE WITH THE CURRENT BUILDING REGULATIONS)
   B) DRIVEWAYS, PARKING AREAS AND YARDS WITH HEIGHT RESTRICTIONS TO PREVENT ENTRY BY VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES - DEPTH NOT LESS THAN 0.75m.
   C) DRIVEWAYS, PARKING AREAS AND NARROW STREETS WITHOUT FOOTWAYS (E.G. MEWS DEVELOPMENTS) WITH LIMITED ACCESS FOR VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES - DEPTH NOT LESS THAN 0.9m
   D) DEPTHS OF SEWERS IN GATED ESTATES SHALL BE SIMILAR TO THAT OUTLINED ABOVE.
   E) AGRICULTURAL LAND AND PUBLIC OPEN SPACE - DEPTH NOT LESS THAN 0.9m
   F) OTHER HIGHWAYS AND PARKING AREAS WITH UNRESTRICTED ACCESS TO VEHICLES WITH A GROSS VEHICLE WEIGHT IN EXCESS OF 7.5 TONNES - DEPTH NOT LESS THAN 1.2m
3. CLAUSE 808 MATERIAL IN ACCORDANCE WITH THE NATIONAL ROADS AUTHORITY SPECIFICATION FOR ROAD WORKS IS TO BE USED AS BACKFILL MATERIAL WHERE THE SEWER MAIN IS LOCATED IN ROADS, FOOTPATHS OR WHEN THE NEAREST PART OF THE TRENCH IS WITHIN 1m OF THE PAVED EDGE OF THE ROADWAY. CLAUSE 808 IS TO BE COMPACTED AS PER CLAUSE 802 OF THE NATIONAL ROADS AUTHORITY SPECIFICATION FOR ROAD WORKS.
4. SELECTED EXCAVATED MATERIAL MAY BE USED IN GREEN-FIELD AREAS ABOVE GRANULAR PIPE SURROUND MATERIAL SUBJECT TO THE APPROVAL OF IRISH WATER.
5. PIPE BEDDING SHALL COMPLY WITH WIS-08-02 AND IGN 4-08-01 GRANULAR MATERIAL SHALL BE 14mm TO 5mm GRADED AGGREGATE OR 10mm SINGLE SIZED AGGREGATE IS EN 13242. CONCRETE BED, HAUNCH & SURROUND, WHERE REQUIRED SHALL BE TO IRISH WATER STANDARDS.
6. IN SOFT GROUND CONDITIONS (CBR <5) THE MATERIAL SHOULD BE EXCAVATED AND DISPOSED OF IN ACCORDANCE WITH THE WASTE MANAGEMENT ACT AND CLAUSE 808 MATERIAL IN ACCORDANCE WITH THE NATIONAL ROADS AUTHORITY SPECIFICATION FOR ROAD WORKS SHALL REPLACE THE EXCAVATED MATERIAL, WRAPPED IN GEO-TEXTILE WRAPPING, ALTERNATIVELY, SPECIAL PIPE SUPPORT ARRANGEMENTS, INCLUDING PILING ETC. MAY BE REQUIRED WHERE THE DEPTH OF SOFT MATERIAL IS EXCESSIVE. SUCH ARRANGEMENTS SHALL BE SUBJECT TO ASSESSMENT BY IRISH WATER BEFORE ADVANCING WITH THE WORK.
7. IN GREEN FIELD AREAS, TYPE B BACKFILL (SELECTED EXCAVATED MATERIAL) WILL BE ALLOWED ABOVE THE SIDE HAUNCH GRANULAR MATERIAL IN THE CASE OF RIGID PIPES. A GRANULAR SURROUND OF A MINIMUM DEPTH OF 150mm ABOVE THE CROWN OF THE PIPE IS REQUIRED FOR FLEXIBLE PIPES, AND TYPE B MATERIAL MAY BE USED AS BACKFILL ABOVE THIS. ALL RISING MAINS IN GREENFIELD AREAS SHALL HAVE A MINIMUM COVER OF 300mmOF GRANULAR MATERIAL ABOVE THE EXTERNAL CROWN OF THE PIPE.
8. PIPES SHALL NOT BE SUPPORTED ON STONES, ROCKS OR ANY HARD OBJECTS AT ANY POINT ALONG THE TRENCH, ROCK SHALL BE EXCAVATED TO A DEPTH OF 150mm BELOW THE ACTUAL DEPTH OF THE TRENCH WITH THE VOID FILLED WITH CLAUSE 808 MATERIAL IN ACCORDANCE WITH THE NATIONAL ROADS AUTHORITY SPECIFICATION FOR ROAD WORKS. THE GRANULAR MATERIAL SHALL BE LAID ABOVE THIS VOID BACKFILL MATERIAL.
9. NON DEGRADABLE MARKER TAPE SHOULD BE INSTALLED AT TOP OF PIPE BEDDING LAYER. IN THE CASE OF NON METAL PIPE MATERIAL, THE TAPE SHOULD INCORPORATE A TRACE WIRE WHICH IS LINKED TO FITTINGS AND TERMINATED AT THE WASTE WATER PUMPING STATION AND DISCHARGE MANHOLE.
10. TRENCH WIDTHS FOR PIPE SIZES ≤80mm MAY BE <500mm, SUBJECT TO CONSIDERATION BEING GIVEN TO THE TRENCH DEPTH, HEALTH & SAFETY & CONSTRUCTION ACCESS TO REQUIREMENTS.



CROSS SECTION IN ROADS
N.T.S



CROSS SECTION IN GRASSED AREAS
N.T.S



TYPE 'A'
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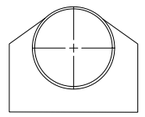

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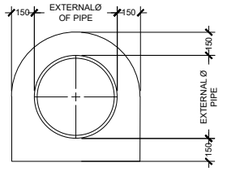

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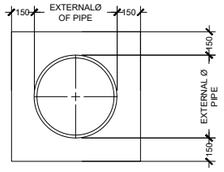
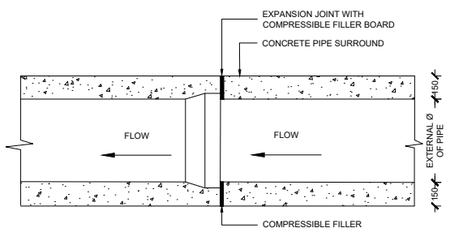


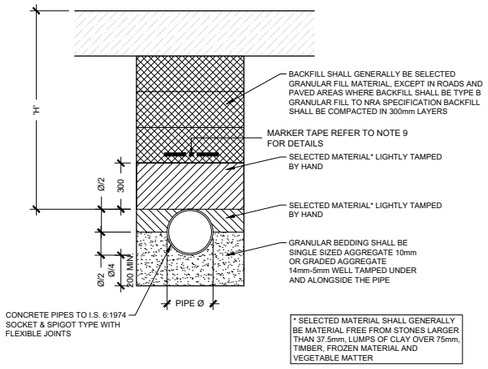
TYPE 'D'
N.T.S.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. CONCRETE PIPE BEDS AND HAUNCHES MAY BE REQUIRED TO ADDRESS MINIMUM COVER SITUATIONS, AND SHALL BE SUBJECT TO SUBMISSION AND ASSESSMENT BY IRISH WATER BEFORE ADVANCING WITH THE WORKS.
3. CONCRETE PIPE BEDS AND HAUNCHES SHALL HAVE A MINIMUM THICKNESS OF 150mm WITH AN ABSOLUTE MINIMUM DEPTH OF COVER ABOVE THE EXTERNAL CROWN OF THE PIPE OF 750mm.
4. CONCRETE TO BE IN ACCORDANCE WITH IS EN 206 AND TO BE CLASS C16/20.
5. THE HAUNCHES AND SURROUNDS TO BE FORMED USING FORM WORK TO PROVIDE A ROUGH CAST FINISH.
6. EXPANSION JOINTS IN THE CONCRETE SHALL BE PROVIDED AT ALL PIPE JOINTS TO ALLOW FOR PIPE FLEXIBILITY. COMPRESSIBLE FILLER BOARD TO BE IN ACCORDANCE WITH BS EN 622-1 AND BS EN 622-4, AN TO BE 18mm THICK.
7. POLYETHYLENE PIPES SHALL BE WRAPPED IN PLASTIC SHEETING HAVING A COMPOSITION IN ACCORDANCE WITH BS 6076 BEFORE BEING CAST INTO CONCRETE.
8. BITUMINOUS MATERIAL SHALL NOT BE PUT IN CONTACT WITH PE OR PVC PIPES.

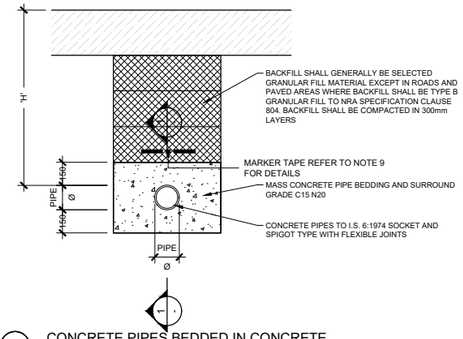


SPIGOT AND SOCKET JOINT
N.T.S.

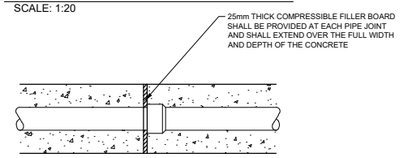


CONCRETE PIPES BEDDED IN GANULAR MATERIAL
SCALE: 1:20

NOTE:
DETAIL APPLIES WHERE COVER 'H' IS GREATER THAN 1.2m IN ROADS AND PAVED AREAS, 0.9m IN FIELDS AND FOOTPATHS AND 0.6m IN GARDENS

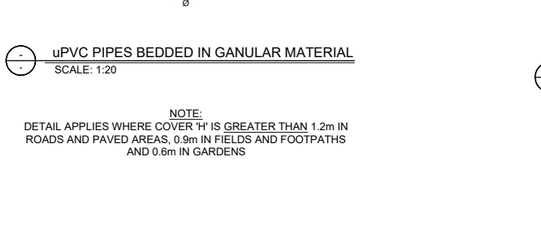


CONCRETE PIPES BEDDED IN CONCRETE
SCALE: 1:20



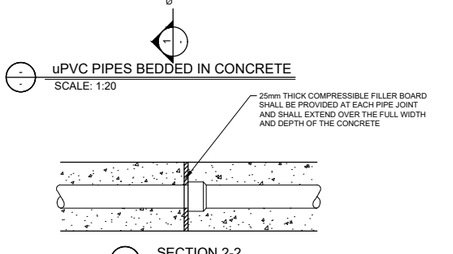
SECTION 1-1
SCALE: 1:20

NOTE:
DETAIL APPLIES WHERE COVER 'H' IS LESS THAN 1.2m IN ROADS AND PAVED AREAS, 0.9m IN FIELDS AND FOOTPATHS AND 0.6m IN GARDENS.



uPVC PIPES BEDDED IN GANULAR MATERIAL
SCALE: 1:20

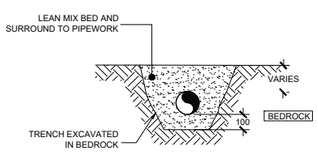
NOTE:
DETAIL APPLIES WHERE COVER 'H' IS GREATER THAN 1.2m IN ROADS AND PAVED AREAS, 0.9m IN FIELDS AND FOOTPATHS AND 0.6m IN GARDENS



uPVC PIPES BEDDED IN CONCRETE
SCALE: 1:20

SECTION 2-2
SCALE: 1:20

NOTE:
DETAIL APPLIES WHERE COVER 'H' IS LESS THAN 1.2m IN ROADS AND PAVED AREAS, 0.9m IN FIELDS AND FOOTPATHS AND 0.6m IN GARDENS.



SECTION A-A CROSS SECTION OF DRAINAGE PIPEWORK WITHIN BUILDINGS
N.T.S

REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

1. ALL ENGINEERS DRAWINGS TO BE READ IN CONJUNCTION WITH RELEVANT DRAWINGS AND SPECIFICATIONS.
2. ALL SETTING OUT TO ARCHITECTS DRAWINGS.
3. DO NOT SCALE FROM ENGINEERS DRAWINGS.
4. ANY DISCREPANCIES BETWEEN DRAWINGS, SKETCHES, VERBAL INSTRUCTIONS AND SITE CONDITIONS TO BE REFERRED TO THE DESIGN TEAM BEFORE WORK COMMENCES.
6. ALL LEVELS ARE STRUCTURAL UNLESS NOTED OTHERWISE.

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	MAR '23

Project Name: CIVIC OFFICES
Scale: A.S. @ A1
Project Number: 2223

Drawing Title: STANDARD DRAINAGE DETAILS SHEET 3

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0013		PL2

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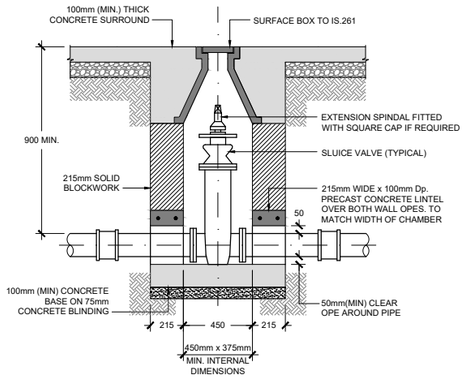
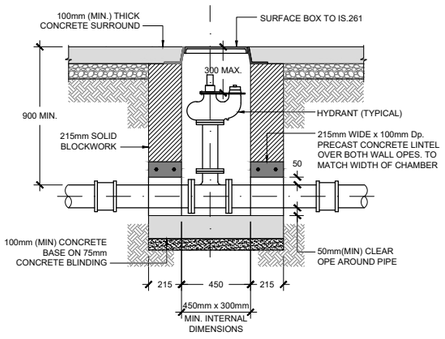
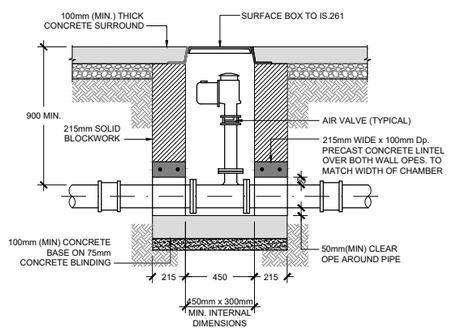
Web: www.cora.ie



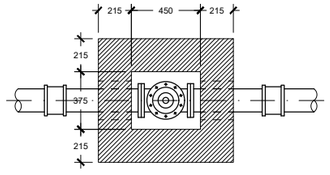
SLUICE VALVE SECTION



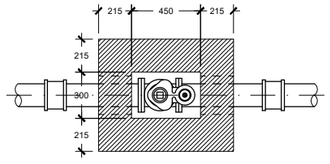
HYDRANT SECTION



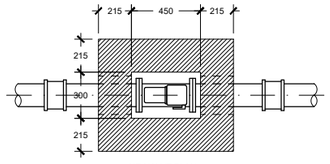
AIR VALVE SECTION



SLUICE VALVE PLAN



HYDRANT PLAN

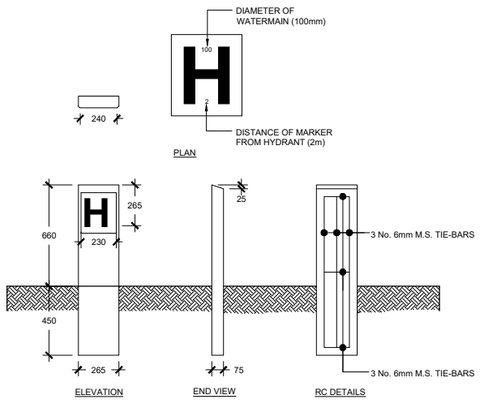


AIR VALVE PLAN

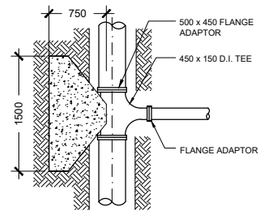
SLUICE VALVE CHAMBER DETAILS
SCALE 1:20

HYDRANT CHAMBER DETAILS
SCALE 1:20

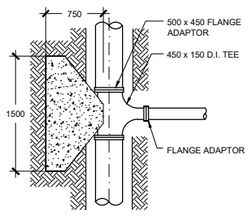
AIR VALVE CHAMBER DETAILS
SCALE 1:20



HYDRANT INDICATOR PLATES
SCALE 1:20



PLAN (TEE)



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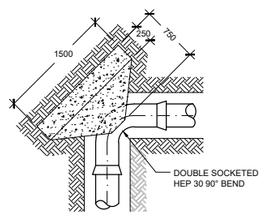
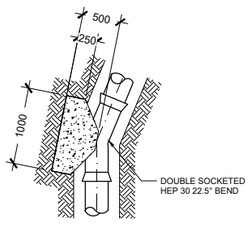
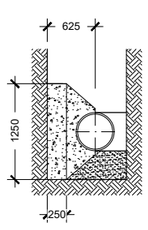


PLAN (90° BEND)



PLAN (22.5° BEND)



TYPICAL SECTION

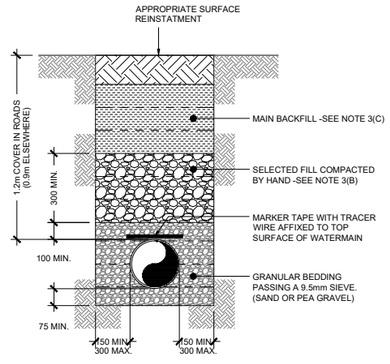
THRUST BLOCK DETAILS

NOTE:

1. CONCRETE ANCHOR BLOCKS SHALL BE PROVIDED ON WATERMAINS AT DEAD ENDS, TEES, BENDS OF GREATER CURVATURE THAN 22½° AND AT BOTH SIDES OF SLUICE VALVE CHAMBERS AND HYDRANTS. ANCHOR BLOCKS SHALL ENCASE THE PIPE IN CONCRETE TO A MINIMUM THICKNESS OF 150mm ALL ROUND AND SHALL BE A MINIMUM LENGTH OF 600mm.
2. THRUST BLOCK CONCRETE SHALL BE PLACED BEHIND THE SOCKET OF THE FITTING AND NOT ALLOWED AGAINST THE PIPE OR JOINT. PROVIDE 1200g VISQUEEN WRAP AROUND PIPE & JOINT IF NECESSARY TO SEPERATE THEM FROM THE THRUST BLOCK.
3. CONCRETE COMPRESSIVE STRENGTH SHALL BE 20N AT 28 DAYS
4. BLOCKS TO BE CAST AGAINST UNDISTURBED EARTH

PIPE DIAMATER (mm)	ANCHOR BLOCK DIMENDIONS IN METRES FOR GROUND BEARING PRESSURE 100kN/m²					
	A	B	C	D	E	F
150	1.2	0.6	0.9	0.6	0.5	1.0
200	1.6	0.6	1.2	1.2	0.6	1.4

THRUST BLOCK DETAILS
SCALE 1:40



WATERMAIN TRENCH DETAIL
SCALE 1:20

NOTE: FOR WATERMAINS UNDER ROADS & IN CAR PARKS USE CL 804 COMPACTED BACKFILL ONLY

REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL ENGINEERS & ARCHITECT'S DRAWINGS.FIGURED DIMENSIONS ONLY (NOT SCALING) TO BE USED. WHERE A CONFLICT OF INFORMATION EXISTS OR IF IN ANY DOUBT - 'ASK'.
2. CONSULTANTS TO BE INFORMED IMMEDIATELY OF ANY DISCREPANCIES BEFORE WORK PROCEEDS.
3. PIPE BEDDING

A. GRANULAR BEDDING FOR PIPES TO BE EITHER:
(i) FREE DRAINING COARSE SAND OR
(ii) 10mm NOMINAL SINGLE SIZED GRAVEL OR
(iii) 5mm TO 10mm GRADED GRAVEL
GRAVELS IN (ii) OR (iii) CAN BE EITHER ROUNDER OR ANGULAR BUT WITH GOOD SELF COMPACTING PROPERTIES.

B. GRANULAR SURROUND & COVER FOR PIPES TO BE AS FOLLOWS:

TABLE 5/3 GRANULAR MATERIALS TO BS882		
NOMINAL PIPE PIPE DIA. (mm)	AGGREGATE TYPE	NOMINAL MAXIMUM AGGREGATE SIZE (mm)
NOT EXCEEDING 140	SINGLE SIZED	10
	GRADED	-
EXCEEDING 140 BUT NOT EXCEEDING 400	SINGLE SIZED	10, 14 OR 20
	GRADED	20 TO 5 OR 14 TO 5
EXCEEDING 400	SINGLE SIZED	10, 14, 20 OR 40
	GRADED	14 TO 5, 20 TO 5 OR 40 TO 5

C. BACKFILL

(i) BACKFILL UNDER FOOTPATH / CYCLEPATH / GRASS VERGE TO BE SELECTED BACKFILL TO NRA SPECIFICATION FOR ROAD WORKS CLAUSE 601, TABLE 6/1 CLASS 2C MATERIAL. COMPACTED IN 300mm LAYERS.
(ii) BACKFILL UNDER CARRIAGEWAYS TO BE SELECTED GRANULAR MATERIAL TO NRA SPECIFICATION FOR ROADWORKS CLAUSE 601, TABLE 6/1 CLASS 6F1 OR 6F2 MATERIAL. COMPACTED IN 300mm LAYERS.

D. WARNING MESH

ALL PIPEWORK SHALL HAVE A 400mm WIDE WATER WARNING MESH - PLYAGE HR 40D BLUE POLYETHYLENE WARNING MESH OR SIMILAR - WITH TRACER WIRE LAID DIRECTLY OVER CENTRELINE OF THE PIPELINE AND TIED TO VALVES AT A DEPT OF 350mm BELOW THE FINISHED GROUND SURFACE.

4. PIPE TESTING

A. PRESSURE TEST

ALL WATERMAINS SHOULD BE HYDRAULICALLY TESTED AFTER LAYING, FOR A PERIOD OF 24 HOURS, AT A TEST PRESSURE OF 1.5 TIMES THE SPECIFIED CLASS PRESSURE (13.5 BAR.) THE PIPELINE SHOULD BE ADEQUATELY ANCHORED OR RESTRAINED, DURING THE TEST.
A TEST PUMP, WITH STOPCOCK, WATER TANK AND PRESSURE GAUGE, IS CONNECTED TO THE WATERMAIN AND OPERATED UNTIL THE GAUGE SHOWS THE REQUIRED TEST PRESSURE. (IF IT IS CONSIDERED NECESSARY, THE CALIBRATION OF THE PRESSURE GAUGE SHOULD BE VALIDATED JUST PRIOR TO THE TEST.) THE AMOUNT OF WATER IN THE TANK IS NOTED AT THE BEGINNING OF THE TEST PERIOD. AN HOUR LATER, GAUGE PRESSURE IS INSPECTED AND IF IT HAS FALLEN, TEST PRESSURE IS RESTORED BY MEANS OF A PUMP. THIS PROCESS IS REPEATED AT HOURLY INTERVALS, DURING THE TEST PERIOD. THE TOTAL QUANTITY OF WATER PUMPED TO MAINTAIN THE PRESSURE DURING THE TEST IS TERMED THE "APPARENT LEAKAGE".
THE APPARENT LEAKAGE SHOULD NOT NORMALLY EXCEED 0.11 LITRES, PER MILLIMETER OF NOMINAL PIPE DIAMETER, PER KILOMETER OF LENGTH, PER 24 HOURS. A REPRESENTATIVE OF DROGHEDA BOROUGH COUNCIL TO BE PRESENT DURING TESTING.

B. CHLORINATION TEST

ALL MAINS SHALL BE SWABBED AND DISINFECTED BEFORE BEING PUT IN TO SUPPLY. THE PIPELINES SHALL BE DISINFECTED WITH WATER HAVING A MINIMUM CONCENTRATION OF 20mg/l OF FREE AVAILABLE CHLORINE.

THE CHLORINATED WATER SHALL BE LEFT IN THE MAIN FOR A PERIOD OF AT LEAST 24 HOURS. CHLORINE RESIDUAL TESTS SHALL BE TAKEN AT THE END OF THE MAIN FURTHEST FROM THE POINT OF INJECTION. THE STERILISATION PROCESS SHALL BE REPEATED IF THE CHLORINE RESIDUAL IS LESS THAN 10mg/l. THE CHLORINATED WATER SHALL BE DISCHARGED INTO FOUL SEWER AFTER TESTING IS COMPLETED.

C. BACTERIOLOGICAL TEST

THE MAIN SHALL BE REFILLED AND A SAMPLE OF THE WATER SHALL BE TAKEN FOR BACTERIOLOGICAL ANALYSIS. GREAT CARE SHALL BE TAKEN WHEN OBTAINING SAMPLES FOR TESTING AND ONLY STERILE CONTAINERS SHALL BE USED. THIS SAMPLING SHALL BE CARRIED OUT IN THE PRESENCE OF A REPRESENTATIVE OF DROGHEDA BOROUGH COUNCIL. SAMPLES SHALL BE TESTED WITHIN 6 HOURS OF COLLECTION.

5. HYDRANTS

HYDRANTS SHALL BE MANUFACTURED IN ACCORDANCE WITH BS 750: 1984 TYPE 2 AND SHALL INCORPORATE A SCREW-DOWN VALVE, UNDERGROUND "GUIDE IN HEAD" TYPE WITH BAYONET LUG OUTLETS AND FALSE SPINDLE CAP, ALL TO DROGHEDA BOROUGH COUNCILS APPROVAL. THE HYDRANT VALVE SHALL BE ANTI-CLOCKWISE OPENING.

6. SLUICE VALVES

SLUICE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH BS 5163:1986. THEY SHALL BE DOUBLE FLANGED; DUCTILE IRON RESILIENT SEAL GATE VALVES, ALL TO DROGHEDA BOROUGH COUNCILS APPROVAL. SLUICE VALVES SHALL BE ANTI-CLOCKWISE CLOSING.

7. AIR VALVES

AIR VALVES TO BE MANUFACTURED IN ACCORDANCE WITH BS5159 AND TO BE TO DROGHEDA BOROUGH COUNCILS APPROVAL.

8. SURFACE COVERS

HYDRANT, SLUICE VALVE & AIR VALVE CHAMBERS SHOULD BE PROVIDED WITH CAST IRON SURFACE BOXES IN COMPLIANCE WITH THE REQUIREMENTS OF IS. 261. SURFACE BOXES FOR ROADWAYS AND AREAS ACCESSIBLE TO WHEEL TRAFFIC SHOULD BE SUBJECT TO THE APPROVAL OF DROGHEDA BOROUGH COUNCIL.

9. HYDRANT AND VALVE INDICATOR PLATES

THE LOCATION OF HYDRANTS, AIR VALVES AND SLUICE VALVES SHOULD BE SHOWN BY INDICATOR PLATES POSITIONED TO THE APPROVAL OF THE LOCAL AUTHORITY.
HYDRANT PLATES SHOULD COMPLY WITH THE REQUIREMENTS OF BS3251. THEY SHOULD SHOW THE DIAMETER OF THE WATERMAIN IN MILLIMETERS ON THE UPPER PART OF THE PLATE AND THE DISTANCE OF THE MARKER FROM THE HYDRANT ON THE LOWER PART OF THE PLATE. ALL CHARACTERS SHOULD BE BLACK AND THE REMAINDER OF THE FRONT FACE SHOULD CONFORM TO COLOUR REFERENCE No. 309 (CANARY YELLOW) OF BS 381C.
SLUICE VALVE, SCOUR VALVE AND AIR VALVE PLATES SHOULD BE CAST IRON MEASURING 200 x 200mm. THEY SHOULD HAVE THE LETTERS SV, ScV OR AV AS APPROPRIATE, CAST IN RELIEF. THE PLATES SHOULD HAVE A BACKGROUND IN BLACK BITUMASTIC PAINT WITH THE LETTERS IN WHITE ENNAMEL.
INDICATOR PLATES MAY BE FIXED TO SOLID BOUNDARY WALLS. WHERE MARKER POSTS ARE USED THEY SHOULD BE CONSTRUCTED AS SHOWN ON THE DRAWING.

Drawing Stage:	Project Details:	
PRE-PLANNING	Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
	Client:	MONAGHAN COUNTY COUNCIL
	Architect:	HENRY J LYONS ARCHITECTS
	M&E Designer:	
	Contractor:	

Notes

1. ALL ENGINEERS DRAWINGS TO BE READ IN CONJUNCTION WITH RELEVANT DRAWINGS AND SPECIFICATIONS.
2. ALL SETTING OUT TO ARCHITECTS DRAWINGS.
3. DO NOT SCALE FROM ENGINEERS DRAWINGS.
4. ANY DISCREPANCIES BETWEEN DRAWINGS, SKETCHES, VERBAL INSTRUCTIONS AND SITE CONDITIONS TO BE REFERRED TO THE DESIGN TEAM BEFORE WORK COMMENCES.
6. ALL LEVELS ARE STRUCTURAL UNLESS NOTED OTHERWISE.

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	MAR '23

Project Name: CIVIC OFFICES | Scale: A.S. @ A1 | Project Number: 2223

Drawing Title: STANDARD DRAINAGE DETAILS SHEET 4

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0014		PL2

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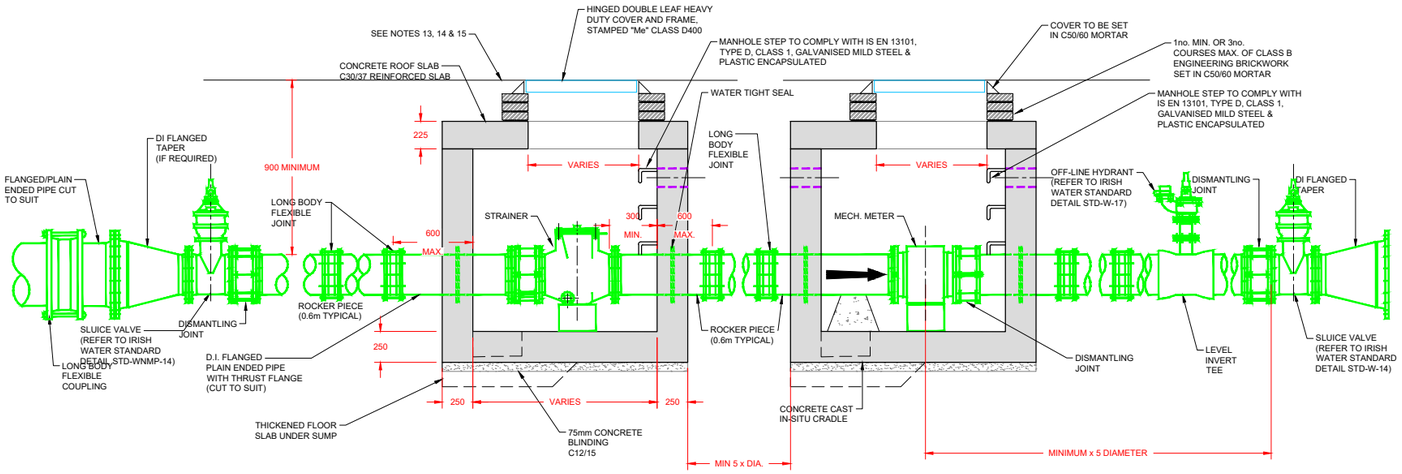
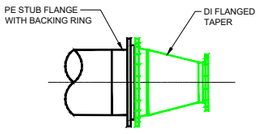
REVISION SCHEDULE

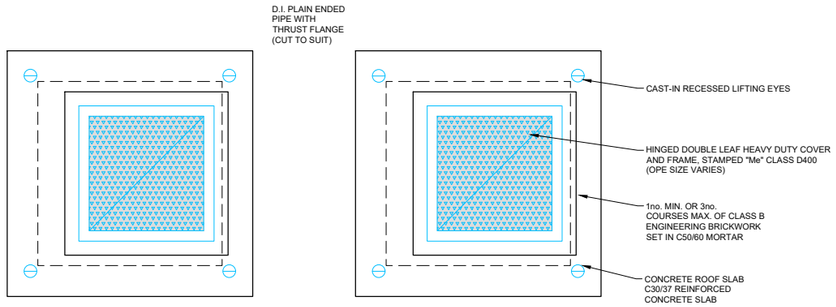
REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC



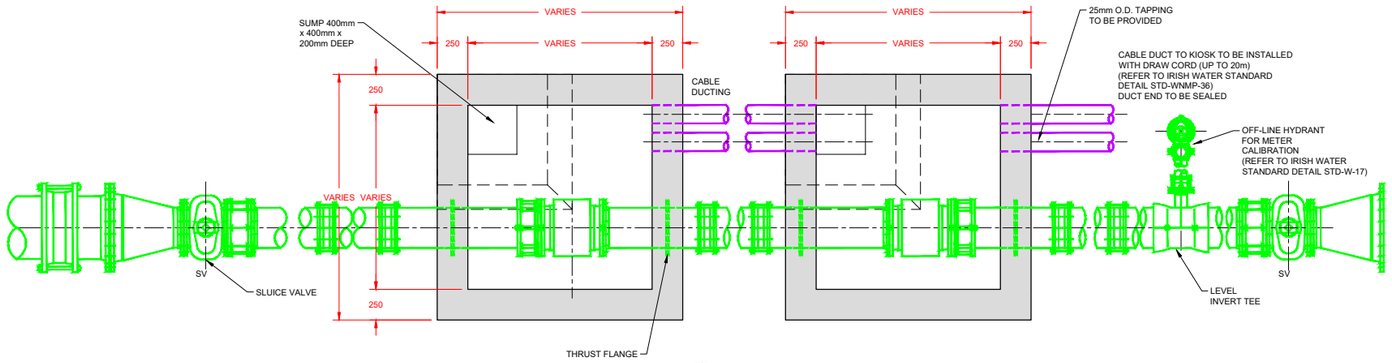
SECTION



PE TO DI DETAIL



ROOF PLAN



FLOOR PLAN

BULK METER

SCALE 1:25

(REFER TO IRISH WATER STANDARD DETAIL NO. STD-W-26-A)

1. ALL DIMENSIONS ARE IN MILLIMETRES (MM) UNLESS NOTED OTHERWISE.
2. STRUCTURAL DESIGN AND REINFORCEMENT DETAIL TO BE PROVIDED BY THE DEVELOPER AND SUBMITTED TO IRISH WATER FOR REVIEW. ROOF SLABS SHALL BE DESIGNED TO CARRY ALL LIVE LOADS & DEAD LOADS, & CONSIST OF A REINFORCED CONCRETE SLAB OF IN-SITU CONCRETE, GRADE C30/37, WITH A MINIMUM THICKNESS OF 225MM. ALTERNATIVELY, PRE-CAST CONCRETE ROOFS MAY BE USED, SUBJECT TO IRISH WATER REVIEW, & COMPLIANCE WITH BS 5011, PART 4.
3. CONCRETE FOR CHAMBERS TO BE C30 / 37.
4. PRECAST UNITS COMPLETED WITH RUBBER SEALING GASKET BETWEEN UNITS, COMPLYING WITH THE REQUIREMENTS OF IS EN 1917 AND BS 5911-PART 3, COMPLETE WITH 150MM CONCRETE SURROUND MAY BE USED AS AN ACCEPTABLE ALTERNATIVE. CONCRETE SURROUND TO BE GRADE C16/20 IN ACCORDANCE WITH IS EN 206.
5. CHAMBERS SHALL BE COVERED WITH APPROVED HEAVY DUTY METAL COVERS TO IS EN 124 RATING D400. COVER AND FRAME SHALL BE SUITABLE FOR ROAD AND TRAFFIC CONDITIONS AND IS SUBJECT TO REVIEW BY IRISH WATER.
6. 200MM ALL ROUND, 100MM DEEP CONCRETE PLINTH AROUND COVER IN GRASS AREAS.
7. ANTI CORROSION TAPE TO BE PROVIDED AROUND BURIED FLANGES.
8. DUCTILE IRON PIPES AND FITTINGS TO BE IN ACCORDANCE WITH IS EN 545. PE PIPES AND FITTINGS TO BE IN ACCORDANCE WITH IS EN 12201:2011.
9. ALL CHAMBERS TO BE CHECKED FOR UPLIFT BY THE DEVELOPER BASED ON GROUND CONDITIONS WITHIN THE SITE. SHOULD ANTI FLOATATION MEASURES BE REQUIRED THEY SHALL BE SUBJECT TO REVIEW BY IRISH WATER.
10. PIPEWORK TO BE DOWNSIZED TO ACCOMMODATE THE REQUIRED RANGE OF THE FLOW METER. STRAIGHT PIPE LENGTHS UPSTREAM AND DOWNSTREAM OF THE METER TO BE PROVIDED. IF THE METER IS NOT CAPABLE OF ACCURATE NIGHT FLOW MEASUREMENTS, A BY-PASS FLOW METER SHALL BE PROVIDED WITH APPROPRIATE VALVES, FITTINGS AND PIPEWORK.
11. ALL CONCRETE TO BE IN ACCORDANCE WITH IS EN 206.
12. A SINGLE METER CHAMBER MAY BE USED, WHERE APPLICABLE, TO THE METER SUPPLIER'S REQUIREMENTS, TO LOCATE BOTH THE METER & STRAINER.
13. ANY SPECIAL ROAD REINSTATEMENT AROUND COVER & FRAME SHALL BE TO ROAD AUTHORITY'S REQUIREMENTS.
14. NEW ROAD CONSTRUCTION & SURFACE FINISH TO BE TO ROAD AUTHORITY REQUIREMENTS.
15. EXISTING ROAD REINSTATEMENT TO COMPLY WITH CURRENT VERSION OF "GUIDELINES FOR MANAGING OPENINGS IN PUBLIC ROADS" BY THE DEPT. OF TRANSPORT, TOURISM & SPORT, OR TRANSPORT INFRASTRUCTURE IRELAND REQUIREMENTS.

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

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3. DO NOT SCALE FROM ENGINEERS DRAWINGS.
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Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	MAR '23

Project Name: CIVIC OFFICES

Scale: A.S. @ A1

Project Number: 2223

Drawing Title: STANDARD DRAINAGE DETAILS SHEET 5

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0015		PL2

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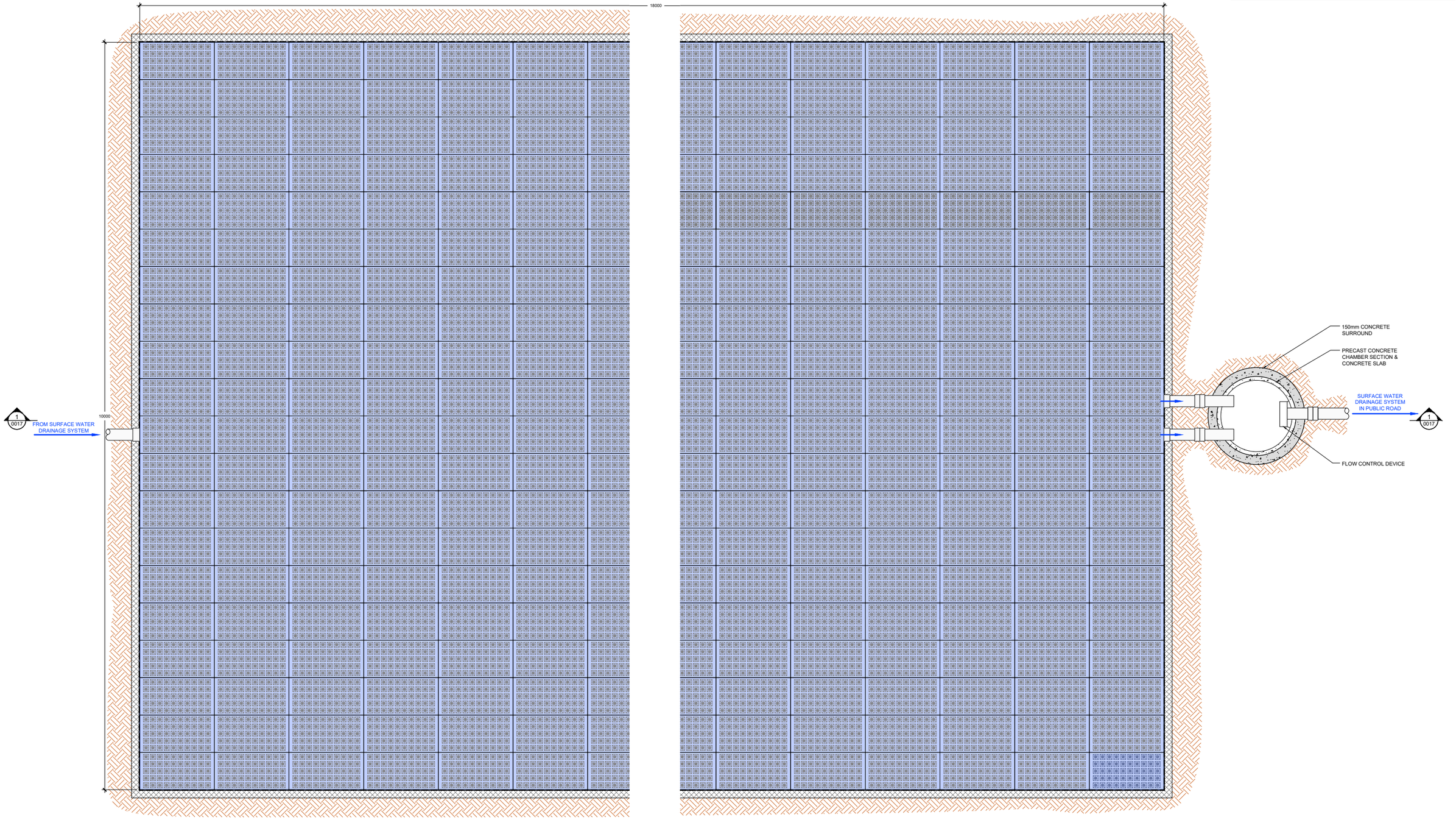
REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC



- PLAN ON WAVIN AQUACELL ATTENUATION TANK (ON-LINE SYSTEM)
SCALE 1:25

Drawing Stage:

PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

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Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	MAR '23

Project Name: CIVIC OFFICES

Scale: A.S. @ A1

Project Number: 2223

Drawing Title: ATTENUATION TANK DETAILS SHEET 1

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0016		PL2

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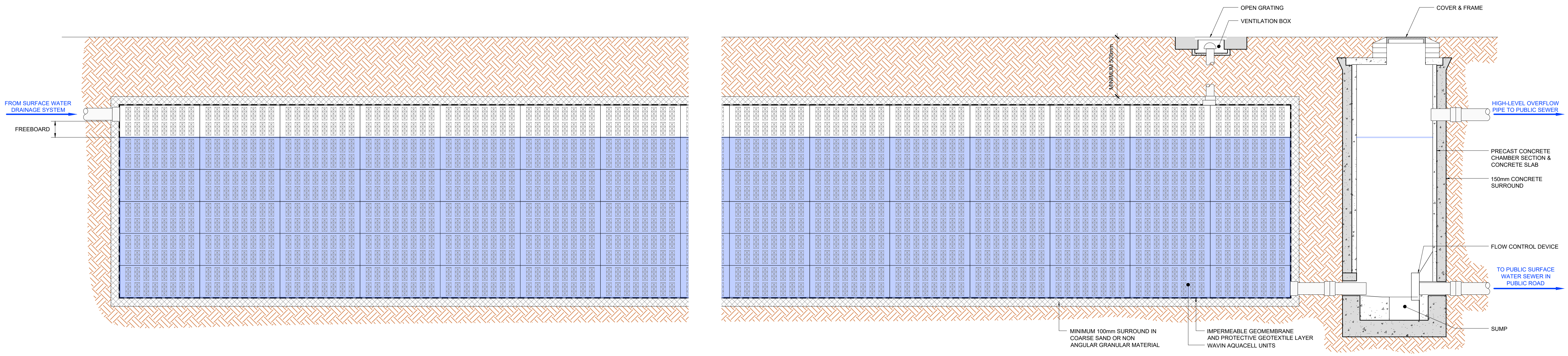
REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC



1/0016 SECTION THROUGH WAVIN AQUACELL ATTENUATION TANK (ON-LINE SYSTEM)
SCALE 1:25

Drawing Stage: PRE-PLANNING	Project Details:	
	Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
	Client:	MONAGHAN COUNTY COUNCIL
	Architect:	HENRY J LYONS ARCHITECTS
	M&E Designer:	
	Contractor:	

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Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	MAR '23

Project Name: CIVIC OFFICES | Scale: A.S. @ A1 | Project Number: 2223

Drawing Title: ATTENUATION TANK DETAILS SHEET 2

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0017		PL2

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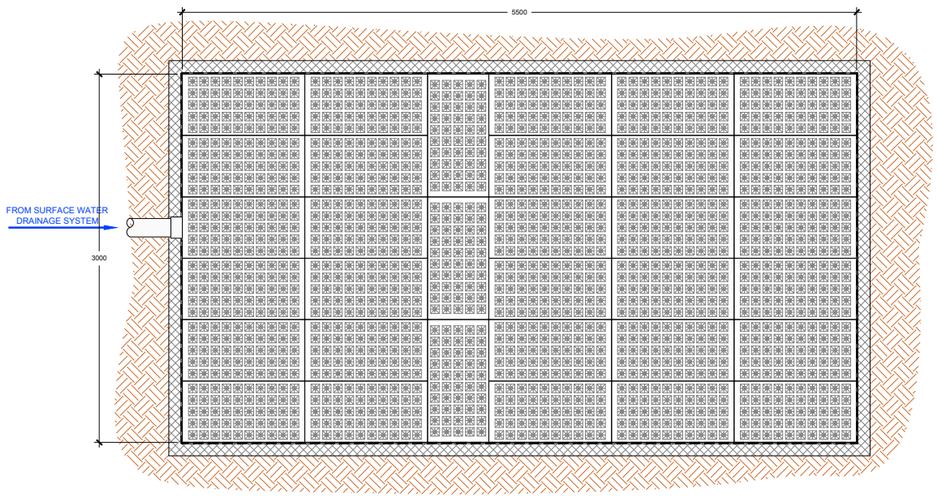
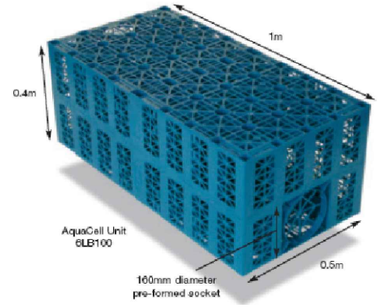
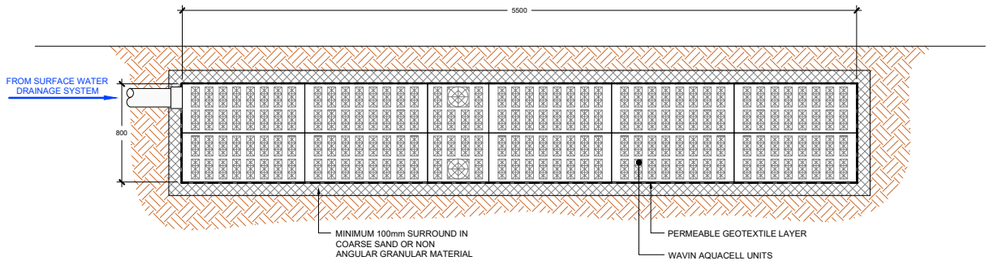
REVISION SCHEDULE				
REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC



1 - PLAN ON WAVIN AQUACELL SOAKAWAY
SCALE 1:25



3 - WAVIN AQUACELL UNIT
NOT TO SCALE



2 - SECTION THROUGH WAVIN AQUACELL SOAKAWAY
SCALE 1:25

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

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Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	MAR '23

Project Name: CIVIC OFFICES | Scale: A.S. @ A1 | Project Number: 2223

Drawing Title: SOAKAWAY DETAILS

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	0018		PL2

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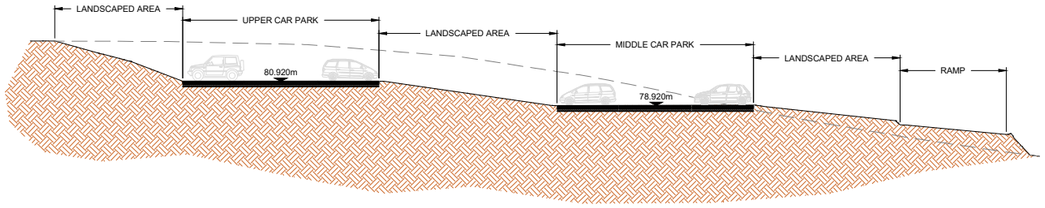
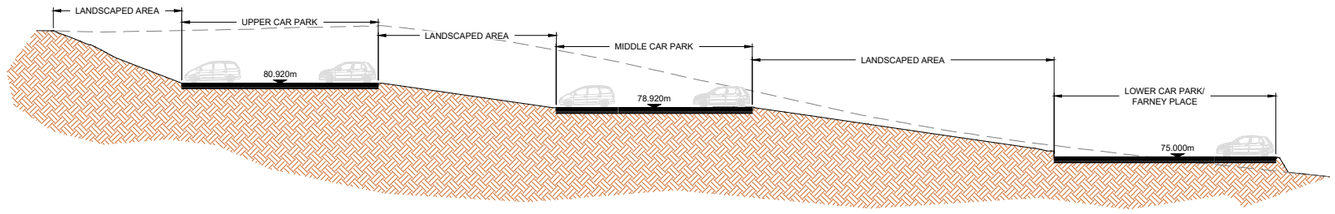
REVISION SCHEDULE				
REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC



1 - SITE SECTION 1-1
SCALE 1:250



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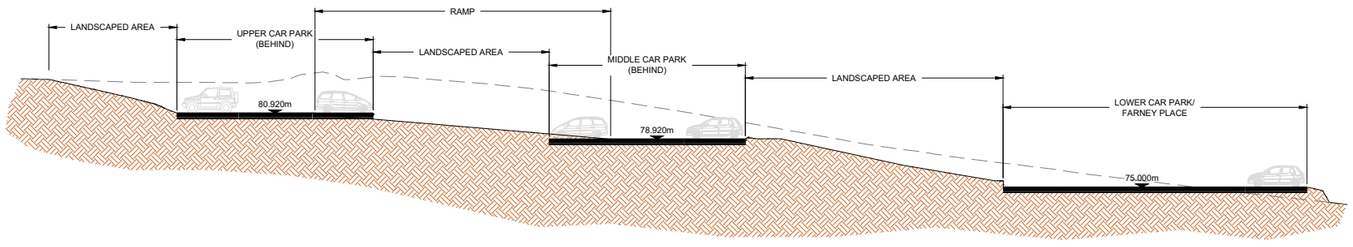
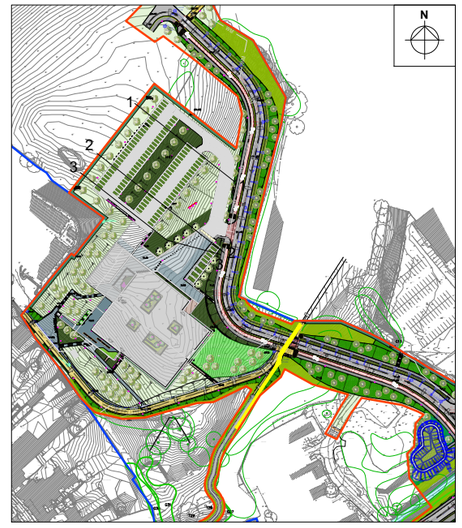
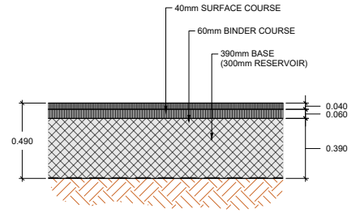
SCALE 1:250



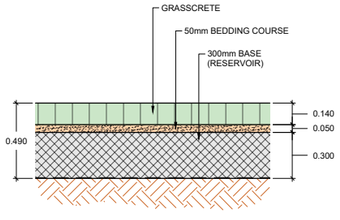
3 - SITE SECTION 3-3
SCALE 1:250



5 - KEY PLAN
SCALE 1:2000



ASPHALT AREAS



PERMEABLE PAVING AREAS

ASSUMED 300mm OF ATTENUATION STORAGE

ASPHALT AREAS IN CIRCULATION AREAS

PERMEABLE PAVING AREAS IN SPACES

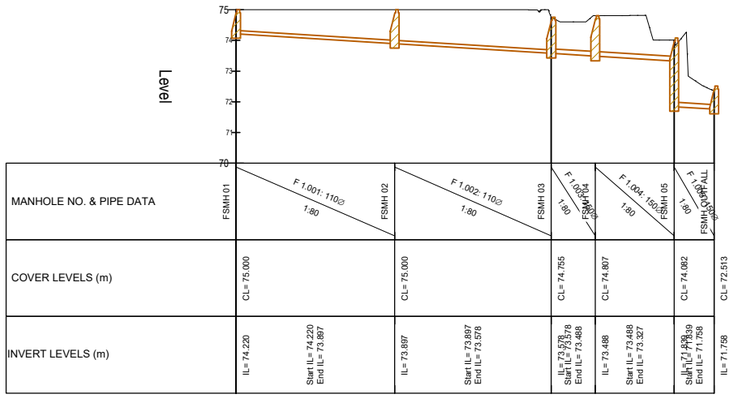
4 - TYPICAL SECTION THRU' CAR PARK CIRCULATION/PARKING SPACES
SCALE 1:20

Drawing Stage:	Project Details:		Notes	Drawn by:	Checked by:	Approved by:	Date:	CORA CONSULTING ENGINEERS	Behan House, 10 Lower Mount Street, Dublin 2. D02 HT71 Tel: +353 1 661 1100 e-mail: info@cora.ie Web: www.cora.ie			
PRE-PLANNING	Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN		JPC	KO'M	JFC	FEB '23					
	Client:	MONAGHAN COUNTY COUNCIL		Project Name: CIVIC OFFICES			Scale: A.S. @ A1	Project Number: 2223				
	Architect:	HENRY J LYONS ARCHITECTS		Drawing Title: SITE SECTIONS - SHEET 1			Project: MCC	Originator: CORA	Zone: ZZ	Level: ZZ	Type: DR	Discipline: C	Drawing No: 1001	Stage:	Revision: PL2
	M&E Designer:											
	Contractor:											

REVISION SCHEDULE

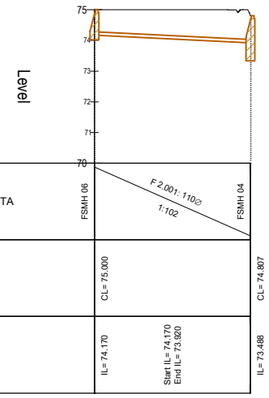
REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

FSMH 01 - FSMH OUTFALL - LONGSECTION
SCALE: H 1:500 / V 1:100
DATUM: 70.000



MANHOLE NO. & PIPE DATA	FSMH 01	F 1.001: 110Ø 1:80	FSMH 02	F 1.002: 110Ø 1:80	FSMH 03	F 1.003: 225Ø 1:80	FSMH 04	F 1.004: 150Ø 1:80	FSMH 05	F 1.005: 150Ø 1:80	FSMH OUTFALL
COVER LEVELS (m)	CL= 75.000		CL= 75.000		CL= 74.755		CL= 74.807		CL= 74.082		CL= 72.513
INVERT LEVELS (m)	IL= 74.220	Start IL= 74.220 End IL= 73.897	IL= 73.897	Start IL= 73.897 End IL= 73.578	IL= 73.578 Start IL= 73.578 End IL= 73.488		IL= 73.488	Start IL= 73.488 End IL= 7 73.327	IL= 71.839 Start IL= 71.839 End IL= 71.798		IL= 71.798

FSMH 06 - FSMH 04 - LONGSECTION
SCALE: H 1:500 / V 1:100
DATUM: 70.000



MANHOLE NO. & PIPE DATA	FSMH 06	F 2.001: 110Ø 1:102	FSMH 04
COVER LEVELS (m)	CL= 75.000		CL= 74.807
INVERT LEVELS (m)	IL= 74.170	Start IL= 74.170 End IL= 73.920	IL= 73.488

Drawing Stage: PRE-PLANNING	Project Details:		Notes	Drawn by: JPC	Checked by: KO'M	Approved by: JFC	Date: FEB '23	CORA CONSULTING ENGINEERS					
	Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN		Project Name: CIVIC OFFICES			Scale: 1:500 @ A1	Project Number: 2223					
	Client:	MONAGHAN COUNTY COUNCIL		Drawing Title: FOUL SEWER LONGSECTIONS SHEET 1			Project: MCC	Originator: CORA	Zone: ZZ	Level: ZZ	Type: DR	Discipline: C	Drawing No: 2301	Stage:	Revision: PL2
	Architect:	HENRY J LYONS ARCHITECTS											
	M&E Designer:												
	Contractor:												

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REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

ALIGNMENT - LS - SWMH 01 - SWMH 09 - LONGSECTION
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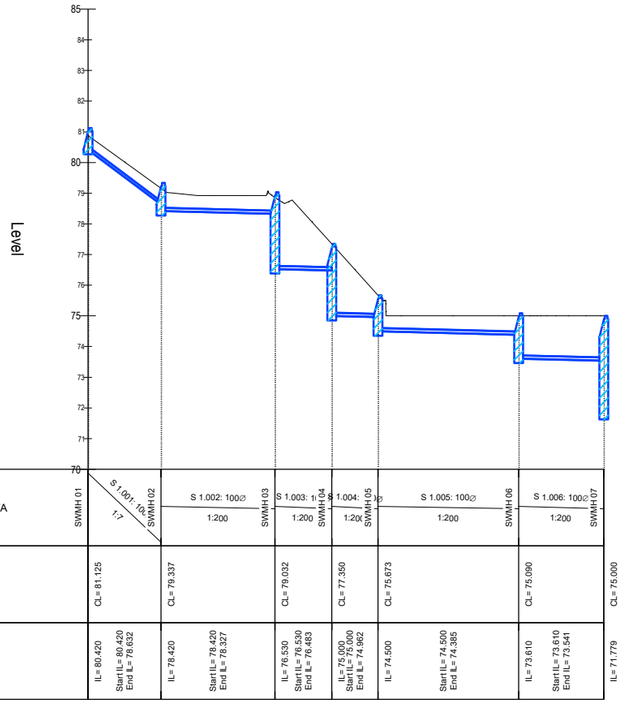
DATUM: 70.000



SWMH 10 - SWMH 07 - LONGSECTION
SCALE: H 1:500 / V 1:100
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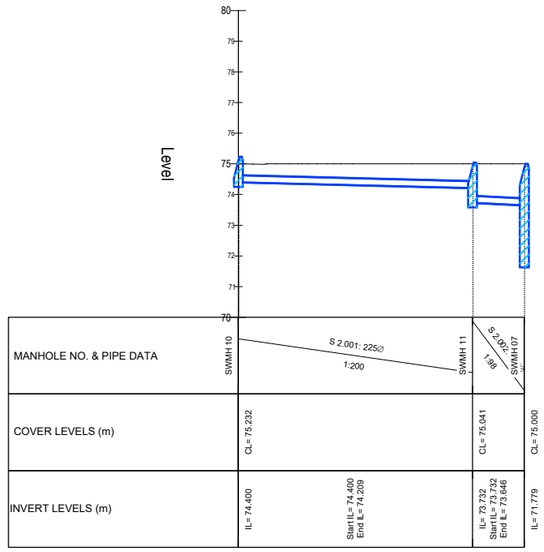

SWMH 07 - SWMH XX - LONGSECTION
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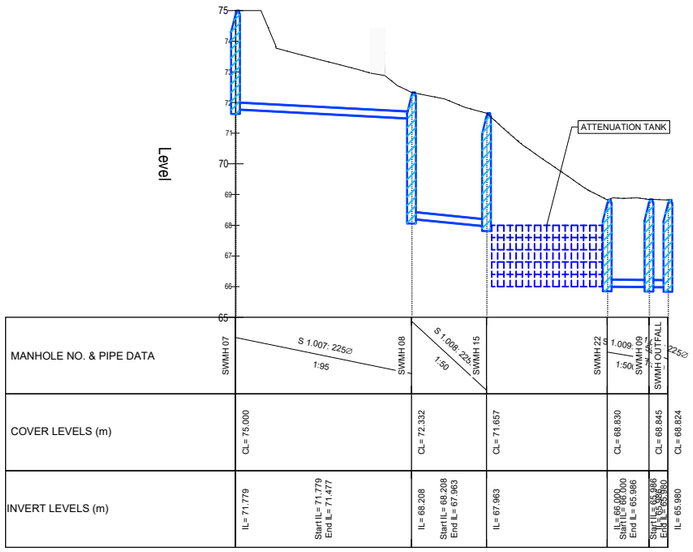

SWMH 19 - SWMH 15 - LONGSECTION
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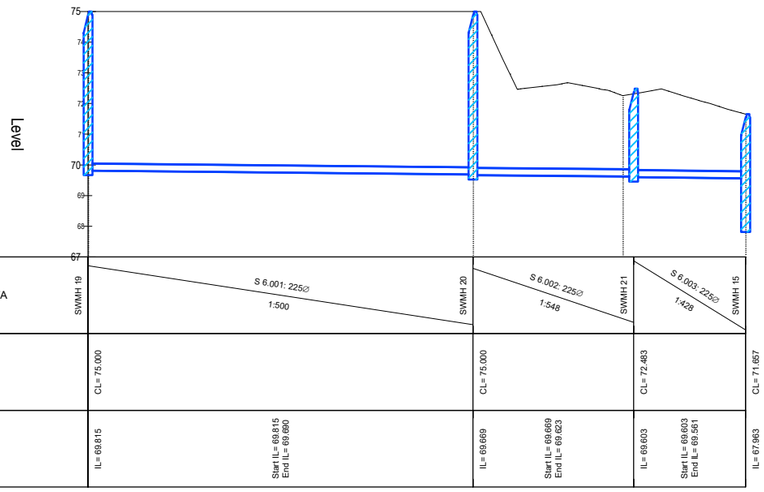
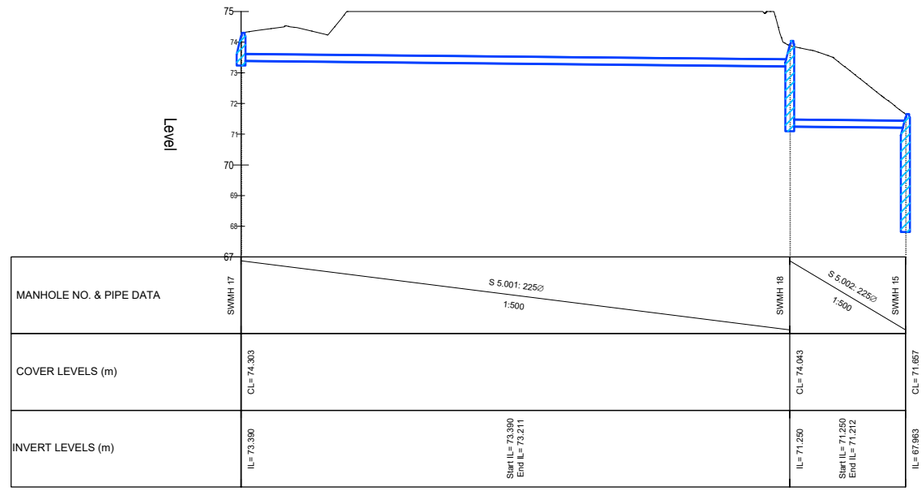
DATUM: 67.000



SWMH 17 - SWMH 15 - LONGSECTION
SCALE: H 1:500 / V 1:100
DATUM: 67.000



Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	FEB '23

Project Name: CIVIC OFFICES
Scale: 1:500 @ A1
Project Number: 2223

Drawing Title: SURFACE WATER LONGSECTIONS SHEET 1

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	2401		PL2

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10 Lower Mount Street,
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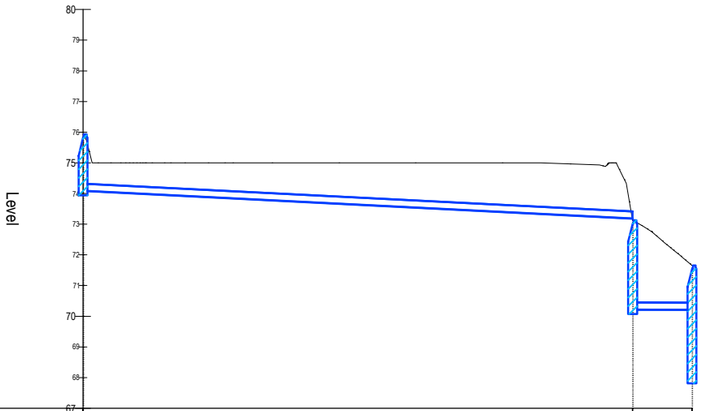
Tel: +353 1 661 1100
e-mail: info@cora.ie
Web: www.cora.ie

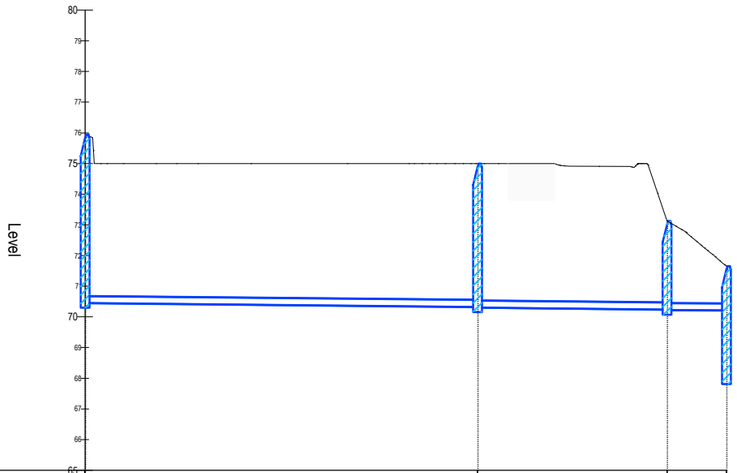
REVISION SCHEDULE				
REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PRE-PLANNING DISCUSSION	16/08/2023	JPC	JFC
PL2	ISSUED FOR PRE-PLANNING DISCUSSION	31/08/2023	JPC	JFC

SWMH 16 - SWMH 15 - LONGSECTION
SCALE: H 1:500 / V 1:100
DATUM: 67.000



MANHOLE NO. & PIPE DATA	SWMH 16	S 4.001: 225Ø 1:99	SWMH 14	S 3.003: 225Ø 1:1038	SWMH 15
COVER LEVELS (m)	CL= 75.931		CL= 73.130		CL= 71.657
INVERT LEVELS (m)	IL= 74.093	Start IL= 74.093 End IL= 73.188	IL= 70.220	Start IL= 70.220 End IL= 70.211	IL= 67.963

SWMH 12 - SWMH 15 - LONGSECTION
SCALE: H 1:500 / V 1:100
DATUM: 65.000



MANHOLE NO. & PIPE DATA	SWMH 12	S 3.001: 225Ø 1:513	SWMH 13	S 3.002: 225Ø 1:482	SWMH 14	S 3.003: 225Ø 1:1038	SWMH 15
COVER LEVELS (m)	CL= 75.945		CL= 75.000		CL= 73.130		CL= 71.657
INVERT LEVELS (m)	IL= 70.449	Start IL= 70.449 End IL= 70.324	IL= 70.304	Start IL= 70.304 End IL= 70.240	IL= 70.220	Start IL= 70.220 End IL= 70.211	IL= 67.963

Drawing Stage: PRE-PLANNING

Project Details:	
Site Address:	MONAGHAN CO. CO. HQ, ROOSKY, MONAGHAN TOWN
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	
Contractor:	

Notes

Drawn by:	Checked by:	Approved by:	Date:
JPC	KO'M	JFC	FEB '23

Project Name: CIVIC OFFICES
Scale: 1:500 @ A1
Project Number: 2223
Drawing Title: SURFACE WATER LONGSECTIONS SHEET 2

Project:	Originator:	Zone:	Level:	Type:	Discipline:	Drawing No:	Stage:	Revision:
MCC	CORA	ZZ	ZZ	DR	C	2402		PL2

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Appendix B – Storm Water Calculations

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Job No.	Ref No.	Rev
2223		PL1
Civic Offices		Page No. 1/1
By: JPC	Checked: JFC	
Title: SW Drainage: Input Data	Date: 16-Aug-2023	

Drainage Input Data

Site Coordinates:

	IG	ITM
E:	267521	667466
N:	333834	833850

Standard Average Annual Rainfall, SAAR =	988 mm	(From Met Éireann Historical Data)
SOIL Type =	3	
SOIL =	0.37	
Q_{BAR} =	**4.3 l/s/ha**	
Overall Site Area, ha =	1.84 ha	(From Site Plan)
Q_{BAR} =	**7.92 l/s**	

Soil Infiltration Rate, f =	0.0000427 m/s	(From Soils Tests)
	0.15372 m/hr	

Growth Curve Factors:

1 Year	0.85
30 Year	2.13
100 Year	2.61
200 Year	2.86

Met Eireann
Return Period Rainfall Depths for sliding Durations
Irish Grid: Easting: 267521, Northing: 333834,

	Interval		Years												
DURATION	6months,	1year,	2,	3,	4,	5,	10,	20,	30,	50,	75,	100,	150,	200,	250,	500,
5 mins	2.5,	3.6,	4.1,	5.0,	5.6,	6.0,	7.5,	9.2,	10.4,	12.0,	13.4,	14.5,	16.2,	17.6,	18.7,	N/A ,
10 mins	3.5,	4.9,	5.7,	6.9,	7.8,	8.4,	10.5,	12.9,	14.4,	16.7,	18.7,	20.2,	22.6,	24.5,	26.0,	N/A ,
15 mins	4.1,	5.8,	6.8,	8.2,	9.1,	9.9,	12.3,	15.1,	17.0,	19.6,	22.0,	23.8,	26.6,	28.8,	30.6,	N/A ,
30 mins	5.4,	7.6,	8.8,	10.5,	11.7,	12.6,	15.6,	19.0,	21.3,	24.4,	27.2,	29.4,	32.7,	35.3,	37.5,	N/A ,
1 hours	7.1,	9.9,	11.4,	13.5,	15.0,	16.1,	19.8,	23.9,	26.6,	30.4,	33.8,	36.4,	40.3,	43.4,	45.9,	N/A ,
2 hours	9.4,	12.9,	14.7,	17.4,	19.2,	20.6,	25.1,	30.1,	33.4,	37.9,	41.9,	44.9,	49.6,	53.2,	56.2,	N/A ,
3 hours	11.1,	15.1,	17.2,	20.2,	22.3,	23.8,	28.9,	34.4,	38.1,	43.1,	47.5,	50.9,	56.0,	60.0,	63.3,	N/A ,
4 hours	12.5,	16.8,	19.1,	22.5,	24.7,	26.4,	31.8,	37.9,	41.8,	47.2,	51.9,	55.6,	61.1,	65.3,	68.8,	N/A ,
6 hours	14.7,	19.7,	22.3,	26.0,	28.5,	30.4,	36.6,	43.3,	47.7,	53.7,	58.9,	62.9,	69.0,	73.7,	77.5,	N/A ,
9 hours	17.3,	23.0,	25.9,	30.2,	33.0,	35.1,	42.0,	49.5,	54.4,	61.0,	66.8,	71.2,	77.9,	83.0,	87.2,	N/A ,
12 hours	19.4,	25.7,	28.9,	33.5,	36.6,	38.9,	46.4,	54.5,	59.7,	66.8,	73.0,	77.8,	84.9,	90.4,	94.9,	N/A ,
18 hours	22.9,	30.0,	33.6,	38.9,	42.3,	44.9,	53.3,	62.3,	68.1,	76.0,	82.8,	88.0,	95.9,	101.9,	106.8,	N/A ,
24 hours	25.7,	33.5,	37.4,	43.1,	46.9,	49.7,	58.8,	68.5,	74.7,	83.2,	90.6,	96.2,	104.6,	111.0,	116.2,	134.0,
2 days	33.2,	41.9,	46.3,	52.5,	56.5,	59.5,	68.9,	78.9,	85.2,	93.7,	101.0,	106.4,	114.6,	120.8,	125.8,	142.7,
3 days	39.6,	49.1,	53.7,	60.3,	64.6,	67.7,	77.6,	87.9,	94.3,	103.0,	110.3,	115.8,	124.0,	130.1,	135.1,	151.8,
4 days	45.3,	55.5,	60.4,	67.4,	71.8,	75.1,	85.3,	95.9,	102.5,	111.3,	118.8,	124.3,	132.6,	138.7,	143.7,	160.3,
6 days	55.7,	67.0,	72.4,	79.9,	84.7,	88.2,	99.1,	110.3,	117.1,	126.2,	133.9,	139.6,	148.0,	154.2,	159.3,	175.9,
8 days	65.2,	77.4,	83.2,	91.2,	96.3,	100.0,	111.4,	123.1,	130.2,	139.6,	147.4,	153.2,	161.8,	168.1,	173.2,	190.0,
10 days	74.2,	87.1,	93.3,	101.7,	107.0,	111.0,	122.8,	134.9,	142.2,	151.8,	159.9,	165.8,	174.5,	180.9,	186.1,	203.0,
12 days	82.7,	96.4,	102.9,	111.7,	117.2,	121.3,	133.5,	145.9,	153.4,	163.3,	171.5,	177.5,	186.4,	192.9,	198.1,	215.2,
16 days	99.0,	113.9,	120.9,	130.4,	136.2,	140.6,	153.5,	166.5,	174.4,	184.6,	193.1,	199.3,	208.4,	215.0,	220.3,	237.6,
20 days	114.6,	130.5,	137.9,	147.9,	154.1,	158.6,	172.2,	185.7,	193.8,	204.3,	213.0,	219.4,	228.6,	235.4,	240.8,	258.3,
25 days	133.4,	150.4,	158.2,	168.8,	175.3,	180.0,	194.2,	208.2,	216.6,	227.4,	236.3,	242.8,	252.3,	259.2,	264.6,	282.4,

NOTES:
N/A Data not available
These values are derived from a Depth Duration Frequency (DDF) Model
For details refer to:
'Fitzgerald D. L. (2007), Estimates of Point Rainfall Frequencies, Technical Note No. 61, Met Eireann, Dublin',
Available for download at www.met.ie/climate/dataproducts/Estimation-of-Point-Rainfall-Frequencies_TN61.pdf

M5-60m = 16.1

M5-2d = 59.5

Ratio R = M5-60m/M5-2d

R = 16.1/59.5

R = 0.271

SAAR = 988mm (from Historical Data)

Greenfield runoff rate estimation for sites

www.uksuds.com | Greenfield runoff tool

Calculated by:	John Callanan
Site name:	2223 - MCC
Site location:	Roosky, Monaghan

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013) , the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	54.24982° N
Longitude:	6.96516° W
Reference:	2827752064
Date:	Aug 17 2023 11:19

Runoff estimation approach

IH124

Site characteristics

Total site area (ha): 1

Methodology

Q_{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	4	3
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.37

Hydrological characteristics

	Default	Edited
SAAR (mm):	1016	988
Hydrological region:	13	13
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	1.65	1.65
Growth curve factor 100 years:	1.95	1.95
Growth curve factor 200 years:	2.15	2.15

Notes

(1) Is Q_{BAR} < 2.0 l/s/ha?

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is SPR/SPRHOST ≤ 0.3?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited

Q_{BAR} (l/s):	7.47	4.3
1 in 1 year (l/s):	6.35	3.65
1 in 30 years (l/s):	12.32	7.09
1 in 100 year (l/s):	14.56	8.38
1 in 200 years (l/s):	16.05	9.24

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		Civic Offices		Page No. 1/1
		By: JPC	Checked: JFC	
Title: SW Drainage: Impermeable Areas			Date: 16-Aug-2023	

Breakdown of Impermeable Areas

				(Run-off Coefficient)			Overall Run-off Coefficient for Analysis
	Overall Area						
Catchment Area 1:	Upper Car Park	A_{CP1} =	1140.0 m²	@ 1.0 =	1140.0 m²		
	Landscaping	A_{L1} =	774.0 m²	@ 0.3 =	232.2 m²	**1372.2 m²**	**(0.717)**
	Overall Area	$A_{O/A}$ =	1914.0 m²				
Catchment Area 2:	Middle Car Park	A_{CP2} =	988.0 m²	@ 1.0 =	988.0 m²		
	Ramp to Upper CP	A_{R1} =	84.0 m²	@ 1.0 =	84.0 m²		
	Ramp from Upper CP	A_{R2} =	140.0 m²	@ 1.0 =	140.0 m²		
	Landscaping	A_{L2} =	943.0 m²	@ 0.3 =	282.9 m²	**1494.9 m²**	**(0.694)**
	Overall Area	$A_{O/A}$ =	2155.0 m²				
Catchment Area 3:	Lower Car Park	A_{CP3} =	1088.0 m²	@ 1.0 =	1088.0 m²		
	Ramp to Middle CP	A_{R3} =	422.0 m²	@ 1.0 =	422.0 m²		
	Site Entrance	A_{SE} =	143.0 m²	@ 1.0 =	143.0 m²		
	Landscaping	A_{L3} =	1419.0 m²	@ 0.3 =	425.7 m²	**2078.7 m²**	**(0.677)**
	Overall Area	$A_{O/A}$ =	3072.0 m²				
Catchment Area 4:	Pedestrian Entrance & Footpaths	A_{PE} =	963.0 m²	@ 1.0 =	963.0 m²		
	ESB Sub-Station	A_{ESB} =	235.0 m²	@ 1.0 =	235.0 m²		
	Hardstanding near Car Park	A_{HS} =	163.0 m²	@ 1.0 =	163.0 m²	**1361.0 m²**	**(1.0)**
	Overall Area	$A_{O/A}$ =	1361.0 m²				
Catchment Area 5:	Roofs	A_{RF} =	3832.0 m²	@ 1.0 =	3832.0 m²	**3832.0 m²**	**(1.0)**
	Overall Area	$A_{O/A}$ =	3832.0 m²				
Catchment Area 6:	Entrance Area at St. Davnet's Row	A_{E} =	239.0 m²	@ 1.0 =	239.0 m²	**239.0 m²**	**(1.0)**
	Overall Area	$A_{O/A}$ =	239.0 m²				
Catchment Area 7:	Podium Level	A_{P} =	494.0 m²	@ 1.0 =	494.0 m²	**494.0 m²**	**(1.0)**
	Overall Area	$A_{O/A}$ =	494.0 m²				
			Overall Impermeable Site Area:			**10871.8 m²**	

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		Civic Offices		Page No. 1/1
		By: JPC	Checked: JFC	
Title: SW Drainage: Storage Volume & Infiltration under Car Park (80.920)			Date: 16-Aug-2023	

Calculation of Storage Volume & Infiltration

Length, l =	71.5 m	Area: 1144.0 m²
Width, w =	16 m	
Depth, d =	300 mm	
Free Volume, V_{free} =	30%	
M5-60min from Met Éireann Data =	16.1 mm	
M5-60m/M5-2d from Met Éireann Data, r =	0.271	
Return Period, years =	100 year	+ 20%
Impermeable Area, A =	1372.2 m²	
Soil Infiltration Rate, f =	0.0000427 m/s	
Surface Area to 50% storage depth, A_{s50} =	26.25 m²	
Outflow Factor, AF =	0.001120875 m³/s	
Max. Inflow (from Podium Permavoid) =	0.0 l/s =	0 m³/s

Duration	M5 Rainfalls	100 year Rainfall	100 year Rainfall + 20%	Inflow (m³)	Additional Inflow (m³)	Outflow (m³)	Storage Required (m³)
5 mins	6.0 mm	14.5 mm	17.4 mm	23.9	0	0.3	23.5
10 mins	8.4 mm	20.2 mm	24.2 mm	33.3	0	0.7	32.6
15 mins	9.9 mm	23.8 mm	28.6 mm	39.2	0	1.0	38.2
30 mins	12.6 mm	29.4 mm	35.3 mm	48.4	0	2.0	46.4
1 hour	16.1 mm	36.4 mm	43.7 mm	59.9	0	4.0	55.9
2 hours	20.6 mm	44.9 mm	53.9 mm	73.9	0	8.1	65.9
3 hours	23.8 mm	50.9 mm	61.1 mm	83.8	0	12.1	71.7
4 hours	26.4 mm	55.6 mm	66.7 mm	91.6	0	16.1	75.4
6 hours	30.4 mm	62.9 mm	75.5 mm	103.6	0	24.2	79.4
9 hours	35.1 mm	71.2 mm	85.4 mm	117.2	0	36.3	80.9
12 hours	38.9 mm	77.8 mm	93.4 mm	128.1	0	48.4	79.7
18 hours	44.9 mm	88.0 mm	105.6 mm	144.9	0	72.6	72.3
24 hours	49.7 mm	96.2 mm	115.4 mm	158.4	0	96.8	61.6

Rainfall Values are taken from Met Éirean Data for the site (see separate data sheet)

Required Storage, S_{reqd} = **80.9 m³**

Actual Storage, S_{act} = **102.96 m³** **(0.79)**

Storage Volume is OK

Time for emptying half volume:

T_{s50} = **00 days 10 hr 01 min 39 s**

Discharge Time is OK

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		Civic Offices		Page No. 1/1
		By: JPC		Checked: JFC
Title: SW Drainage: Storage Volume & Infiltration under Car Park (78.920)				Date: 16-Aug-2023

Calculation of Storage Volume & Infiltration

Length, l =	66 m	Area: 1056.0 m²
Width, w =	16 m	
Depth, d =	300 mm	
Free Volume, V_{free} =	30%	
M5-60min from Met Éireann Data =	16.1 mm	
M5-60m/M5-2d from Met Éireann Data, r =	0.271	
Return Period, years =	100 year	+ 20%
Impermeable Area, A =	1494.9 m²	
Soil Infiltration Rate, f =	0.0000427 m/s	
Surface Area to 50% storage depth, A_{s50} =	24.6 m²	
Outflow Factor, AF =	0.00105042 m³/s	
Max. Inflow (from Podium Permavoid) =	0.0 l/s	= 0 m³/s

Duration	M5 Rainfalls	100 year Rainfall	100 year Rainfall + 20%	Inflow (m³)	Additional Inflow (m³)	Outflow (m³)	Storage Required (m³)
5 mins	6.0 mm	14.5 mm	17.4 mm	26.0	0	0.3	25.7
10 mins	8.4 mm	20.2 mm	24.2 mm	36.2	0	0.6	35.6
15 mins	9.9 mm	23.8 mm	28.6 mm	42.7	0	0.9	41.7
30 mins	12.6 mm	29.4 mm	35.3 mm	52.7	0	1.9	50.8
1 hour	16.1 mm	36.4 mm	43.7 mm	65.3	0	3.8	61.5
2 hours	20.6 mm	44.9 mm	53.9 mm	80.5	0	7.6	73.0
3 hours	23.8 mm	50.9 mm	61.1 mm	91.3	0	11.3	80.0
4 hours	26.4 mm	55.6 mm	66.7 mm	99.7	0	15.1	84.6
6 hours	30.4 mm	62.9 mm	75.5 mm	112.8	0	22.7	90.1
9 hours	35.1 mm	71.2 mm	85.4 mm	127.7	0	34.0	93.7
12 hours	38.9 mm	77.8 mm	93.4 mm	139.6	0	45.4	94.2
18 hours	44.9 mm	88.0 mm	105.6 mm	157.9	0	68.1	89.8
24 hours	49.7 mm	96.2 mm	115.4 mm	172.6	0	90.8	81.8

Rainfall Values are taken from Met Éirean Data for the site (see separate data sheet)

Required Storage, S_{reqd} = **94.2 m³**

Actual Storage, S_{act} = **95.04 m³** **(0.99)**

Storage Volume is OK

Time for emptying half volume:

T_{s50} = **00 days 12 hr 27 min 12 s**

Discharge Time is OK

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		Civic Offices		Page No. 1/1
		By: JPC	Checked: JFC	
Title: SW Drainage: Storage Volume & Infiltration under Car Park (75.000)			Date: 16-Aug-2023	

Calculation of Storage Volume & Infiltration

Length, l =	69 m	Area: 1104.0 m²
Width, w =	16 m	
Depth, d =	350 mm	
Free Volume, V_{free} =	30%	
M5-60min from Met Éireann Data =	16.1 mm	
M5-60m/M5-2d from Met Éireann Data, r =	0.271	
Return Period, years =	100 year	+ 20%
Impermeable Area, A =	2078.7 m²	
Soil Infiltration Rate, f =	0.0000427 m/s	
Surface Area to 50% storage depth, A_{s50} =	29.75 m²	
Outflow Factor, AF =	0.001270325 m³/s	
Max. Inflow (from Podium Permavoid) =	0.0 l/s	= 0 m³/s

Duration	M5 Rainfalls	100 year Rainfall	100 year Rainfall + 20%	Inflow (m³)	Additional Inflow (m³)	Outflow (m³)	Storage Required (m³)
5 mins	6.0 mm	14.5 mm	17.4 mm	36.2	0	0.4	35.8
10 mins	8.4 mm	20.2 mm	24.2 mm	50.4	0	0.8	49.6
15 mins	9.9 mm	23.8 mm	28.6 mm	59.4	0	1.1	58.2
30 mins	12.6 mm	29.4 mm	35.3 mm	73.3	0	2.3	71.0
1 hour	16.1 mm	36.4 mm	43.7 mm	90.8	0	4.6	86.2
2 hours	20.6 mm	44.9 mm	53.9 mm	112.0	0	9.1	102.9
3 hours	23.8 mm	50.9 mm	61.1 mm	127.0	0	13.7	113.2
4 hours	26.4 mm	55.6 mm	66.7 mm	138.7	0	18.3	120.4
6 hours	30.4 mm	62.9 mm	75.5 mm	156.9	0	27.4	129.5
9 hours	35.1 mm	71.2 mm	85.4 mm	177.6	0	41.2	136.4
12 hours	38.9 mm	77.8 mm	93.4 mm	194.1	0	54.9	139.2
18 hours	44.9 mm	88.0 mm	105.6 mm	219.5	0	82.3	137.2
24 hours	49.7 mm	96.2 mm	115.4 mm	240.0	0	109.8	130.2

Rainfall Values are taken from Met Éirean Data for the site (see separate data sheet)

Required Storage, S_{reqd} = **139.2 m³**

Actual Storage, S_{act} = **115.92 m³** **(1.20)**

Storage Volume is NOT OK

NOTE: Anything above the following will be directed to the overflow pipe
100yr + 0% Climate Change is 0.92
50yr + 20% Climate Change is 0.96

Time for emptying half volume:

T_{s50} = **00 days 15 hr 13 min 05 s**

Discharge Time is OK

CORA CONSULTING ENGINEERS	Behan House 10 Lower Mount Street Dublin D02 HT71 t: +353 1 6611100 e: info@cora.ie	Job No. 2223	Ref No.	Rev PL1
		Civic Offices		Page No. 1/1
		By: JPC		Checked: JFC
Title: SW Drainage: Attenuation Storage Volume under Podium				Date: 16-Aug-2023

Calculation of Attenuation Volume

Length, l =	33.6 m		Area: 336.0 m²
Width, w =	10 m		
Depth, d =	0.08 m		
Free Volume, V_{free} =	95%		
M5-60min from Met Éireann Data =	16.1 mm		
M5-60m/M5-2d from Met Éireann Data, r =	0.271		
Return Period, years =	100 year	+ 20%	
Contributory Area, A =	494 m²		
Outflow Factor, AF =	2.0 l/s	(0.002 m³/s)	
Max. Inflow (from RWHT) =	0.0 l/s	= 0 m³/s	

Duration	M5 Rainfalls	100 year Rainfall	100 year Rainfall + 20%	Inflow (m³)	Additional Inflow (m³)	Outflow (m³)	Storage Required (m³)
5 mins	6.0 mm	14.5 mm	17.4 mm	8.6	0	0.6	8.0
10 mins	8.4 mm	20.2 mm	24.2 mm	12.0	0	1.2	10.8
15 mins	9.9 mm	23.8 mm	28.6 mm	14.1	0	1.8	12.3
30 mins	12.6 mm	29.4 mm	35.3 mm	17.4	0	3.6	13.8
1 hour	16.1 mm	36.4 mm	43.7 mm	21.6	0	7.2	14.4
2 hours	20.6 mm	44.9 mm	53.9 mm	26.6	0	14.4	12.2
3 hours	23.8 mm	50.9 mm	61.1 mm	30.2	0	21.6	8.6
4 hours	26.4 mm	55.6 mm	66.7 mm	33.0	0	28.8	4.2
6 hours	30.4 mm	62.9 mm	75.5 mm	37.3	0	43.2	-5.9
9 hours	35.1 mm	71.2 mm	85.4 mm	42.2	0	64.8	-22.6
12 hours	38.9 mm	77.8 mm	93.4 mm	46.1	0	86.4	-40.3
18 hours	44.9 mm	88.0 mm	105.6 mm	52.2	0	129.6	-77.4
24 hours	49.7 mm	96.2 mm	115.4 mm	57.0	0	172.8	-115.8

Rainfall Values are taken from Met Éirean Data for the site (see separate data sheet)

Required Storage, S_{reqd} =	**14.4 m³**	
Actual Storage, S_{act} =	**25.54 m³**	**(0.56)**

Storage Volume is OK

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		Civic Offices		Page No. 1/1
		By: JPC	Checked: JFC	
Title: SW Drainage: Attenuation Storage Volume			Date: 16-Aug-2023	

Calculation of Attenuation Volume

Length, l =	18 m	Area: 180.0 m²	
Width, w =	10 m		
Depth, d =	2 m		
Free Volume, V_{free} =	95%		
M5-60min from Met Éireann Data =	16.1 mm		
M5-60m/M5-2d from Met Éireann Data, r =	0.271		
Return Period, years =	100 year	+ 20%	
Contributory Area, A =	5193 m²		
Outflow Factor, AF =	7.92 l/s	(0.00792 m³/s)	
Max. Inflow (from RWHT) =	0.0 l/s	= 0 m³/s	

Duration	M5 Rainfalls	100 year Rainfall	100 year Rainfall + 20%	Inflow (m³)	Additional Inflow (m³)	Outflow (m³)	Storage Required (m³)
5 mins	6.0 mm	14.5 mm	17.4 mm	90.4	0	2.4	88.0
10 mins	8.4 mm	20.2 mm	24.2 mm	125.9	0	4.8	121.1
15 mins	9.9 mm	23.8 mm	28.6 mm	148.3	0	7.1	141.2
30 mins	12.6 mm	29.4 mm	35.3 mm	183.2	0	14.3	169.0
1 hour	16.1 mm	36.4 mm	43.7 mm	226.8	0	28.5	198.3
2 hours	20.6 mm	44.9 mm	53.9 mm	279.8	0	57.0	222.8
3 hours	23.8 mm	50.9 mm	61.1 mm	317.2	0	85.5	231.7
4 hours	26.4 mm	55.6 mm	66.7 mm	346.5	0	114.0	232.4
6 hours	30.4 mm	62.9 mm	75.5 mm	392.0	0	171.1	220.9
9 hours	35.1 mm	71.2 mm	85.4 mm	443.7	0	256.6	187.1
12 hours	38.9 mm	77.8 mm	93.4 mm	484.8	0	342.1	142.7
18 hours	44.9 mm	88.0 mm	105.6 mm	548.4	0	513.2	35.2
24 hours	49.7 mm	96.2 mm	115.4 mm	599.5	0	684.3	-84.8

Rainfall Values are taken from Met Éirean Data for the site (see separate data sheet)

Required Storage, S_{reqd} =	**232.4 m³**	
Actual Storage, S_{act} =	**342.0 m³**	**(0.68)**

Storage Volume is OK

ADDITIONAL STORAGE FOR OVERFLOWS FROM OTHER AREAS

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		Civic Offices		Page No. 1/1
		By: JPC	Checked: JFC	
Title: SW Drainage: Soakaway - Storage & Infiltration Calculation			Date: 16-Aug-2023	

Calculation of Storage Volume & Infiltration

Length, l =	5.5 m	Area: 16.5 m²
Width, w =	3 m	
Depth, d =	800 mm	
Free Volume, V_{free} =	95%	
M5-60min from Met Éireann Data =	16.1 mm	
M5-60m/M5-2d from Met Éireann Data, r =	0.271	
Return Period, years =	100 year	+ 20%
Impermeable Area, A =	239 m²	
Soil Infiltration Rate, f =	0.0000427 m/s	
Surface Area to 50% storage depth, A_{s50} =	6.8 m²	
Outflow Factor, AF =	0.00029036 m³/s	
Max. Inflow =	0.0 l/s	= 0 m³/s

Duration	M5 Rainfalls	100 year Rainfall	100 year Rainfall + 20%	Inflow (m³)	Additional Inflow (m³)	Outflow (m³)	Storage Required (m³)
5 mins	6.0 mm	14.5 mm	17.4 mm	4.2	0	0.1	4.1
10 mins	8.4 mm	20.2 mm	24.2 mm	5.8	0	0.2	5.6
15 mins	9.9 mm	23.8 mm	28.6 mm	6.8	0	0.3	6.6
30 mins	12.6 mm	29.4 mm	35.3 mm	8.4	0	0.5	7.9
1 hour	16.1 mm	36.4 mm	43.7 mm	10.4	0	1.0	9.4
2 hours	20.6 mm	44.9 mm	53.9 mm	12.9	0	2.1	10.8
3 hours	23.8 mm	50.9 mm	61.1 mm	14.6	0	3.1	11.5
4 hours	26.4 mm	55.6 mm	66.7 mm	15.9	0	4.2	11.8
6 hours	30.4 mm	62.9 mm	75.5 mm	18.0	0	6.3	11.8
9 hours	35.1 mm	71.2 mm	85.4 mm	20.4	0	9.4	11.0
12 hours	38.9 mm	77.8 mm	93.4 mm	22.3	0	12.5	9.8
18 hours	44.9 mm	88.0 mm	105.6 mm	25.2	0	18.8	6.4
24 hours	49.7 mm	96.2 mm	115.4 mm	27.6	0	25.1	2.5

Rainfall Values are taken from Met Éirean Data for the site (see separate data sheet)

Required Storage, S_{reqd} = **11.8 m³**

Actual Storage, S_{act} = **12.54 m³** **(0.94)**

Storage Volume is OK

Time for emptying half volume:

T_{s50} = **00 days 05 hr 37 min 44 s**

Discharge Time is OK

Appendix C – Soil Tests

PROPOSED DEVELOPMENT
NEW CIVIC CENTRE
MONAGHAN
MONAGHAN CO. COUNCIL

CORA
CONSULTING ENGINEERS

CONTENTS

APPENDICES

FOREWORD

The following Conditions and Notes on Site Investigation Procedures should be read in conjunction with this report.

General.

Recommendations made, and opinions expressed in the report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held for conditions which have not been revealed by exploratory work, or which occur between exploratory hole locations. Whilst the report may suggest the likely configuration of strata, both between exploratory hole locations, or below the maximum depth of the investigation, this is only indicative, and liability cannot be accepted for its accuracy.

Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction below or close to the site.

Standards

The ground investigation works for this project have been carried out by IGSL in accordance with Eurocode 7 - Part 2: Ground Investigation & Testing (EN 1997-2:2007). This has been used together with complementary documents such as BS 5930 (1999), BS 1377 (Parts 1 to 9) and Engineers Ireland Specification & Related Documents for Ground Investigation in Ireland (2006). The following Irish (IS) and European Standards or Norms are referenced:

- IS EN 1997-2 Eurocode 7: 2007 – Geotechnical Design – Part 2: Ground Investigation & Testing
- IS EN ISO 22475-1:2006 Geotechnical Investigation and Sampling – Sampling Methods & Groundwater Measurements
- IS EN ISO 14688-1:2002 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 1: Identification and Description
- IS EN ISO 14688-2:2004 Geotechnical Investigation and Testing – Identification and Classification of Soil, Part 2: Classification Principles

Routine Sampling.

Undisturbed samples of soils, predominantly cohesive in nature are obtained unless otherwise stated by a 104mm diameter open-drive tube sampler or Piston Sampler. In granular soils, and where undisturbed sampling is inappropriate, disturbed samples are collected. Smaller disturbed samples are also recovered at intervals to allow a visual examination of the full strata section.

In-Situ Testing.

Standard penetration tests were conducted strictly in accordance with Section 4.6 of IS EN 1997-2:2007. The SPT equipment (hammer energy test) has been calibrated in accordance with EN ISO 22476-3:2005 to obtain the Energy Ratio (E_r) of each hammer. A calibration certificate is available upon request. The E_r is defined as the ratio of the actual energy E_{mess} (measured energy during calibration) delivered to the drive weight assembly into the drive rod below the anvil, to the theoretical energy (E_{theor}) as calculated from the drive weight assembly. The recorded number of blows (N) reported on the engineering logs are uncorrected. In sands, the energy losses due to rod length and the effect of the overburden pressure should be taken into account (see IS EN ISO 22476-3:2005).

Groundwater

The depth of entry of any influx of groundwater is recorded during the course of boring operations. However, the normal rate of boring does not usually permit the recording of an equilibrium level for any one water strike. Where possible drilling is suspended for a period of twenty minutes to monitor the subsequent rise in water level. Groundwater conditions observed in the borings or pits are those appertaining to the period of investigation. It should be noted however, that groundwater levels are subject to diurnal, seasonal and climatic variations and can also be affected by drainage conditions, tidal variations etc.

Engineering Logging

Soil and rock identification has been based on the examination of the samples recovered and conforms with IS EN ISO 14688-1:2002 and IS EN ISO 14689-1:2004.

Where peat has been encountered during site works, samples have been logged in accordance with the Von Post Classification (ref. Von Post, L. 1992. Sveriges Gologiska Undersoknings torvinventering och nogra av dess hittils vunna resultat (SGU peat inventory and some preliminary results) Svenska Mosskulturforeningens Tidskrift, Jonkoping, Swedden, 36, 1-37 & Hobbs N. B. Mire morphology and the properties of some British and foreign peats. QJEG, Vol. 19, 1986).

Retention of Samples.

After satisfactory completion of all the scheduled laboratory tests on any sample, the remaining material is discarded unless a period of retention of samples is agreed, it is our normal practice to discard all soil samples one month after submission of our final report.

Reporting

Recommendations made and opinions expressed in this report are based on the strata observed in the exploratory holes, together with the results of in-situ and laboratory tests. No responsibility can be held by IGSL Ltd for ground conditions between exploratory hole locations.

The engineering logs provide ground profiles and configuration of strata relevant to the investigation depths achieved and caution should be taken when extrapolating between exploratory points. No liability is accepted for ground conditions extraneous to the investigation points. Unless specifically stated, no account has been taken of possible subsidence due to mineral extraction, mining works or karstification below or close to the site.

This report has been prepared for the project client and the information should not be used without prior written permission. Any recommendations developed in this report specifically relate to the proposed development. IGSL Ltd accepts no responsibility or liability for this document being used other than for the purposes for which it was intended.

REPORT ON A SITE INVESTIGATION

NEW CIVIC OFFICES
FOR
MONAGHAN COUNTY COUNCIL

CORA
CONSULTING ENGINEERS

Report No. 24665 **July 2023**

I Introduction

A major new development is proposed for a site in Monaghan where new Civic Offices are to be located.

An investigation of sub soil conditions in the area of the new development has been carried out by IGSL for CORA, Consulting Engineers, on behalf of Monaghan County Council.

The scheduled site investigation included the following elements.

*	Cable Percussion Boreholes	8 nr.
•	Rotary Core Holes	3 nr.
•	Standpipe Installations	1 nr.
•	Trial Pits	14 nr.
•	BRE Digest 365 Infiltration Tests	4 nr.
•	Geotechnical Laboratory Tests	
*	Chemical and Environmental Tests	

This report includes all factual data from field and laboratory operations and discusses these findings relative to foundation and infrastructural design for the proposed new development.

II Fieldwork

This development is to take place on an undulating greenfield site in Monaghan Town.

The exploratory locations are noted on the drawing enclosed in Appendix VI and were marked out by IGSL on site. All locations have been referenced to national grid and ground levels established.

The various elements of the investigation are detailed in the following paragraphs. All field works were supervised by an experienced geotechnical engineer who carefully recorded stratification, took photographs as necessary, recovered samples and prepared detailed records.

Close liaison was maintained throughout with CORA Consulting Engineers and Monaghan County Council personnel.

All appropriate documentation was submitted and approved prior to site commencement. Each location was scanned electronically (CAT) to ensure that existing services were not damaged. A shallow trial pit was also opened by hand at borehole / corehole locations to confirm this.

Drawings from the various utilities were also examined to ensure that major services were avoided.

Statutory HSE safety precautions relating to general safety and COVID 19 were strictly observed, with working areas restricted to IGSL personnel only, to ensure safety of the general public.

Boreholes

Boreholes were 200mm diameter and were constructed using conventional cable percussion equipment. Holes were referenced BH01 to BH08. A trial pit was opened at each borehole location to 1.00 metre deep to ensure that underground services were not damaged.

Shallow refusal was recorded on boulder obstructions at two locations (BH04 and BH06). Following a period of abortive chiselling, the equipment was moved by about 3 metres and re-bores were taken. These are referenced BH04A and BH06A.

Detailed geotechnical records are contained in Appendix I to this report - the records give details of stratification, sampling, in-situ testing and groundwater. Note is also taken of any obstructions to normal boring requiring the use of the heavy chisel for advancement. It was not possible to recover undisturbed samples because of the hard and granular nature of the strata encountered.

The findings are fairly consistent, with topsoil generally overlying a1.50 stratum of soft to firm brown sandy SILT /CLAY.

Stiff brown sandy gravelly CLAY , typically containing cobble and boulder material, is encountered at shallow depth (generally 0.50 to 1.00 metres). This stratum continues to about 2.50 metres where very stiff to hard dark grey gravelly CLAY is noted. This stratum also contains significant cobbles and boulder.

Boreholes were terminated on boulder obstructions in all locations at varying depths. Chiselling techniques were used in all locations in an attempt to advance borehole depths without success.

The stiff brown and grey gravelly CLAY encountered on this site is a GLACIAL TILL or BOULDER CLAY with the high percentage of coarse material typical of the stratum.

The increasing strength with depth pattern particularly in the base grey boulder clay is also noted. The final refusal depths are **NOT** indicative of rock horizon.

The borehole findings are summarised in the following **TABLE A:**

TABLE A

Ref	Sandy Clay	Stiff brown BC	Stiff grey BC	Refusal Depth
BH01	0.30 – 1.20	1.20 – 3.00		3.00
BH02	0.30 – 0.70	0.70 – 2.50	2.50 – 4.50	4.50
BH03	0.30 – 1.50	1.50 – 3.70		3.70
BH04	0.30 – 1.20			1.20
BH04A	0.30 – 0.50	0.50 – 2.50	2.50 – 4.50	4.50
BH05	0.30 – 1.50	1.50 – 2.00	2.00 – 4.50	4.50
BH06	0.30 – 0.50	0.50 – 1.00		1.00
BH06A	0.30 – 0.50	0.50 – 1.00		1.00
BH07	0.20 – 0.50	0.50 – 1.00		1.00
BH08	0.30 – 1.00	1.00 – 1.80	1.80 – 3.40	3.40

Ground water ingress was note in two locations, at 3.00 metre BGL in BH01 and at 4.50 metres BGL in BH05. The remaining boreholes were DRY.

Rotary Core Drilling

Rotary core drilling was employed at three of the borehole locations to advance investigation depth, establish bedrock horizon and recover representative rock core if practical.

A BT-44 drilling rig was used to drill in each location using triple tube core drilling technique and an air-mist coolant. Symmetrix open hole drilling (100mm diameter) was used through the overburden deposits.

Detailed drilling records are presented in Appendix II with accompanying core photographs. The records note Total and Solid Core Recovery (TCR / SCR) and provide a detailed geological description of the rock.

Drilling continued in each location to depths between 10.50 and 15.00 metres, penetrating very stiff to hard GLACIAL TILL consisting of brown or grey gravelly CLAY with extensive boulder presence.

Some core was recovered in the hard base till. The enclosed core photographs clearly indicate the significant boulder presence.

The strength of the boulder clay was established by standard penetration tests taken at 1.50 metre intervals during the drilling operation. Results are noted in the right hand column of the records. SPT values typically exceed N=40 with numerous test refusals recorded.

A slotted PVC standpipe was installed in RC02 to facilitate on-going monitoring of ground water level. The installation was sealed at surface and protected by a steel cover.

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The rotary core findings are summarised in the following table.

TABLE B

Hole No.	Overburden	Core Recovered	Standpipe
RC02	0 – 10.50		0 – 10.50
RC03	0 – 10.50	8.10 – 10.50	
RC06	0 – 15.00	13.5 – 15.00	

Trial Pits

Trial Pits were scheduled in fourteen specified locations and referenced TP01 to TP14. A tracked excavator was used under engineering supervision. Detailed records for each location are presented in Appendix III. These records note the soil stratification and record sampling and ground water details.

Topsoil surface was noted in each location generally overlying a zone of soft SILT/CLAY. Firm to stiff brown or grey gravelly CLAY was then encountered, this stratum typically containing cobbles and boulders.

The findings are consistent with the stratification noted in the boreholes.

Several trial pits were terminated on large boulders. The findings are summarised and presented as follows:

TABLE C

Ref No.	Topsoil	Soft SILT- CLAY	Stiff gravelly CLAY	Water
TP01	0 – 0.25	0.25 – 0.90	0.90 – 1.80	Dry
TP02	0 – 0.25	0.25 - 0.55	0.55 – 1.40	Dry
TP03	0 – 0.20	0.20 – 0.80	0.80 – 1.70	Dry
TP04	0 – 0.10	0.10 – 0.60	0.60 – 1.80	Dry
TP05	0 – 0.20	0.20 – 0.50	0.50 – 2.10	Dry
TP06	0 – 0.25	0.25 – 0.80	0.80 – 1.50	1.00
TP07	0 – 0.25	0.25 – 1.50	1.50 – 1.90	Dry
TP08	0 – 0.25	0.25 – 0.50	0.50 – 2.20	Dry
TP09	0 – 0.25	0.25 – 0.50	0.50 – 1.50	Dry
TP10	0 – 0.30	0.30 – 0.50	0.50 – 2.50	Dry
TP11	0 – 0.20	0.20 – 1.10	1.10 – 2.30	Dry
TP12	0 – 0.30	0.30 – 1.00	1.00 – 1.80	Dry
TP13	0 – 0.20	0.20 – 0.50	0.50 – 1.40	Dry
TP14	0 – 0.20	0.20 – 0.50	0.50 – 2.10	Dry

Trial Pits were backfilled with the excavated spoil, compacted in layers, the disturbed areas were levelled and coarse material was removed.

BRE Digest 365 Test

Infiltration testing was performed at four locations as specified in accordance with BRE Digest 365 'Soakaway Design'. Tests are referenced SA01 to SA04. Detailed data is presented in Appendix IV.

To obtain a measure of the infiltration rate of the sub-soils, water is poured into the test pit, and records taken of the fall in water level against time. The test is carried out over two cycles following initial soakage.

The infiltration rate is the volume of water dispersed per unit exposed area per unit of time, and is generally expressed as metres/minute. In these calculations the exposed area is the sum of the base area and the average internal area of the permeable stratum over the test duration. Design is based on the slowest infiltration rate, which has been calculated from the final cycle.

The stratification in the test area comprised Topsoil over gravelly sandy SILT/ CLAY.

Results are summarised as follows:

TABLE D

Test No.	Depth	Soil Type	Infiltration Rate (f) (Metres/ Minute)
SA 01	1.30	Gravelly CLAY	0.00173
SA02	1.60	Gravelly CLAY	0.00023
SA03	1.60	Gravelly CLAY	5.3E-05
SA04	1.30	Gravelly CLAY	0.0000

The results confirm low to very low permeability for the cohesive gravelly clay soils present on the site.

III. Testing

In Situ

Standard penetration tests were carried out at approximate 1.00 metre intervals in the geotechnical boreholes and at 1.50 metres in the Rotary Core Holes to measure relative in-situ soil strength. N values are noted in the right hand column of the individual records, representing the blow count required to drive the standard sampler 300mm into the soil, following initial seating blows. Where full test penetration was not achieved the blow count for a specific penetration is recorded, or refusal is indicated where appropriate. The results of the tests are summarised as follows:

STRATUM	N VALUE RANGE	COMMENT
Gravelly CLAY (Boulder Clay)		
1.00 m BGL	6 to 13	Soft to Firm
2.00 m BGL	10 to 29	Firm to Stiff
3.00 m BGL	26 to 50	Stiff to Hard
4.00 m BGL	> 50	Hard
4.00 to 15.00 m BGL (Rotary Holes)	40 to >50	Hard

Limited penetration SPT tests with refusal were recorded on numerous occasions, reflecting a high concentration of cobble / boulder material in the glacial till

Laboratory

A programme of laboratory testing was scheduled following completion of site operations. Geotechnical testing was carried out by IGSL in it's INAB-Accredited laboratory. Chemical and environmental testing was carried out in the UK by EUROFINS / CHEMTEST Ltd. The test programme included the following elements:

Liquid and Plastic Limits / Moisture Content	IGSL
PSD Grading by Wet Sieve and Hydrometer	IGSL
MCV	IGSL
CBR	IGSL
Compaction	IGSL
Organic Content	EUROFINS
Sulphate / Chloride / pH	EUROFINS
RILTA Suite Environmental	EUROFINS

All laboratory data is presented in Appendices Va and Vb and individual tests are discussed briefly as follows:

Index Properties / Natural Moisture Content

Classification tests have been carried out on samples of the cohesive soils from borehole and trial pit locations.

The glacial tills plot generally in the CI/CL zone of the standard Classification chart indicative of low plasticity gravelly CLAY matrix material. Natural Moisture Content ranges from 14 to 19 %.

Grading

Wet sieve and hydrometer analysis has been carried out on samples of the cohesive soils from both boreholes and trial pits. The graphs are typically straight line, grading from the fine clay to coarse gravel fraction. The pattern is very typical of glacial till or boulder clay deposition.

Organic Content

Six samples of the soils from the site had organic contents established. Samples were generally taken from shallow depths below the topsoil. Values of 1.0 to 2.5% were determined indicative of very low to negligible organic content.

MCV/CBR/Compaction

Six large composite samples were selected from Trial Pits 01 / 03 / 05 / 09 / 12 and 14 and a series of tests were scheduled to establish the soil characteristics relative to possible re-use during the new development.

The tests carried out included MCV (Moisture Condition Value), Natural Moisture Content, CBR (California Bearing Ratio), Dry Density / Moisture Content relationship.

The results are summarised as follows:

Ref No.	**TP01**	**TP03**	**TP05**	**TP09**	**TP12**	**TP14**
Depth	0.70	0.6	0.7	0.7	0.8	1.5
Natural MC (%)	15	13	13	13	10	14
MCV	6.6	7.3	6.8	6.8	6.7	7.8
CBR (%)	5.6	4.6	4.1	2.0	7.7	3.0
Max.Dry Density (mg/cu.m.)	1.90	1.86	1.86	1.88	1.89	1.85
Optimum Moisture (%)	11	12	12	12	12	14

Chemical Suite (Sulphate Chloride pH)

Six samples were sent for analysis to BRE Chemical Suite parameters.

Sulphate concentrations (SO4 2:1 extract) of <0.010 to 0.240 g/l were established with pH values ranging from 7.8 to 8.6. Chloride concentrations (<0.010 to 0.24 g/l) were also determined.

The results indicate a design class of DS-1 (ACEC Classification for Concrete) for sulphate concentrations below 0.5 g/l. No special precautions are necessary to protect below ground foundation concrete.

RILTA Environmental Suite

Six samples of the sub soils were sent to specialist environmental laboratory EUROFINS and testing was carried out in accordance with RILTA requirements to establish Landfill Waste Acceptance Criteria (WAC).

Detailed results are presented in Appendix V o. All samples tested fall into the INERT category with no elevated contaminant levels recorded.

Material excavated from this site can be safely disposed of either within the site boundary or off site to a suitably licensed Landfill Facility

Asbestos screening was carried out on all RILTA samples with no traces of Asbestos noted.

A comprehensive Waste Characterisation Assessment may be required by landfill operators. This can be prepared by specialist environmental consultants using the factual data from field and laboratory as presented in this report.

IV. Discussion:

A major development is being undertaken at this site in Monaghan. A new CIVIC CENTRE is to be constructed for Monaghan County Council.

A detailed investigation of subsoil and bedrock has been carried out under the direction of CORA Consulting Engineers in the area of development.

The exploratory locations are detailed on the site plan in Appendix VI.

The factual data from the field and laboratory is presented in Sections 1 to III of this report.

The site is grassed with some significant variation in ground level.

SUMMARY STRATIFICATION

TOPSOIL overlies soft to firm sandy SILT/CLAY. This upper material extends to depth between 0.50 and 1.50 metres as shown in TABLE A and TABLE B.

Stiff brown gravelly CLAY (brown BOULDER CLAY) is then encountered and continues to about 2.00 metres where it changes to very stiff to hard grey gravelly CLAY (grey black BOULDER CLAY). Proof core drilling confirmed that the GLACIAL TILL continues to at least 15 metres BGL. Bedrock was not established.

UPPER SILT/CLAY

The soils extending from surface to depths up to 1.50 metre are described as soft to firm sandy slightly gravelly SILT/CLAY. SPT values of N=6 to N=10 have been recorded at a depth of 1.00 metre.

BOULDER CLAY

GLACIAL TILL or BOULDER CLAY has been confirmed below approximately 1.50 metres, the stratum continues to at least 15.00 metres BGL. Visual inspection of trial pit excavations and results of in-situ Standard Penetration Tests are indicative of stiff to hard consistency.

The characteristics of the regional boulder clay or glacial till are very well documented and the findings from this detailed investigation are consistent with extensive published data.

ALLOWABLE BEARING PRESSURES

The soil strength has been assessed visually in the trial pits and confirmed by Standard Penetration Tests in boreholes and core holes. The allowable bearing pressures indicated by the field data are summarised as follows:

Depth	Average N Value	Allowable Bearing Pressure	
1.00	7	75 kPa	(Upper Silt/Clay)
2.00	20	200 kPa	(Boulder Clay)
3.00	35	300 kPa	
4.00	>50	400 kPa	

FOUNDATION RECOMMENDATIONS

The use of traditional reinforced foundations for the new Civic Offices development is proposed. Foundations to be placed on the stiff brown or grey boulder CLAY using the allowable bearing pressures indicated above.

We strongly recommend visual inspection of foundation excavations by experienced personnel to ensure uniformity and suitability of the founding medium. Any soft or suspect material should be removed and where necessary replaced with low-grade concrete. The glacial till soils are sensitive to moisture variation and should be protected by blinding following excavation.

The presence of extensive boulders should also be noted with possible over-break in excavation occurring.

The majority of boreholes and trial pits were dry with only occasional water seepages recorded. This may indicate isolated water bearing gravelly zones, typical of the heterogeneous nature of the regional Glacial Till.

SETTLEMENT

Settlement of the order of 5 to 10mm can be expected under the foundation loadings indicated above. Settlement should be quite uniform and differential movement is not anticipated.

EXCAVATION

Given the variations in site levels it is likely that significant cut and fill operations will be required. No major issues will arise with excavation, other than the presence of boulder obstructions and possibly water ingress if gravel zones are encountered.

A detailed programme of laboratory testing has been carried out to establish soil parameters relative to the suitability of excavated material for re-use as engineered fill.

The results reflect a high degree of consistency in the boulder clay over the site area and will allow the appointed contractor to design a suitable programme for earthworks on this site.

BRE DIGEST 365 TESTS

The test results reflect very low permeability characteristics in the gravelly CLAY soils. This is very typical of the cohesive material. Clay matrix material is generally unsuited to dispersion of storm or surface water and consideration should be given to the use of the Local Authority Drainage System for this development.

FOUNDATION CONCRETE

No special precautions are necessary for protection of below ground concrete.

ENVIRONMENTAL

Six samples have been tested to RILTA Suite Parameters and the results confirm an INERT classification for the soils. Excavated material can be safely used on the site or can be disposed of to a suitably licensed Landfill.

A waste Characterisation Assessment (WCA) may be necessary and should be carried out by environmental specialists. This WCA should be submitted to the relevant waste management facility, to confirm suitability for acceptance.

IGSL/JC
July 2023

Appendix I Boring Records

GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	BOREHOLE NO.	BH01
		SHEET	Sheet 1 of 1
CO-ORDINATES	RIG TYPE Dando 2000	DATE COMMENCED	13/05/2023
GROUND LEVEL (m AOD)	BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 3.00	DATE COMPLETED	13/05/2023
CLIENT Monaghan Co.Co.	SPT HAMMER REF. NO.	BORED BY	P.Allan
ENGINEER DBFL	ENERGY RATIO (%)	PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Firm brown sandy SILT/CLAY with occasional gravel			1.00	AA192931	B	0.50			
1	Firm grey sandy SILT/CLAY			1.20	AA192932	B	1.00		N = 13 (2, 3, 2, 3, 4, 4)	
	Brown sandy gravelly CLAY with occasional cobbles			2.70	AA192933	B	2.00		N = 17 (2, 2, 2, 4, 5, 6)	
2	Brown sandy gravelly CLAY with some cobble			3.00						
3	Obstruction End of Borehole at 3.00 m								N = 50/75 mm (25, 25, 50)	
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
2.8	3	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
3.00	3.00	No	1.50	20	Moderate

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
11-05-23	3.00	Nil	1.50	End of BH

REMARKS CAT scanned location and hand dug inspection pit was carried out .

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 24665M.GPJ IGSL.GDT 26/5/23

GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	BOREHOLE NO.	BH02
		SHEET	Sheet 1 of 1
CO-ORDINATES		RIG TYPE	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		BOREHOLE DEPTH (m)	4.50
		DATE COMMENCED	13/05/2023
		DATE COMPLETED	14/05/2023
CLIENT	Monaghan Co.Co.	SPT HAMMER REF. NO.	
ENGINEER	DBFL	ENERGY RATIO (%)	
		BORED BY	P.Allan
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Soft brown sandy SILT/CLAY with occasional gravel			0.70	AA197801	B	0.50			
1	Stiff brown sandy SILT/CLAY with some gravel				AA197802	B	1.00		N = 6 (1, 0, 1, 1, 2, 2)	
2					AA197803	B	2.00		N = 26 (2, 3, 6, 8, 5, 7)	
				2.50						
3	Stiff to very stiff grey sandy gravelly CLAY with occasional cobbles				AA197804	B	3.00		N = 50/225 mm (4, 5, 9, 15, 26)	
4					AA197805	B	4.00		N = 50/150 mm (6, 10, 20, 30)	
				4.50						
5	Obstruction End of Borehole at 4.50 m									
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
0.7	0.9	1	
4.3	4.5	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out .

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 24665M.GPJ IGSL.GDT 26/5/23

GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	**BOREHOLE NO.**	**BH03**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	3.70
		DATE COMMENCED	12/05/2023
		DATE COMPLETED	12/05/2023
CLIENT	Monaghan Co.Co.	**SPT HAMMER REF. NO.**	
ENGINEER	DBFL	**ENERGY RATIO (%)**	
		BORED BY	P.Allan
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Soft to firm brown sandy SILT/CLAY with occasional gravel				AA192934	B	0.50			
1					AA192935	B	1.00		N = 7 (1, 2, 1, 2, 2, 2)	
2				2.30	AA192936	B	2.00		N = 10 (2, 2, 2, 3, 2, 3)	
	Very brown sandy gravelly CLAY with occasional cobbles									
3					AA192937	B	3.00		N = 50 (6, 6, 10, 10, 20, 10)	
				3.70					N = 50/75 mm (25, 50)	
4	Obstruction End of Borehole at 3.70 m									
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
2.7	2.9	1	
3.5	3.7	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out .

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 24665M.GPJ IGSL.GDT 26/5/23

GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	BOREHOLE NO.	BH04
		SHEET	Sheet 1 of 1
CO-ORDINATES		RIG TYPE	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		BOREHOLE DEPTH (m)	1.20
		DATE COMMENCED	12/05/2023
		DATE COMPLETED	12/05/2023
CLIENT	Monaghan Co.Co.	SPT HAMMER REF. NO.	
ENGINEER	DBFL	ENERGY RATIO (%)	
		BORED BY	P.Allan
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Grey SILT/CLAY with some gravel and occasional cobbles				AA192938	B	0.50		N = 50/75 mm (25, 50)	
1				1.20						
	Obstruction End of Borehole at 1.20 m									
2										
3										
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
1.1	1.2	1	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out . Obstruction encountered . Moved to BH04A and attempted rebore .

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

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GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	**BOREHOLE NO.**	**BH04A**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	4.50
		DATE COMMENCED	13/05/2023
		DATE COMPLETED	13/05/2023
CLIENT	Monaghan Co.Co.	**SPT HAMMER REF. NO.**	
ENGINEER	DBFL	**ENERGY RATIO (%)**	
		BORED BY	P.Allan
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Stiff bown sandy SILT/CLAY with some gravel				AA192939	B	1.00			
1										
					AA192940	B	2.00		N = 21 (2, 2, 3, 6, 8, 4)	
2				2.50						
	Very stiff grey sandy gravelly CLAY with some cobbles				AA192941	B	3.00		N = 50 (4, 4, 5, 10, 20, 15)	
3										
					AA192942	B	4.00		N = 40/150 mm (6, 10, 19, 21)	
4				4.50					N = 50/75 mm (25, 50)	
	Obstruction End of Borehole at 4.50 m									
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
1.1	1.3	1	
4.4	4.5	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out .

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

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GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	BOREHOLE NO.	BH05
		SHEET	Sheet 1 of 1
CO-ORDINATES		RIG TYPE	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		BOREHOLE DEPTH (m)	4.50
		DATE COMMENCED	15/05/2023
		DATE COMPLETED	15/05/2023
CLIENT	Monaghan Co.Co.	SPT HAMMER REF. NO.	
ENGINEER	DBFL	ENERGY RATIO (%)	
		BORED BY	P.Allan
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Soft to firm brown sandy SILT/CLAY with occasional gravel				AA192946	B	0.50			
1					AA192947	B	1.00		N = 6 (2, 6, 1, 1, 2, 2)	
				2.00						
2	Stiff to very stiff grey sandy gravelly CLAY with occasion cobbles				AA192948	B	2.00		N = 19 (2, 2, 3, 4, 5, 7)	
	Firm to stiff brown sandy gravelly CLAY with some cobbles									
3	Stiff to very stiff grey sandy gravelly CLAY with occasion cobbles				AA192949	B	3.00		N = 26 (2, 3, 4, 6, 8, 8)	
	Firm to stiff brown sandy gravelly CLAY with some cobbles									
4					AA192950	B	4.00		N = 50/150 mm (6, 8, 20, 30)	
				4.50					N = 50/75 mm (17, 8, 50)	
	Obstruction End of Borehole at 4.50 m									
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
3.7	3.9	1	
4.3	4.5	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
4.50	4.50	No	3.50	0	Moderate

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out .

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

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GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	**BOREHOLE NO.**	**BH06**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	1.00
		DATE COMMENCED	16/05/2023
		DATE COMPLETED	16/05/2023
CLIENT	Monaghan Co.Co.	**SPT HAMMER REF. NO.**	
ENGINEER	DBFL	**ENERGY RATIO (%)**	
		BORED BY	P.Allan
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Very stiff brown sandy SILT/CLAY with some gravel and occasional cobbles			1.00	AA197914	B	0.80		N = 50/75 mm (25, 50)	
1	Obstruction End of Borehole at 1.00 m									
2										
3										
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
0.9	1	1	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out . Obstruction encountered . Moved to BH06A and attempted rebore.

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

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GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	BOREHOLE NO.	BH06A
		SHEET	Sheet 1 of 1
CO-ORDINATES		RIG TYPE	Dando 2000
		BOREHOLE DIAMETER (mm)	
GROUND LEVEL (m AOD)		BOREHOLE DEPTH (m)	1.00
		DATE COMMENCED	16/05/2023
		DATE COMPLETED	16/05/2023
CLIENT	Monaghan Co.Co.	SPT HAMMER REF. NO.	
		BORED BY	P.Allan
ENGINEER	DBFL	ENERGY RATIO (%)	
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Very stiff brown sandy SILT/CLAY with some gravel and occasional cobbles			1.00	AA171709	B	0.80		N = 50/75 mm (25, 50)	
1	Obstruction End of Borehole at 1.00 m									
2										
3										
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
0.9	1	1	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out .

Sample Legend
D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 24665M.GPJ IGSL.GDT 26/5/23

GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	BOREHOLE NO.	BH07
		SHEET	Sheet 1 of 1
CO-ORDINATES		RIG TYPE	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		BOREHOLE DEPTH (m)	1.00
		DATE COMMENCED	16/05/2023
		DATE COMPLETED	16/05/2023
CLIENT	Monaghan Co.Co.	SPT HAMMER REF. NO.	
ENGINEER	DBFL	ENERGY RATIO (%)	
		BORED BY	P.Allan
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Samples: Sample Type	Samples: Depth (m)	Samples: Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.20						
	Very stiff brown sandy SILT/CLAY with some gravel and occasional cobbles			1.00	AA171710	B	0.80		N = 50/75 mm (25, 50)	
1	Obstruction End of Borehole at 1.00 m									
2										
3										
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
0.9	1	1	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out .

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 24665M.GPJ IGSL.GDT 26/5/23

GEOTECHNICAL BORING RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	**BOREHOLE NO.**	**BH08**
		SHEET	Sheet 1 of 1
CO-ORDINATES		**RIG TYPE**	Dando 2000
		BOREHOLE DIAMETER (mm)	200
GROUND LEVEL (m AOD)		**BOREHOLE DEPTH (m)**	3.40
		DATE COMMENCED	14/05/2023
		DATE COMPLETED	14/05/2023
CLIENT	Monaghan Co.Co.	**SPT HAMMER REF. NO.**	
ENGINEER	DBFL	**ENERGY RATIO (%)**	
		BORED BY	P.Allan
		PROCESSED BY	F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples: Ref. Number	Sample Type	Depth (m)	Recovery	Field Test Results	Standpipe Details
0	TOPSOIL			0.30						
	Firm brown sandy SILT/CLAY with occasional gravel				AA192945	B	0.50			
1					AA192946	B	1.00		N = 12 (1, 2, 2, 2, 3, 5)	
				1.80						
2	Stiff to very stiff grey sandy gravelly CLAY with occasional cobbles				AA192947	B	2.00		N = 29 (2, 3, 3, 10, 10, 6)	
3				3.40					N = 50/150 mm (10, 15, 25, 25)	
	Obstruction End of Borehole at 3.40 m								N = 50/75 mm (34, 25, 50)	
4										
5										
6										
7										
8										
9										

HARD STRATA BORING/CHISELLING

From (m)	To (m)	Time (h)	Comments
2.6	2.8	0.75	
3.2	3.4	1.5	

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike

GROUNDWATER PROGRESS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS CAT scanned location and hand dug inspection pit was carried out .

Sample Legend

D - Small Disturbed (tub)
B - Bulk Disturbed
LB - Large Bulk Disturbed
Env - Environmental Sample (Jar + Vial + Tub)
UT - Undisturbed 100mm Diameter Sample
P - Undisturbed Piston Sample
W - Water Sample

IGSL BH LOG 24665M.GPJ IGSL.GDT 26/5/23

Appendix II Rotary Core Logs Photographs

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site
CO-ORDINATES	
GROUND LEVEL (mOD)	
CLIENT	Monaghan Co.Co.
ENGINEER	CORA
RIG TYPE	Beretta T44
FLUSH	Air/Mist
INCLINATION (deg)	-90
CORE DIAMETER (mm)	78
DRILLHOLE NO	RC02
SHEET	Sheet 1 of 2
DATE DRILLED	25/05/2023
DATE LOGGED	25/05/2023
DRILLED BY	IGSL - JK
LOGGED BY	D.O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0												
1	1.50	0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of soft CLAY.				
2		0	0	0								
3	3.00	0	0	0								N = 24 (3, 2, 4, 7, 7, 6)
4	4.50								4.50			
5		0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of gravelly CLAY with occasional cobbles				N = 53 (7, 7, 11, 10, 15, 17)
6	6.00	0	0	0								N = 43 (4, 6, 10, 10, 10, 13)
7	7.50	0	0	0								
8		0	0	0								N = 51 (17, 9, 11, 13, 13, 14)
9	9.00	0	0	0								N = 51/102 mm (7, 18, 33, 18)

REMARKS

Hole cased from 0.00-10.50m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
25-05-23	10.50	1.00	10.50	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	**DRILLHOLE NO**	**RC02**
		SHEET	Sheet 2 of 2
CO-ORDINATES		**DATE DRILLED**	25/05/2023
GROUND LEVEL (mOD)		**DATE LOGGED**	25/05/2023
CLIENT	Monaghan Co.Co.	**DRILLED BY**	IGSL - JK
ENGINEER	CORA	**LOGGED BY**	D.O'Shea
RIG TYPE	Beretta T44		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	78		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10	10.50							SYMMETRIX DRILLING: No recovery, observed by driller as returns of gravelly CLAY with occasional cobbles *(continued)*	10.50			N = 48 (6, 8, 11, 12, 12, 13)
								End of Borehole at 10.50 m				
11												
12												
13												
14												
15												
16												
17												
18												
19												

REMARKS

Hole cased from 0.00-10.50m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type
25-05-23	10.50	1.00	10.50	50mm SP

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site
CO-ORDINATES	
GROUND LEVEL (mOD)	
CLIENT	Monaghan Co.Co.
ENGINEER	CORA
RIG TYPE	Beretta T44
FLUSH	Air/Mist
INCLINATION (deg)	-90
CORE DIAMETER (mm)	78
DRILLHOLE NO	RC03
SHEET	Sheet 1 of 2
DATE DRILLED	26/05/2023
DATE LOGGED	28/05/2023
DRILLED BY	IGSL - JK
LOGGED BY	D.O'Shea

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0								SYMMETRIX DRILLING: No recovery, observed by driller as returns of gravelly CLAY with occasional cobbles				
1												
2												
3												N = 57 (9, 13, 17, 11, 15, 14)
4		0	0	0								
5												N = 50 (5, 11, 10, 17, 11, 12)
6												
7												N = 47 (4, 7, 9, 9, 14, 15)
8	8.10								8.10			
		100	0	0				Returns of stiff to very stiff, dark brown, slightly sandy, gravelly CLAY, with occasional cobbles. Sand is fine. Gravel is angular to subrounded fine to coarse of limestone. Cobbles are of limestone.			N = 53 (4, 11, 11, 13, 13, 16)
9	9.10											
		71	0	0								N = 50 (8, 11, 12, 13, 10, 15)

REMARKS

Hole cased from 0.00-8.00m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	**DRILLHOLE NO**	**RC03**
		SHEET	Sheet 2 of 2
CO-ORDINATES		**DATE DRILLED**	26/05/2023
GROUND LEVEL (mOD)		**DATE LOGGED**	28/05/2023
CLIENT	Monaghan Co.Co.	**DRILLED BY**	IGSL - JK
ENGINEER	CORA	**LOGGED BY**	D.O'Shea
RIG TYPE	Beretta T44		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	78		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10	10.50							End of Borehole at 10.50 m	10.50			
11												
12												
13												
14												
15												
16												
17												
18												
19												

REMARKS

Hole cased from 0.00-8.00m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
29-05-23	10.50	8.00	10.40	Water levels recorded 5 mins after end of drilling.

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	**DRILLHOLE NO**	**RC06**
		SHEET	Sheet 1 of 2
CO-ORDINATES		**DATE DRILLED**	23/05/0223
GROUND LEVEL (mOD)		**DATE LOGGED**	23/05/2023
CLIENT	Monaghan Co.Co.	**DRILLED BY**	IGSL - JK
ENGINEER	CORA	**LOGGED BY**	D.O'Shea
RIG TYPE	Beretta T44		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	78		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
0												
1	1.50	0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of CLAY.	1.50			
2	2.60	73	0	0				Returns of stiff to very stiff, dark brown, slightly sandy, gravelly CLAY, with occasional cobbles. Sand is fine. Gravel is angular to subrounded fine to coarse of limestone. Cobbles are of limestone.	2.60			
3	4.00	0	0	0				SYMMETRIX DRILLING: No recovery, observed by driller as returns of gravelly CLAY with occasional cobbles				N = 57 (13, 12, 27, 11, 9, 10)
4												
5	5.50	100	0	0								N = 55 (6, 17, 18, 11, 12, 14)
6	7.00	0	0	0								N = 44 (5, 7, 10, 11, 10, 13)
7												
8	8.50	0	0	0								N = 46 (8, 9, 8, 14, 13, 11)
9												
	10.00	0	0	0								N = 10/75 mm (7, 14, 10)

REMARKS

Hole cased from 0.00-15.00m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments

IGSL RC FI 10M 24665 - MAIN SITE.GPJ IGSL.GDT 6/8/23

GEOTECHNICAL CORE LOG RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel - Main Site	**DRILLHOLE NO**	**RC06**
		SHEET	Sheet 2 of 2
CO-ORDINATES		**DATE DRILLED**	23/05/0223
GROUND LEVEL (mOD)		**DATE LOGGED**	23/05/2023
CLIENT	Monaghan Co.Co.	**DRILLED BY**	IGSL - JK
ENGINEER	CORA	**LOGGED BY**	D.O'Shea
RIG TYPE	Beretta T44		
FLUSH	Air/Mist		
INCLINATION (deg)	-90		
CORE DIAMETER (mm)	78		

Downhole Depth (m)	Core Run Depth (m)	T.C.R.%	S.C.R.%	R.Q.D.%	Fracture Spacing Log (mm) 0 250 500	Non-intact Zone	Legend	Description	Depth (m)	Elevation	Standpipe Details	SPT (N Value)
10								SYMMETRIX DRILLING: No recovery, observed by driller as returns of gravelly CLAY with occasional cobbles *(continued)*				
11	11.50	0	0	0								N = 46 (4, 11, 12, 9, 11, 14)
12	13.00	0	0	0								N = 55 (15, 16, 19, 11, 12, 13)
13	13.50	0	0	0					13.50			
14	15.00	100	0	0				Returns of stiff to very stiff, dark brown, slightly sandy, gravelly CLAY, with occasional cobbles. Sand is fine. Gravel is angular to subrounded fine to coarse of limestone. Cobbles are of limestone.	15.00			N = 50/32 mm (25, 50)
15								End of Borehole at 15.00 m				
16												
17												
18												
19												

REMARKS

Hole cased from 0.00-15.00m

WATER STRIKE DETAILS

Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
					No water strike recorded

INSTALLATION DETAILS

Date	Tip Depth	RZ Top	RZ Base	Type

GROUNDWATER DETAILS

Date	Hole Depth	Casing Depth	Depth to Water	Comments
23-05-23	15.00	15.00	13.40	Water levels recorded 5 mins after end of drilling.

RC03 – Box 1 of 1 – 8.10-10.50m

RC06 – Box 1 of 1 – 1.50-15.00m

Appendix III Trial Pit Records
Photographs

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP01**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,406.85 E 833,817.07 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	72.34
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25	72.09						
Firm, greyish brown to brown, slightly sandy gravelly CLAY with medium cobbles content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are small to coarse subangular to subrounded		0.90	71.44		AA200193	B	0.70		
1.0 Firm to stiff, grey, slightly sandy gravelly slightly silty CLAY with high cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.		1.80	70.54		AA200194	B	1.60		
TP terminated at 1.8m due to many boulders End of Trial Pit at 1.80m									
2.0									
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP02**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,417.94 E 833,782.52 N
		DATE STARTED	27/04/2023
		DATE COMPLETED	27/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	69.34
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
TOPSOIL		0.25	69.09						
Soft to firm, brown, slightly sandy slighlty gravelly CLAY with low cobbles content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are small subangular to subrounded.		0.55	68.79						
Dense, brownish grey, very clayey very sandy fine to coarse subrounded to subangular GRAVEL with high subangular to angular cobbles and boulders content.					AA200181	B	0.80		
TP terminated at 1.4m due to many boulders End of Trial Pit at 1.40m		1.40	67.94						

Groundwater Conditions
TP dry

Stability
TP slightly unstable from 0.55m

General Remarks
TP done for civic offices project

IGSL TP LOG 24665.GPJ IGSL.GDT 10/5/23

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP03**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,451.08 E 833,766.18 N
		DATE STARTED	27/04/2023
		DATE COMPLETED	27/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	72.15
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20	71.95						
Soft, brown, sandy slighlty gravelly CLAY with low cobbles content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are small subangular to subrounded.					AA200179	B	0.60		
Firm to stiff, greyish brown, slightly sandy gravelly slightly silty CLAY with high cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.		0.80	71.35						
1.0					AA200180	B	1.50		
TP terminated at 1.7m due to many boulders End of Trial Pit at 1.70m		1.70	70.45						
2.0									
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

IGSL TP LOG 24665.GPJ IGSL.GDT 10/5/23

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP04**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,481.57 E 833,781.44 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	73.74
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.10	73.64						
Firm, brown, slightly sandy very gravelly CLAY with high cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular. (POSSIBLE FILL)		0.60	73.14		AA200184	B	0.50		
1.0 Firm to stiff, greyish brown, sandy gravelly slightly silty CLAY with high cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.					AA200185	B	1.30		
TP terminated at 1.8m due to many boulders End of Trial Pit at 1.80m		1.80	71.94						
2.0									
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

IGSL TP LOG 24665.GPJ IGSL.GDT 10/5/23

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP05**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,507.95 E 833,782.70 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	69.54
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0	TOPSOIL		0.20	69.34						
	Soft, brown, slightly sandy slightly gravelly CLAY. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded.		0.50	69.04						
1.0	Firm to stiff, brownish grey, slightly sandy gravelly slightly silty CLAY with high cobbles and low boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to subrounded.					AA200182	B	0.70		
						AA200183	B	1.70		
2.0	TP terminated at 2.1m due to many boulders End of Trial Pit at 2.10m		2.10	67.44						
3.0										
4.0										

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

IGSL TP LOG 24665.GPJ IGSL.GDT 10/5/23

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP06**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,474.33 E 833,810.79 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	74.34
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25	74.09						
Firm, brown, slightly sandy slightly gravelly CLAY with low cobbles content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are subangular to subrounded.		0.80	73.54	1 (Seepage)	AA200186	B	0.70		
Firm to stiff, greyish brown, slightly sandy gravelly slightly silty CLAY with high cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.		1.50	72.84		AA200187	B	1.40		
1.0 TP terminated at 1.5m due to many boulders End of Trial Pit at 1.50m									
2.0									
3.0									
4.0									

Groundwater Conditions
Seepage flow at 1.0m

Stability
TP stable

General Remarks
TP done for civic offices project

IGSL TP LOG 24665.GPJ IGSL.GDT 10/5/23

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP07**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,458.22 E 833,833.25 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	75.79
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
Soft, brown, slightly sandy slighlty gravelly CLAY with some hair roots. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded.		0.25	75.54						
Soft to firm, greyish brown, very sandy gravelly CLAY with medium cobbles content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are small subangular to angular. (Possible very clayey gravelly sand).		0.60	75.19		AA200188	B	0.50		
1.0					AA200189	B	1.30		
Firm to stiff, brown, slightly sandy gravelly CLAY with high cobbles and low boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.		1.50	74.29						
TP terminated at 1.9m due to many boulders End of Trial Pit at 1.90m		1.90	73.89		AA200190	B	1.80		
2.0									
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP08**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,426.80 E 833,858.25 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	79.90
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25	79.65						
Soft to firm, brown, slightly sandy gravelly CLAY with low cobbles and hair roots content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are small subangular to subrounded.		0.50	79.40						
Firm to stiff, greyish brown, slightly sandy gravelly CLAY with high cobbles and low boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.					AA200195	B	0.80		
1.0									
2.0					AA200196	B	1.80		
TP terminated at 2.2m due to many boulders End of Trial Pit at 2.20m		2.20	77.70						
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP09**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,477.14 E 833,842.01 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	75.17
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.25	74.92						
Soft, brown, slightly sandy slightly gravelly CLAY with hair roots content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded.		0.50	74.67						
Firm to stiff, greyish brown, slightly sandy gravelly slightly silty CLAY with high cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.					AA200191	B	0.70		
1.0									
TP terminated at 1.5m due to many boulders End of Trial Pit at 1.50m		1.50	73.67		AA200192	B	1.50		
2.0									
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP10**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,449.28 E 833,875.03 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	81.69
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
		0.30	81.39						
Soft, brown, slightly sandy slightly gravelly CLAY with hair roots content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded.		0.50	81.19						
Stiff to very stiff, greyish brown to brown, slightly sandy gravelly CLAY with high cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.					AA200197	B	0.60		
1.0									
					AA200198	B	1.60		
2.0									
End of Trial Pit at 2.50m		2.50	79.19		AA200199	B	2.50		
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

IGSL TP LOG 24665.GPJ IGSL.GDT 10/5/23

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP11**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,482.17 E 833,886.75 N
		DATE STARTED	28/04/2023
		DATE COMPLETED	28/04/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	76.84
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20	76.64						
Soft to firm, brown/grey mottled, slightly sandy slightly gravelly CLAY with low cobbles content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are small subangular to subrounded.					AA205152	B	0.70		
1.0 Firm to stiff, greyish brown, slightly sandy gravelly CLAY with medium cobbles and low boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to angular.		1.10	75.74		AA205153	B	1.50		
2.0 TP terminated at 2.3m due to many boulders End of Trial Pit at 2.30m		2.30	74.54		AA205154	B	2.20		
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP12**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,491.71 E 833,909.43 N
		DATE STARTED	04/05/2023
		DATE COMPLETED	04/05/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	77.46
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
		0.30	77.16						
Soft, brown, slightly sandy slightly slightly gravelly CLAY with hair roots content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded.		0.55	76.91						
Soft to firm, greyish brown , slightly sandy slightly gravelly CLAY with low cobbles content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles are small subangular to subrounded.					AA205178	B	0.80		
1.0		1.00	76.46						
Soft to firm, greyish brown , slightly sandy very gravelly CLAY with high cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to angular, cobbles and boulders are subangular to angular. (possible very clayey angular gravel and cobbles)									
		1.80	75.66		AA205179	B	1.70		
TP terminated at 1.8m due to boulders or rock End of Trial Pit at 1.80m									
2.0									
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

IGSL TP LOG 24665.GPJ IGSL.GDT 10/5/23

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP13**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,464.88 E 833,929.00 N
		DATE STARTED	04/05/2023
		DATE COMPLETED	04/05/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	83.28
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL									
Soft, brown, slightly sandy slightly slightly gravelly CLAY with hair roots content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded.		0.20	83.08						
Firm to stiff, greyish brown, slightly sandy slightly gravelly CLAY with low cobbles and boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to subrounded.		0.50	82.78		AA205173	B	0.60		
1.0									
TP terminated at 1.4m due to many boulders End of Trial Pit at 1.40m		1.40	81.88		AA205174	B	1.40		
2.0									
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

TRIAL PIT RECORD

REPORT NUMBER 24665

CONTRACT	Monaghan Active Travel	**TRIAL PIT NO.**	**TP14**
		SHEET	Sheet 1 of 1
LOGGED BY	I.Reder	**CO-ORDINATES**	667,490.90 E 833,949.34 N
		DATE STARTED	04/05/2023
		DATE COMPLETED	04/05/2023
CLIENT	Monaghan Co.Co.	**GROUND LEVEL (m)**	80.90
ENGINEER	DBFL/Cora	**EXCAVATION METHOD**	3T Tracked machine

Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples: Sample Ref	Samples: Type	Samples: Depth	Vane Test (KPa)	Hand Penetrometer (KPa)
0.0 TOPSOIL		0.20	80.70						
Soft to firm, brown, slightly sandy slightly slightly gravelly CLAY with hair roots content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded.		0.50	80.40						
Firm to stiff, greyish brown, slightly sandy gravelly CLAY with low cobbles and low boulders content. Sand is fine to coarse, gravel is fine to coarse subangular to subrounded, cobbles and boulders are subangular to subrounded.					AA205175	B	0.70		
1.0					AA205176	B	1.50		
2.0 TP terminated at 2.1m due to many boulders End of Trial Pit at 2.10m		2.10	78.80		AA105177	B	2.10		
3.0									
4.0									

Groundwater Conditions
TP dry

Stability
TP stable

General Remarks
TP done for civic offices project

IGSL TP LOG 24665.GPJ IGSL.GDT 10/5/23

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 01

TP 01 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 02

TP 02 – spoil

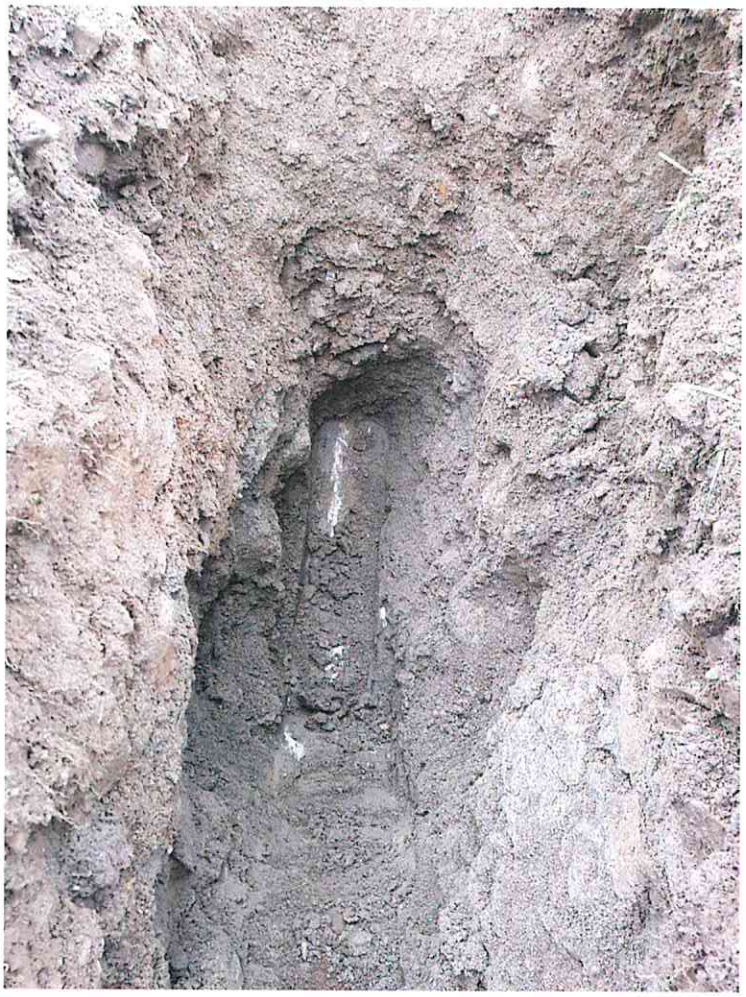
Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 03

TP 03 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 04



TP 04 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 05

TP 05 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 06

TP 06 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 07

TP 07 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 08

TP 08 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 09

TP 09 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 10

TP 10 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 11

TP 11 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 12

TP 12 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 13

TP 13 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
TP 14

TP 14 – spoil

Appendix IV BRE Digest 365 Test

Soakaway Design f -value from field tests

IGSL

Contract: Monaghan, Active Travel 24665
Test No. SA01
Engineer CORA
Date: 04/05/2023

Summary of ground conditions

from	to	Description	Ground water
0.00	0.25	TOPSOIL	DRY
0.25	0.50	Soft, brown, slightly sandy slightly gravelly CLAY with low hair roots content	
0.50	1.30	Soft to firm, brown/grey mottled, slightly sandy gravelly slightly silty CLAY with	
		high subangular to angular cobbles and boulders content	
1.30		Obstruction - boulders	

Location: E:667491.477; N:833784.047; G.L. 71.944mOD
Notes: SA01 done for Civic Offices project

Field Data

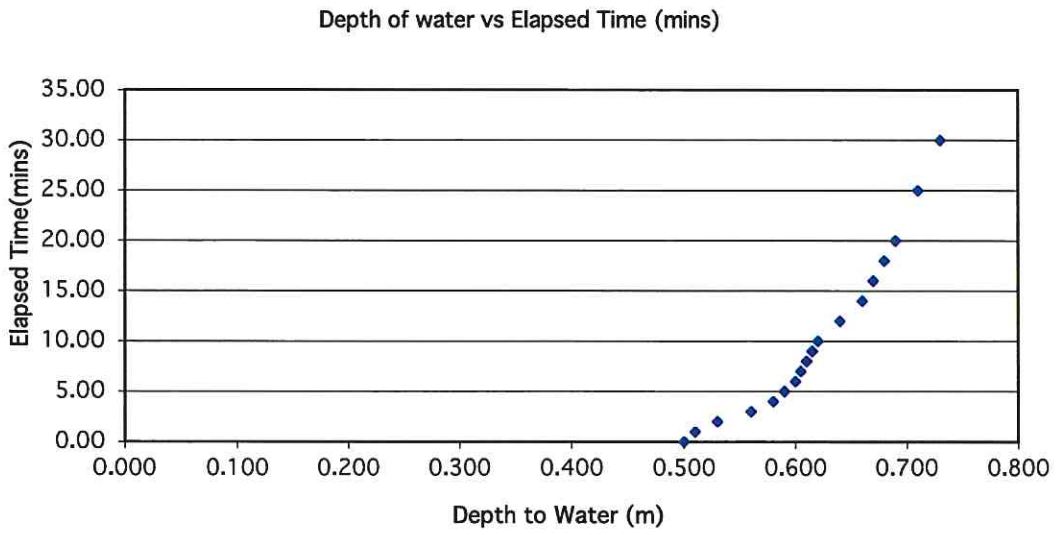
Depth to Water (m)	Elapsed Time (min)
0.500	0.00
0.510	1.00
0.530	2.00
0.560	3.00
0.580	4.00
0.590	5.00
0.600	6.00
0.605	7.00
0.610	8.00
0.615	9.00
0.620	10.00
0.640	12.00
0.660	14.00
0.670	16.00
0.680	18.00
0.690	20.00
0.710	25.00
0.730	30.00

Field Test

Depth of Pit (D)	1.30	m
Width of Pit (B)	0.50	m
Length of Pit (L)	2.00	m
Initial depth to Water =	0.50	m
Final depth to water =	0.73	m
Elapsed time (mins)=	30.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1	m2
*Av. side area of permeable stratum over test perio	3.425	m2
Total Exposed area =	4.425	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00173 m/min or 2.88763E-05 m/sec



Soakaway Design f -value from field tests

IGSL

Contract: Monaghan, Active Travel
Test No. SA02
Engineer CORA
Date: 04/05/2023

24665

Summary of ground conditions

from	to	Description	Ground water
0.00	0.20	TOPSOIL	DRY
0.20	0.70	Soft to firm, brown, slightly sandy slightly gravelly CLAY with medium cobbles	
0.70	1.60	Firm to stiff, greyish brown, slightly sandy gravelly slightly silty CLAY with low subangular to angular cobbles and boulders content	

Location: E:667480.695; N:833861.983; G.L. 75.647mOD
Notes: SA02 done for Civic Offices project

Field Data

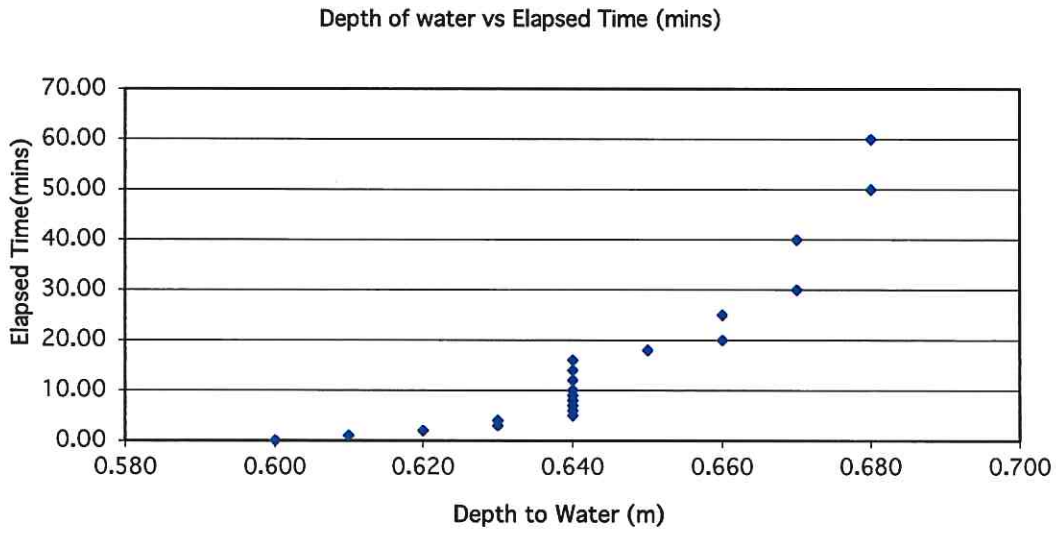
Depth to Water (m)	Elapsed Time (min)
0.600	0.00
0.610	1.00
0.620	2.00
0.630	3.00
0.630	4.00
0.640	5.00
0.640	6.00
0.640	7.00
0.640	8.00
0.640	9.00
0.640	10.00
0.640	12.00
0.640	14.00
0.640	16.00
0.650	18.00
0.660	20.00
0.660	25.00
0.670	30.00
0.670	40.00
0.680	50.00
0.680	60.00

Field Test

Depth of Pit (D)	1.60	m
Width of Pit (B)	0.50	m
Length of Pit (L)	2.00	m
Initial depth to Water =	0.60	m
Final depth to water =	0.68	m
Elapsed time (mins)=	60.00	
Top of permeable soil		m
Base of permeable soil		m
Base area=	1	m2
*Av. side area of permeable stratum over test perio	4.8	m2
Total Exposed area =	5.8	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0.00023 m/min or 3.83142E-06 m/sec



Soakaway Design f -value from field tests

IGSL

Contract: Monaghan, Active Travel
Test No. SA03
Engineer CORA
Date: 04/05/2023

24665

Summary of ground conditions

from	to	Description	Ground water
0.00	0.30	TOPSOIL	DRY
0.30	1.60	Firm to stiff, greyish brown, slightly sandy gravelly slightly silty CLAY with high cobbles and low boulders content	

Location: E:667448.448; N:833888.586; G.L. 83.582mOD
Notes: SA03 done for Civic Offices project

Field Data

Depth to Water (m)	Elapsed Time (min)
0.540	0.00
0.540	1.00
0.540	2.00
0.540	3.00
0.550	4.00
0.550	5.00
0.550	6.00
0.550	7.00
0.550	8.00
0.550	9.00
0.550	10.00
0.550	12.00
0.550	14.00
0.550	16.00
0.550	18.00
0.550	20.00
0.550	25.00
0.550	30.00

Field Test

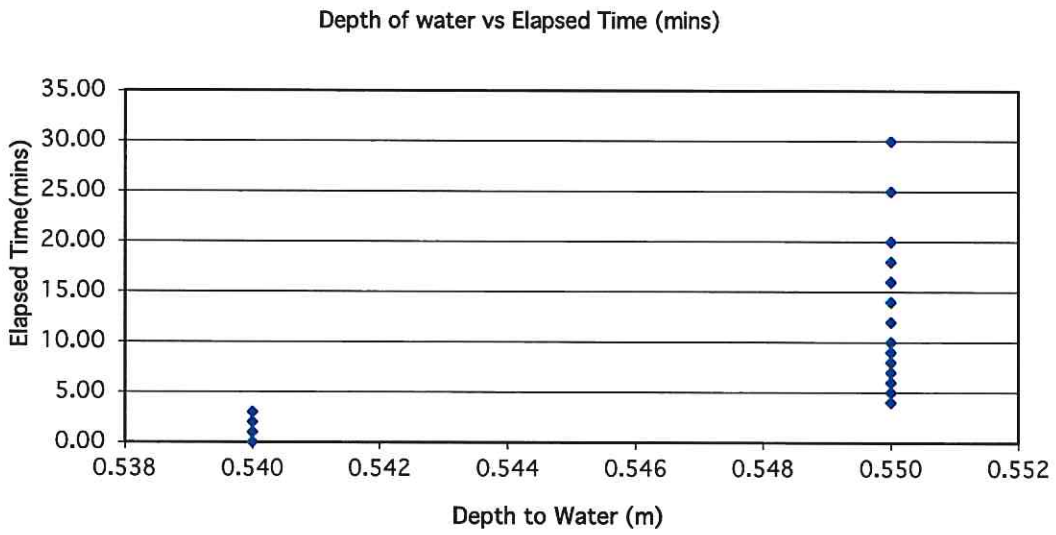
Depth of Pit (D)	1.60	m
Width of Pit (B)	0.50	m
Length of Pit (L)	2.00	m
Initial depth to Water =	0.54	m
Final depth to water =	0.55	m
Elapsed time (mins)=	30.00	
Top of permeable soil		m
Base of permeable soil		m

Water movement stoped at 0.55m

Base area=	1	m2
*Av. side area of permeable stratum over test perio	5.275	m2
Total Exposed area =	6.275	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 5.3E-05 m/min or 8.85347E-07 m/sec



Soakaway Design f -value from field tests

IGSL

Contract: Monaghan, Active Travel
Test No. SA04
Engineer CORA
Date: 04/05/2023

24665

Summary of ground conditions

from	to	Description	Ground water
0.00	0.25	TOPSOIL	
0.25	0.50	Soft, brown, sl. sandy sl. gravelly CLAY with low cobbles and hair rrots content	
0.50	1.30	Firm to stiff, brown, slightly sandy gravelly CLAY with high subangular to subrour	DRY
		cobbles and low boulders content	
1.30		Obstruction - boulders	

Location: E:667494.53; N:833936.177; G.L. 79.506mOD
Notes: SA04 done for Civic Offices project

Field Data

Depth to Water (m)	Elapsed Time (min)
0.480	0.00
0.480	1.00
0.480	2.00
0.480	3.00
0.480	4.00
0.480	5.00
0.480	6.00
0.480	7.00
0.480	8.00
0.480	9.00
0.480	10.00
0.480	12.00
0.480	14.00
0.480	16.00
0.480	18.00
0.480	20.00
0.480	25.00
0.480	30.00

Field Test

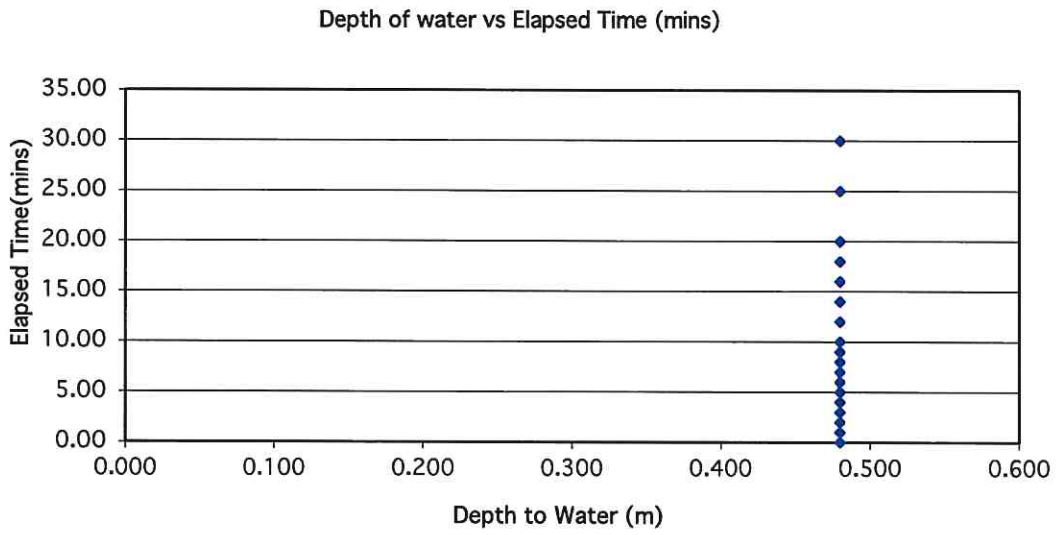
Depth of Pit (D)	1.30	m
Width of Pit (B)	0.50	m
Length of Pit (L)	1.50	m
Initial depth to Water =	0.48	m
Final depth to water =	0.48	m
Elapsed time (mins)=	30.00	
Top of permeable soil		m
Base of permeable soil		m

No Water Movement

Base area=	0.75	m2
*Av. side area of permeable stratum over test perio	3.28	m2
Total Exposed area =	4.03	m2

Infiltration rate (f) = Volume of water used/unit exposed area / unit time

f= 0 m/min or 0 m/sec



Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
SA 01

SA 01 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
SA 02

SA 02 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
SA 03

SA 03 – spoil

Project Number: 24665
Site: Monaghan Active Travel
Project Engineer: DBFL/CORA

TRIAL PIT PHOTOGRAPHY RECORD
SA 04

SA 04 – spoil

Appendix Va Geotechnical Laboratory Data

IGSL Ltd
Materials Laboratory
Unit J5, M7 Business Park
Newhall, Naas
Co. Kildare
045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits

Tested in accordance with BS1377:Part 2:1990, clauses 3.2, 4.3, 4.4 & 5.3**

Report No. **R147891** Contract No. 24665/1 Contract Name: Monaghan Town Active Travel Development Site

Customer Cora

Samples Received: 09/06/23 Date Tested: 09/06/23

BH/TP*	Sample No.	Depth* (m)	Lab. Ref	Sample Type*	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
BH01	AA192933	2.0	A23/1710	B	18	28	14	14	67	WS	4.4	C L	Brown sandy gravelly CLAY
BH02	AA197802	1.0	A23/1711	B	14	33	17	16	56	WS	4.4	C L	Brown sandy gravelly CLAY
BH03	AA192935	1.0	A23/1712	B	16	36	19	17	71	WS	4.4	C I	Brown sandy gravelly CLAY
BH05	AA192947	1.0	A23/1714	B	19	32	NP	NP	82	WS	4.4		Brown sandy gravelly SILT
TP01	AA200193	0.7	A23/1716	B	14	30	16	14	61	WS	4.4	C L	Grey brown sandy gravelly CLAY
TP03	AA200179	0.6	A23/1717	B	14	33	19	14	72	WS	4.4	C L	Grey brown sandy gravelly CLAY

Preparation: WS - Wet sieved
AR - As received
NP - Non plastic

Liquid Limit Clause: 4.3 Cone Penetrometer definitive method
4.4 Cone Penetrometer one point method

Sample Type: B - Bulk Disturbed
U - Undisturbed

Remarks:
Results relate only to the specimen tested,in as received condition unless otherwise noted.
NOTE: **These clauses have been superceded by EN 17892-1 and EN17892-12.
Opinions and interpretations are outside the scope of accreditation. * denotes Customer supplied information.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports
H Byrne (Laboratory Manager)

Approved by | Date: 18/07/23 | Page: 1 of 1

TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)

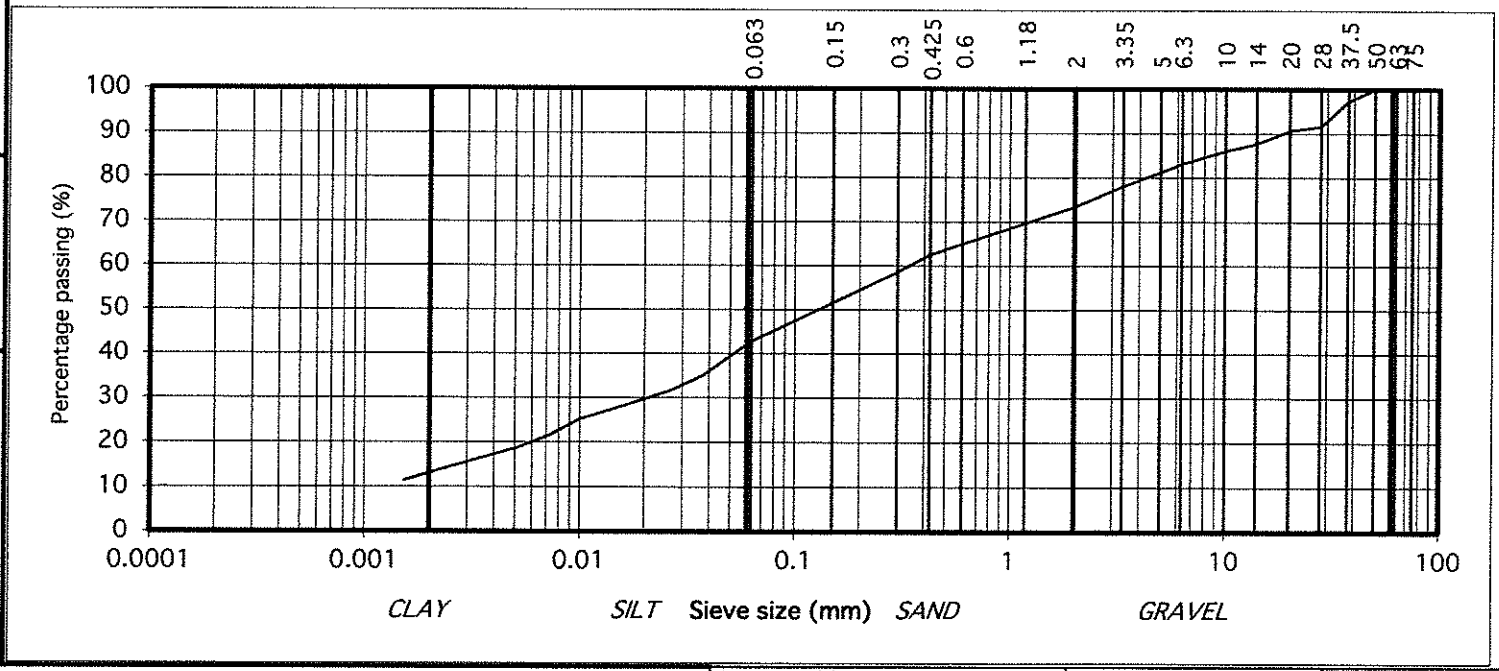
ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	97	
28	92	
20	91	
14	88	
10	86	
6.3	83	
5	81	
3.35	78	
2	73	
1.18	70	SAND
0.6	65	
0.425	62	
0.3	59	
0.15	52	
0.063	43	SILT/CLAY
0.037	35	
0.027	32	
0.017	29	
0.010	25	
0.007	22	
0.005	19	
0.002	11	

Contract No. 24665/1 Report No. R147892
Contract Name : Monaghan Town Active Travel Development Site
BH/TP No. BH04A
Sample No.* AA192941 Lab. Sample No. A23/1713
Sample Type: B
Depth* (m) 3.00 Customer: CORA
Date Received 09/06/2023 Date Testing started 09/06/2023
Description: Grey slightly sandy, slightly gravelly, SILT/CLAY

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.
This report shall not be reproduced except in full without the written approval of the Laboratory.



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
	18/07/23	1 of 1

Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT
Determination of Particle Size Distribution
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	94	GRAVEL
37.5	94	
28	89	
20	88	
14	86	
10	85	
6.3	82	
5	80	
3.35	77	
2	74	
1.18	72	SAND
0.6	67	
0.425	64	
0.3	58	
0.15	48	
0.063	38	SILT/CLAY
0.037	31	
0.027	28	
0.017	25	
0.010	22	
0.007	19	
0.005	17	
0.002	10	

Contract No. 24665/1 Report No. R147893
Contract Name : Monaghan Town Active Travel Development Site
BH/TP No. BH08
Sample No.* AA192947 Lab. Sample No. A23/1715
Sample Type: B
Depth* (m) 2.00 Customer: CORA
Date Received 09/06/2023 Date Testing started 09/06/2023
Description: Grey sandy, slightly gravelly, SILT/CLAY

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .

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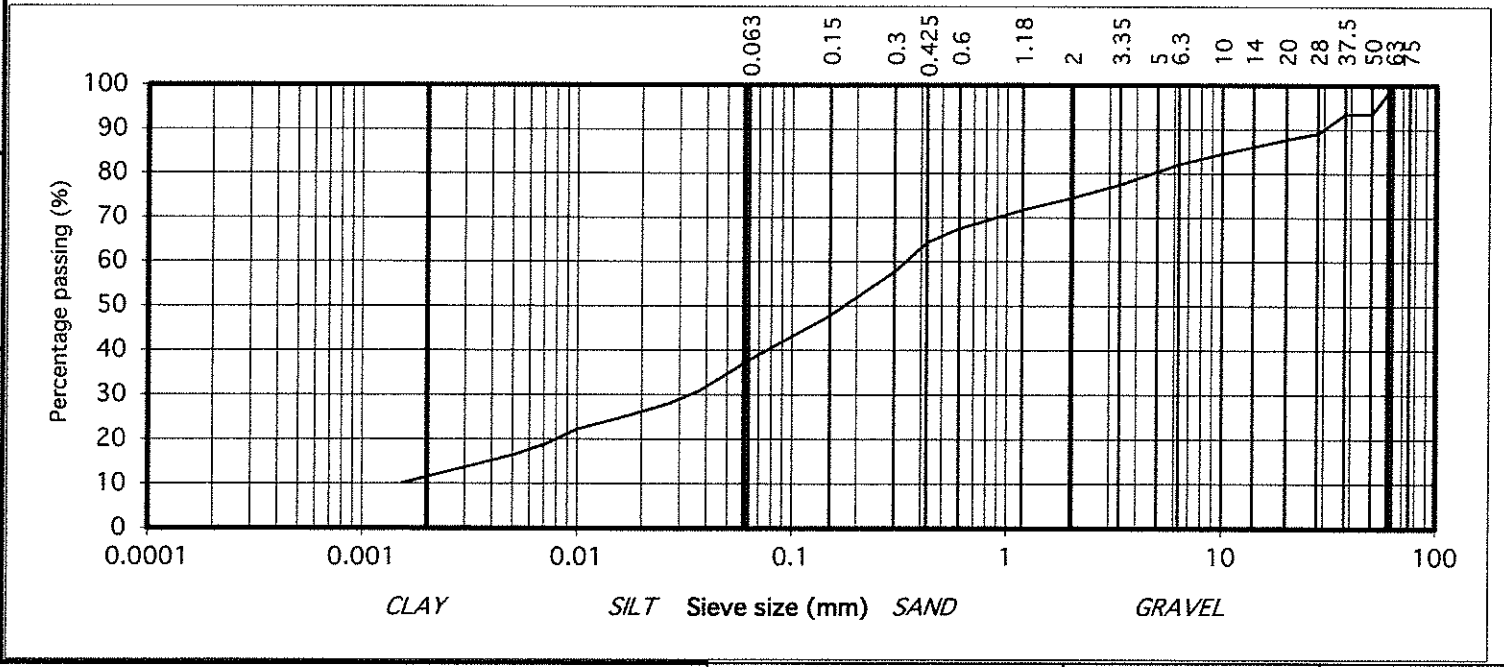

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Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**

(note: Sedimentation stage not accredited)

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	99	
20	98	
14	96	
10	95	
6.3	93	
5	92	
3.35	90	
2	87	
1.18	84	SAND
0.6	81	
0.425	79	
0.3	75	
0.15	66	
0.063	55	SILT/CLAY
0.037	46	
0.027	41	
0.017	35	
0.010	29	
0.007	26	
0.005	21	
0.002	14	

Contract No. 24665/1 Report No. R147894

Contract Name : Monaghan Town Active Travel Development Site

BH/TP No. TP05

Sample No.* AA200182 Lab. Sample No. A23/1718

Sample Type: B

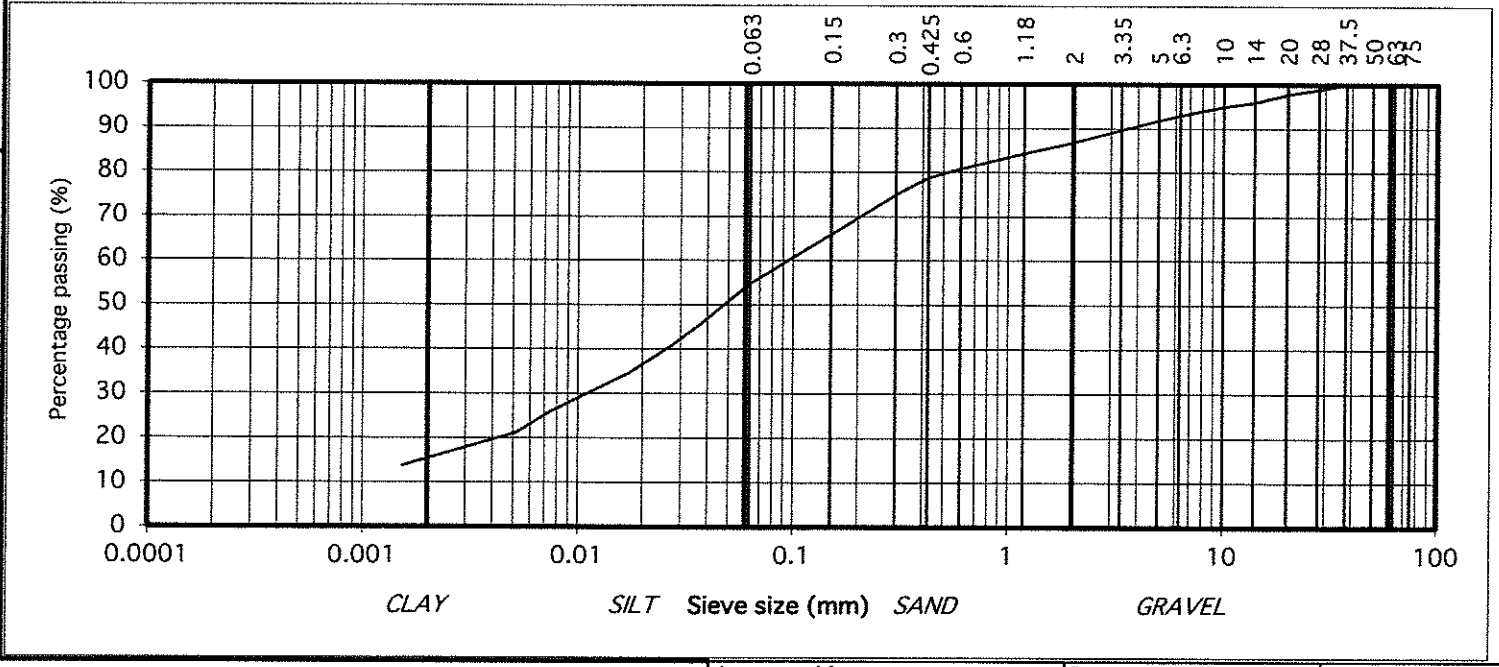
Depth* (m) 0.70 Customer: CORA

Date Received 09/06/2023 Date Testing started 09/06/2023

Description: Brown slightly sandy, slightly gravelly, SILT/CLAY

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.



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TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**

(note: Sedimentation stage not accredited)

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.1331

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	96	
28	92	
20	91	
14	88	
10	85	
6.3	81	
5	78	
3.35	74	
2	69	
1.18	65	SAND
0.6	60	
0.425	56	
0.3	51	
0.15	39	
0.063	28	SILT/CLAY
0.038	23	
0.027	21	
0.017	18	
0.010	16	
0.007	15	
0.005	12	
0.002	9	

Contract No. 24665/1 Report No. R147895

Contract Name : Monaghan Town Active Travel Development Site

BH/TP No. TP09

Sample No.* AA200191 Lab. Sample No. A23/1719

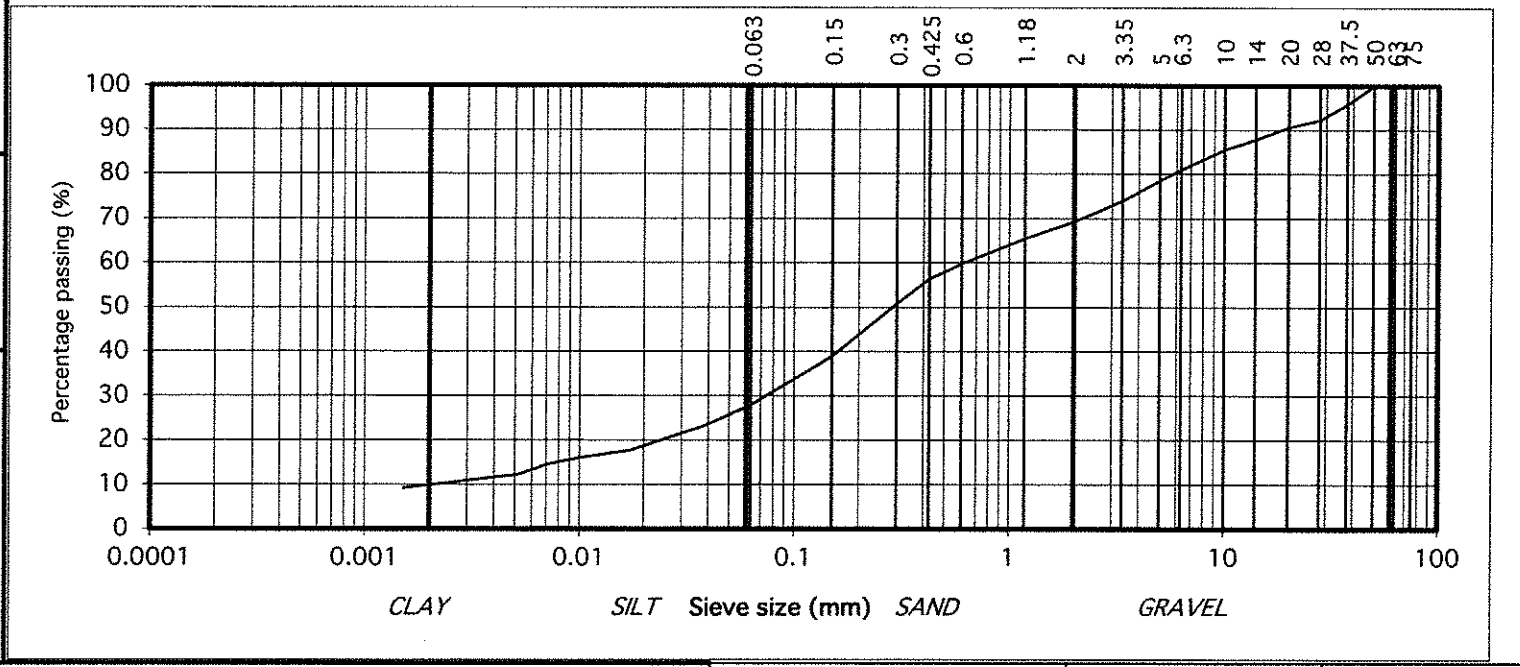
Sample Type: B

Depth* (m) 0.70 Customer: CORA

Date Received 09/06/2023 Date Testing started 09/06/2023

Description: Grey brown sandy, slightly gravelly, SILT/CLAY

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .



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TEST REPORT
Determination of Particle Size Distribution
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**
(note: Sedimentation stage not accredited)

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	90	GRAVEL
37.5	82	
28	80	
20	75	
14	71	
10	68	
6.3	63	
5	60	
3.35	57	
2	52	
1.18	48	SAND
0.6	42	
0.425	39	
0.3	34	
0.15	29	
0.063	20	SILT/CLAY
0.038	17	
0.027	15	
0.017	13	
0.010	12	
0.007	11	
0.005	9	
0.002	7	

Contract No. 24665/1 Report No. R147896
Contract Name : Monaghan Town Active Travel Development Site
BH/TP No. TP12
Sample No.* AA205178 Lab. Sample No. A23/1720
Sample Type: B
Depth* (m) 0.80 Customer: CORA
Date Received 09/06/2023 Date Testing started 09/06/2023
Description: Brown slightly sandy, gravelly, SILT/CLAY

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .

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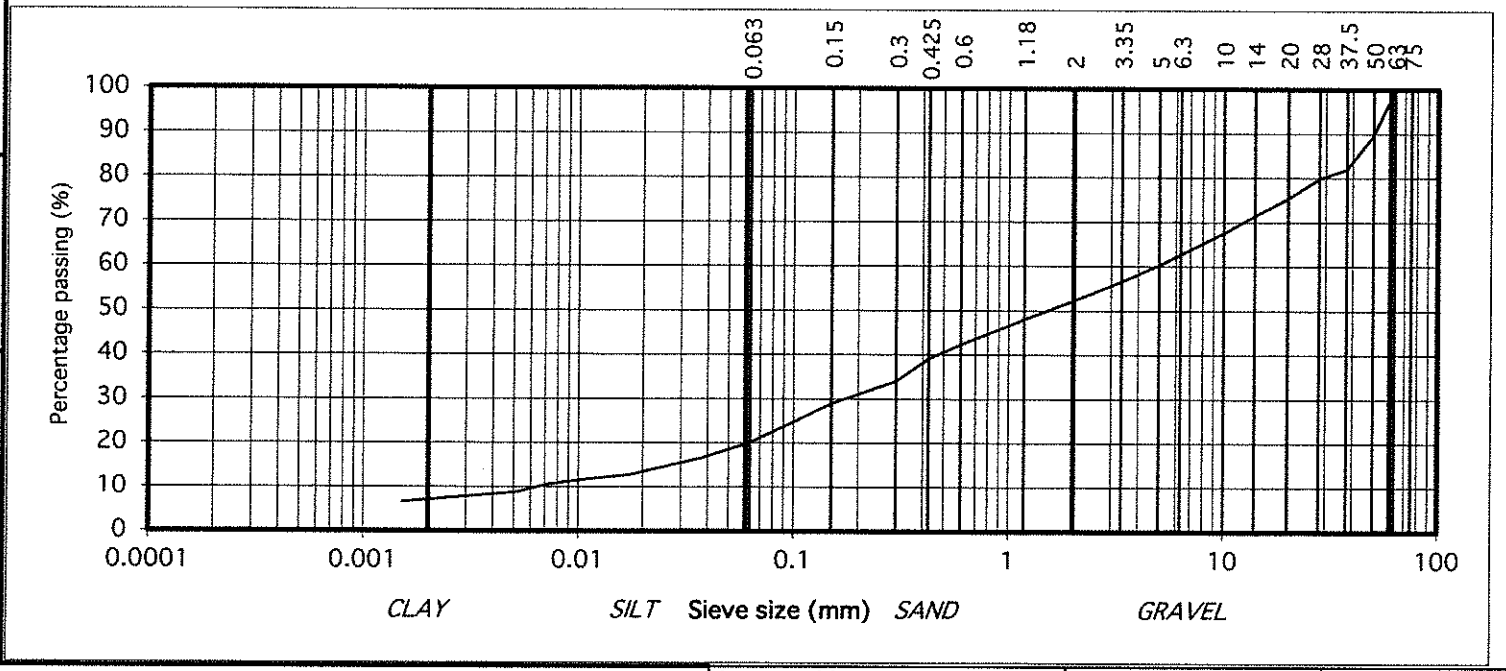

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TEST REPORT

Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5**

(note: Sedimentation stage not accredited)

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	93	
28	89	
20	86	
14	82	
10	77	
6.3	72	
5	69	
3.35	60	
2	53	
1.18	49	SAND
0.6	45	
0.425	43	
0.3	40	
0.15	34	
0.063	26	SILT/CLAY
0.038	23	
0.027	21	
0.017	19	
0.010	17	
0.007	15	
0.005	13	
0.002	10	

Contract No. 24665/1 Report No. R147897

Contract Name : Monaghan Town Active Travel Development Site

BH/TP No. TP14

Sample No.* AA205176 Lab. Sample No. A23/1721

Sample Type: B

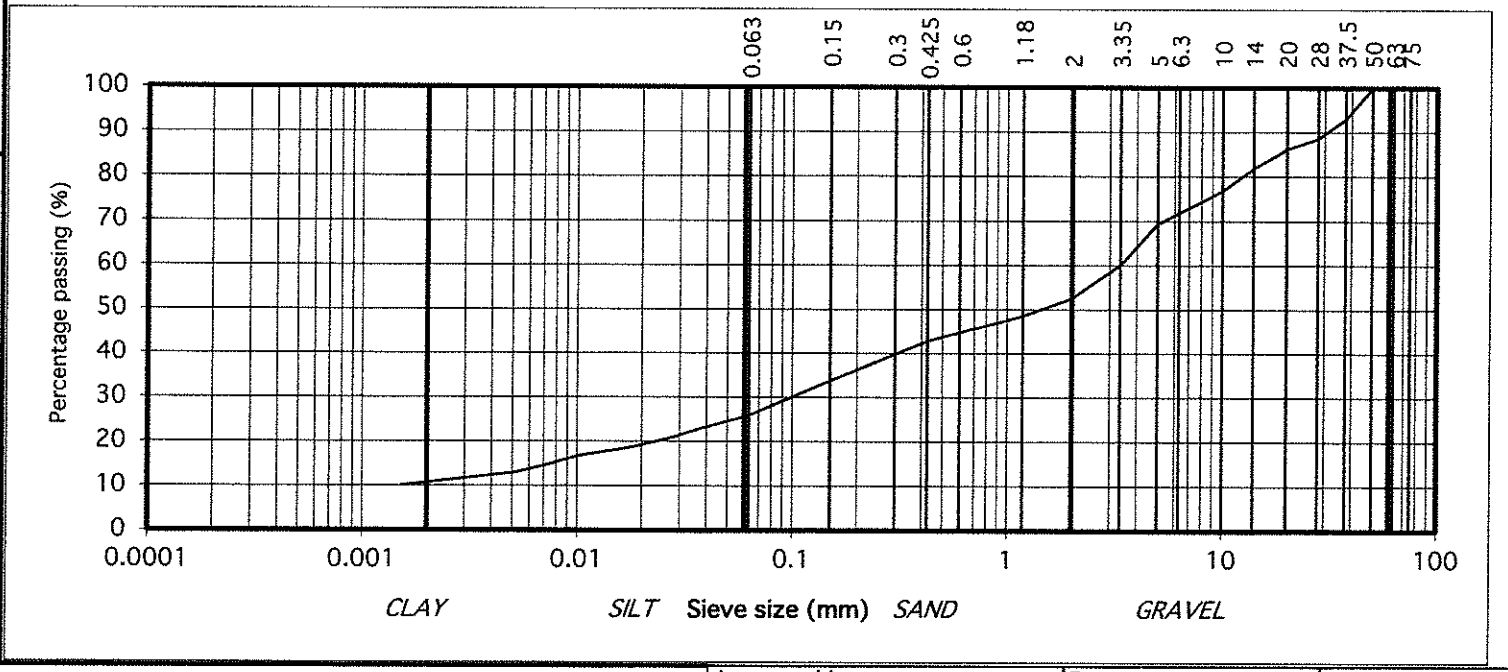
Depth* (m) 1.50 Customer: CORA

Date Received 09/06/2023 Date Testing started 09/06/2023

Description: Grey brown slightly sandy, gravelly, SILT/CLAY

Remarks Note: **Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016 .

Results relate only to the specimen tested in as received condition unless otherwise noted. * denotes Customer supplied information. Opinions and interpretations are outside the scope of accreditation.



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Unit J5,M7 Business Park
Naas
Co. Kildare
045 899324

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 1331

Report No.	**R147898**
Contract No.	24665/1
Contract Name:	Monaghan Town Active Travel Development Site
Customer:	CORA
BH/TP*	TP01
Sample No.*	AA200193
Depth* (m)	0.70
Sample Type:	B
Lab Sample No.	A23/1716
Source* (if applicable)	N/A
Material Type* (if applicable):	B
Sample Received:	09/06/23
Date Tested:	09/06/23
Sample Cert:	Not Provided
Moisture Content (%):	15
% Particles > 20mm (By dry mass):	16
MCV:	6.6
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown sandy gravelly CLAY

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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R147899**
Contract No.	24665/1
Contract Name:	Monaghan Town Active Travel Development Site
Customer:	CORA
BH/TP*	TP03
Sample No.*	AA200179
Depth* (m)	0.60
Sample Type:	B
Lab Sample No.	A23/1717
Source* (if applicable)	N/A
Material Type* (if applicable):	B
Sample Received:	09/06/23
Date Tested:	09/06/23
Sample Cert:	Not Provided
Moisture Content (%):	13
% Particles > 20mm (By dry mass):	15
MCV:	7.3
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown sandy gravelly CLAY

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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R147900**
Contract No.	24665/1
Contract Name:	Monaghan Town Active Travel Development Site
Customer:	CORA
BH/TP*	TP05
Sample No.*	AA200182
Depth* (m)	0.70
Sample Type:	B
Lab Sample No.	A23/1718
Source* (if applicable)	N/A
Material Type* (if applicable):	B
Sample Received:	09/06/23
Date Tested:	09/06/23
Sample Cert:	Not Provided
Moisture Content (%):	13
% Particles > 20mm (By dry mass):	11
MCV:	6.8
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown slightly sandy, slightly gravelly, SILT/CLAY

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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R147901**
Contract No.	24665/1
Contract Name:	Monaghan Town Active Travel Development Site
Customer:	CORA
BH/TP*	TP09
Sample No.*	AA200191
Depth* (m)	0.70
Sample Type:	B
Lab Sample No.	A23/1719
Source* (if applicable)	N/A
Material Type* (if applicable):	B
Sample Received:	09/06/23
Date Tested:	09/06/23
Sample Cert:	Not Provided
Moisture Content (%):	13
% Particles > 20mm (By dry mass):	11
MCV:	6.8
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown sandy, slightly gravelly, SILT/CLAY

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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R147902**
Contract No.	24665/1
Contract Name:	Monaghan Town Active Travel Development Site
Customer:	CORA
BH/TP*	TP12
Sample No.*	AA205178
Depth* (m)	0.80
Sample Type:	B
Lab Sample No.	A23/1720
Source* (if applicable)	N/A
Material Type* (if applicable):	B
Sample Received:	09/06/23
Date Tested:	09/06/23
Sample Cert:	Not Provided
Moisture Content (%):	10
% Particles > 20mm (By dry mass):	21
MCV:	6.7
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown slightly sandy, gravelly, SILT/CLAY

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	H Byrne	18/07/23	1 of 1

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Unit J5,M7 Business Park
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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R147903**
Contract No.	24665/1
Contract Name:	Monaghan Town Active Travel Development Site
Customer:	CORA
BH/TP*	TP14
Sample No.*	AA205176
Depth* (m)	1.50
Sample Type:	B
Lab Sample No.	A23/1721
Source* (if applicable)	N/A
Material Type* (if applicable):	B
Sample Received:	09/06/23
Date Tested:	09/06/23
Sample Cert:	Not Provided
Moisture Content (%):	14
% Particles > 20mm (By dry mass):	15
MCV:	7.8
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly sandy, gravelly, SILT/CLAY

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IGSL Ltd Materials Laboratory	Approved by	Date	Page
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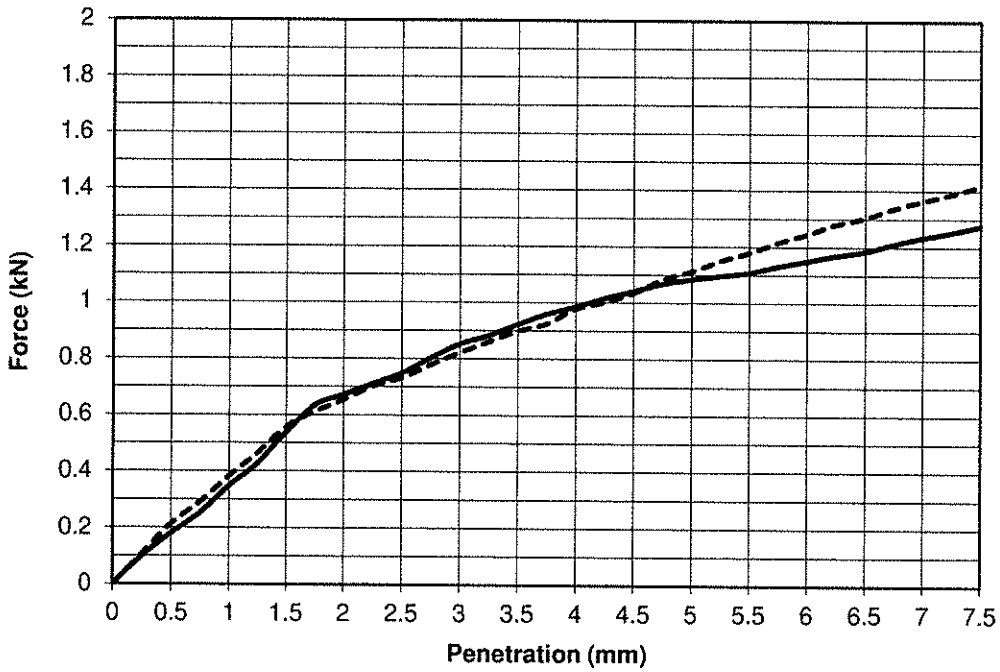
IGSL Ltd Materials Laboratory Unit J5,M7 Business Park Naas Co.Kildare 045 899324	TEST REPORT Determination of California Bearing Ratio (CBR) Tested in accordance with BS1377:Part 4:1990, clause 7	ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	R147904	Contract	Monaghan Town Active Travel Development Site
Contract No.	24665/1	Customer	Cora
Date received	09/06/23	Date Tested	15/06/23
BH/TP No.*	TP01	Sample No.*	AA200193 Type: B
Depth* (m)	0.70	Lab sample No.	A23/1716



Key: ———— Top ---------- Base

Description:	Grey brown sandy gravelly CLAY		
Initial Condition:	Unsoaked		
Moisture Content (%):	14	Bulk Density (Mg/m^3):	2.01
Surcharge (kg):	4	Dry Density (Mg/m^3):	1.76
% Material >20mm:	13		
Method of compaction:	Static Compaction Method 2		

Test Result	Top	Base
CBR %	**5.7**	**5.6**
Moisture Content %	14	14

Results relate only to the specimen tested, in as received condition unless otherwise noted.
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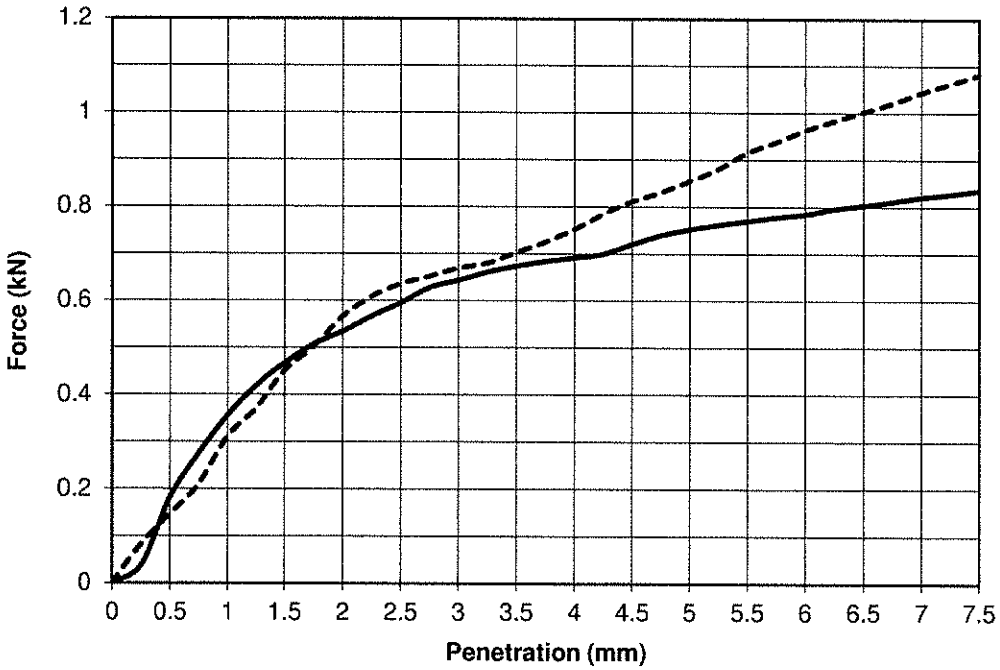
IGSL Ltd Materials Laboratory Unit J5,M7 Business Park Naas Co.Kildare 045 899324	TEST REPORT Determination of California Bearing Ratio (CBR) Tested in accordance with BS1377:Part 4:1990, clause 7	ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.1331

Report No.	R147905	Contract	Monaghan Town Active Travel Development Site
Contract No.	24665/1	Customer	Cora
Date received	09/06/23	Date Tested	15/06/23
BH/TP No.*	TP03	Sample No.*	AA200179 Type: B
Depth* (m)	0.60	Lab sample No.	A23/1717



Key: ———— Top ---------- Base

Description:	Grey brown sandy gravelly CLAY		
Initial Condition:	Unsoaked		
Moisture Content (%):	12	Bulk Density (Mg/m^3):	2.03
Surcharge (kg):	4	Dry Density (Mg/m^3):	1.82
% Material >20mm:	10		
Method of compaction:	Static Compaction Method 2		

Test Result	Top	Base
CBR %	**4.5**	**4.8**
Moisture Content %	12	11

Results relate only to the specimen tested, in as received condition unless otherwise noted.
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IGSL Ltd Materials Laboratory	Approved by	Date	Page No.
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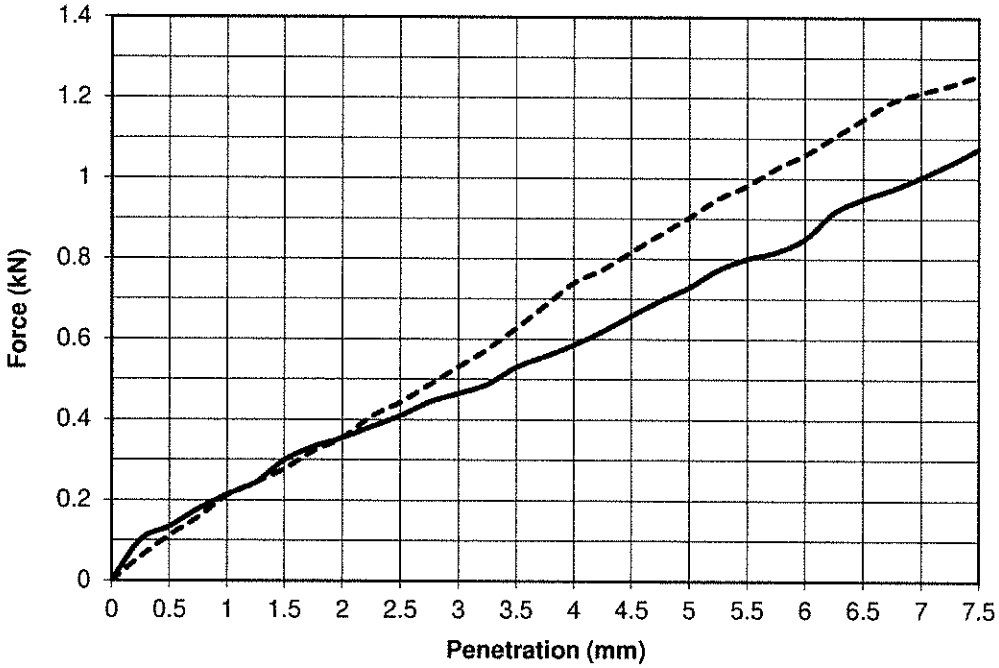
IGSL Ltd Materials Laboratory Unit J5,M7 Business Park Naas Co.Kildare 045 899324	TEST REPORT Determination of California Bearing Ratio (CBR) Tested in accordance with BS1377:Part 4:1990, clause 7	ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.1337

Report No.	R147906	Contract	Monaghan Town Active Travel Development Site
Contract No.	24665/1	Customer	Cora
Date received	09/06/23	Date Tested	15/06/23
BH/TP No.*	TP05	Sample No.*	AA200182 Type: B
Depth* (m)	0.70	Lab sample No.	A23/1718



Key: ———— Top ---------- Base

Description:	Brown slightly sandy, slightly gravelly, SILT/CLAY		
Initial Condition:	Unsoaked		
Moisture Content (%):	13	Bulk Density (Mg/m^3):	2.08
Surcharge (kg):	4	Dry Density (Mg/m^3):	1.83
% Material >20mm:	10		
Method of compaction:	Static Compaction Method 2		

Test Result	Top	Base
CBR %	**3.7**	**4.5**
Moisture Content %	14	13

Results relate only to the specimen tested, in as received condition unless otherwise noted

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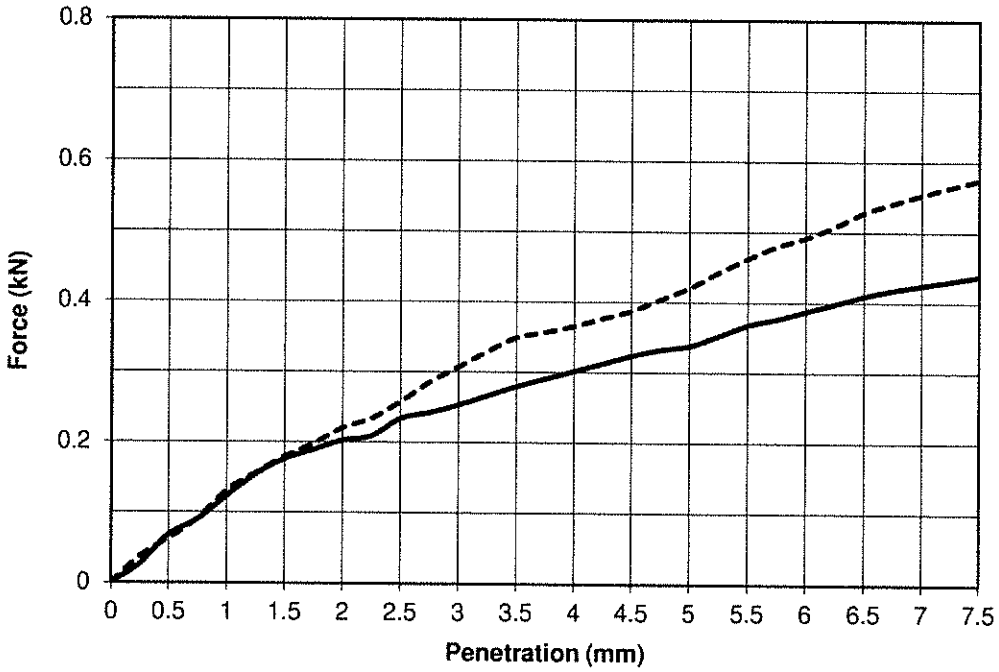
IGSL Ltd Materials Laboratory Unit J5,M7 Business Park Naas Co.Kildare 045 899324	TEST REPORT Determination of California Bearing Ratio (CBR) Tested in accordance with BS1377:Part 4:1990, clause 7	ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	R147907	Contract	Monaghan Town Active Travel Development Site
Contract No.	24665/1	Customer	Cora
Date received	09/06/23	Date Tested	15/06/23
BH/TP No.*	TP09	Sample No.*	AA200191 Type: B
Depth* (m)	0.70	Lab sample No.	A23/1719



Key: ———— Top ---------- Base

Description:	Grey brown sandy, slightly gravelly, SILT/CLAY		
Initial Condition:	Unsoaked		
Moisture Content (%):	14	Bulk Density (Mg/m^3):	2.11
Surcharge (kg):	4	Dry Density (Mg/m^3):	1.85
% Material >20mm:	13		
Method of compaction:	Static Compaction Method 2		

Test Result	Top	Base
CBR %	**1.8**	**2.1**
Moisture Content %	14	14

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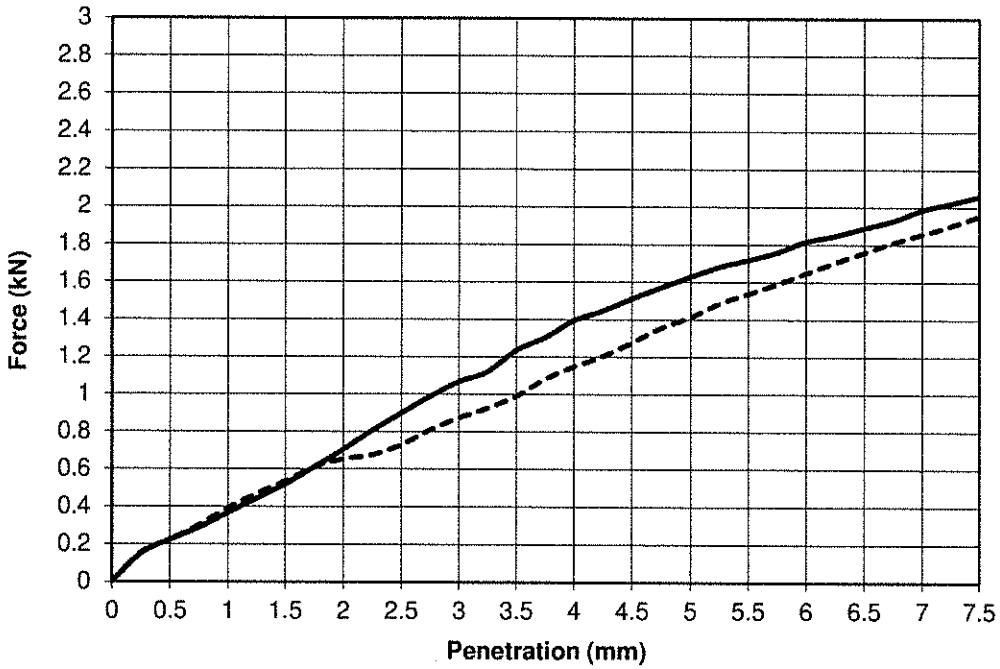
IGSL Ltd Materials Laboratory Unit J5,M7 Business Park Naas Co.Kildare 045 899324	TEST REPORT Determination of California Bearing Ratio (CBR) Tested in accordance with BS1377:Part 4:1990, clause 7	ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.1331

Report No.	R147908	Contract	Monaghan Town Active Travel Development Site
Contract No.	24665/1	Customer	Cora
Date received	09/06/23	Date Tested	15/06/23
BH/TP No.*	TP12	Sample No.*	AA205178 Type: B
Depth* (m)	0.80	Lab sample No.	A23/1720



Key: ———— Top ---------- Base

Description:	Brown slightly sandy, gravelly, SILT/CLAY		
Initial Condition:	Unsoaked		
Moisture Content (%):	10	Bulk Density (Mg/m^3):	2.15
Surcharge (kg):	4	Dry Density (Mg/m^3):	1.95
% Material >20mm:	21		
Method of compaction:	Static Compaction Method 2		

Test Result	Top	Base
CBR %	**8.2**	**7.1**
Moisture Content %	10	10

Results relate only to the specimen tested, in as received condition unless otherwise noted

Opinions and interpretations are outside the scope of accreditation.

* denotes Customer supplied information

Persons authorized to approve reports
J Barrett (Quality Manager)
H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory	Approved by	Date	Page No.
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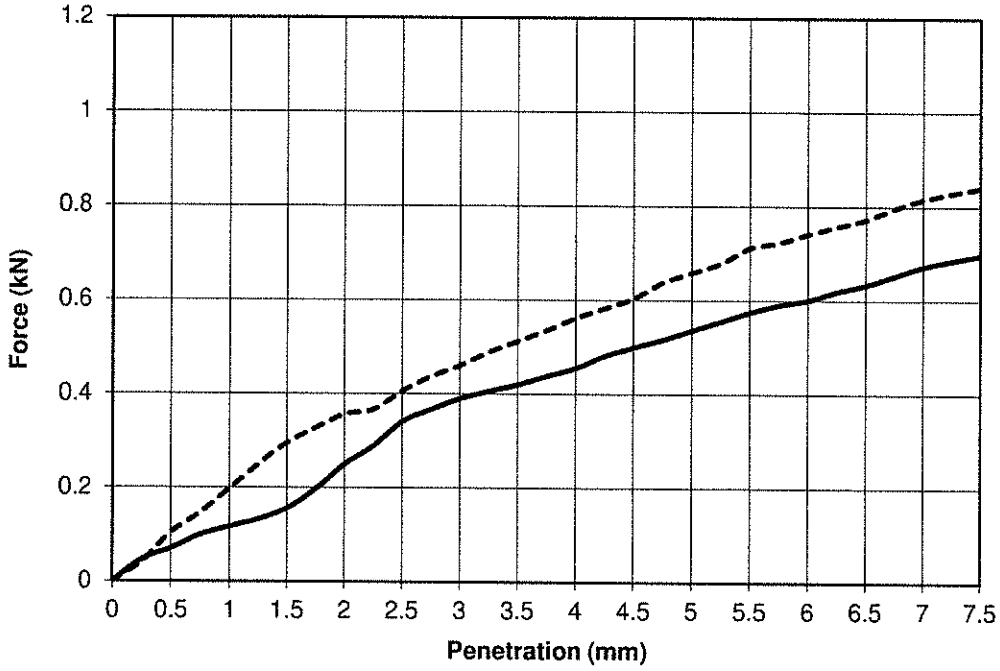
IGSL Ltd Materials Laboratory Unit J5,M7 Business Park Naas Co.Kildare 045 899324	TEST REPORT Determination of California Bearing Ratio (CBR) Tested in accordance with BS1377:Part 4:1990, clause 7	ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.1331

Report No.	R147909	Contract	Monaghan Town Active Travel Development Site
Contract No.	24665/1	Customer	Cora
Date received	09/06/23	Date Tested	15/06/23
BH/TP No.*	TP14	Sample No.*	AA205176 Type: B
Depth* (m)	1.50	Lab sample No.	A23/1721



Key: ———— Top ---------- Base

Description:	Grey brown slightly sandy, gravelly, SILT/CLAY		
Initial Condition:	Unsoaked		
Moisture Content (%):	14	Bulk Density (Mg/m^3):	2.04
Surcharge (kg):	4	Dry Density (Mg/m^3):	1.79
% Material >20mm:	15		
Method of compaction:	Static Compaction Method 2		

Test Result	Top	Base
CBR %	**2.7**	**3.3**
Moisture Content %	14	13

Results relate only to the specimen tested, in as received condition unless otherwise noted

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	H Byrne	18/07/23	1 of 1

IGSL Ltd
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M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

Report No. R147910 Contract No. 24665/1

Contract Name: Monaghan Town Active Travel Development Site

Location*: TP01

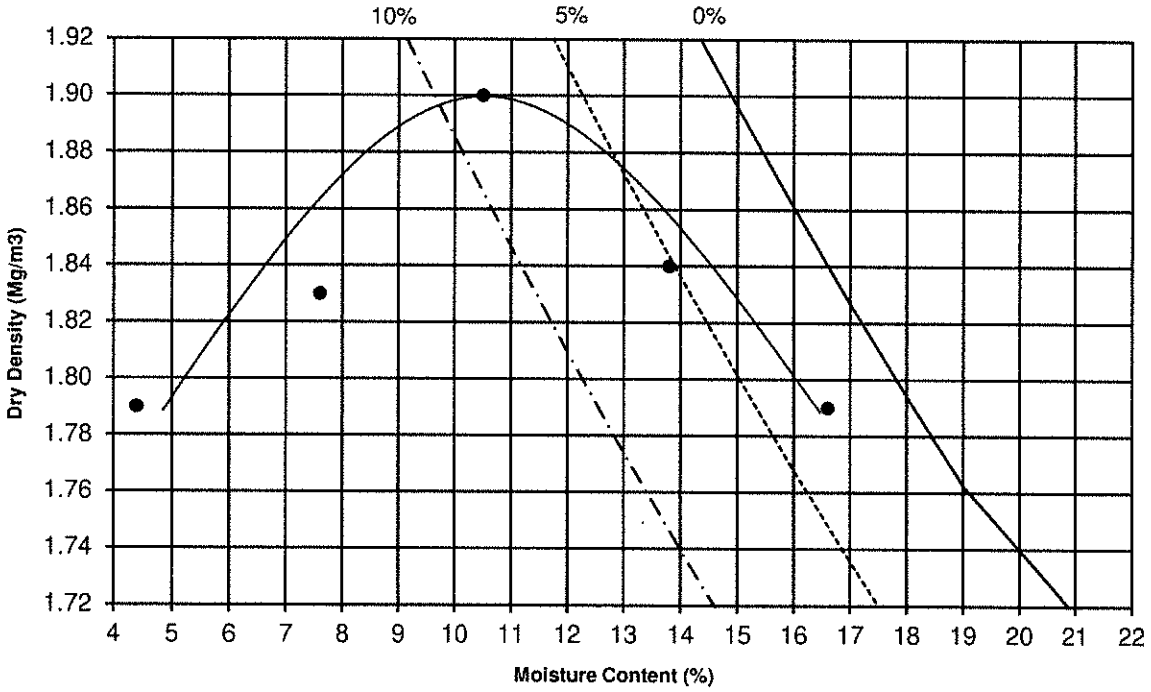
Sample No*. AA200193 Depth* (m) 0.7 Material Type B

Lab sample no. A23/1716 Customer: CORA

Date Received: 09/06/2023 Test Method: 2.5 Kg Rammer

Date Tested: 03/07/2023 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.90	1.79	1.83	1.84	1.79		
Moisture Content (%)	11	4.4	7.6	14	17	0	



Maximum Dry Density (Mg/m^3): 1.90 Optimum Moisture Content (%): 11

Description: Brown sandy gravelly SILT/CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 13

Results relate only to the specimen tested, in as received condition unless otherwise noted.
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Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R147911 Contract No. 24665/1

Contract Name: Monaghan Town Active Travel Development Site

Location*: TP03

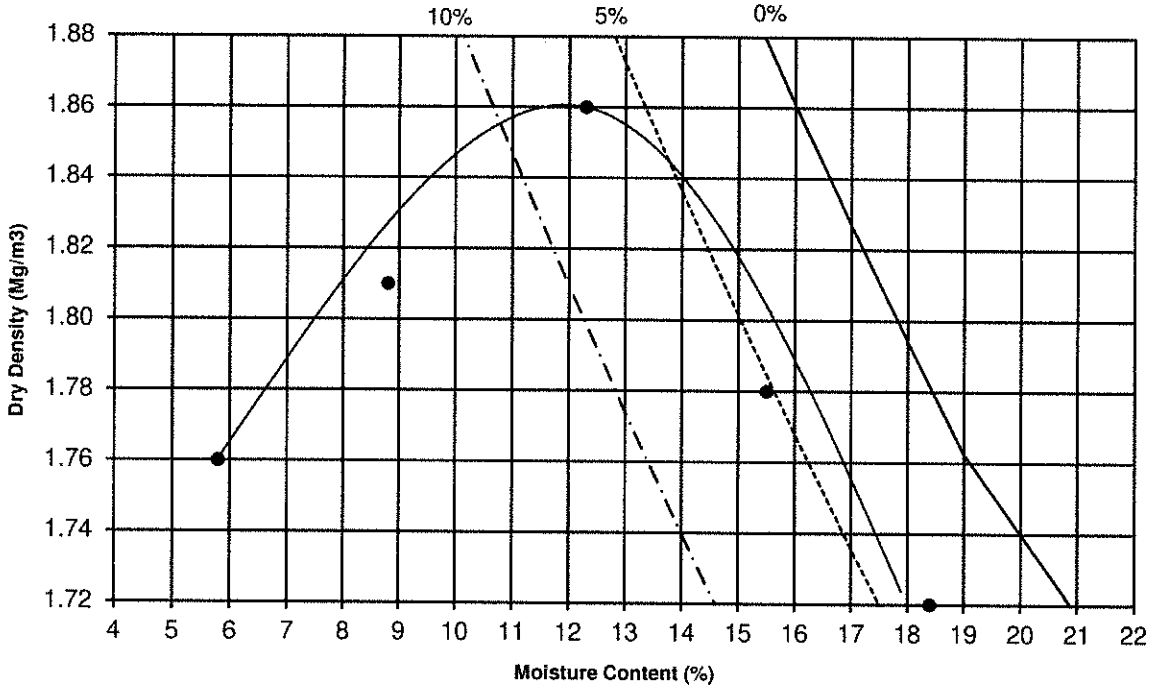
Sample No*. AA200179 Depth* (m) 0.7 Material Type B

Lab sample no. A23/1717 Customer: CORA

Date Received: 09/06/2023 Test Method: 2.5 Kg Rammer

Date Tested: 03/07/2023 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.86	1.76	1.81	1.78	1.72		
Moisture Content (%)	12	5.8	8.8	16	18	0	



Maximum Dry Density (Mg/m^3): 1.86 Optimum Moisture Content (%): 12

Description: Brown sandy gravelly SILT/CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 10

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Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 1331

Report No. R147912 Contract No. 24665/1

Contract Name: Monaghan Town Active Travel Development Site

Location*: TP05

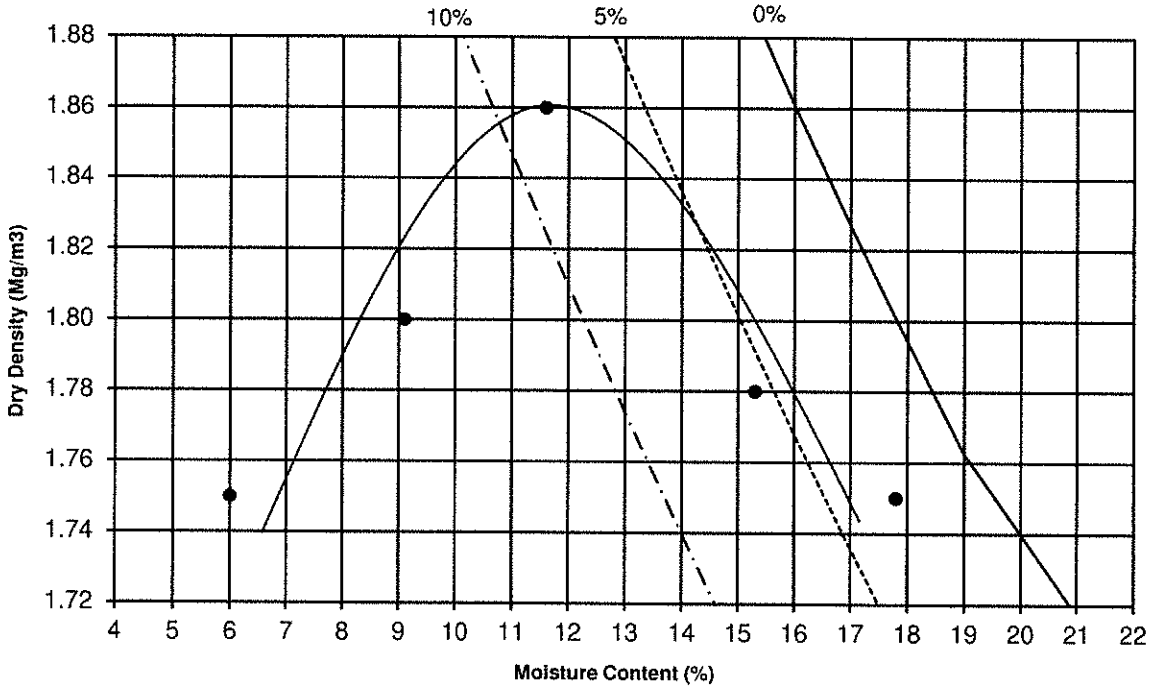
Sample No*. AA200182 Depth* (m) 0.7 Material Type B

Lab sample no. A23/1718 Customer: CORA

Date Received: 09/06/2023 Test Method: 2.5 Kg Rammer

Date Tested: 03/07/2023 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.86	1.75	1.80	1.78	1.75		
Moisture Content (%)	12	6.0	9.1	15	18	0	



Maximum Dry Density (Mg/m^3): 1.86 Optimum Moisture Content (%): 12

Description: Brown slightly sandy, slightly gravelly, SILT/CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 10

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Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 1337

Report No. R147913 Contract No. 24665/1

Contract Name: Monaghan Town Active Travel Development Site

Location*: TP09

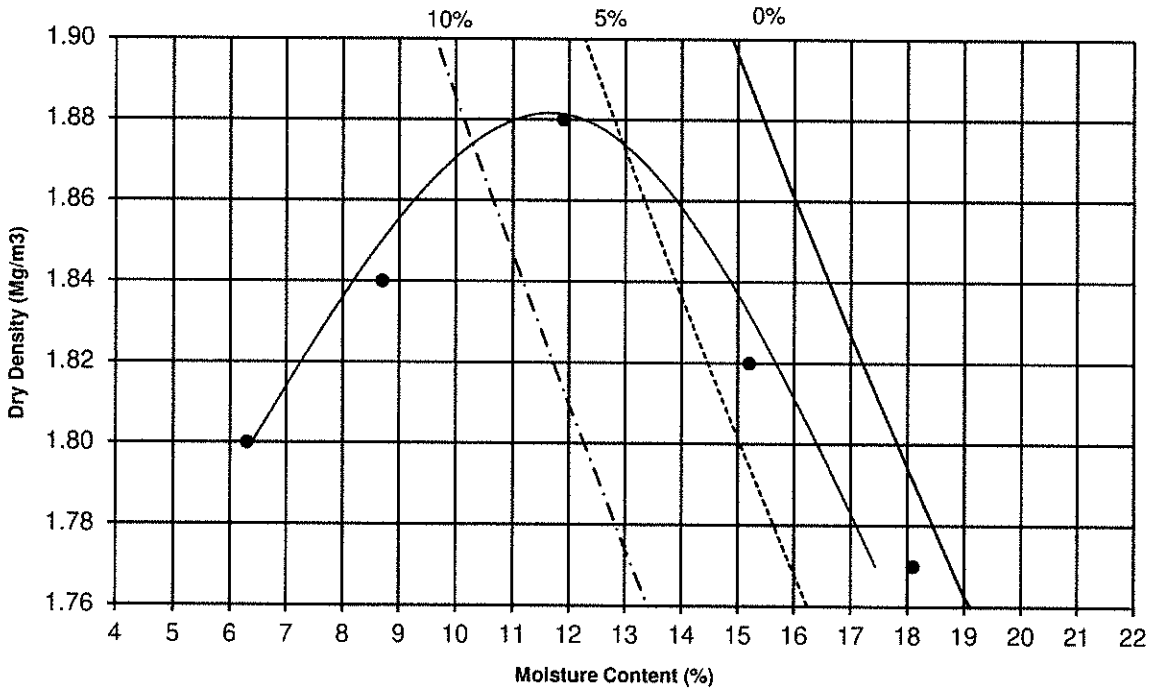
Sample No*. AA200191 Depth* (m) 0.7 Material Type B

Lab sample no. A23/1719 Customer: CORA

Date Received: 09/06/2023 Test Method: 2.5 Kg Rammer

Date Tested: 03/07/2023 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.88	1.80	1.84	1.82	1.77		
Moisture Content (%)	12	6.3	8.7	15	18	0	



Maximum Dry Density (Mg/m^3): 1.88 Optimum Moisture Content (%): 12

Description: Grey brown sandy, slightly gravelly, SILT/CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 13

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IGSL Ltd
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M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 1331

Report No. R147914 Contract No. 24665/1

Contract Name: Monaghan Town Active Travel Development Site

Location*: TP12

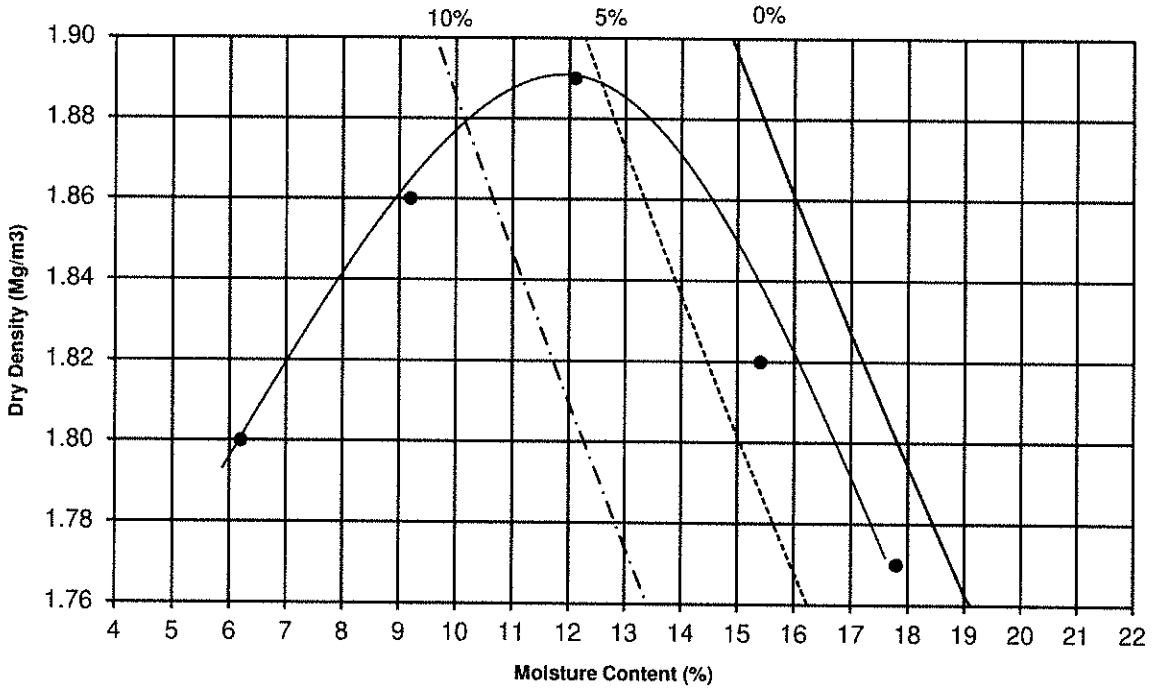
Sample No*. AA205179 Depth* (m) 0.8 Material Type B

Lab sample no. A23/1720 Customer: CORA

Date Received: 09/06/2023 Test Method: 2.5 Kg Rammer

Date Tested: 03/07/2023 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.89	1.80	1.86	1.82	1.77		
Moisture Content (%)	12	6.2	9.2	15	18	0	



Maximum Dry Density (Mg/m^3): 1.89 Optimum Moisture Content (%): 12

Description: Brown slightly sandy, gravelly, SILT/CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 19

Results relate only to the specimen tested, In as received condition unless otherwise noted.
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Persons authorised to approve reports
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Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 131T

Report No. R147915 Contract No. 24665/1

Contract Name: Monaghan Town Active Travel Development Site

Location*: TP14

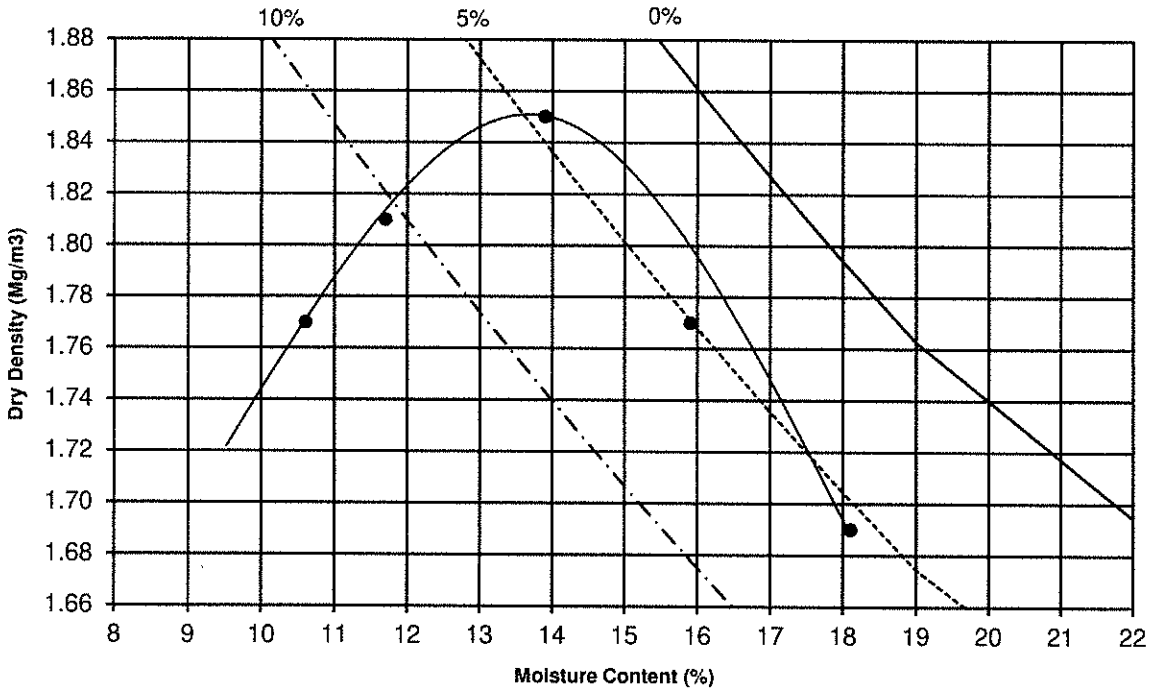
Sample No*. AA205176 Depth* (m) 1.5 Material Type B

Lab sample no. A23/1721 Customer: CORA

Date Received: 09/06/2023 Test Method: 2.5 Kg Rammer

Date Tested: 03/07/2023 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.77	1.69	1.85	1.81	1.77		
Moisture Content (%)	11	18	14	12	16	0	



Maximum Dry Density (Mg/m^3): 1.85 Optimum Moisture Content (%): 14

Description: Grey brown slightly sandy, gravelly, SILT/CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 14

Results relate only to the specimen tested, in as received condition unless otherwise noted.
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Persons authorised to approve reports
J Barrett (Quality Manager)
H Byrne (Laboratory Manager)

IGSL Materials Laboratory	Approved by	Date	Page
		18/07/23	1 of 1

Appendix Vb Chemical / Environmental Laboratory Data

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

UKAS TESTING
2183

Final Report

Report No.:	23-19446-1
Initial Date of Issue:	19-Jun-2023
Re-Issue Details:	
Client	IGSL
Client Address:	M7 Business Park Naas County Kildare Ireland
Contact(s):	Darren Keogh
Project	24665 / 1 Monaghan Town Active Travel Development Site(CORA)
Quotation No.:	Q20-19951
Order No.:	
No. of Samples:	18
Turnaround (Wkdays):	7
Date Approved:	19-Jun-2023
Approved By:	
Details:	Stuart Henderson, Technical Manager

Date Received:	08-Jun-2023
Date Instructed:	08-Jun-2023
Results Due:	16-Jun-2023

Results - Leachate

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

Client: IGSL				Chemtest Job No.:		23-19446	23-19446	23-19446	23-19446	23-19446	23-19446
Quotation No.: Q20-19951				Chemtest Sample ID.:		1653387	1653389	1653392	1653395	1653398	1653402
Order No.:				Client Sample Ref.:		AA192931	AA192934	AA171710	AA200184	AA200195	AA205173
				Sample Location:		BH01	BH03	BH07	TP04	TP08	TP13
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.50	0.50	0.80	0.50	0.80	0.60
Determinand	**Accred.**	**SOP**	**Type**	**Units**	**LOD**						
pH	U	1010	10:1		N/A	8.4	8.1	8.8	8.9	8.9	8.2
Ammonium	U	1220	10:1	mg/l	0.050	0.22	0.13	0.11	0.11	0.12	0.15
Ammonium	N	1220	10:1	mg/kg	0.10	2.5	1.4	1.5	1.6	1.7	1.6
Boron (Dissolved)	U	1455	10:1	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo[j]fluoranthene	N	1800	10:1	µg/l	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010

Results - Soil

Project: 24665 / 1 Monaghan Town Active Travel Development
Site(CORA)

Client: IGSL				Chemtest Job No.:	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446
Quotation No.: Q20-19951				Chemtest Sample ID.:	1653387	1653388	1653389	1653390	1653391	1653392	1653393	1653394	1653395
Order No.:				Client Sample Ref.:	AA192931	AA197802	AA192934	AA192939	AA192947	AA171710	AA200193	AA200179	AA200184
				Sample Location:	BH01	BH02	BH03	BH04A	BH05	BH07	TP01	TP03	TP04
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.50	1.00	0.50	1.00	1.00	0.80	0.70	0.60	0.50
				Asbestos Lab:	DURHAM		DURHAM			NEW-ASB			NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A	-		-			-			-
Asbestos Identification	U	2192		N/A	No Asbestos Detected		No Asbestos Detected			No Asbestos Detected			No Asbestos Detected
Moisture	N	2030	%	0.020	25	7.0	22	11	11	6.8	10	16	10
pH (2.5:1)	N	2010		4.0		[A] 8.6		[A] 8.5	[A] 8.5				
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	[A] < 0.40		[A] < 0.40			[A] < 0.40			[A] < 0.40
Magnesium (Water Soluble)	N	2120	g/l	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010				
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		[A] < 0.010		[A] < 0.010	[A] < 0.010				
Total Sulphur	U	2175	%	0.010		[A] 0.032		[A] 0.015	[A] 0.019				
Sulphur (Elemental)	U	2180	mg/kg	1.0	[A] 2.7		[A] 3.2			[A] 2.3			[A] 2.2
Chloride (Water Soluble)	U	2220	g/l	0.010		[A] 0.11		[A] < 0.010	[A] < 0.010				
Nitrate (Water Soluble)	N	2220	g/l	0.010		< 0.010		< 0.010	< 0.010				
Cyanide (Total)	U	2300	mg/kg	0.50	[A] < 0.50		[A] < 0.50			[A] < 0.50			[A] < 0.50
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50	[A] 14		[A] 4.7			[A] 2.5			[A] 4.6
Ammonium (Water Soluble)	U	2220	g/l	0.01		< 0.01		< 0.01	< 0.01				
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.024	[A] 0.057	[A] 0.018	[A] 0.029	[A] 0.031	[A] 0.014			[A] 0.053
Arsenic	U	2455	mg/kg	0.5	3.3		3.6			3.3			5.1
Barium	U	2455	mg/kg	0	28		39			38			34
Cadmium	U	2455	mg/kg	0.10	< 0.10		< 0.10			< 0.10			< 0.10
Chromium	U	2455	mg/kg	0.5	15		16			15			18
Molybdenum	U	2455	mg/kg	0.5	< 0.5		< 0.5			< 0.5			< 0.5
Antimony	N	2455	mg/kg	2.0	< 2.0		< 2.0			< 2.0			< 2.0
Copper	U	2455	mg/kg	0.50	10		13			11			13
Mercury	U	2455	mg/kg	0.05	< 0.05		< 0.05			0.05			0.07
Nickel	U	2455	mg/kg	0.50	23		31			21			28
Lead	U	2455	mg/kg	0.50	8.1		12			14			20
Selenium	U	2455	mg/kg	0.25	< 0.25		< 0.25			< 0.25			< 0.25
Zinc	U	2455	mg/kg	0.50	29		38			37			62
Chromium (Trivalent)	N	2490	mg/kg	1.0	15		16			15			18
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50		< 0.50			< 0.50			< 0.50
Organic Matter	U	2625	%	0.40							[A] 2.5	[A] 1.8	
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10	< 10		< 10			< 10			< 10
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0

Results - Soil

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

Client: IGSL				Chemtest Job No.:	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446
Quotation No.: Q20-19951				Chemtest Sample ID.:	1653387	1653388	1653389	1653390	1653391	1653392	1653393	1653394	1653395
Order No.:				Client Sample Ref.:	AA192931	AA197802	AA192934	AA192939	AA192947	AA171710	AA200193	AA200179	AA200184
				Sample Location:	BH01	BH02	BH03	BH04A	BH05	BH07	TP01	TP03	TP04
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.50	1.00	0.50	1.00	1.00	0.80	0.70	0.60	0.50
				Asbestos Lab:	DURHAM		DURHAM			NEW-ASB			NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0		[A] < 5.0			[A] < 5.0			[A] < 5.0
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0	[A] < 5.0		[A] < 5.0			[A] < 5.0			[A] < 5.0
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0	[A] < 10		[A] < 10			[A] < 10			[A] < 10
Benzene	U	2760	µg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Toluene	U	2760	µg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Ethylbenzene	U	2760	µg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
m & p-Xylene	U	2760	µg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
o-Xylene	U	2760	µg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0	[A] < 1.0		[A] < 1.0			[A] < 1.0			[A] < 1.0
Naphthalene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Acenaphthylene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Acenaphthene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Fluorene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Phenanthrene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Anthracene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Fluoranthene	N	2800	mg/kg	0.010	[A] 0.17		[A] < 0.010			[A] < 0.010			[A] < 0.010
Pyrene	N	2800	mg/kg	0.010	[A] 0.18		[A] < 0.010			[A] < 0.010			[A] < 0.010
Benzo[a]anthracene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Chrysene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Benzo[b]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Benzo[k]fluoranthene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Benzo[a]pyrene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Coronene	N	2800	mg/kg	0.010	[A] < 0.010		[A] < 0.010			[A] < 0.010			[A] < 0.010
Total Of 17 PAH's	N	2800	mg/kg	0.20	[A] 0.35		[A] < 0.20			[A] < 0.20			[A] < 0.20
PCB 28	N	2815	mg/kg	0.0010	[A] < 0.0010		[A] < 0.0010			[A] < 0.0010			[A] < 0.0010

Results - Soil

Project: 24665 / 1 Monaghan Town Active Travel Development
Site(CORA)

Client: IGSL			Chemtest Job No.:	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446
Quotation No.: Q20-19951			Chemtest Sample ID.:	1653387	1653388	1653389	1653390	1653391	1653392	1653393	1653394	1653395
Order No.:			Client Sample Ref.:	AA192931	AA197802	AA192934	AA192939	AA192947	AA171710	AA200193	AA200179	AA200184
			Sample Location:	BH01	BH02	BH03	BH04A	BH05	BH07	TP01	TP03	TP04
			Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
			Top Depth (m):	0.50	1.00	0.50	1.00	1.00	0.80	0.70	0.60	0.50
			Asbestos Lab:	DURHAM		DURHAM			NEW-ASB			NEW-ASB
Determinand	**Accred.**	**SOP**	**Units**	**LOD**								
PCB 52	N	2815	mg/kg	0.0010	[A] < 0.0010		[A] < 0.0010			[A] < 0.0010			[A] < 0.0010
PCB 90+101	N	2815	mg/kg	0.0010	[A] < 0.0010		[A] < 0.0010			[A] < 0.0010			[A] < 0.0010
PCB 118	N	2815	mg/kg	0.0010	[A] < 0.0010		[A] < 0.0010			[A] < 0.0010			[A] < 0.0010
PCB 153	N	2815	mg/kg	0.0010	[A] < 0.0010		[A] < 0.0010			[A] < 0.0010			[A] < 0.0010
PCB 138	N	2815	mg/kg	0.0010	[A] < 0.0010		[A] < 0.0010			[A] < 0.0010			[A] < 0.0010
PCB 180	N	2815	mg/kg	0.0010	[A] < 0.0010		[A] < 0.0010			[A] < 0.0010			[A] < 0.0010
Total PCBs (7 congeners)	N	2815	mg/kg	0.0010	[A] < 0.0010		[A] < 0.0010			[A] < 0.0010			[A] < 0.0010
Total Phenols	U	2920	mg/kg	0.10	< 0.10		< 0.10			< 0.10			< 0.10

Results - Soil

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

Client: IGSL				Chemtest Job No.:	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446
Quotation No.: Q20-19951				Chemtest Sample ID.:	1653396	1653397	1653398	1653399	1653400	1653401	1653402	1653403	1653404
Order No.:				Client Sample Ref.:	AA200182	AA200188	AA200195	AA200196	AA200191	AA205178	AA205173	AA205175	AA205176
				Sample Location:	TP05	TP07	TP08	TP08	TP09	TP12	TP13	TP14	TP14
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.70	0.50	0.80	1.80	0.70	0.80	0.60	0.70	1.50
				Asbestos Lab:			COVENTRY				NEW-ASB		
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
ACM Type	U	2192		N/A			-				-		
Asbestos Identification	U	2192		N/A			No Asbestos Detected				No Asbestos Detected		
Moisture	N	2030	%	0.020	13	12	10	7.8	11	11	19	17	13
pH (2.5:1)	N	2010		4.0		[A] 8.0		[A] 8.6				[A] 7.8	
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40			[A] < 0.40				[A] 0.52		
Magnesium (Water Soluble)	N	2120	g/l	0.010		[A] < 0.010		[A] < 0.010				[A] < 0.010	
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010		[A] < 0.010		[A] < 0.010				[A] 0.24	
Total Sulphur	U	2175	%	0.010		[A] 0.034		[A] 0.027				[A] 0.077	
Sulphur (Elemental)	U	2180	mg/kg	1.0			[A] 2.6				[A] 3.8		
Chloride (Water Soluble)	U	2220	g/l	0.010		[A] 0.028		[A] < 0.010				[A] < 0.010	
Nitrate (Water Soluble)	N	2220	g/l	0.010		0.017		< 0.010				< 0.010	
Cyanide (Total)	U	2300	mg/kg	0.50			[A] < 0.50				[A] < 0.50		
Sulphide (Easily Liberatable)	N	2325	mg/kg	0.50			[A] 3.3				[A] 3.3		
Ammonium (Water Soluble)	U	2220	g/l	0.01		< 0.01		< 0.01				< 0.01	
Sulphate (Acid Soluble)	U	2430	%	0.010		[A] 0.065	[A] 0.033	[A] 0.045			[A] 0.040	[A] 0.075	
Arsenic	U	2455	mg/kg	0.5			4.5				5.3		
Barium	U	2455	mg/kg	0			48				43		
Cadmium	U	2455	mg/kg	0.10			< 0.10				< 0.10		
Chromium	U	2455	mg/kg	0.5			27				28		
Molybdenum	U	2455	mg/kg	0.5			< 0.5				< 0.5		
Antimony	N	2455	mg/kg	2.0			< 2.0				< 2.0		
Copper	U	2455	mg/kg	0.50			21				18		
Mercury	U	2455	mg/kg	0.05			< 0.05				< 0.05		
Nickel	U	2455	mg/kg	0.50			43				37		
Lead	U	2455	mg/kg	0.50			16				13		
Selenium	U	2455	mg/kg	0.25			< 0.25				< 0.25		
Zinc	U	2455	mg/kg	0.50			48				41		
Chromium (Trivalent)	N	2490	mg/kg	1.0			27				28		
Chromium (Hexavalent)	N	2490	mg/kg	0.50			< 0.50				< 0.50		
Organic Matter	U	2625	%	0.40	[A] 1.1				[A] 1.1	[A] 1.0			[A] 1.1
Mineral Oil (TPH Calculation)	N	2670	mg/kg	10			< 10				< 10		
Aliphatic TPH >C5-C6	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0		
Aliphatic TPH >C6-C8	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0		
Aliphatic TPH >C8-C10	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0		
Aliphatic TPH >C10-C12	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0		
Aliphatic TPH >C12-C16	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0		
Aliphatic TPH >C16-C21	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0		

Results - Soil

Project: 24665 / 1 Monaghan Town Active Travel Development
Site(CORA)

Client: IGSL					Chemtest Job No.:	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446
Quotation No.: Q20-19951					Chemtest Sample ID.:	1653396	1653397	1653398	1653399	1653400	1653401	1653402	1653403	1653404
Order No.:					Client Sample Ref.:	AA200182	AA200188	AA200195	AA200196	AA200191	AA205178	AA205173	AA205175	AA205176
					Sample Location:	TP05	TP07	TP08	TP08	TP09	TP12	TP13	TP14	TP14
					Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
					Top Depth (m):	0.70	0.50	0.80	1.80	0.70	0.80	0.60	0.70	1.50
					Asbestos Lab:			COVENTRY				NEW-ASB		
Determinand	**Accred.**	**SOP**	**Units**	**LOD**										
Aliphatic TPH >C21-C35	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Aliphatic TPH >C35-C44	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Total Aliphatic Hydrocarbons	N	2680	mg/kg	5.0			[A] < 5.0				[A] < 5.0			
Aromatic TPH >C5-C7	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Aromatic TPH >C7-C8	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Aromatic TPH >C8-C10	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Aromatic TPH >C10-C12	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Aromatic TPH >C12-C16	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Aromatic TPH >C16-C21	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Aromatic TPH >C21-C35	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Aromatic TPH >C35-C44	N	2680	mg/kg	1.0			[A] < 1.0				[A] < 1.0			
Total Aromatic Hydrocarbons	N	2680	mg/kg	5.0			[A] < 5.0				[A] < 5.0			
Total Petroleum Hydrocarbons	N	2680	mg/kg	10.0			[A] < 10				[A] < 10			
Benzene	U	2760	µg/kg	1.0			[A] < 1.0				[A] < 1.0			
Toluene	U	2760	µg/kg	1.0			[A] < 1.0				[A] < 1.0			
Ethylbenzene	U	2760	µg/kg	1.0			[A] < 1.0				[A] < 1.0			
m & p-Xylene	U	2760	µg/kg	1.0			[A] < 1.0				[A] < 1.0			
o-Xylene	U	2760	µg/kg	1.0			[A] < 1.0				[A] < 1.0			
Methyl Tert-Butyl Ether	U	2760	µg/kg	1.0			[A] < 1.0				[A] < 1.0			
Naphthalene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Acenaphthylene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Acenaphthene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Fluorene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Phenanthrene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Anthracene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Fluoranthene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Pyrene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Benzo[a]anthracene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Chrysene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Benzo[b]fluoranthene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Benzo[k]fluoranthene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Benzo[a]pyrene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Indeno(1,2,3-c,d)Pyrene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Benzo[g,h,i]perylene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Coronene	N	2800	mg/kg	0.010			[A] < 0.010				[A] < 0.010			
Total Of 17 PAH's	N	2800	mg/kg	0.20			[A] < 0.20				[A] < 0.20			
PCB 28	N	2815	mg/kg	0.0010			[A] < 0.0010				[A] < 0.0010			

Results - Soil

Project: 24665 / 1 Monaghan Town Active Travel Development
Site(CORA)

Client: IGSL				Chemtest Job No.:	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446	23-19446
Quotation No.: Q20-19951				Chemtest Sample ID.:	1653396	1653397	1653398	1653399	1653400	1653401	1653402	1653403	1653404
Order No.:				Client Sample Ref.:	AA200182	AA200188	AA200195	AA200196	AA200191	AA205178	AA205173	AA205175	AA205176
				Sample Location:	TP05	TP07	TP08	TP08	TP09	TP12	TP13	TP14	TP14
				Sample Type:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):	0.70	0.50	0.80	1.80	0.70	0.80	0.60	0.70	1.50
				Asbestos Lab:			COVENTRY				NEW-ASB		
Determinand	**Accred.**	**SOP**	**Units**	**LOD**									
PCB 52	N	2815	mg/kg	0.0010			[A] < 0.0010				[A] < 0.0010		
PCB 90+101	N	2815	mg/kg	0.0010			[A] < 0.0010				[A] < 0.0010		
PCB 118	N	2815	mg/kg	0.0010			[A] < 0.0010				[A] < 0.0010		
PCB 153	N	2815	mg/kg	0.0010			[A] < 0.0010				[A] < 0.0010		
PCB 138	N	2815	mg/kg	0.0010			[A] < 0.0010				[A] < 0.0010		
PCB 180	N	2815	mg/kg	0.0010			[A] < 0.0010				[A] < 0.0010		
Total PCBs (7 congeners)	N	2815	mg/kg	0.0010			[A] < 0.0010				[A] < 0.0010		
Total Phenols	U	2920	mg/kg	0.10			< 0.10				< 0.10		

Results - Single Stage WAC

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-19446						
Chemtest Sample ID:	1653387						
Sample Ref:	AA192931						
Sample ID:							
Sample Location:	BH01						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 2.4	3	5	6
Loss On Ignition	2610	U	%	5.0	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] 0.35	100	--	--
pH	2010	U		7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0080	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0002	0.0023	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	0.0011	0.011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0006	0.0058	0.5	10	30
Nickel	1455	U	0.0007	0.0066	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	0.005	0.046	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.15	1.5	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	45	450	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.8	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	25

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-19446						
Chemtest Sample ID:	1653389						
Sample Ref:	AA192934						
Sample ID:							
Sample Location:	BH03						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 2.0	3	5	6
Loss On Ignition	2610	U	%	1.5	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.0	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.012	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0031	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	0.0011	0.011	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0008	0.0079	0.5	10	30
Nickel	1455	U	0.0005	0.0050	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	0.003	0.033	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.10	1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	47	470	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.1	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	22

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-19446						
Chemtest Sample ID:	1653392						
Sample Ref:	AA171710						
Sample ID:							
Sample Location:	BH07						
Top Depth(m):	0.80						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 1.3	3	5	6
Loss On Ignition	2610	U	%	10	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.011	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0030	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	0.0016	0.016	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0006	0.0062	0.5	10	30
Nickel	1455	U	0.0008	0.0077	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	0.003	0.035	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.14	1.4	10	150	500
Sulphate	1220	U	2.3	23	1000	20000	50000
Total Dissolved Solids	1020	N	40	400	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.4	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	6.8

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-19446						
Chemtest Sample ID:	1653395						
Sample Ref:	AA200184						
Sample ID:							
Sample Location:	TP04						
Top Depth(m):	0.50						
Bottom Depth(m):							
Sampling Date:					**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Determinand	**SOP**	**Accred.**	**Units**				
Total Organic Carbon	2625	U	%	[A] 1.3	3	5	6
Loss On Ignition	2610	U	%	3.1	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0060	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0003	0.0029	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	0.0010	0.010	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0008	0.0081	0.5	10	30
Nickel	1455	U	0.0005	0.0053	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	0.005	0.055	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.12	1.2	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	31	310	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	3.5	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	10

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-19446						
Chemtest Sample ID:	1653398						
Sample Ref:	AA200195						
Sample ID:							
Sample Location:	TP08						
Top Depth(m):	0.80						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.77	3	5	6
Loss On Ignition	2610	U	%	2.8	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		8.4	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.017	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0006	0.0061	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0050	0.5	10	70
Copper	1455	U	0.0006	0.0060	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0008	0.0076	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0050	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0050	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	0.003	0.034	4	50	200
Chloride	1220	U	< 1.0	< 10	800	15000	25000
Fluoride	1220	U	0.096	< 1.0	10	150	500
Sulphate	1220	U	< 1.0	< 10	1000	20000	50000
Total Dissolved Solids	1020	N	31	310	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	3.0	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	10

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Results - Single Stage WAC

Project: 24665 / 1 Monaghan Town Active Travel Development Site(CORA)

					Landfill Waste Acceptance Criteria Limits		
Chemtest Job No:	23-19446						
Chemtest Sample ID:	1653402						
Sample Ref:	AA205173						
Sample ID:							
Sample Location:	TP13						
Top Depth(m):	0.60						
Bottom Depth(m):							
Sampling Date:							
Determinand	**SOP**	**Accred.**	**Units**		**Inert Waste Landfill**	**Stable, Non-reactive hazardous waste in non-hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon	2625	U	%	[A] 0.34	3	5	6
Loss On Ignition	2610	U	%	4.7	--	--	10
Total BTEX	2760	U	mg/kg	[A] < 0.010	6	--	--
Total PCBs (7 congeners)	2815	N	mg/kg	[A] < 0.0010	1	--	--
TPH Total WAC	2670	U	mg/kg	[A] < 10	500	--	--
Total Of 17 PAH's	2800	N	mg/kg	[A] < 0.20	100	--	--
pH	2010	U		7.8	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.0090	--	To evaluate	To evaluate
Eluate Analysis			**10:1 Eluate mg/l**	**10:1 Eluate mg/kg**	**Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg**		
Arsenic	1455	U	0.0019	0.019	0.5	2	25
Barium	1455	U	< 0.005	< 0.050	20	100	300
Cadmium	1455	U	< 0.00011	< 0.0011	0.04	1	5
Chromium	1455	U	0.0036	0.036	0.5	10	70
Copper	1455	U	0.0058	0.058	2	50	100
Mercury	1455	U	< 0.00005	< 0.00050	0.01	0.2	2
Molybdenum	1455	U	0.0004	0.0043	0.5	10	30
Nickel	1455	U	0.0056	0.056	0.4	10	40
Lead	1455	U	0.0013	0.013	0.5	10	50
Antimony	1455	U	< 0.0005	< 0.0050	0.06	0.7	5
Selenium	1455	U	< 0.0005	< 0.0050	0.1	0.5	7
Zinc	1455	U	0.010	0.10	4	50	200
Chloride	1220	U	1.1	11	800	15000	25000
Fluoride	1220	U	0.12	1.2	10	150	500
Sulphate	1220	U	2.0	20	1000	20000	50000
Total Dissolved Solids	1020	N	13	130	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	5.7	57	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	19

Waste Acceptance Criteria

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1653387	AA192931		BH01		A	Amber Glass 250ml
1653387	AA192931		BH01		A	Plastic Tub 500g
1653388	AA197802		BH02		A	Amber Glass 250ml
1653388	AA197802		BH02		A	Plastic Tub 500g
1653389	AA192934		BH03		A	Amber Glass 250ml
1653389	AA192934		BH03		A	Plastic Tub 500g
1653390	AA192939		BH04A		A	Amber Glass 250ml
1653390	AA192939		BH04A		A	Plastic Tub 500g
1653391	AA192947		BH05		A	Amber Glass 250ml
1653391	AA192947		BH05		A	Plastic Tub 500g
1653392	AA171710		BH07		A	Amber Glass 250ml
1653392	AA171710		BH07		A	Plastic Tub 500g
1653393	AA200193		TP01		A	Amber Glass 250ml
1653393	AA200193		TP01		A	Plastic Tub 500g
1653394	AA200179		TP03		A	Amber Glass 250ml
1653394	AA200179		TP03		A	Plastic Tub 500g
1653395	AA200184		TP04		A	Amber Glass 250ml
1653395	AA200184		TP04		A	Plastic Tub 500g
1653396	AA200182		TP05		A	Amber Glass 250ml
1653396	AA200182		TP05		A	Plastic Tub 500g
1653397	AA200188		TP07		A	Amber Glass 250ml
1653397	AA200188		TP07		A	Plastic Tub 500g

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1653398	AA200195		TP08		A	Amber Glass 250ml
1653398	AA200195		TP08		A	Plastic Tub 500g
1653399	AA200196		TP08		A	Amber Glass 250ml
1653399	AA200196		TP08		A	Plastic Tub 500g
1653400	AA200191		TP09		A	Amber Glass 250ml
1653400	AA200191		TP09		A	Plastic Tub 500g
1653401	AA205178		TP12		A	Amber Glass 250ml
1653401	AA205178		TP12		A	Plastic Tub 500g
1653402	AA205173		TP13		A	Amber Glass 250ml
1653402	AA205173		TP13		A	Plastic Tub 500g
1653403	AA205175		TP14		A	Amber Glass 250ml
1653403	AA205175		TP14		A	Plastic Tub 500g
1653404	AA205176		TP14		A	Amber Glass 250ml
1653404	AA205176		TP14		A	Plastic Tub 500g

Test Methods

SOP	Title	Parameters included	Method summary
1010	pH Value of Waters	pH	pH Meter
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Conductivity Meter
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.
2010	pH Value of Soils	pH	pH Meter
2015	Acid Neutralisation Capacity	Acid Reserve	Titration
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2180	Sulphur (Elemental) in Soils by HPLC	Sulphur	Dichloromethane extraction / HPLC with UV detection
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measuremernt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.
2325	Sulphide in Soils	Sulphide	Steam distillation with sulphuric acid / analysis by 'Aquakem 600' Discrete Analyser, using N,N--dimethyl-p-phenylenediamine.
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.

Test Methods

SOP	Title	Parameters included	Method summary
2610	Loss on Ignition	loss on ignition (LOI)	Determination of the proportion by mass that is lost from a soil by ignition at 550°C.
2625	Total Organic Carbon in Soils	Total organic Carbon (TOC)	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.
2670	Total Petroleum Hydrocarbons (TPH) in Soils by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO*TPH C8–C40	Dichloromethane extraction / GC-FID
2680	TPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Dichloromethane extraction / GCxGC FID detection
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.
640	Characterisation of Waste (Leaching C10)	Waste material including soil, sludges and granular waste	ComplianceTest for Leaching of Granular Waste Material and Sludge

Report Information

Key	
U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
Uncertainty of measurement for the determinands tested are available upon request
None of the results in this report have been recovery corrected
All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis
All Asbestos testing is performed at the indicated laboratory
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

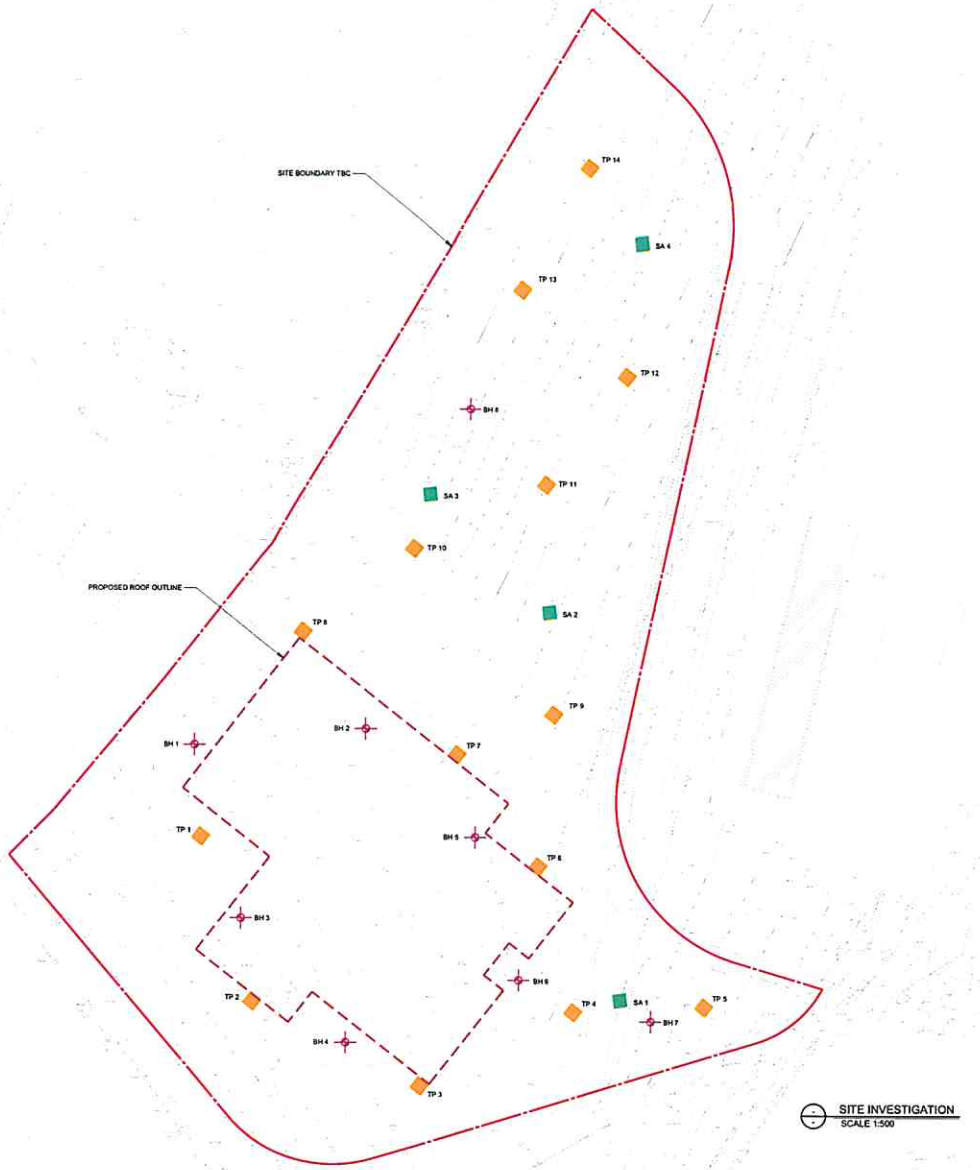
A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt
All water samples will be retained for 14 days from the date of receipt
Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Appendix VI Site Plans



SITE INVESTIGATION
SCALE 1:500

REVISION SCHEDULE

REV. NO.	REV. DESCRIPTION	REV. DATE	DRAWN	CHECKED
PL1	ISSUED FOR PLANNING	24/02/2023	BF	JFC

LEGEND

TP # — TRIAL PIT TO 2m BELOW EX GROUND LEVEL
SA # — SOAKAWAY TEST TO BRE 365
BH # — BOREHOLE ESTIMATED AT 6-9m DEEP

IMPORTANT NOTE:

TAKE SAMPLES AT 1m INTERVALS FOR WAC ANALYSIS IN BOREHOLES (BH) AND TRIAL PITS (TP)

Drawing Stage:	PLANNING
Project Details:	
Site Address:	-
Client:	MONAGHAN COUNTY COUNCIL
Architect:	HENRY J LYONS ARCHITECTS
M&E Designer:	-
Contractor:	-

Notes

Drawn by: BF	Checked by: KO'M	Approved by: JFC	Date: FEB '23
Project Name: MONAGHAN CIVIC OFFICES		Scale: 1:500 @ A1	Project Number: 2223
Drawing Title: SITE INVESTIGATION			

Project	Originator	Zone	Level	Type	Discipline	Drawing No	Stage	Revision
2223	CORA	ZZ	ZZ	DR	SK	20	PL	PL1

CORA CONSULTING ENGINEERS
Behan House, 10 Lower Mount Street, Dublin 2. D02 H171
Tel: +353 1 661 1100
e-mail: info@cora.ie
Web: www.cora.ie

Appendix D – Irish Water Correspondence

CONFIRMATION OF FEASIBILITY

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

John Callanan

CORA Consulting Engineers
10 Lower Mount Street
Dublin 2
Co. Dublin
D02HT71

7 June 2023

Our Ref: CDS23004020 Pre-Connection Enquiry
Monaghan County Council Headquarters, Roosky, Monaghan Town, Monaghan

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Business Connection of 1 unit(s) at Monaghan County Council Headquarters, Roosky, Monaghan Town, Monaghan, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection** - **Feasible Subject to upgrades**

  - Please note, while flows in excess of your required demand may be achieved in the Irish Water network and could be utilised in the event of a fire, Irish Water cannot guarantee a flow rate to meet your fire flow requirement. To guarantee a flow to meet the Fire Authority requirements you should provide adequate fire storage capacity within your development.

    Please note that according to our records there is an existing 200mm dia water main running through this site (see drawing attached).
    Any structures or works over or in close

		proximity to Irish Water infrastructure that will inhibit access for maintenance or endanger structural or functional integrity of the infrastructure are not allowed. The layout of the development must ensure that this pipe is protected and adequate separation distances are provided between Irish Water infrastructure and any structures on site. Alternatively you may enter into a diversion agreement with Irish Water and divert the pipe to accommodate your development. If you wish to proceed with this option please contact Irish Water at Diversions@water.ie and submit detailed design drawings before submitting your planning application. It will be necessary to provide a wayleave over this pipe to the benefit of Irish Water and ensure that it is accessible for maintenance. For more information, please see go to the link below: https://www.water.ie/connections/developer-services/diversions/ A connection off this diverted watermain for the proposed building is feasible.
• **Wastewater Connection**	-	**Feasible Subject to upgrades** - A 130m network extension in the public domain (along Rooskey Vale Rd) will be required.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Irish Water.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

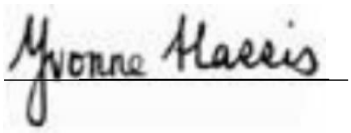
Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Irish Water's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Irish Water's network(s). This is not a connection offer and capacity in Irish Water's network(s) may only be secured by entering into a connection agreement with Irish Water.

For any further information, visit **www.water.ie/connections**, **email** **newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,



Yvonne Harris
Head of Customer Operations

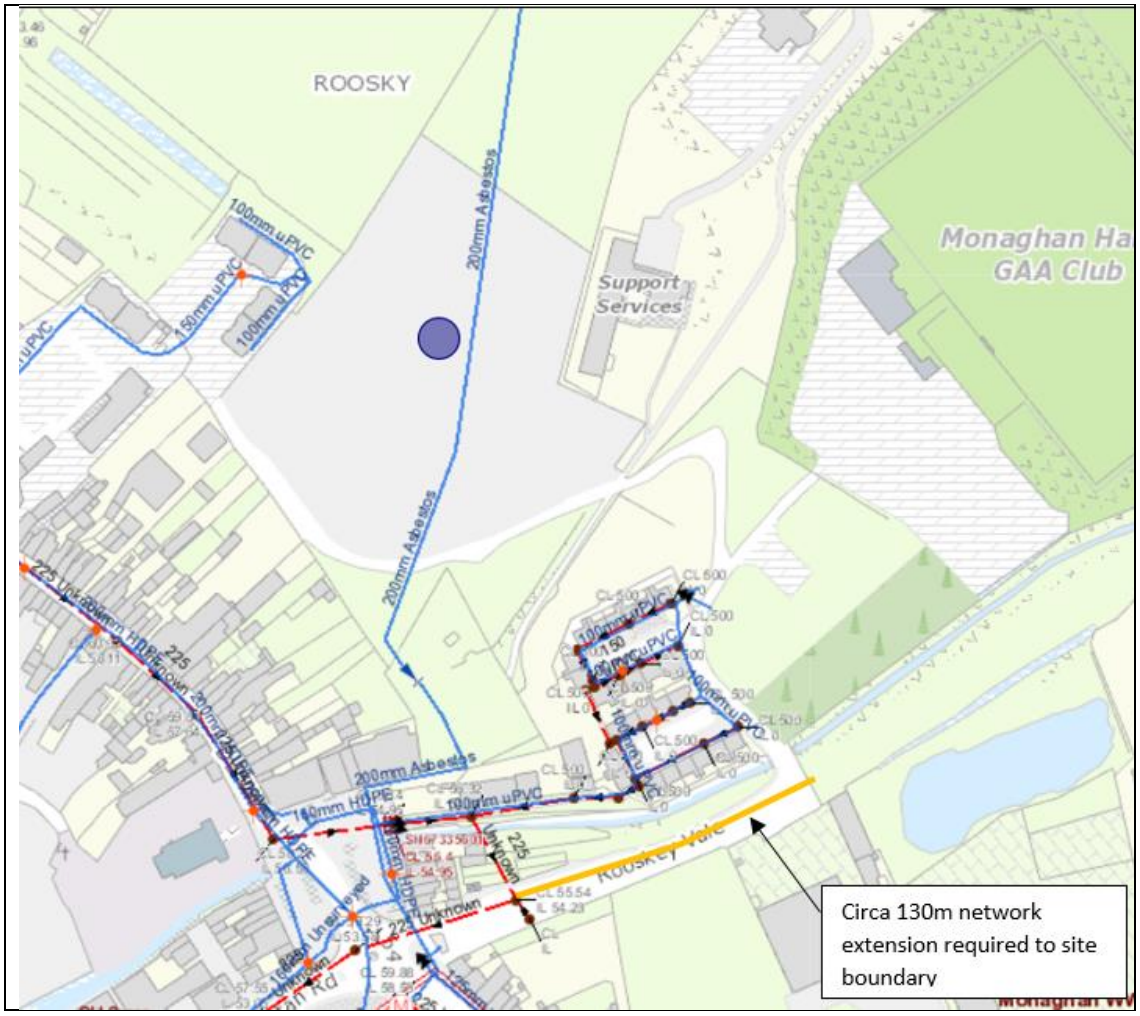
Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Irish Water's network(s)?	• Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Irish Water Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Irish Water's Network(s)

The map included below outlines the current Irish Water infrastructure adjacent the Development: To access Irish Water Maps email datarequests@water.ie



Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Note: The information provided on the included maps as to the position of Irish Water's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Irish Water.

Whilst every care has been taken in respect of the information on Irish Water's network(s), Irish Water assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Irish Water's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Irish Water's underground network(s) is identified prior to

excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Appendix E – Water Protection Checklist

MONAGHAN LOCAL AUTHORITIES
Water Protection Plan Checklist

(To be accompanied by a Site Drainage Plan - Refer to Chapter 4 of Monaghan County Development Plan 2013-2019)

General Site and Water Body Details			
Planning Ref. No.	Not yet assigned	Applicant	Monaghan Co. Co.
Townland	Roosky	Water Supply Source	Public Watermain
X Co-ordinate [1]	267521	Y Co-ordinate [1]	333834
WMU [2]		RWB [2]	Shambles_010
WB Status [2]		Objective [2]	
Groundwater Vulnerability [3]	Low to Moderate	Aquifer Importance [3]	Regionally Important Aquifer
Proximity to nearest watercourse (culverted or open), wetland or lake (meters)			Patena Lake – 450m Ulster Canal – 650m

Proposed Development Is the development entirely or part of one of the following? (tick)					
Domestic dwelling		Agricultural (cattle/dairy)		Industrial-food related	
Public Works	✓	Agricultural (mushrooms)		Industrial-non food	
Housing		Agricultural (poultry)		Quarrying/extractive industries	
Institutional		Agricultural (piggery)		Transport related	
Commercial/Retail		Other agricultural – specify below		Filling station/Fuel depot	
Mixed Use Development				Other	

Waste Water Production and Treatment Method	
Domestic type waste waters	Discharged to Public Sewer
Waste waters produced from any trade, food, preparation or business [4]	Minor amounts produced from food preparation
Wheel wash, vehicle wash, cooling waters	N/A
Waste waters produced from quarrying etc [4]	N/A
Other waste waters [4]	N/A
Construction phase waste waters	
Frequently asked questions for septic tanks may assist in the "fit for purpose" assessment refer to http://www.monaghan.ie/en/services/environment/water/waterawareness/faqforseptictanks/	

Fuel or Outdoor Material Storage for Non Domestic Developments	
Number of fuel storage tanks existing or proposed on site?	None
Are fuel storage tanks bunded [5]?	N/A
Detail liquid / feedstuffs / organic / chemical / waste oil storage on outdoor sites	N/A

Hard Surface and Open Yard Areas for Non Domestic Developments	
Footprint of proposed development including yard areas in m^2	
Is there potential for soiled yard areas from material, product waste or manure handling, fuel dispensing, silt and soil, yard washing etc.	N/A
If yes, are silt trap(s), interceptor(s), soiled water tanks or other control measures shown on drainage plan?	Permeable Paving geotextile deals with minor petrol spills
Has the use of SUDS (Sustainable Urban Drainage Systems – http://www.susdrain.org) been considered in the design of this	Yes

development?	

Development History – All Developments	
Have previous pollution prevention planning conditions been complied with [6]?	N/A
Does existing development have an up to date (as constructed) site drainage plan?	N/A
Is the existing/proposed development sewered or unsewered?	Sewered
If unsewered, is the existing wastewater treatment system fit for purpose[7]?	N/A
Has the storm water drainage system been examined and/or surveyed for misconnections? (Information leaflet available from Environment Section)	Prior to works
Checklist of items to be included on Site Drainage Plan	
Location of lakes, watercourse, wells used for water supply, or karst features on or within 25m of domestic or 100m of non domestic development site	N/A
Location of all drainage outfall points	Yes
Foul water drainage system (in Red)	Yes (Brown)
Storm water drainage system (in Blue)	Yes
Soiled yard area, soiled water drainage and management system, including silt traps, oil interceptor(s) and any SUDS facilities	
Location of waste water treatment facilities	N/A
Location of fuel storage tank(s)	N/A
Stream/Lake/Wetland/Riparian Corridors	

Footnotes and Useful Information
[1] Projection in the Irish Grid
[2] WMU, RWB, WB status. Objectives available on water maps at www.wfdireland.ie
[3] Available in the public mapping section at www.gsi.ie
[4] For information leaflets on Business Premises and Proper Use of Drains and information on discharge licensing see: http://www.monaghan.ie/contentv3/services/environment/formsguidesdocumentsdownlands/ http://www.monaghan.ie/contentv3/services/environemtn/water/waterawareness/leaftletsandguidelines/
[5] Guidance: www.envirocentre.ie Best practice for Oil Storage (BPGCS05)
[6] Has certification of installation for previously granted wastewater treatment system been required and if so has it been submitted.
[7] Refer to EPA Guidance at: http://www.monaghan.ie/contentv3/services/environment/water/waterawareness/faqforseptictanks/ and http://www.monaghan.ie/contentv3/media/monaghanie/content/files/pdf/environment/Water Pollution&DrainageSystems.pdf
[8] Refer to Water Body, Sensitive Waters and Sensitive Land Maps in Chapter 4 of the Monaghan County Development Plan 2013-2019

Abbreviations	
WMU	Water Management Unit
RWB	River Water Body
WB Status	Water Body Status
IPPC	Integrated Pollution Prevention Control Licence
EIA	Environmental Impact Assessment

For Office Use: Sensitivity of Location	
Is the development located upstream of a high river quality site [8]?	
Is the development located within a good status waterbody [8]?	
Is the development located in the catchment of a water supply source [8]?	
Is the development located within the Source Protection Zone (SPZ) of a groundwater supply source [8]?	
Does the development require a discharge licence to surface or ground waters under the Water Pollution Acts?	
Risk to waters in relation to scale of development, previous planning/environmental history, IPPC or EIA aspects, site management and location in a sensitive area	

Applicant:_____

Agent:_____ Date_____

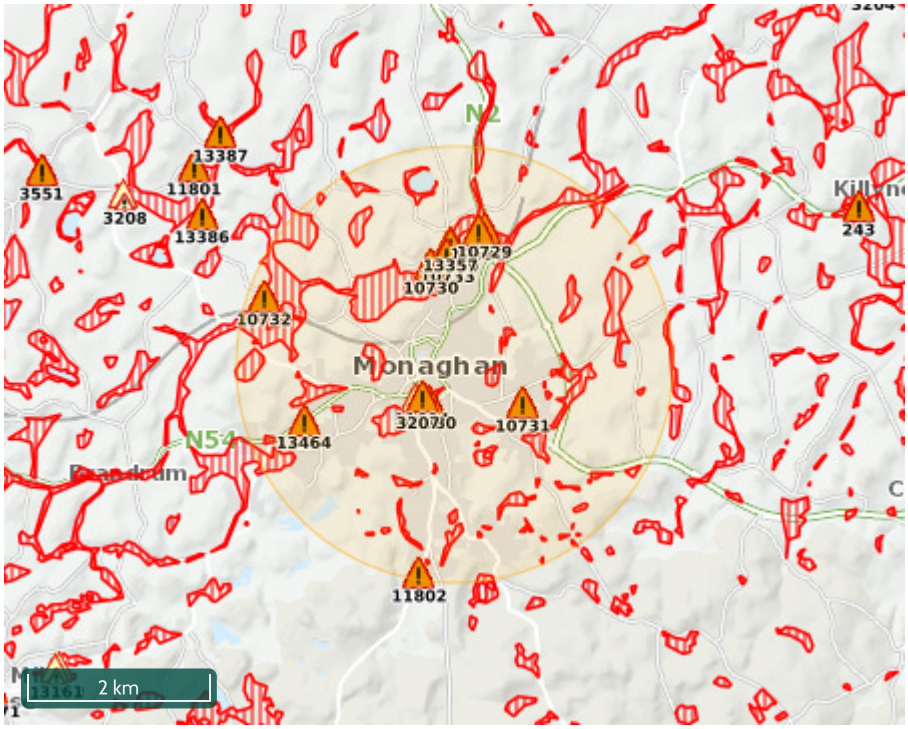
Appendix F – Flood Map

Past Flood Event Local Area Summary Report

Report Produced: **1/9/2023 9:33**

This Past Flood Event Summary Report summarises all past flood events within 2.5 kilometres of the map centre.

This report has been downloaded from www.floodinfo.ie (the "**Website**"). The users should take account of the restrictions and limitations relating to the content and use of the Website that are explained in the Terms and Conditions. It is a condition of use of the Website that you agree to be bound by the disclaimer and other terms and conditions set out on the Website and to the privacy policy on the Website.



Map Legend

- Single Flood Event
- Recurring Flood Event
- Past Flood Event Extents
- Drainage Districts Benefited Lands*
- Land Commission Benefited Lands*
- Arterial Drainage Schemes Benefited Lands*

* Important: These maps do not indicate flood hazard or flood extent. Their purpose and scope is explained on Floodinfo.ie

13 Results

	Name (Flood_ID)	Start Date	Event Location
1.	Monaghan Town Cootehill Rd Monaghan 24th Oct 2011 (ID-11802)	23/10/2011	Approximate Point
	Additional Information: Reports (1) Press Archive (0)		
2.	Monaghan Recurring (ID-3207)	n/a	Approximate Point
	Additional Information: Reports (1) Press Archive (2)		
3.	Flooding at Ballyalbany on 05/12/2015 (ID-13357)	05/12/2015	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		
4.	Flooding at Coolshannagh on 05/12/2015 (ID-13369)	05/12/2015	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		
5.	Flooding at Monaghan on 05/12/2015 (ID-13380)	05/12/2015	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		
6.	Flooding at Monaghan on 28/12/2015 (ID-13464)	28/12/2015	Approximate Point
	Additional Information: Reports (0) Press Archive (0)		

	Name (Flood_ID)	Start Date	Event Location
7.	Monaghan C115 Ballyalbony 20th Nov 2009 (ID-10730) **Additional Information:** Reports (1) Press Archive (0)	19/11/2009	Approximate Point
8.	Shambles Monaghan Town 20th Nov 2009 (ID-10731) **Additional Information:** Reports (1) Press Archive (0)	19/11/2009	Approximate Point
9.	Monaghan Crover 20th Nov 2009 (ID-10732) **Additional Information:** Reports (1) Press Archive (0)	19/11/2009	Approximate Point
10.	Monaghan C115 Coolshannagh 20th Nov 2009 (ID-10733) **Additional Information:** Reports (1) Press Archive (0)	19/11/2009	Approximate Point
11.	Monaghan C115 Creamery 20th Nov 2009 (ID-10729) **Additional Information:** Reports (1) Press Archive (0)	19/11/2009	Approximate Point
12.	Monaghan Blackwater Monaghan Town Creamery 24th October 2011 (ID-11691) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Approximate Point
13.	Shambles River Monaghan Town 24th October 2011 (ID-11694) **Additional Information:** Reports (1) Press Archive (0)	23/10/2011	Approximate Point