

TEST REPORT

Determination of Particle Size Distribution

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

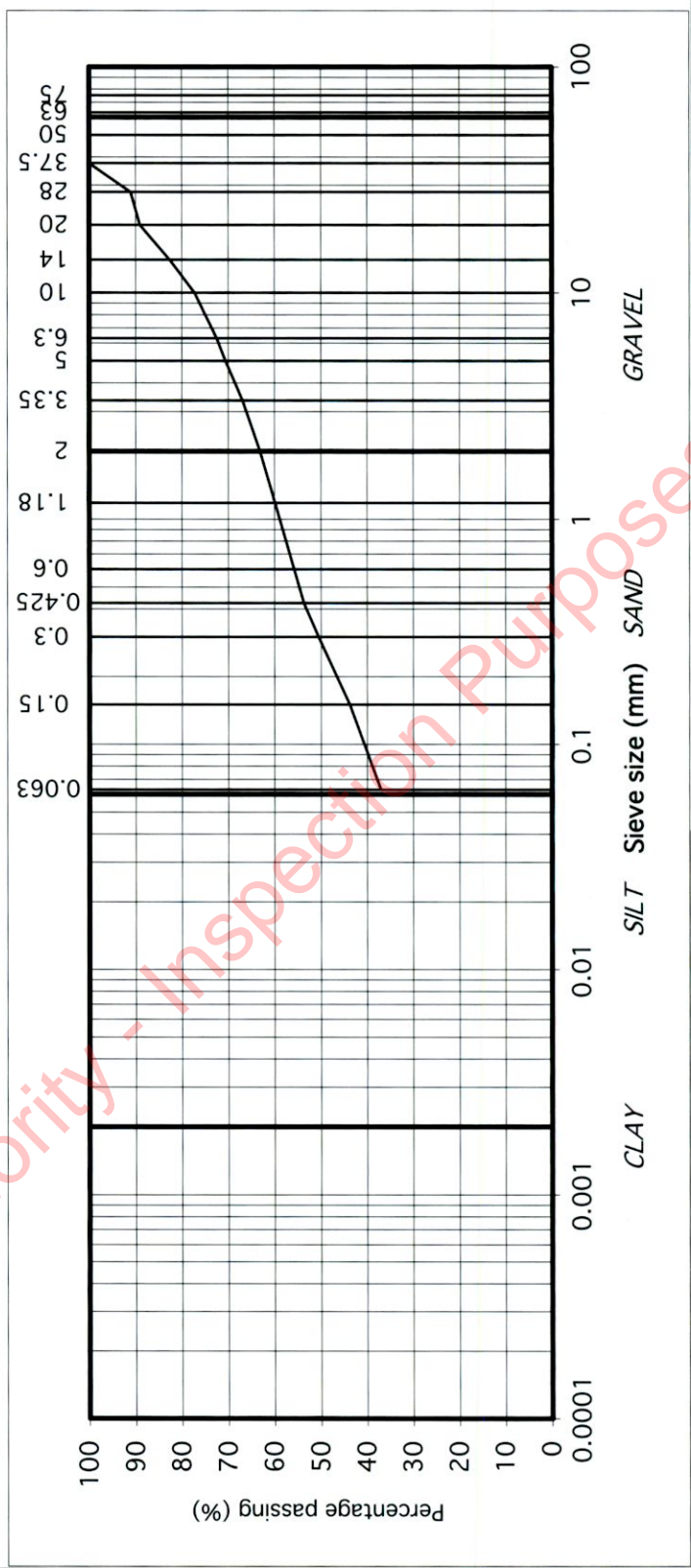


Contract No.	24083	Report No.	R135336
Contract Name:	Tesco, Cavan		
BH/TP*:	BH01	Lab. Sample No.	A22/3553
Sample No.*	AA172991	Customer:	Tesco Irl./ Pinnacle
Sample Type:	B	Date Testing started	20/06/2022
Depth* (m)	1.00	Description:	Grey/brown slightly sandy, gravelly, CLAY

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Remarks

Note: \*\*Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2016.



particle size	% passing
75	100
63	100
50	100
37.5	100
28	91
20	89
14	83
10	77
6.3	72
5	71
3.35	67
2	63
1.18	60
0.6	56
0.425	54
0.3	50
0.15	44
0.063	37

Approved by: *[Signature]* Date: 06/07/22 Page no: 1 of 1

IGSL Ltd Materials Laboratory

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)

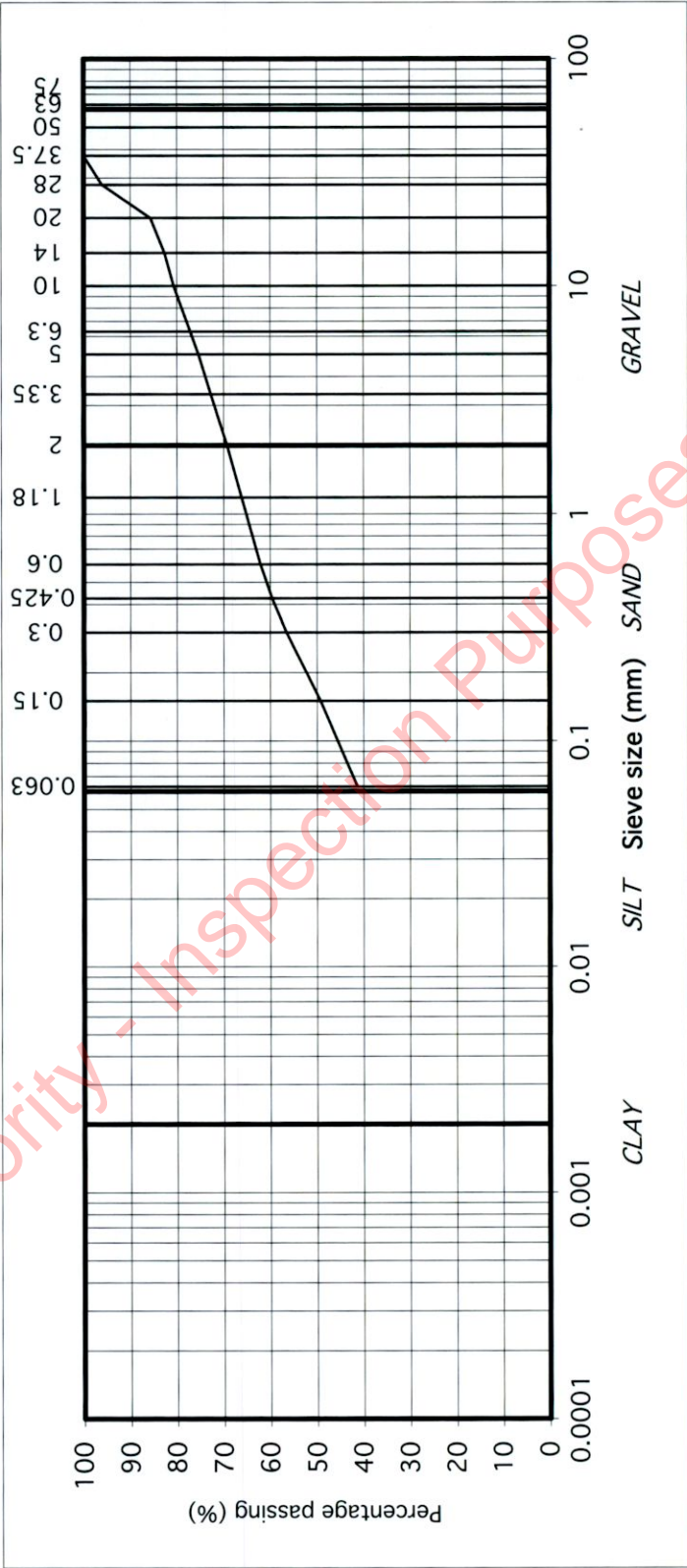


Contract No.	24083	Report No.	R135337
Contract Name :	Tesco, Cavan		
BH/TP* :	BH03		
Sample No.*	AA172982	Lab. Sample No.	A22/3555
Sample Type:	B		
Depth* (m)	2.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Brown slightly sandy, slightly gravelly, CLAY		

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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### Remarks

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particle size	% passing
75	100
63	100
50	100
37.5	100
28	96
20	86
14	83
10	81
6.3	77
5	75
3.35	73
2	69
1.18	66
0.6	62
0.425	60
0.3	57
0.15	49
0.063	41

**IGSL Ltd Materials Laboratory**

Approved by: *J Barrett* Date: 06/07/22 Page no: 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)

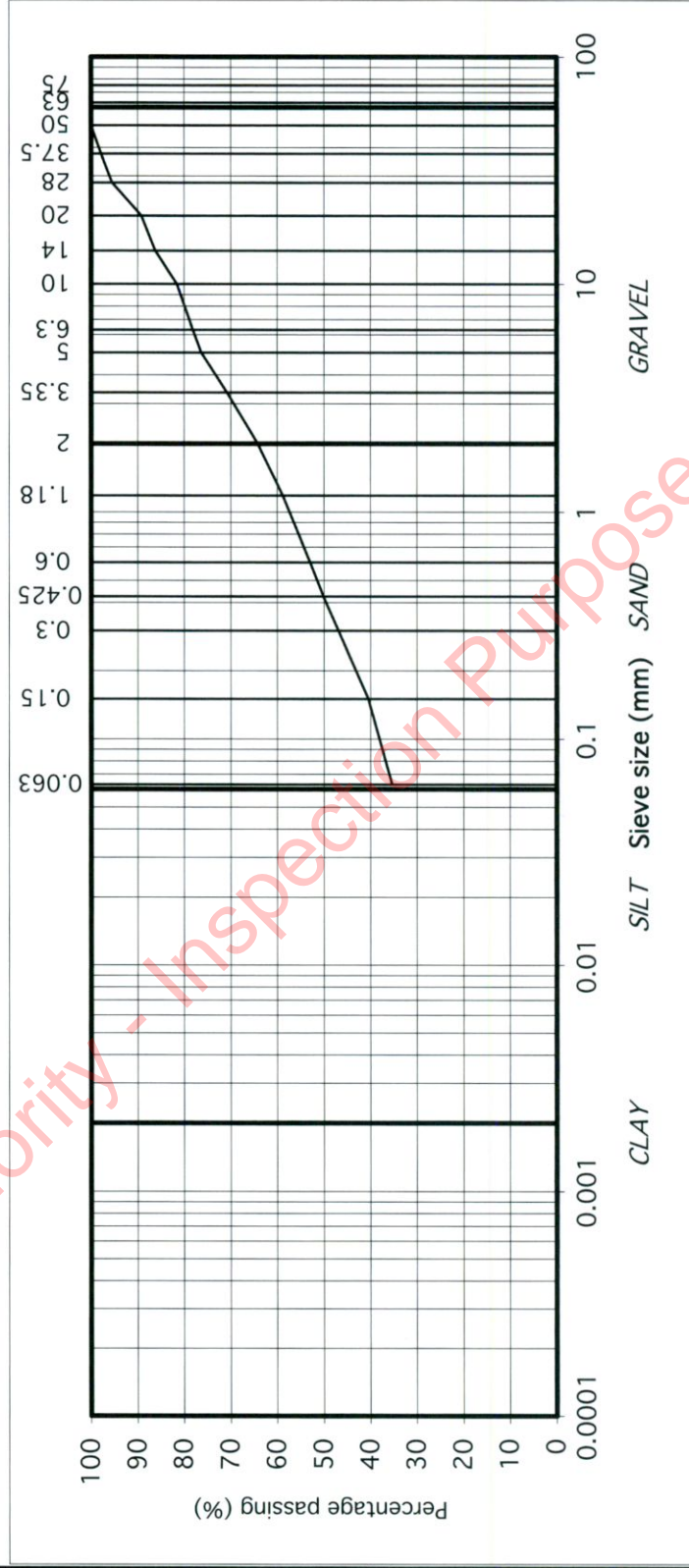


Contract No.	24083	Report No.	R135338
Contract Name:	Tesco, Cavan		
BH/TP*:	BH03		
Sample No.*	AA172984	Lab. Sample No.	A22/3556
Sample Type:	B		
Depth* (m)	4.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Brown slightly sandy, gravelly, CLAY		

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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### Remarks

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



particle size	% passing
75	100
63	100
50	100
37.5	98
28	96
20	89
14	86
10	82
6.3	78
5	76
3.35	71
2	64
1.18	59
0.6	53
0.425	50
0.3	47
0.15	40
0.063	35

IGSL Ltd Materials Laboratory	
Approved by:	Date: 06/07/22
Page no: 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)



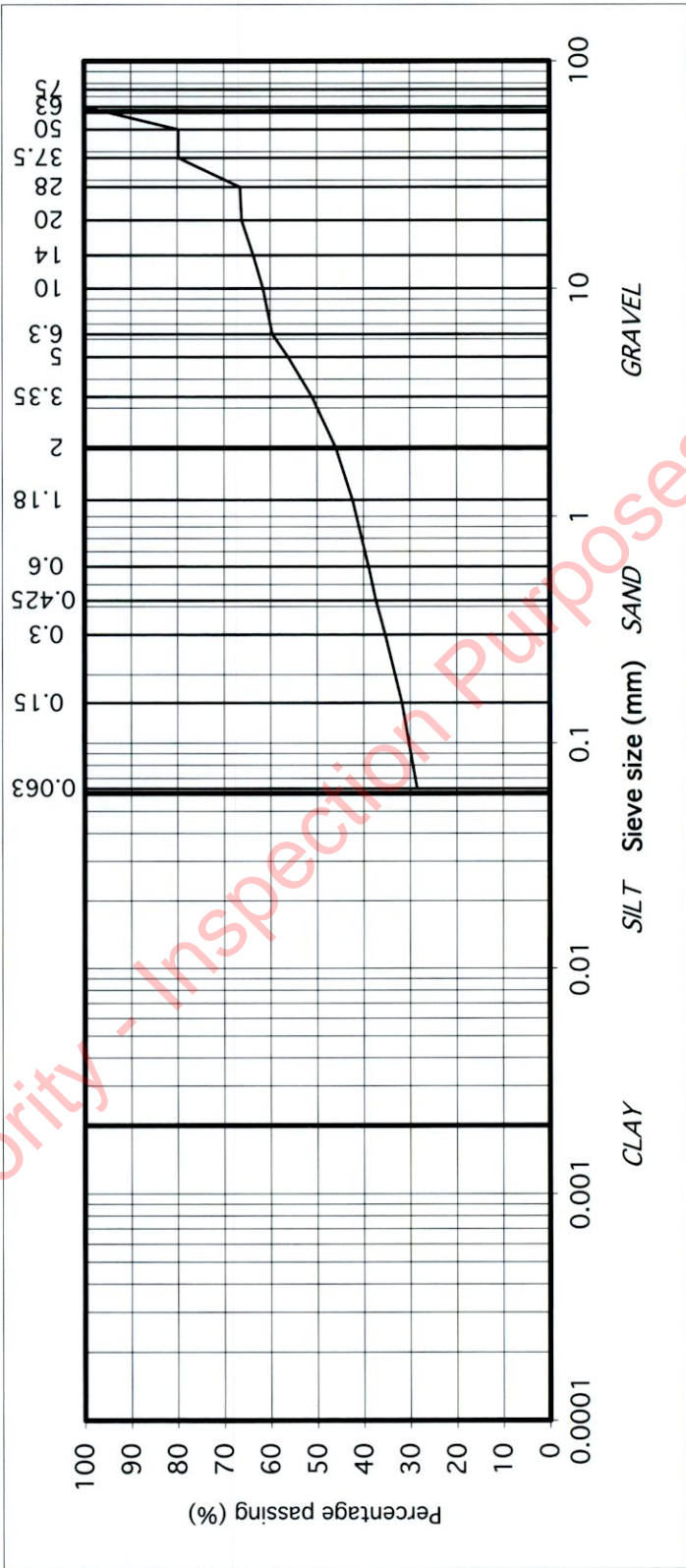
Contract No.	24083	Report No.	R135339
Contract Name :	Tesco, Cavan		
BH/TP* :	BH05		
Sample No.*	AA177951	Lab. Sample No.	A22/3557
Sample Type:	B		
Depth* (m)	1.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Grey/brown slightly sandy, gravelly, CLAY		

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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### Remarks

Note: \*\*Clause 9.2 and Clause 9.5 of BS1377:Part 2:1990 have been superseded by ISO17892-4:2. Sample size did not meet the requirements of BS1377

particle size	% passing	
75	100	COBBLES
63	100	
50	80	
37.5	80	
28	66	
20	66	
14	64	GRAVEL
10	62	
6.3	60	
5	56	
3.35	51	
2	46	
1.18	42	
0.6	39	
0.425	37	SAND
0.3	35	
0.15	32	
0.063	29	SILT/CLAY



Approved by: *H Byrne* Date: 06/07/22 Page no: 1 of 1

IGSL Ltd Materials Laboratory

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)

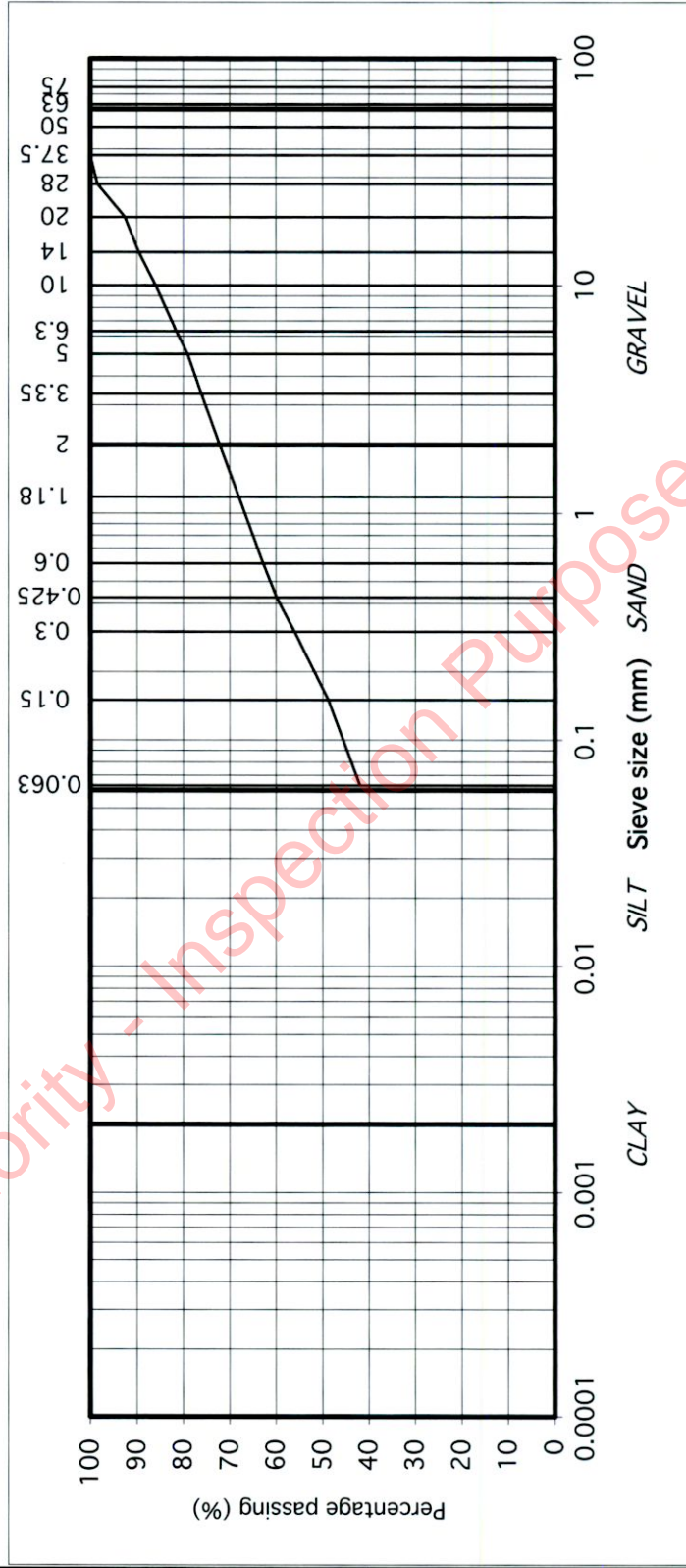


Contract No.	24083	Report No.	R135340
Contract Name :	Tesco, Cavan		
BH/TP* :	BH05		
Sample No.*	AA177963	Lab. Sample No.	A22/3558
Sample Type:	B		
Depth* (m)	3.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Brown slightly sandy, slightly gravelly, CLAY		

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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### Remarks

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



particle size	% passing
75	100
63	100
50	100
37.5	100
28	98
20	93
14	90
10	86
6.3	82
5	79
3.35	76
2	72
1.18	68
0.6	63
0.425	60
0.3	56
0.15	49
0.063	42

<b>IGSL Ltd Materials Laboratory</b>	
Approved by:	Date:
<i>H Byrne</i>	06/07/22
Page no:	1 of 1

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

# TEST REPORT

## Determination of Particle Size Distribution

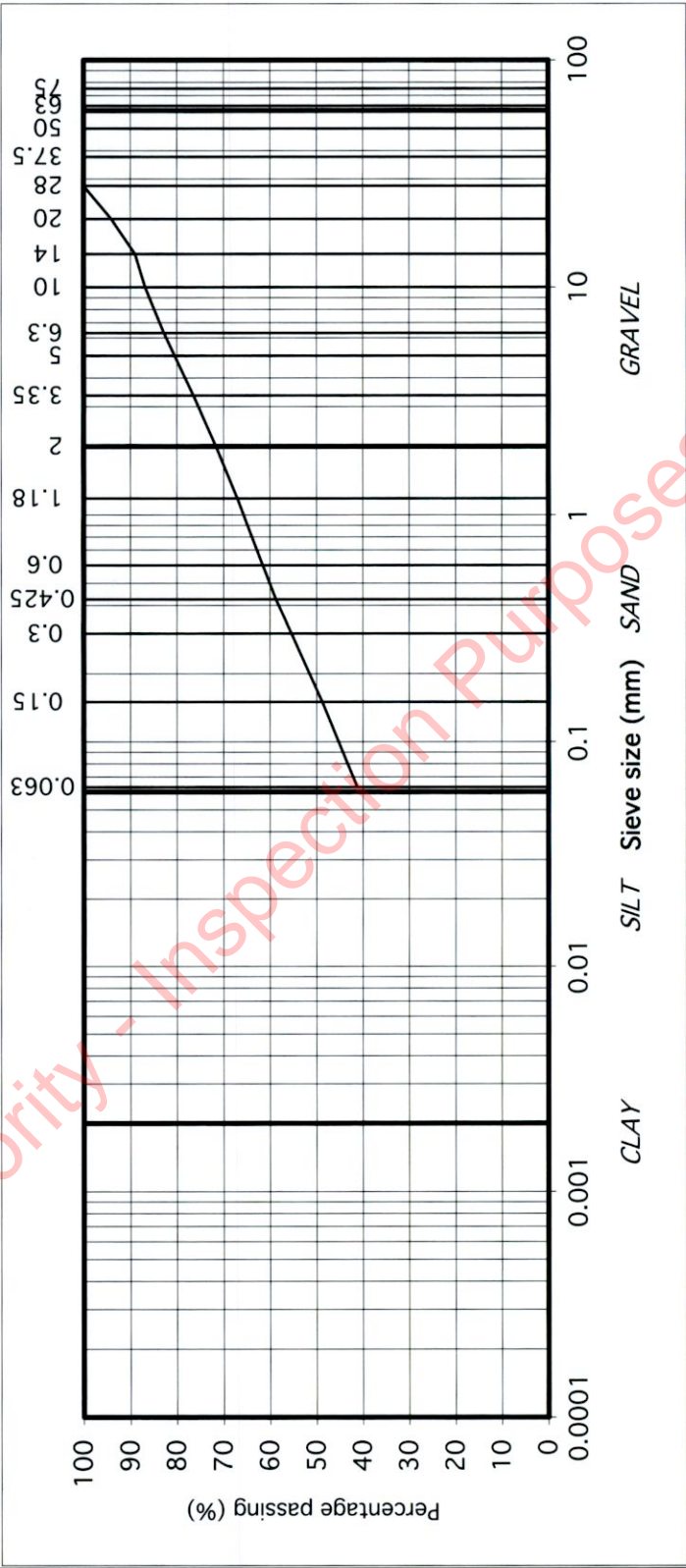
Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5\*\*  
(note: Sedimentation stage not accredited)



Contract No.	24083	Report No.	R135341
Contract Name:	Tesco, Cavan		
BH/TP*:	BH06		
Sample No.*	AA177961	Lab. Sample No.	A22/3559
Sample Type:	B		
Depth* (m)	1.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Grey/brown slightly sandy, slightly gravelly, CLAY		

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



particle size	% passing
75	100
63	100
50	100
37.5	100
28	100
20	94
14	89
10	87
6.3	83
5	81
3.35	76
2	72
1.18	67
0.6	62
0.425	59
0.3	55
0.15	49
0.063	41

IGSL Ltd Materials Laboratory

Approved by: *[Signature]* Date: 06/07/22 Page no: 1 of 1

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



TE REPORT

Determination of Particle Size Distribution

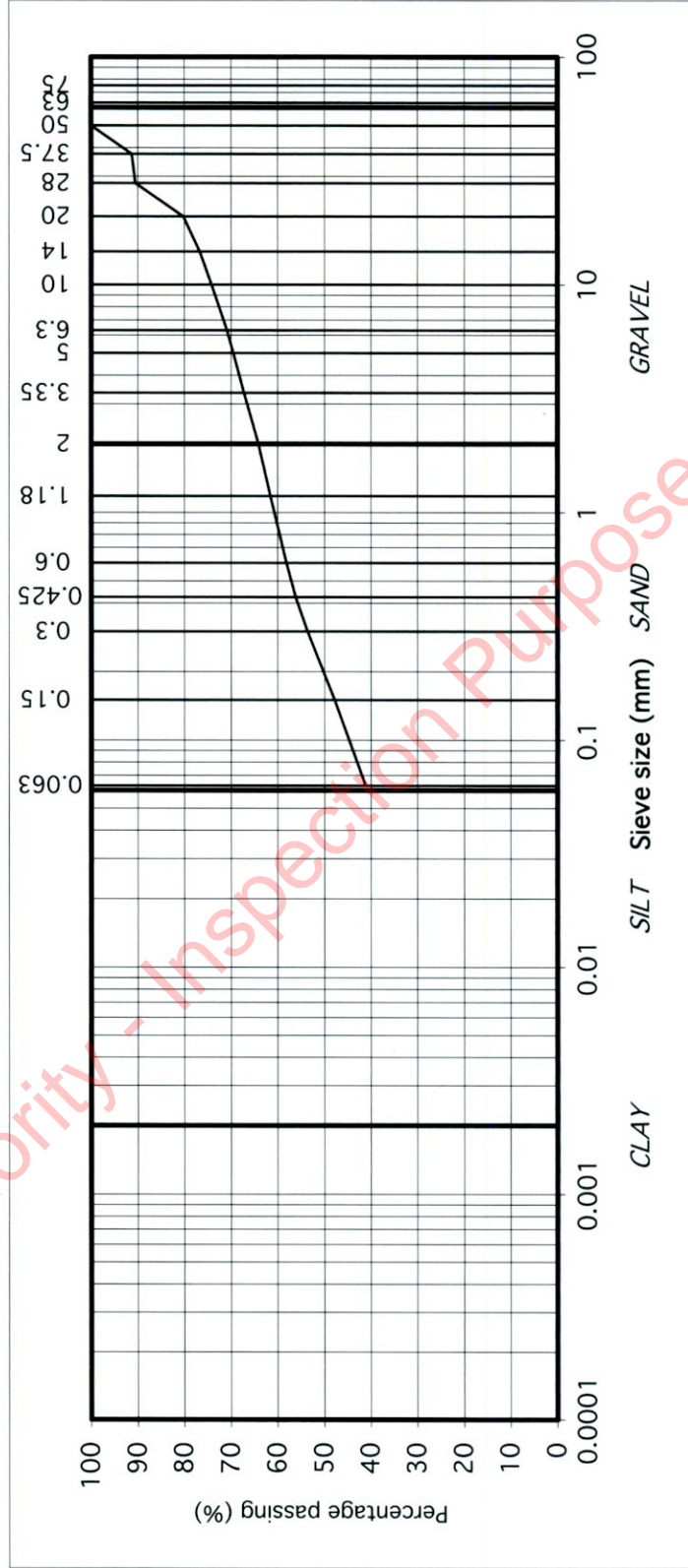
Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5\*\*  
(note: Sedimentation stage not accredited)



Contract No.	24083	Report No.	R135342
Contract Name :	Tesco, Cavan		
BH/TP* :	BH06		
Sample No.*	AA177963	Lab. Sample No.	A22/3560
Sample Type:	B		
Depth* (m)	3.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Brown slightly sandy, gravelly, CLAY		

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



particle size	% passing
75	100
63	100
50	100
37.5	91
28	90
20	80
14	77
10	74
6.3	71
5	69
3.35	67
2	64
1.18	62
0.6	58
0.425	56
0.3	54
0.15	48
0.063	41

<b>IGSL Ltd Materials Laboratory</b>	
Approved by:	Date: 06/07/22
Page no:	1 of 1

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

# TEST REPORT

## Determination of Particle Size Distribution

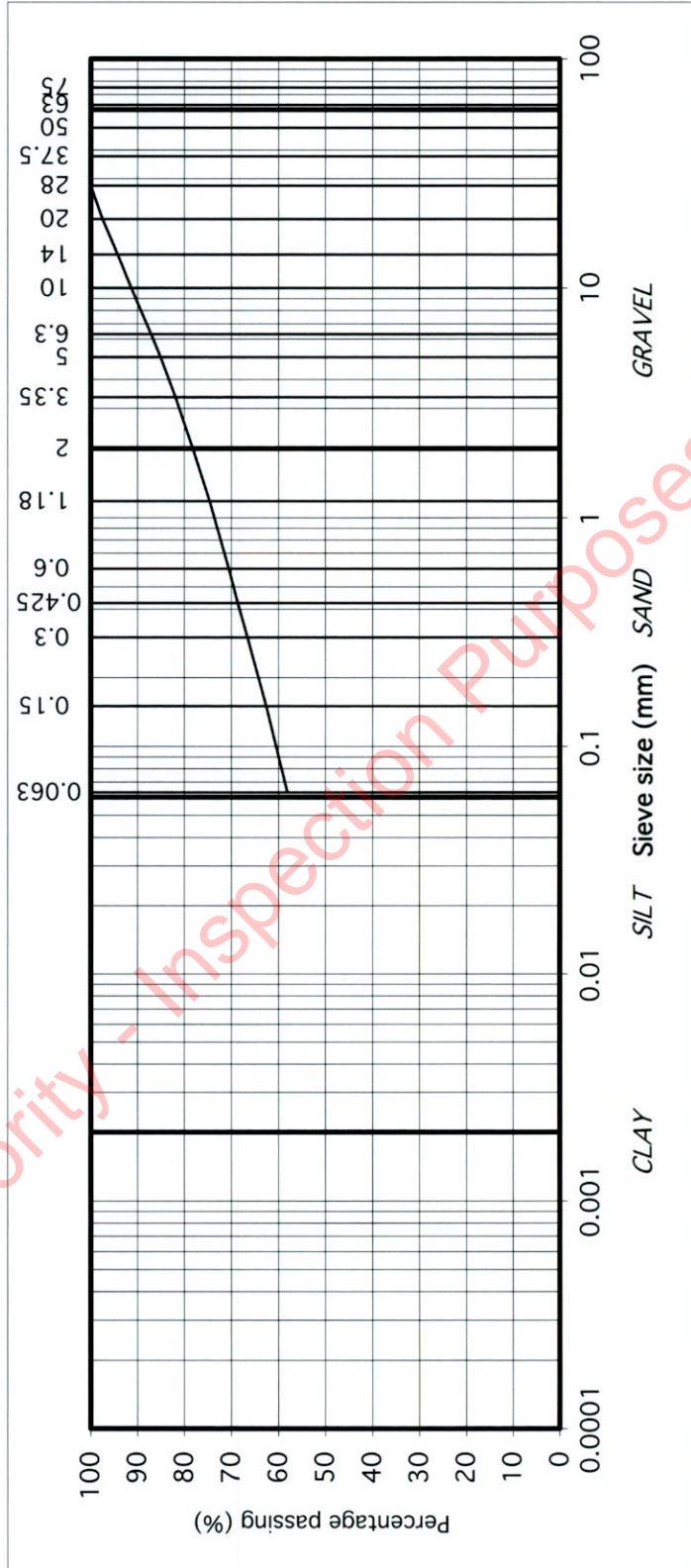
Tested in accordance with: BS1377:Part2:1990, clause 9.2 & 9.5\*\*  
(note: Sedimentation stage not accredited)



Contract No.	24083	Report No.	R135343
Contract Name :	Tesco, Cavan		
BH/TP* :	BH07		
Sample No.*	AA177987	Lab. Sample No.	A22/3562
Sample Type:	B		
Depth* (m)	1.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Grey/brown slightly sandy, slightly gravelly, CLAY		

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



particle size	% passing
75	100
63	100
50	100
37.5	100
28	100
20	97
14	94
10	91
6.3	87
5	85
3.35	82
2	78
1.18	75
0.6	71
0.425	69
0.3	67
0.15	63
0.063	58

IGSL Ltd Materials Laboratory

Approved by: *J Barrett* Date: 06/07/22 Page no: 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)

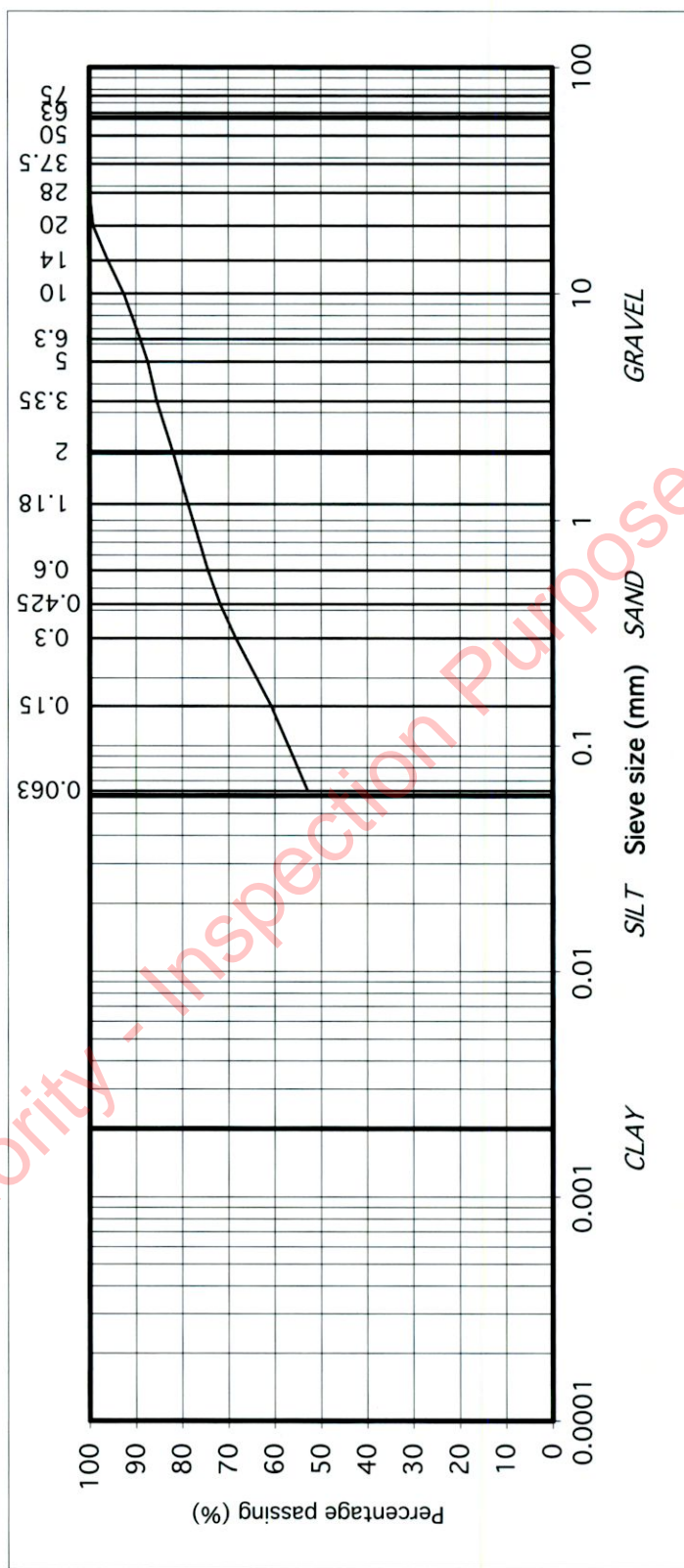


Contract No.	24083	Report No.	R136161
Contract Name :	Tesco, Cavan		
BH/TP* :	BH07		
Sample No.*	AA177990	Lab. Sample No.	A22/3563
Sample Type:	B		
Depth* (m)	3.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	28/06/2022
Description:	Brown slightly sandy, slightly gravelly, CLAY		

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particle size	% passing
75	100
63	100
50	100
37.5	100
28	100
20	99
14	96
10	93
6.3	89
5	87
3.35	85
2	82
1.18	79
0.6	74
0.425	72
0.3	68
0.15	61
0.063	53

Approved by: *H Byrne* Date: 06/07/22 Page no: 1 of 1

IGSL Ltd Materials Laboratory

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)

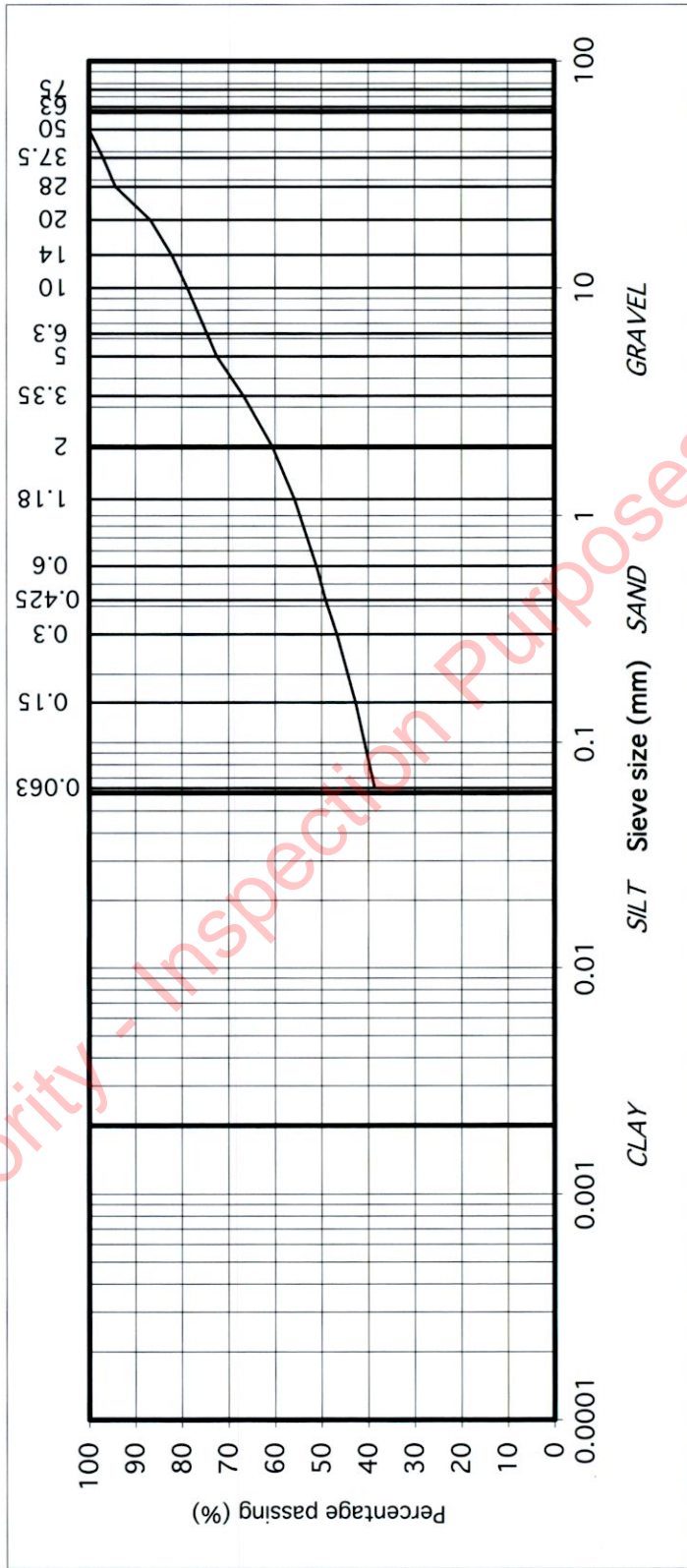


Contract No.	24083	Report No.	R135345
Contract Name :	Tesco, Cavan		
BH/TP* :	BH09		
Sample No.*	AA177971	Lab. Sample No.	A22/3564
Sample Type:	B		
Depth* (m)	2.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Brown slightly sandy, gravelly, CLAY		

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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### Remarks

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



particle size	% passing
75	100
63	100
50	100
37.5	97
28	94
20	87
14	82
10	79
6.3	75
5	72
3.35	67
2	60
1.18	56
0.6	51
0.425	49
0.3	47
0.15	43
0.063	39

IGSL Ltd Materials Laboratory	
Approved by:	Date: 06/07/22
Page no:	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)

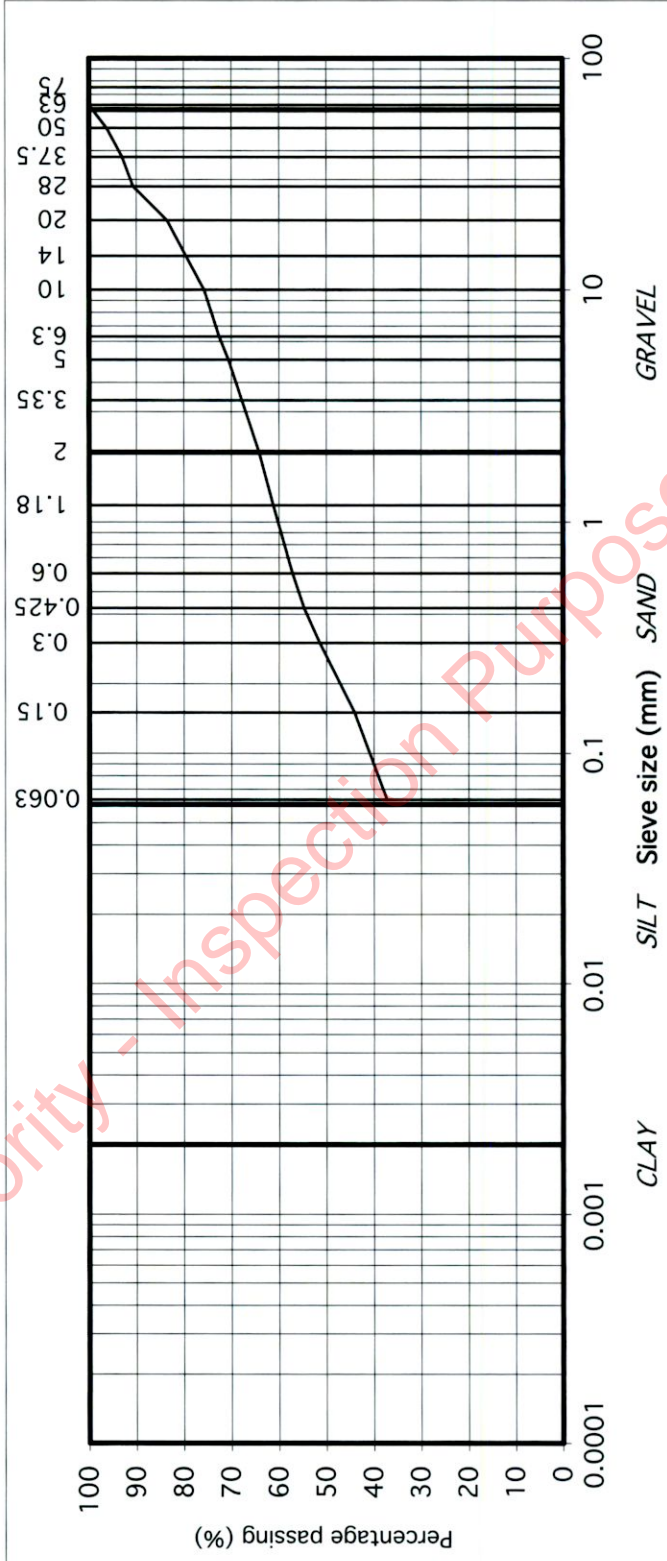


Contract No.	24083	Report No.	R135346
Contract Name:	Tesco, Cavan		
BH/TP*:	BH09		
Sample No.*	AA177975	Lab. Sample No.	A22/3565
Sample Type:	B		
Depth* (m)	5.00	Customer:	Tesco Irl./ Pinnacle
Date Received	20/06/2022	Date Testing started	20/06/2022
Description:	Brown slightly sandy, gravelly, CLAY		

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

particle size	% passing	Soil Classification
75	100	COBBLES
63	100	
50	96	GRAVEL
37.5	93	
28	91	GRAVEL
20	84	
14	80	GRAVEL
10	76	
6.3	73	GRAVEL
5	71	
3.35	68	GRAVEL
2	64	
1.18	61	GRAVEL
0.6	57	
0.425	55	SAND
0.3	51	
0.15	44	SAND
0.063	37	
		SILT/CLAY



IGSL Ltd Materials Laboratory	Approved by: <i>H Byrne</i>	Date: 06/07/22	Page no: 1 of 1
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Persons authorised to approve report: J Barrett (Quality Manager) H Byrne (Laboratory Manager)

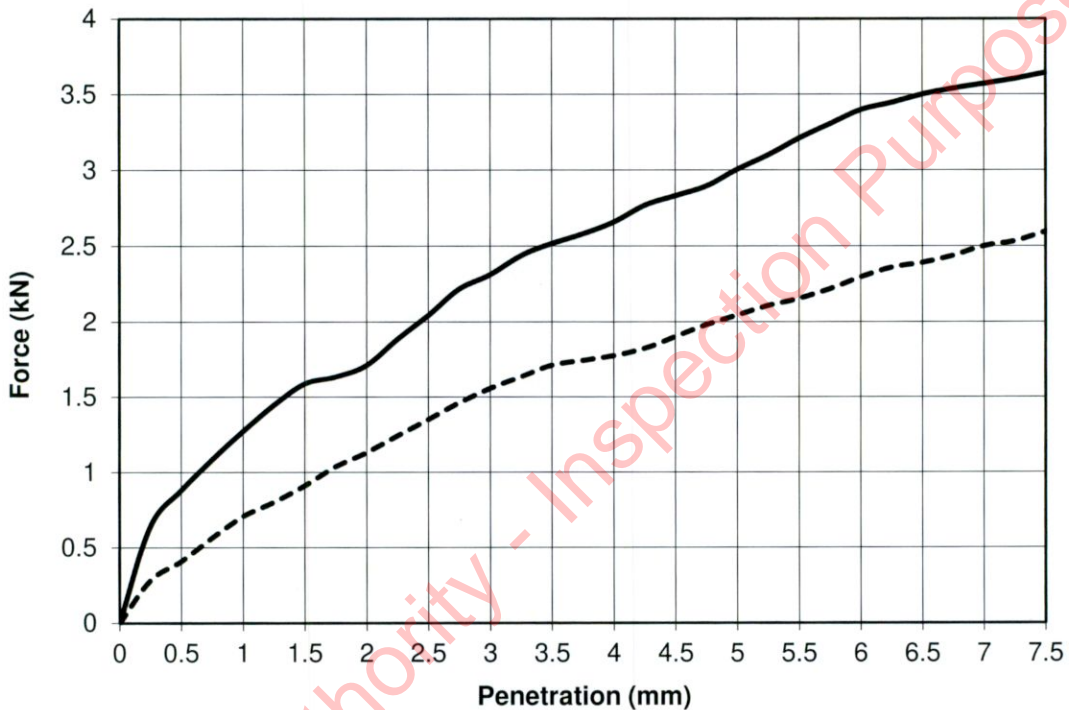
IGSL Ltd  
 Materials Laboratory  
 Unit J5,M7 Business Park  
 Naas Co.Kildare  
 045 899324

**TEST REPORT**  
 Determination of California Bearing  
 Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

Report No. R135295 Contract Tesco , Cavan  
 Contract No. 24083 Customer Tesco Irl / Pinnacle  
 Date received 20/06/22 Date Tested 21/06/22  
 BH/TP No.\* TP05 Sample No.\* AA178465 Type: B  
 Depth\* (m) 1.80 Lab sample No. A22/3549



Key: ——— Top      - - - - - Base

Description: Brown slightly sandy, slightly gravelly, SILT/CLAY			
Initial Condition:		Unsoaked	
Moisture Content (%):	10	Bulk Density (Mg/m <sup>3</sup> ):	2.30
Surcharge (kg):	4	Dry Density (Mg/m <sup>3</sup> ):	2.09
% Material >20mm:	3.2		
Method of compaction:		Static Compaction Method 2	

Test Result	Top	Base
<b>CBR %</b>	<b>15</b>	<b>10</b>
Moisture Content %	10	10

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

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\* denotes Customer supplied information

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Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory	Approved by	Date	Page No.
	<i>H Byrne</i>	06/07/22	1 of 1



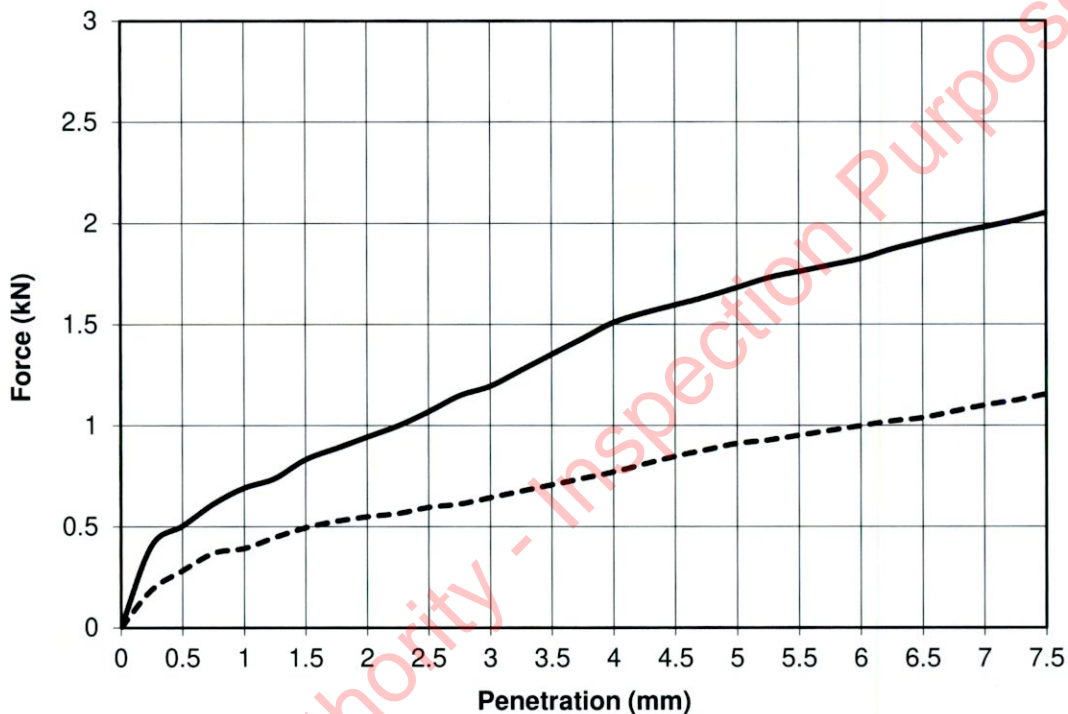
IGSL Ltd  
 Materials Laboratory  
 Unit J5,M7 Business Park  
 Naas Co.Kildare  
 045 899324

**TEST REPORT**  
 Determination of California Bearing  
 Ratio (CBR)



Tested in accordance with BS1377:Part 4:1990, clause 7

Report No. R135296 Contract Tesco , Cavan  
 Contract No. 24083 Customer Tesco Irl / Pinnacle  
 Date received 20/06/22 Date Tested 21/06/22  
 BH/TP No.\* TP07 Sample No.\* AA178460 Type: B  
 Depth\* (m) 1.30 Lab sample No. A22/3560



Key: ————— Top      - - - - - Base

Description: Brown slightly sandy, gravelly, CLAY			
Initial Condition:		Unsoaked	
Moisture Content (%):	8	Bulk Density (Mg/m <sup>3</sup> ):	4.57
Surcharge (kg):	4	Dry Density (Mg/m <sup>3</sup> ):	2.30
% Material >20mm:	6.3		
Method of compaction:		Static Compaction Method 2	

Test Result	Top	Base
CBR %	8.4	4.6
Moisture Content %	11	11

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

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Persons authorized to approve reports

J Barrett (Quality Manager)

H Byrne (Laboratory Manager)

IGSL Ltd Materials Laboratory

Approved by

*H Byrne*

Date

06/07/22

Page No.

1 of 1

Cavan Planning Authority - Inspection Purposes Only!



Appendix 6

Environmental Laboratory Test Records

Cavan Planning Authority - Inspection Purposes Only!

Cavan Planning Authority - Inspection Purposes Only!





# Final Report

**Report No.:** 22-23116-1  
**Initial Date of Issue:** 29-Jun-2022  
**Client:** IGSL  
**Client Address:** M7 Business Park  
Naas  
County Kildare  
Ireland  
**Contact(s):** Paul Quigley  
**Project:** 24083 Tesco, Cavan  
**Quotation No.:** Q20-21693  
**Date Received:** 21-Jun-2022  
**Order No.:**  
**Date Instructed:** 21-Jun-2022  
**No. of Samples:** 9  
**Turnaround (Wkdays):** 7  
**Results Due:** 29-Jun-2022  
**Date Approved:** 29-Jun-2022  
**Approved By:**

**Details:** Stuart Henderson, Technical Manager

Cavan Planning Authority - Inspection Purposes Only!

## Results - Leachate

Project: 24083 Tesco, Cavan

Client: IGSL	Chemtest Job No.:		22-23116		22-23116		22-23116	
	Quotation No.:	Chemtest Sample ID.:	1452431	1452432	1452433	1452438	1452438	1452438
Order No.:	Client Sample Ref.:		AA178464		AA178466		AA177979	
	Sample Location:		TP 5		TP 5		TP 6	
	Sample Type:		SOIL		SOIL		SOIL	
	Top Depth (m):		0.60		2.60		0.90	
Determinand	Accred.	SOP	Type	Units	LOD			
pH	U	1010	10:1		N/A	8.2	8.3	8.2
Ammonium	U	1220	10:1	mg/l	0.050	0.24	0.15	0.20
Ammonium	N	1220	10:1	mg/kg	0.10	2.6	1.7	2.1
Boron (Dissolved)	U	1455	10:1	mg/kg	0.01	< 0.01	< 0.01	< 0.01
Benzofluranthene	N	1800	10:1	µg/l	0.010	< 0.010	< 0.010	< 0.010

Cavan Planning Authority - Inspection Purposes Only!



# Results - Soil

Project: 24083 Tesco, Cavan

Client: IGSL	Chemtest Job No.:		Chemtest Sample ID.:		22-23116		22-23116		22-23116		22-23116		22-23116		22-23116		22-23116	
	Quotation No.:	Client Sample Ref.:	Sample Location:	Sample Type:	Top Depth (m):	Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD														
ACM Type	U	2192		N/A														
Asbestos Identification	U	2192		N/A														
Moisture	N	2030	%	0.020	8.4	11	8.7	8.0	10	No Asbestos Detected	10							
pH (2.5:1)	N	2010		4.0	[A] > 12.0	[A] 11.0	[A] 10.6	[A] 9.8										[A] 9.6
Boron (Hot Water Soluble)	U	2120	mg/kg	0.40	[A] < 0.40													[A] < 0.40
Magnesium (Water Soluble)	N	2120	g/l	0.010	[A] < 0.010	[A] < 0.010	[A] 0.012	[A] < 0.010										[A] < 0.010
Sulphate (2:1 Water Soluble) as SO4	U	2120	g/l	0.010	[A] 1.2	[A] 0.16	[A] 0.48	[A] 0.29										[A] 0.22
Total Sulphur	U	2175	%	0.010	[A] 0.53	[A] 0.36	[A] 0.57	[A] 0.61										[A] 0.86
Sulphur (Elemental)	U	2180	mg/kg	1.0	[A] 3.0	[A] < 1.0	[A] 1.2											[A] 1.3
Chloride (Water Soluble)	U	2220	g/l	0.010														[A] < 0.010
Nitrate (Water Soluble)	N	2220	g/l	0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010	[A] < 0.010										[A] < 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] 2.2	[A] 3.5	[A] 7.2											[A] 5.1
Ammonium (Water Soluble)	U	2220	g/l	0.01														< 0.01
Sulphate (Acid Soluble)	U	2430	%	0.010	[A] 0.044	[A] 0.14	[A] 0.032	[A] 0.048										[A] 0.066
Arsenic	U	2455	mg/kg	0.5	4.7	4.2	3.5											3.8
Barium	U	2455	mg/kg	0	81	92	59											54
Cadmium	U	2455	mg/kg	0.10	0.79	2.1	0.41											0.44
Chromium	U	2455	mg/kg	0.5	21	14	15											16
Molybdenum	U	2455	mg/kg	0.5	0.8	0.8	< 0.5											0.5
Antimony	N	2455	mg/kg	2.0	3.8	10	< 2.0											< 2.0
Copper	U	2455	mg/kg	0.50	20	19	13											12
Mercury	U	2455	mg/kg	0.05	< 0.05	0.05	< 0.05											< 0.05
Nickel	U	2455	mg/kg	0.50	29	18	20											23
Lead	U	2455	mg/kg	0.50	18	32	11											11
Selenium	U	2455	mg/kg	0.25	0.68	0.57	0.50											0.63
Zinc	U	2455	mg/kg	0.50	81	160	51											51
Chromium (Trivalent)	N	2490	mg/kg	1.0	21	14	15											16
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50											< 0.50
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	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0											[A] < 1.0
Aliphatic TPH >C10-C12	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0											[A] < 1.0
Aliphatic TPH >C12-C16	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0											[A] < 1.0
Aliphatic TPH >C16-C21	U	2680	mg/kg	1.0	[A] < 1.0	[A] < 1.0	[A] < 1.0											[A] < 1.0
Aliphatic TPH >C21-C35	U	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







## Results - Soil

Project: 24083 Tesco, Cavan

Client: IGSL	Chemtest Job No.:		22-23116		22-23116		22-23116		22-23116		22-23116		22-23116		22-23116		22-23116		
	Quotation No.: Q20-21693	Chemtest Sample ID.:	1452431	1452432	1452433	1452434	1452435	1452436	1452437	1452438	1452439	1452436	1452437	1452438	1452439	1452436	1452437	1452438	1452439
Order No.:	Client Sample Ref.:	AA178464	AA178466	AA178462	AA172991	AA177951	AA177961	AA177987	AA177979	AA177971	AA177971	AA177961	AA177987	AA177979	AA177971	AA177961	AA177987	AA177979	AA177971
Sample Location:		TP 5	TP 5	TP 6	BH 1	BH 5	BH 6	BH 7	BH 8	BH 9	TP 5	TP 5	TP 6	BH 1	BH 5	BH 6	BH 7	BH 8	BH 9
Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Top Depth (m):		0.60	2.60	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00
Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	Accred.	SOP	Units	LOD															
PCB 153	N	2815	mg/kg	0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 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	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 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	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 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	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 0.0010	[A] < 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	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Project: 24083 Tesco, Cavan

22-23116

1452431

AA178464

Chemtest Job No:

Chemtest Sample ID:

Sample Ref:

Sample ID:

Sample Location:

Top Depth(m):

Bottom Depth(m):

Sampling Date:

SOP

Accred.

Units

Total Organic Carbon

Loss On Ignition

Total BTEX

Total PCBs (7 congeners)

TPH Total WAC

Total Of 17 PAH's

pH

Acid Neutralisation Capacity

Eluate Analysis

Arsenic

Barium

Cadmium

Chromium

Copper

Mercury

Molybdenum

Nickel

Lead

Antimony

Selenium

Zinc

Chloride

Fluoride

Sulphate

Total Dissolved Solids

Phenol Index

Dissolved Organic Carbon

2625

2610

2760

2815

2670

2800

2010

2015

1455

1455

1455

1455

1455

1455

1455

1455

1455

1455

1455

1455

1455

1455

1455

1220

1220

1220

1020

1920

1610

U

U

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N

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U

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U

U

N

U

U

%

%

mg/kg

mg/kg

mg/kg

mg/kg

mol/kg

mg/l

0.0003

0.061

< 0.00011

< 0.0005

< 0.0005

< 0.00005

0.0060

< 0.0005

< 0.0005

0.0007

0.0033

< 0.003

3.5

0.14

51

120

< 0.030

9.5

[A] 0.46

2.1

[A] < 0.010

[A] < 0.0010

[A] < 10

[A] < 0.20

11.3

0.042

0.0026

0.61

< 0.00011

< 0.0005

< 0.0005

< 0.00005

0.060

< 0.0005

< 0.0005

0.0070

0.033

< 0.003

35

1.4

510

1200

< 0.30

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Project: 24083 Tesco, Cavan

22-23116

1452432

AA178466

Chemtest Job No:

Chemtest Sample ID:

Sample Ref:

Sample ID:

Sample Location:

Top Depth(m):

Bottom Depth(m):

Sampling Date:

TP 5

2.60

Determinand	SOP	Accred.	Units
Total Organic Carbon	2625	U	%
Loss On Ignition	2610	U	%
Total BTEX	2760	U	mg/kg
Total PCBs (7 congeners)	2815	N	mg/kg
TPH Total WAC	2670	U	mg/kg
Total Of 17 PAH's	2800	N	mg/kg
pH	2010	U	
Acid Neutralisation Capacity	2015	N	mol/kg

**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	Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Arsenic	0.0002	0.0021	0.5	2	25	
Barium	0.056	0.56	20	100	300	
Cadmium	< 0.00011	< 0.00011	0.04	1	5	
Chromium	< 0.0005	< 0.0005	0.5	10	70	
Copper	< 0.0005	< 0.0005	2	50	100	
Mercury	< 0.00005	< 0.00005	0.01	0.2	2	
Molybdenum	0.0031	0.031	0.5	10	30	
Nickel	< 0.0005	< 0.0005	0.4	10	40	
Lead	< 0.0005	< 0.0005	0.5	10	50	
Antimony	0.0007	0.0066	0.06	0.7	5	
Selenium	0.0023	0.023	0.1	0.5	7	
Zinc	< 0.003	< 0.003	4	50	200	
Chloride	1.3	13	800	15000	25000	
Fluoride	0.16	1.6	10	150	500	
Sulphate	46	460	1000	20000	50000	
Total Dissolved Solids	120	1200	4000	60000	100000	
Phenol Index	< 0.030	< 0.30	1	-	-	
Dissolved Organic Carbon	5.6	56	500	800	1000	

**Solid Information**

Dry mass of test portion/kg	0.090
Moisture (%)	5.7

**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.

Project: 24083 Tesco, Cavan

Chemtest Job No: 22-23116  
 Chemtest Sample ID: 1452433  
 Sample Ref: AA178462

Sample ID: TP 6  
 Sample Location: 0.90  
 Top Depth(m):  
 Bottom Depth(m):

Sampling Date:

Determinand	SOP	Accred.	Units	Landfill Waste Acceptance Criteria Limits			
				Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill	
Total Organic Carbon	2625	U	%	[A] 0.44	3	5	6
Loss On Ignition	2610	U	%	2.9	--	--	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		11.2	--	>6	--
Acid Neutralisation Capacity	2015	N	mol/kg	0.053	--	To evaluate	To evaluate
<b>Eluate Analysis</b>			<b>10:1 Eluate mg/l</b>	<b>10:1 Eluate mg/kg</b>	<b>Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg</b>		
Arsenic	1455	U	< 0.0002	< 0.0002	0.5	2	25
Barium	1455	U	0.046	0.46	20	100	300
Cadmium	1455	U	< 0.00011	< 0.00011	0.04	1	5
Chromium	1455	U	< 0.0005	< 0.0005	0.5	10	70
Copper	1455	U	< 0.0005	< 0.0005	2	50	100
Mercury	1455	U	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	1455	U	0.0039	0.039	0.5	10	30
Nickel	1455	U	< 0.0005	< 0.0005	0.4	10	40
Lead	1455	U	< 0.0005	< 0.0005	0.5	10	50
Antimony	1455	U	0.0005	0.0054	0.06	0.7	5
Selenium	1455	U	0.0013	0.013	0.1	0.5	7
Zinc	1455	U	< 0.003	< 0.003	4	50	200
Chloride	1220	U	2.8	28	800	15000	25000
Fluoride	1220	U	0.27	2.7	10	150	500
Sulphate	1220	U	50	500	1000	20000	50000
Total Dissolved Solids	1020	N	130	1300	4000	60000	100000
Phenol Index	1920	U	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	1610	U	4.7	< 50	500	800	1000

Solid Information	
Dry mass of test portion/kg	0.090
Moisture (%)	9.4

**Waste Acceptance Criteria**

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



Project: 24083 Tesco, Cavan

22-23116

Chemtest Job No:

1452438

Sample Ref:

AA177979

Sample ID:

BH 8

Sample Location:

1.00

Top Depth(m):

Bottom Depth(m):

Sampling Date:

Determinand	SOP	Accred.	Units
Total Organic Carbon	2625	U	%
Loss On Ignition	2610	U	%
Total BTEX	2760	U	mg/kg
Total PCBs (7 congeners)	2815	N	mg/kg
TPH Total WAC	2670	U	mg/kg
Total Of 17 PAH's	2800	N	mg/kg
pH	2010	U	
Acid Neutralisation Capacity	2015	N	mol/kg

	10:1 Eluate mg/l	10:1 Eluate mg/kg	Landfill Waste Acceptance Criteria Limits		
			Inert Waste Landfill	Stable, Non-reactive hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
	< 0.0002	< 0.0002	3	5	6
	0.038	0.38	--	--	10
	< 0.00011	< 0.00011	6	--	--
	< 0.0005	< 0.0005	1	--	--
	< 0.0005	< 0.0005	500	--	--
	< 0.0005	< 0.0005	100	--	--
	11.2	11.2	--	>6	--
	0.039	0.039	--	To evaluate	To evaluate
<b>Eluate Analysis</b>					
			<b>Limit values for compliance leaching test using BS EN 12457 at L/S 10 l/kg</b>		
Arsenic	< 0.0002	< 0.0002	0.5	2	25
Barium	0.038	0.38	20	100	300
Cadmium	< 0.00011	< 0.00011	0.04	1	5
Chromium	< 0.0005	< 0.0005	0.5	10	70
Copper	< 0.0005	< 0.0005	2	50	100
Mercury	< 0.00005	< 0.00005	0.01	0.2	2
Molybdenum	0.0032	0.032	0.5	10	30
Nickel	< 0.0005	< 0.0005	0.4	10	40
Lead	< 0.0005	< 0.0005	0.5	10	50
Antimony	0.0006	0.0061	0.06	0.7	5
Selenium	0.0010	0.0096	0.1	0.5	7
Zinc	< 0.003	< 0.003	4	50	200
Chloride	1.7	17	800	15000	25000
Fluoride	0.19	1.9	10	150	500
Sulphate	35	350	1000	20000	50000
Total Dissolved Solids	110	1100	4000	60000	100000
Phenol Index	< 0.030	< 0.30	1	-	-
Dissolved Organic Carbon	5.1	50	500	800	1000

<b>Solid Information</b>	
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.

## 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:
1452431	AA178464		TP 5		A	Amber Glass 250ml
1452431	AA178464		TP 5		A	Plastic Tub 500g
1452432	AA178466		TP 5		A	Amber Glass 250ml
1452432	AA178466		TP 5		A	Plastic Tub 500g
1452433	AA178462		TP 6		A	Amber Glass 250ml
1452433	AA178462		TP 6		A	Plastic Tub 500g
1452434	AA172991		BH 1		A	Amber Glass 250ml
1452434	AA172991		BH 1		A	Plastic Tub 500g
1452435	AA177951		BH 5		A	Amber Glass 250ml
1452435	AA177951		BH 5		A	Plastic Tub 500g
1452436	AA177961		BH 6		A	Amber Glass 250ml
1452436	AA177961		BH 6		A	Plastic Tub 500g
1452437	AA177987		BH 7		A	Amber Glass 250ml
1452437	AA177987		BH 7		A	Plastic Tub 500g
1452438	AA177979		BH 8		A	Amber Glass 250ml
1452438	AA177979		BH 8		A	Plastic Tub 500g
1452439	AA177971		BH 9		A	Amber Glass 250ml
1452439	AA177971		BH 9		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 measurement 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	Alkaline 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.
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-diphenylcarbazine.
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.

## Test Methods

SOP	Title	Parameters included	Method summary
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– C44 Aromatics: >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) ICES7 Congeners 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 Trimethylphenols Note: 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	Compliance Test 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](mailto:customerservices@chemtest.com)

Cavan Planning Authority - Inspection Purposes Only!



Appendix 7

Chemical Laboratory Test Records

Cavan Planning Authority - Inspection Purposes Only!

Cavan Planning Authority - Inspection Purposes Only!





IGSL  
Unit F  
M7 Business Park  
Naas

**Analytical Test Report: L22/03471/IGS - 22-27746**

Your Project Reference:	<b>24083 Cavan Tesco</b>	Testing Received / Instructed:	04/07/2022 / 04/07/2022
Your Order Number:	20487	Sample Tested:	04/07 to 22/07/2022
Report Issue Number:	1	Report issued:	22/07/2022
Samples Analysed:	3 soil samples		

Signed

**James Gane**  
Analytical Services Manager  
Nicholls Colton Group

**Notes:**

---

Samples will be retained for 14 days after issue of this report unless otherwise requested.

The results included within the report are representative of the samples submitted for analysis.

A certificate of sampling was not supplied

Samples were supplied by customer, results apply to the samples as received.

Within the report any information provided by the client is identified with a 'H'

**Where specification limits are included these are for guidance only. Where a measured value has been highlighted this is not implying acceptance or failure and certainty of measurement values have not been taken into account.**

Uncertainty of measurement values are available on request.

**Accreditation Key**

UKAS = UKAS Accreditation, u = Unaccredited

Date of Issue 10/12/2020

Owned by Emily Blissett - Commercial Reporting Supervisor

Authorised by Lee Harbottle - GCM Operations Manager

L:\DATA\REPORTS\R1294\{L22-03471-IGS - 22-27746.XLSM}\Methodology

Cavan Training Authority - Inspection Purposes Only!



L22/03471/IGS - 22-27746

Project Reference - 24083 Cavan Tesco

Analytical Test Results

NC Reference			248309	248310	248311
Client Sample Reference			A22/3548	A22/3545	A22/3552
Material			Soil	Soil	Soil
Source / Client Ref			TP03	TP01	TP07
Sample Description			Grey Crushed Rock	Grey Crushed Rock	Grey Crushed Rock
	<b>Units</b>	<b>Accreditation</b>			
<b>EN 1744 Determinations</b>					
Total Sulphur content (as S)	(%)	UKAS	0.29	0.27	0.45
Acid soluble sulphate content (as SO <sub>3</sub> )	(%)	UKAS	0.05	0.31	0.26
Acid soluble sulphate content (as SO <sub>4</sub> )	(%)	u	0.06	0.37	0.31
Water soluble sulphate content (as SO <sub>3</sub> )	(%)	UKAS	0.04	0.25	0.20
Water soluble sulphate content (as SO <sub>3</sub> )	(mg/l)	u	177	1250	995
Water soluble sulphate content (as SO <sub>4</sub> )	(%)	u	0.04	0.30	0.24
Water soluble sulphate content (as SO <sub>4</sub> )	(mg/l)	u	212	1490	1190

Cavan Planning Authority - Inspection Purposes Only!





Nicholls Colton Group  
 7 - 11 Harding Street  
 Leicester  
 LE1 4DH

L22/03471/IGS - 22-27746

Project Reference - 24083 Cavan Tesco

Analysis Methodologies

Test Title	Details and Test method used
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EN1744 Total Sulphur (Cl. 11.1)	Testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 11.
---------------------------------	---

Suite A - EN 1744 ASS, WSS, TS (Cl. 12,10.1,11.2)	Total sulphur testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 11.☺ Acid soluble sulphate testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 12.☺ Water soluble sulphate testing was in accordance with BS EN 1744-1:2009 + A1:2012 clause 10.☺
---	---

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<b>Project No.</b> 24083	<b>Sample Ref No.</b> A22/3545
<b>Project Location:</b> Tesco, Cavan	<b>Sample Location:</b> TP01 - 0.50-0.60m
<b>Engineer:</b> Pinnacle	<b>Examination &amp; Log by:</b> J. Lawler BSc MSc P Geo
	<b>Date Logged:</b> 22/07/2022

Sheet 1 of 2

**Notes on sample preparation & examination:** Sample reduced (riffled & quartered) in accordance with IS EN 932-2:1999. Sample examined and classified by IGSL Professional Geologist in accordance with IS EN 14689-1:2004, IS EN 932-3:1997 and IS 398:2013 Part 1, Testing & Categorization Protocol. Sample examined with hand lens and binocular microscope.

Bulk Sample	Sample Description
	<p>Aggregate consists of argillaceous limestone and green siltstone with fine grained dark grey coatings. No evidence of mineralogical changes, encrustations (e.g. gypsum) or deleterious constituents (e.g. calcareous mudstone or shale) in the sample provided. Sample in a very moist state.</p>

Riffled & Quartered Sub-Sample	Washed Fragments Sub-Sample Characteristics						
	<p><b>Particle Sizes Estimation (mm):</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Max</th> <th>Mean</th> <th>Min.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">80</td> <td style="text-align: center;">25</td> <td style="text-align: center;">10</td> </tr> </tbody> </table> <p><b>Particle Shape:</b> Angular to subrounded</p> <p><b>Nature of Fines:</b> Dark grey, silt or clay size</p> <p><b>Nature of Coatings:</b> Dark grey, fine sand &amp; silt / clay size</p>	Max	Mean	Min.	80	25	10
Max	Mean	Min.					
80	25	10					

Image of Washed Fragments	Assessed Rock Types (lithologies) in Bulk Sample										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">Rock Types</th> <th style="width: 30%;">% Present</th> </tr> </thead> <tbody> <tr> <td>Type 1: Siltstone</td> <td style="text-align: center;">75%</td> </tr> <tr> <td>Type 1: Argillaceous Limestone</td> <td style="text-align: center;">25%</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table> <p><i>Note: Rock types and proportions assessed by examining bulk sample and washing the fragments and examining by naked eye, hand lens and binocular microscope.</i></p>	Rock Types	% Present	Type 1: Siltstone	75%	Type 1: Argillaceous Limestone	25%				
Rock Types	% Present										
Type 1: Siltstone	75%										
Type 1: Argillaceous Limestone	25%										



**ROCK Type 1**

Siltstone  
 Dominant Particle size: 10-80mm  
 Colour: Dark green  
 Strength: Medium strong  
 Apparent Porosity / Water Absorption: Low  
 Reaction to dilute HCL (Dry Sample): N/A

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	Clay/silt
Staining	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	

**ROCK Type 2**

Muddy Limestone / Argillaceous Limestone  
 Dominant Particle size: 10-40mm  
 Colour: Dark grey/black  
 Strength: Medium strong to strong  
 Apparent Porosity / Water Absorption: Moderate  
 Reaction to dilute HCL (Dry Sample): Low

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	Clay/silt
Staining	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	Local slight iron-oxide
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	

**ROCK Type 3**

Dominant Particle size:  
 Colour:  
 Strength:  
 Apparent Porosity / Water Absorption:  
 Reaction to dilute HCL (Dry Sample):

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Staining	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	

**Selected Microscopy Images**


# SIMPLIFIED PETROLOGY ©



<b>Project No.</b> 24083	<b>Sample Ref No.</b> TP03 - 0.40-0.50m
<b>Project Location:</b> Tesco, Cavan	<b>Sample Location:</b> TP03 - 0.40-0.50m
<b>Engineer:</b> Pinnacle	<b>Examination &amp; Log by:</b> J. Lawler BSc MSc P Geo
	<b>Date Logged:</b> 22/07/2022

Sheet 1 of 2

**Notes on sample preparation & examination:** Sample reduced (riffled & quartered) in accordance with IS EN 932-2:1999. Sample examined and classified by IGSL Professional Geologist in accordance with IS EN 14689-1:2004, IS EN 932-3:1997 and IS 398:2013 Part 1, Testing & Categorization Protocol. Sample examined with hand lens and binocular microscope.

Bulk Sample	Sample Description
	Aggregate consists of argillaceous limestone and green siltstone with fine grained dark grey coatings. No evidence of mineralogical changes, encrustations (e.g. gypsum) or deleterious constituents (e.g. calcareous mudstone or shale) in the sample provided. Sample in a moist to very moist state.

Riffled & Quartered Sub-Sample	Washed Fragments Sub-Sample Characteristics						
	<p><b>Particle Sizes Estimation (mm):</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Max</th> <th>Mean</th> <th>Min.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">60</td> <td style="text-align: center;">25</td> <td style="text-align: center;">10</td> </tr> </tbody> </table> <p><b>Particle Shape:</b> Angular to subrounded</p> <p><b>Nature of Fines:</b> Dark grey, silt or clay size</p> <p><b>Nature of Coatings:</b> Dark grey, fine sand &amp; silt / clay size</p>	Max	Mean	Min.	60	25	10
Max	Mean	Min.					
60	25	10					

Image of Washed Fragments	Assessed Rock Types (lithologies) in Bulk Sample										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">Rock Types</th> <th style="width: 30%;">% Present</th> </tr> </thead> <tbody> <tr> <td>Type 1: Siltstone</td> <td style="text-align: center;">65%</td> </tr> <tr> <td>Type 2: Argillaceous Limestone</td> <td style="text-align: center;">35%</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table> <p><i>Note: Rock types and proportions assessed by examining bulk sample and washing the fragments and examining by naked eye, hand lens and binocular microscope.</i></p>	Rock Types	% Present	Type 1: Siltstone	65%	Type 2: Argillaceous Limestone	35%				
Rock Types	% Present										
Type 1: Siltstone	65%										
Type 2: Argillaceous Limestone	35%										



**ROCK Type 1**

Siltstone

Dominant Particle size: 10-60mm  
 Colour: Dark green  
 Strength: Medium strong  
 Apparent Porosity / Water Absorption: Low  
 Reaction to dilute HCL (Dry Sample): N/A

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	Clay/silt
Staining	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	

**ROCK Type 2**

Muddy Limestone / Argillaceous Limestone

Dominant Particle size: 10-40mm  
 Colour: Dark grey/black  
 Strength: Medium strong to strong  
 Apparent Porosity / Water Absorption: Moderate  
 Reaction to dilute HCL (Dry Sample): Low

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	Clay/silt
Staining	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	Local slight iron-oxide
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	

**ROCK Type 3**

Dominant Particle size:  
 Colour:  
 Strength:  
 Apparent Porosity / Water Absorption:  
 Reaction to dilute HCL (Dry Sample):

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Staining	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	

**Selected Microscopy Images**




# SIMPLIFIED PETROLOGY ©



<b>Project No.</b> 24083	<b>Sample Ref No.</b> A22/3552
<b>Project Location:</b> Tesco, Cavan	<b>Sample Location:</b> TP07 - 0.30-0.40m
<b>Engineer:</b> Pinnacle	<b>Examination &amp; Log by:</b> J. Lawler BSc MSc P Geo
	<b>Date Logged:</b> 22/07/2022

Sheet 1 of 2

**Notes on sample preparation & examination:** Sample reduced (riffled & quartered) in accordance with IS EN 932-2:1999. Sample examined and classified by IGSL Professional Geologist in accordance with IS EN 14689-1:2004, IS EN 932-3:1997 and IS 398:2013 Part 1, Testing & Categorization Protocol. Sample examined with hand lens and binocular microscope.

Bulk Sample	Sample Description
	Aggregate consists of argillaceous limestone and green siltstone with fine grained dark grey coatings. No evidence of mineralogical changes, encrustations (e.g. gypsum) or deleterious constituents (e.g. calcareous mudstone or shale) in the sample provided. Sample in a moist state.

Riffled & Quartered Sub-Sample	Washed Fragments Sub-Sample Characteristics						
	<p><b>Particle Sizes Estimation (mm):</b></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Max</th> <th>Mean</th> <th>Min.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">70</td> <td style="text-align: center;">25</td> <td style="text-align: center;">10</td> </tr> </tbody> </table> <p><b>Particle Shape:</b> Angular to subrounded</p> <p><b>Nature of Fines:</b> Dark grey, silt or clay size</p> <p><b>Nature of Coatings:</b> Dark grey, fine sand &amp; silt / clay size</p>	Max	Mean	Min.	70	25	10
Max	Mean	Min.					
70	25	10					

Image of Washed Fragments	Assessed Rock Types (lithologies) in Bulk Sample										
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">Rock Types</th> <th style="width: 30%;">% Present</th> </tr> </thead> <tbody> <tr> <td>Type 1: Siltstone</td> <td style="text-align: center;">85%</td> </tr> <tr> <td>Type 2: Argillaceous Limestone</td> <td style="text-align: center;">15%</td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table> <p><b>Note:</b> Rock types and proportions assessed by examining bulk sample and washing the fragments and examining by naked eye, hand lens and binocular microscope.</p>	Rock Types	% Present	Type 1: Siltstone	85%	Type 2: Argillaceous Limestone	15%				
Rock Types	% Present										
Type 1: Siltstone	85%										
Type 2: Argillaceous Limestone	15%										



**ROCK Type 1**

Siltstone

Dominant Particle size: 10-80mm  
 Colour: Dark green  
 Strength: Medium strong  
 Apparent Porosity / Water Absorption: Low  
 Reaction to dilute HCL (Dry Sample): N/A

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	Clay/silt
Staining	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	

**ROCK Type 2**

Muddy Limestone / Argillaceous Limestone

Dominant Particle size: 10-50mm  
 Colour: Dark grey/black  
 Strength: Medium strong to strong  
 Apparent Porosity / Water Absorption: Moderate  
 Reaction to dilute HCL (Dry Sample): Low

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input checked="" type="checkbox"/>	NO	<input checked="" type="checkbox"/>	Clay/silt
Staining	YES	<input checked="" type="checkbox"/>	NO	<input type="checkbox"/>	Local slight iron-oxide
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input checked="" type="checkbox"/>	

**ROCK Type 3**

Dominant Particle size:  
 Colour:  
 Strength:  
 Apparent Porosity / Water Absorption:  
 Reaction to dilute HCL (Dry Sample):

Presence of Laminations in hand specimen	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	If YES, Laminar Spacing
Surface Coatings	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Staining	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Secondary Mineral Present	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Carbonate Mineralisation	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	
Sulphate Mineralisation	YES	<input type="checkbox"/>	NO	<input type="checkbox"/>	

**Selected Microscopy Images**

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Cavan Planning Authority - Inspection Purposes Only!

Cavan Planning Authority - Inspection Purposes Only!



Appendix 8

Exploratory Hole Location Plans

Cavan Planning Authority - Inspection Purposes Only!

Cavan Planning Authority - Inspection Purposes Only!

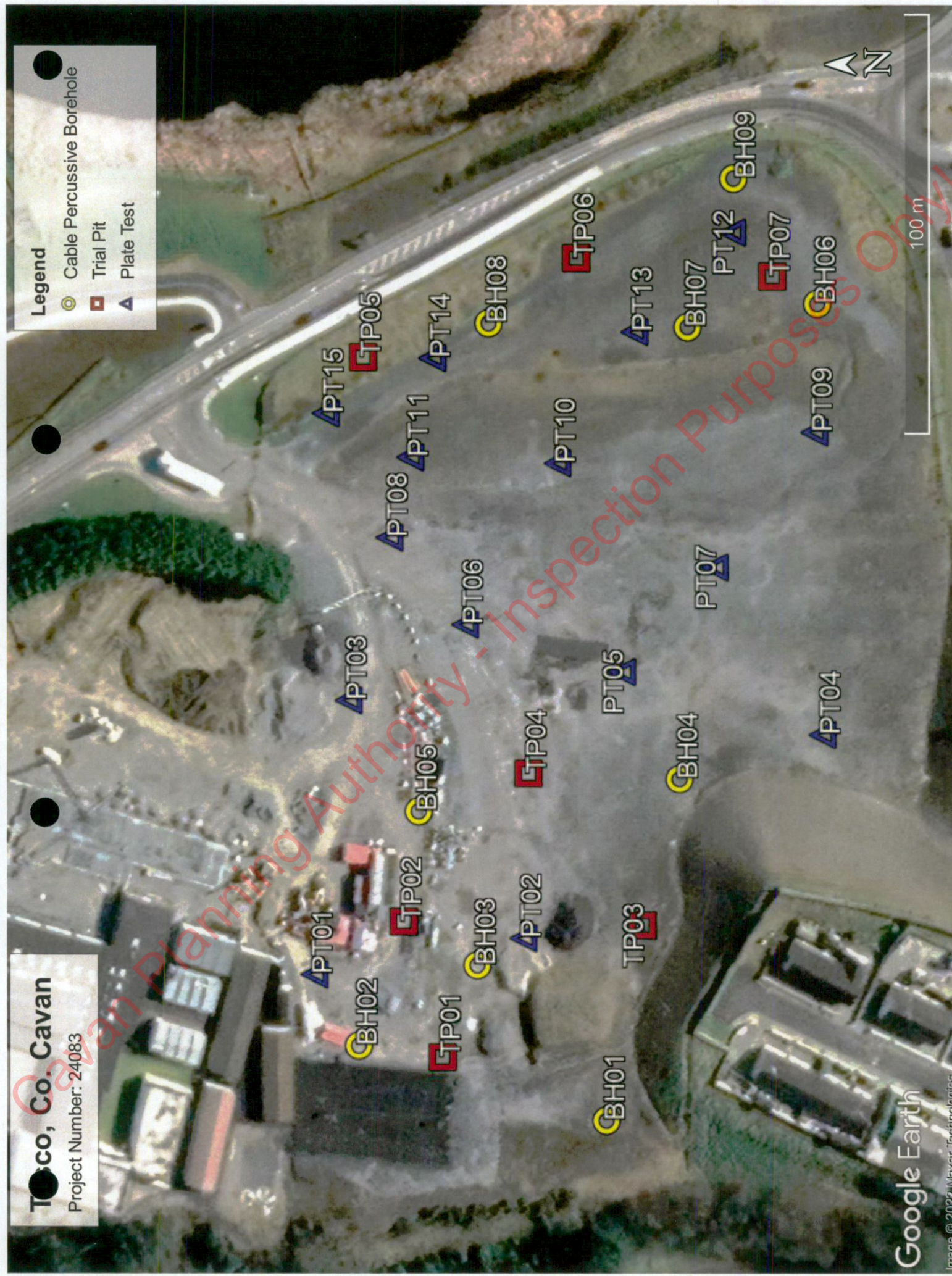


**Tosco, Co. Cavan**

Project Number: 24083

**Legend**

- Cable Percussive Borehole
- Trial Pit
- ▲ Plate Test





Cavan Planning Authority - Inspection Purposes Only!



**GENERAL NOTES:**

1. ALL FOUL SEWERS, MANHOLES AND CONNECTIONS TO BE CONSTRUCTED IN ACCORDANCE WITH IRISH WATER CODE OF PRACTICE FOR WASTEWATER INFRASTRUCTURE AND IRISH WATER WASTEWATER INFRASTRUCTURE STANDARD DETAILS.
2. SEWER HOUSE CONNECTIONS TO BE MIN. 100MM Ø UPVC TO IS EN 1401 AND 100mm STIFFNESS CLASS 8KN/M<sup>2</sup> IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
3. ALL PUBLIC FOUL SEWERS TO BE MINIMUM 225MM DIAMETER THERMOPLASTIC STRUCTURED WALL PIPES TO IS EN 13746 (2007/2009), TYPE SN8 AND WIS 4-35-01 (2008) AND COMPLY WITH THE REQUIREMENTS OF THE IRISH WATER CODE OF PRACTICE.
4. ALL PUBLIC SURFACE WATER SEWERS TO BE MINIMUM 225 DIA. CLASS H CONCRETE TO EN1916 & IS 6 2004 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
5. ALL SURFACE WATER CONNECTIONS TO BE MINIMUM 150MM Ø UPVC TO IS EN 1401 2009/2012 IN ACCORDANCE WITH THE GREATER DUBLIN REGIONAL CODE OF PRACTICE FOR DRAINAGE WORKS.
6. LOCATION AND INVERT LEVELS OF EXISTING MANHOLES OR OUTFALL POINTS, WHERE APPLICABLE TO BE VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
7. ALL FOUL CONNECTIONS TO COMPLY WITH THE REQUIREMENTS OF THE IRISH WATER CODE OF PRACTICE.
8. ALL FOUL SEWERS TO BE AIR TESTED IN ACCORDANCE WITH IRISH WATER SPECIFICATIONS.
9. ALL COVER LEVELS TO MATCH FINISHED ROAD/VERGE/FOOTPATH/CYCLETRACK LEVELS UNLESS OTHERWISE STATED.
10. CONTRACTOR TO INCLUDE FOR CCTV SURVEY OF ALL SEWERS UPON COMPLETION OF SAME.

**GENERAL NOTES**

1. DO NOT SCALE THIS DRAWING. WORK ONLY TO FIGURED DIMENSIONS.
2. FOR ALL RELEVANT NOTES, REFER TO STRUCTURAL AND CIVIL ENGINEERING PERFORMANCE SPECIFICATION.
3. ANY DISCREPANCIES ARE TO BE REPORTED TO PINNACLE CONSULTING ENGINEERS IMMEDIATELY.
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS, SPECIFICATIONS AND SUB-CONTRACTORS DRAWINGS AND DETAILS.

**LEGEND**

- PROPOSED FOUL SEWER
- PROPOSED FOUL RISING MAIN
- PROPOSED FOUL SEWER WITH 150MM CONCRETE ENCASEMENT
- PROPOSED FOUL INSPECTION CHAMBER AND SERVICE CONNECTION AS PER IRISH WATER STANDARD DETAIL STD-WW-03
- PROPOSED SURFACE WATER SEWER
- PROPOSED SURFACE WATER TO BE ABANDONED AND REMOVED
- PROPOSED STORM ARMSTRONG JOINT (HOUSE CONNECTION DIRECT TO MAINS DRAINAGE)
- PROPOSED BACKDROP MANHOLE
- PROPOSED ROAD GULLY
- 1500 SURFACE WATER PIPE
- FINDRAIN
- SW DISTRIBUTION BOX
- SILT TRAP
- RWDIP
- PROPOSED ATTENUATION TANK
- PERMEABLE PAVING
- EXISTING PUBLIC SURFACE
- EXISTING PUBLIC FOUL SEWER
- SITE BOUNDARY
- LAND DRAIN
- SURFACE WATER INTERCEPTION CHAMBER

**NOTE:**  
REFER TO DRAWING P210904-204 FOR DRAINAGE DETAILS.  
REFER TO DRAWING P210904-206 FOR PERMEABLE PAVING DETAILS.

0 50MM ON A1 DWG 50

REV	DESCRIPTION	BY	CHK	DATE
P03	INTERNAL COMMENTS UPDATED	F.VJR	SOR	2022/12/14
P02	LAYOUT UPDATED	F.VJR	SOR	2022/12/09
P01	ISSUED FOR INFORMATION	F.VJR	SOR	2022/11/15

CLIENT  
**TESCO IRELAND LIMITED**

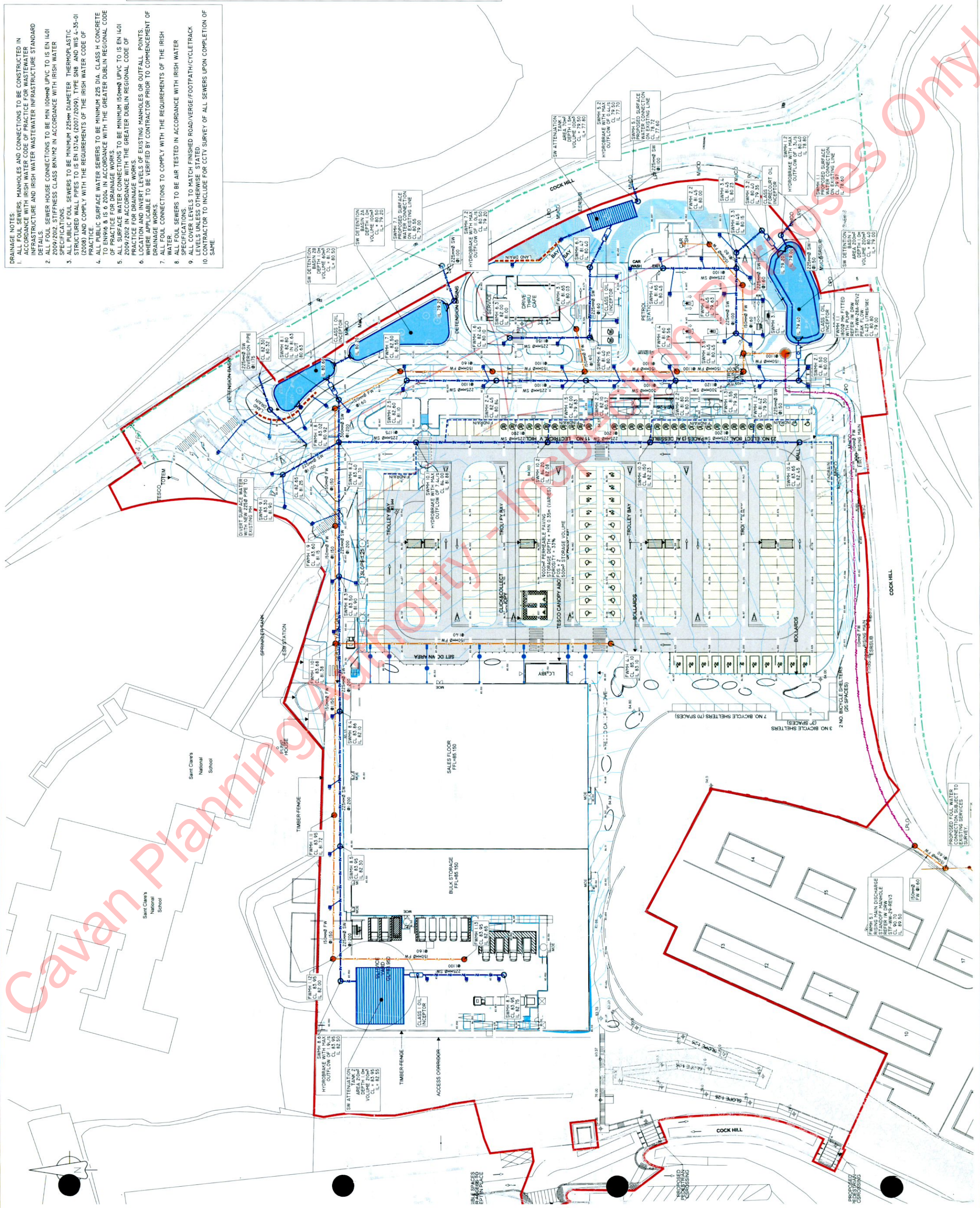
PROJECT  
**TESCO DEVELOPMENT  
CAVAN TOWN**

DRAWING TITLE  
**PROPOSED DRAINAGE LAYOUT**

**PINNACLE**  
CONSULTING ENGINEERS

GROVEDOR COURT,  
67A PATRICK STREET,  
DUBLIN 6,  
IRELAND  
WELYN GARDEN CITY | NORWICH | LONDON | THE HAGUE  
TELEPHONE +353 231 1041

DRAWING STATUS	PLANNING
SCALE	A1
DATE	NOV '22
DRAWN BY	F.VJR
CHECKED BY	SOR
REVISED	
DWG NO.	P210904 - 201
PROJECT	P03



PROPOSED WATER CONNECTIONS TO EXISTING SERVICES

PROPOSED WATER CONNECTIONS TO EXISTING SERVICES

PROPOSED WATER CONNECTIONS TO EXISTING SERVICES

PROPOSED WATER CONNECTIONS TO EXISTING SERVICES

PROPOSED WATER CONNECTIONS TO EXISTING SERVICES

PROPOSED WATER CONNECTIONS TO EXISTING SERVICES



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## 9.0 Biodiversity

Cavan Planning Authority - Inspection Purposes Only!

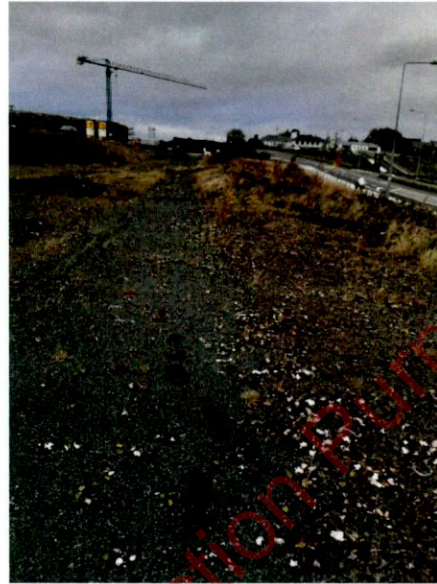
Cavan Planning Authority - Inspection Purposes Only!



Appendix 9.1 – Site Photographs



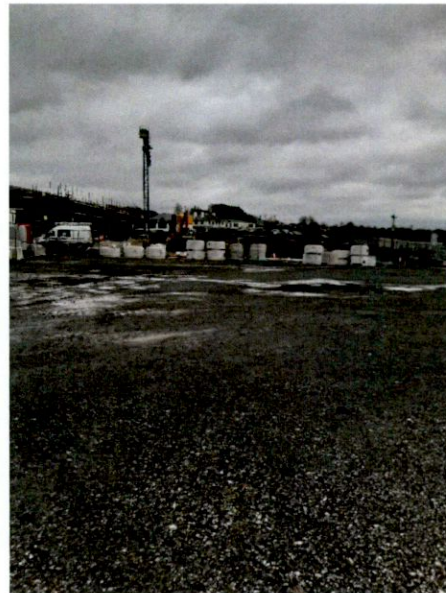
Grassy Verge along Eastern Boundary



Grassy Verge along Eastern Boundary



Bare Ground Habitats within the Site



Bare Ground / Adjacent Construction Site in Background



Embankment and Treeline Along Western Boundary



View of Killymooney Lough from Application Site (Looking North)

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## Appendix 9.2 – Plant Species List

Common Name	Scientific Name
Autumn hawkbit	Scorzoneroides autumnalis
Beech	Fagus Sylvatica
Bindweed	Calystegia sepium
Birch	Betula sp/
Bramble	Rubus fruticosus agg.
Broom	<i>Cytisus scoparius</i>
Bulrush	Typha latifolia
Cat's ear	Hypochaeris radicata
Cleavers	Galium aparine
Clover	Trifolium resupinatum
Cock's-foot	Dactylis glomerata
Colt's foot	Tussilago farfara
Common chickweed	Stellaria media
Common ragwort	Senecio jacobaea
Couch grass	Elymus repens
Creeping buttercup	Ranunculus repens
Dandelion	Taraxacum officinale
Fescue grasses	Festuca sp.
Germander speedwell	Veronica chamaedrys
Gorse	Ulex europaeus
Hairy bittercress	Cardamine hirsuta
Hawthorn	Crataegus monogyna
Herb Robert	Geranium robertianum
Hogweed	Heracleum sphondylium
Ivy	Hedera helix
Meadow Grass	Poa annua
Meadow grasses	Poa sp.
Nettle	Urtica dioica
Oak	Quercus
Pedunculate oak	Quercus robur
Ragwort	Jacobaea vulgaris
Red clover	Trifolium pratense
Ribwort plantain	Pantago lanceolate
Rosebay willowherb	Chamaenerion angustifolium
Rye grasses	Lolium asp.
Short-fruit willowherb	Epilobium obscurum
Silver Birch	Betula pendula
Spear thistle	Cirsium vulgare
Vetches	Vicia sp
Willow	Salix sp.
Willowherb	Ebilobium sp

Cavan Planning Authority - Inspection Purposes Only!



## 11.0 Noise and Vibration

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Cavan Planning Authority - Inspection Purposes Only!





Client:	Tesco, Cavan
Project Code:	OR0301 - EJAR
Project Description:	Development of the site for Tesco
Scenario Description:	Site Preparation, Receptor at 30m

Plant Type	BS 5228 Ref. $L_{WA}$ at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq}(10h)$	Activity $L_{Aeq}(11h)$	TOTAL Noise at Receptor (stationary sources)
						Distance	Screening	Reflection						
Diesel Generator	4.76	61	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	47	8	72%	-1	46	46

Plant Type	BS 5228 Ref. Average $L_{WA}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 10hrs)	Correction to $L_{Aeq}(10h)$	Activity $L_{Aeq}(11h)$	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection							
Wheeled Loader Lorry	C2.28	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	60	0.66	12	72%	-1	59	67
Track Excavator	C2.22	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	58	0.66	12	72%	-1	57	
Dozer	C2.13	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	64	0.66	12	72%	-1	63	
Dump Truck	C4.2	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	64	0.66	12	72%	-1	63	

TOTAL Noise at Receptor (ALL sources)

68

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Client:	Tesco, Cavan
Project Code:	OR0301 - EIA
Project Description:	Development of the site for Tesco
Scenario Description:	Site Preparation, Receptor at 50m

Plant Type	BS 5228 Ref.	L <sub>WA</sub> at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>WA</sub>	Distance	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to L <sub>WA</sub> (10h)	Activity L <sub>WA</sub> (11h)	TOTAL Noise at Receptor (stationary sources)
							Distance	Screening	Reflection							
Diesel Generator	4.76	61	50	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	42	8	72%	-1	41	41	

Plant Type	BS 5228 Ref.	Average L <sub>WA</sub>	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>WA</sub>	Distance Ratio	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 10hrs)	Correction to L <sub>WA</sub> (10h)	Activity L <sub>WA</sub> (11h)	TOTAL Noise at Receptor (mobile sources)
								Distance	Screening	Reflection								
Wheeled Loader Lorry	C2.28	74	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	55	12.0	0.66	12	72%	-1	54	63
Track Excavator	C2.22	72	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	53	12.0	0.66	12	72%	-1	52	
Dozer	C2.13	78	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	59	12.0	0.66	12	72%	-1	58	
Dump Truck	C4.2	78	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	59	12.0	0.66	12	72%	-1	58	

TOTAL Noise at Receptor (ALL sources)

63

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Client:	Tesco, Cavan
Project Code:	OR0301 - EJAR
Project Description:	Development of the site for Tesco
Scenario Description:	Site Preparation, Receptor at 100m

Plant Type	BS 5228 Ref. $L_{Aeq}$ at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq}(10h)$	Activity $L_{Aeq}(11h)$	TOTAL Noise at Receptor (stationary sources)
						Distance	Screening	Reflection						
Diesel Generator	4.76	100	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	36	8	72%	-1	34	34

Plant Type	BS 5228 Ref. $L_{WA}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 10hrs)	Correction to $L_{Aeq}(10h)$	Activity $L_{Aeq}(11h)$	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection							
Wheeled Loader Lorry	C2.28	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	49	6.0	12	72%	-1	48	56
Track Excavator	C2.22	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	47	6.0	12	72%	-1	46	
Dozer	C2.13	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	53	6.0	12	72%	-1	52	
Dump Truck	CA.2	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	53	6.0	12	72%	-1	52	

TOTAL Noise at Receptor (ALL sources)

56

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Client:	Tesco, Cavan
Project Code:	OR0301 - EIAR
Project Description:	Development of the site for Tesco
Scenario Description:	Foundations, Receptor at 30m

Plant Type	BS 5228 Ref. $L_{Aeq}$ at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	#NUM!	0	#NUM!	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq}(10h)$	Activity $L_{Aeq}(11h)$	#NUM!	TOTAL Noise at Receptor (stationary sources)
						Distance	Screening	Reflection										

Plant Type	BS 5228 Ref. Average $L_{WA}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Distance Ratio	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 10hrs)	Correction to $L_{Aeq}(10h)$	Activity $L_{Aeq}(11h)$	#NUM!	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection									
Tracked Excavator	C3.24	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	60	20.0	0.666	12	72%	-1	59	68	
Concrete Pump	C3.25	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	64	20.0	0.666	12	72%	-1	63		
Compressor	C3.19	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	61	20.0	0.666	12	72%	-1	60		
Poker/Vibrator	C4.33	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	64	20.0	0.666	12	72%	-1	63		

TOTAL Noise at Receptor (ALL sources)

68

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Client:	Tesco, Cavan
Project Code:	OR0301 - E1AR
Project Description:	Development of the site for Tesco
Scenario Description:	Foundations, Receptor at 100m

Plant Type	BS 5228 Ref.	L <sub>WA</sub> at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>WA</sub>	#NUM!	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to L <sub>WA</sub> (11h)	Activity L <sub>WA</sub> (11h)	TOTAL Noise at Receptor (stationary sources)
							Distance	Screening	Reflection							
								0	0	0		0%	#DIV/0!	#NUM!		

Plant Type	BS 5228 Ref.	Average L <sub>WA</sub>	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>WA</sub>	Distance Ratio	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 10hrs)	Correction to L <sub>WA</sub> (11h)	Activity L <sub>WA</sub> (11h)	TOTAL Noise at Receptor (mobile sources)
								Distance	Screening	Reflection								
Tracked Excavator	C3.24	74	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	49	6.0	0.66	12	72%	-1	48	56
Concrete Pump	C3.25	78	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	53	6.0	0.66	12	72%	-1	52	
Compressor	C3.19	75	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	50	6.0	0.66	12	72%	-1	49	
Poker Vibrator	CA.33	78	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	53	6.0	0.66	12	72%	-1	52	

TOTAL Noise at Receptor (ALL sources)

56

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Client:	Tesco, Cavan
Project Code:	OR0301 - EIAR
Project Description:	Development of the site for Tesco
Scenario Description:	General Construction, Receptor at 30m

Plant Type	BS 5228 Ref.	L <sub>max</sub> at .10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>req</sub>	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to L <sub>req(11h)</sub>	Activity L <sub>req(11h)</sub>	TOTAL Noise at Receptor (stationary sources)
							Distance	Screening	Reflection						
Tower Crane	C4.48	76	30	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	62	8	72%	-1	61	61

Plant Type	BS 5228 Ref.	Average L <sub>WA</sub>	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>req</sub>	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to L <sub>req(11h)</sub>	Activity L <sub>req(11h)</sub>	TOTAL Noise at Receptor (mobile sources)
								Distance	Screening	Reflection							
Articulated lorry	C12.10	77	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	63	0.66	12	72%	-1	62	69
Hand tools	-	81	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	67	0.66	12	72%	-1	66	
Pneumatic Circular Saw	D7.79	75	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	61	0.66	12	72%	-1	60	
Internal fit - out	-	70	30	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-12	-5	3	56	0.66	12	72%	-1	55	

TOTAL Noise at Receptor (ALL sources)

69

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patel tonra  
environmental solutions

BS 5228-1:2009 Noise Predictions for Developments - Worksheet

Client:	Tesco, Cavan
Project Code:	OR0301 - EIAR
Project Description:	Development of the site for Tesco
Scenario Description:	General Construction, Receptor at 50m

Plant Type	BS 5228 Ref.	L <sub>WA</sub> at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>WA</sub>	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to L <sub>WA</sub> (11h)	Activity L <sub>WA</sub> (11h)	TOTAL Noise at Receptor (stationary sources)
							Distance	Screening	Reflection						
Tower Crane	C4.48	76	50	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	57	8	72%	-1	56	56

Plant Type	BS 5228 Ref.	Average L <sub>WA</sub>	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>WA</sub>	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to L <sub>WA</sub> (11h)	Activity L <sub>WA</sub> (11h)	TOTAL Noise at Receptor (mobile sources)
								Distance	Screening	Reflection							
Articulated lorry	C12.10	77	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	58	12.0	12	72%	-1	57	64
Hand tools	-	81	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	62	12.0	12	72%	-1	61	61
Pneumatic Circular Saw	D7.79	75	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	56	12.0	12	72%	-1	55	55
Internal fit - out	-	70	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	51	12.0	12	72%	-1	50	50

TOTAL Noise at Receptor (ALL sources)

64

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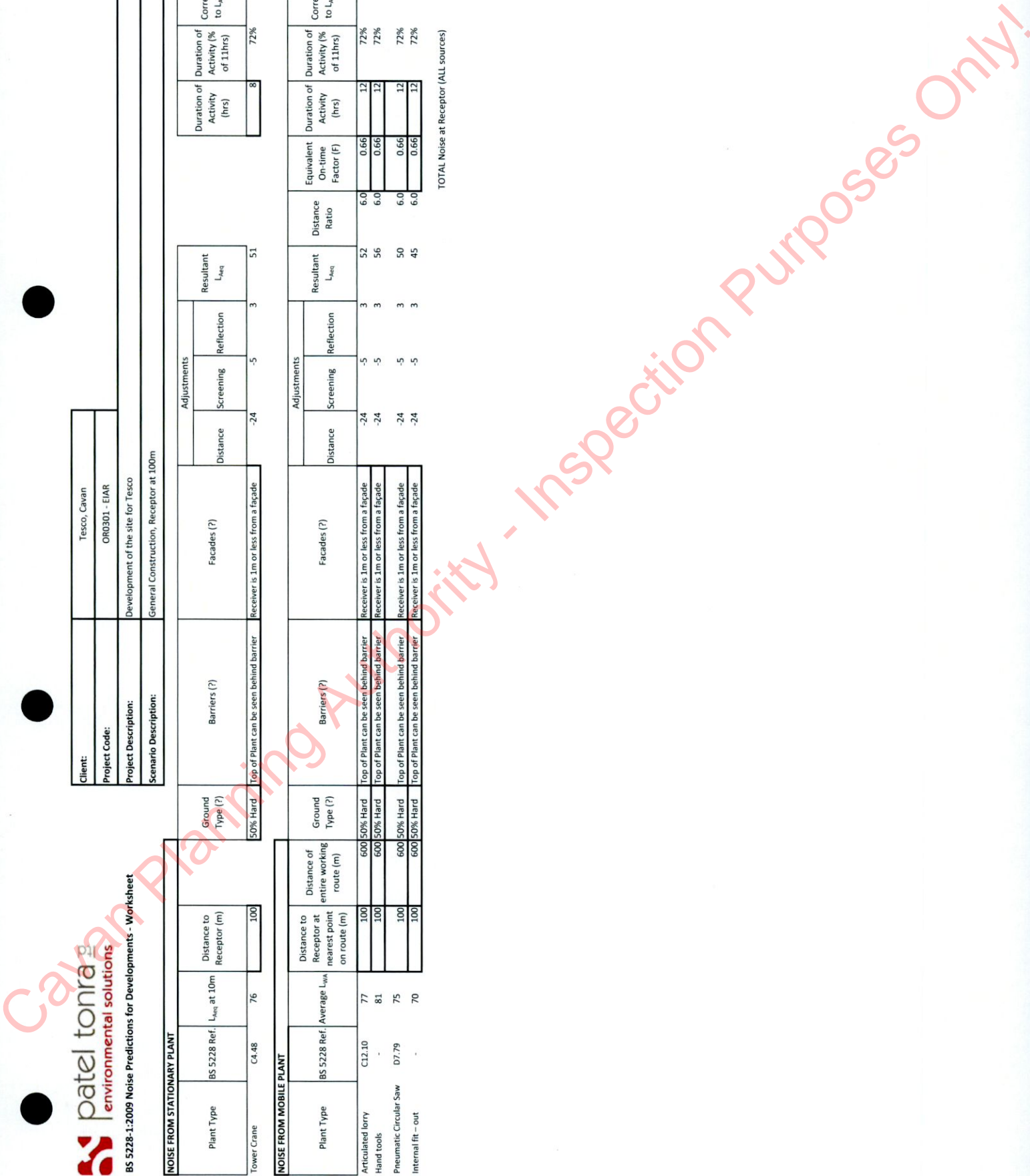
Client:	Tesco, Cavan
Project Code:	OR0301 - EIAR
Project Description:	Development of the site for Tesco
Scenario Description:	General Construction, Receptor at 100m

Plant Type	BS 5228 Ref. $L_{Aeq}$ at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq}(11h)$	Activity $L_{Aeq}(11h)$	TOTAL Noise at Receptor (stationary sources)
						Distance	Screening	Reflection						
Tower Crane	C4.48	76	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a façade	-24	-5	3	51	8	72%	-1	49	49

Plant Type	BS 5228 Ref. $L_{Aeq}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq}(11h)$	Activity $L_{Aeq}(11h)$	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection							
Articulated lorry	C12.10	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a façade	-24	-5	3	52	0.66	12	72%	-1	51	57
Hand tools	-	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a façade	-24	-5	3	56	0.66	12	72%	-1	55	
Pneumatic Circular Saw	D7.79	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a façade	-24	-5	3	50	0.66	12	72%	-1	49	
Internal fit - out	-	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a façade	-24	-5	3	45	0.66	12	72%	-1	44	

TOTAL Noise at Receptor (ALL sources)

58





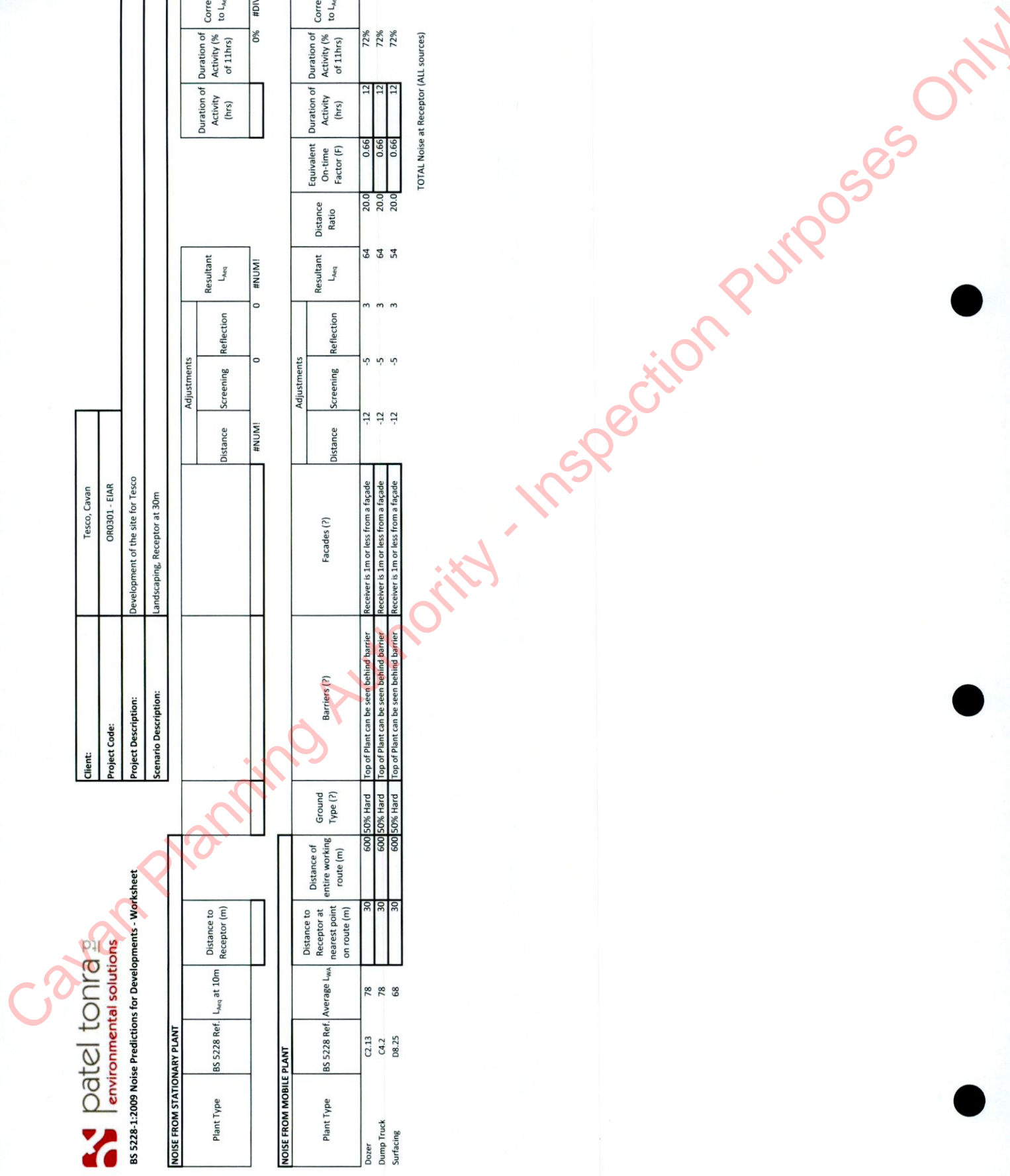
Client:	Tesco, Cavan
Project Code:	OR0301 - EIAR
Project Description:	Development of the site for Tesco
Scenario Description:	Landscaping, Receptor at 30m

Plant Type	BS 5228 Ref. $L_{WA}$ at 10m	Distance to Receptor (m)	Adjustments			Resultant $L_{Aeq}$	#NUM!	0	0	#NUM!	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq(11h)}$	Activity $L_{Aeq(11h)}$	#NUM!	TOTAL Noise at Receptor (stationary sources)
			Distance	Screening	Reflection											

Plant Type	BS 5228 Ref. $L_{WA}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Distance Ratio	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq(11h)}$	Activity $L_{Aeq(11h)}$	#NUM!	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection									

TOTAL Noise at Receptor (ALL sources)

66







Client:	Tesco, Cavan
Project Code:	OR0301 - EJAR
Project Description:	Development of the site for Tesco
Scenario Description:	Landscaping, Receptor at 50m

Plant Type	BS 5228 Ref. $L_{Aeq}$ at 10m	Distance to Receptor (m)	Adjustments			Resultant $L_{Aeq}$	#NUM!	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq}(11h)$	Activity $L_{Aeq}(11h)$	#NUM!	TOTAL Noise at Receptor (stationary sources)
			Distance	Screening	Reflection								
				0	0			0%					

Plant Type	BS 5228 Ref. $L_{WA}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Distance Ratio	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to $L_{Aeq}(11h)$	Activity $L_{Aeq}(11h)$	#NUM!	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection									
Dumper	C2.13	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	59	12.0	0.66	12	72%	-1	58	61	
Dump Truck	C4.2	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	59	12.0	0.66	12	72%	-1	58		
Surfacing	D8.25	50	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-17	-5	3	49	12.0	0.66	12	72%	-1	48		

TOTAL Noise at Receptor (ALL sources)

61

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patel tonra  
environmental solutions

BS 5228-1:2009 Noise Predictions for Developments - Worksheet

Client:	Tesco, Cavan
Project Code:	OR0301 - EIAI
Project Description:	Development of the site for Tesco
Scenario Description:	Landscaping, Receptor at 100m

Plant Type	BS 5228 Ref.	L <sub>WA</sub> at 10m	Distance to Receptor (m)	Adjustments			Resultant L <sub>WA</sub>	#NUM!	0	0	#NUM!	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to L <sub>WA</sub> (11h)	Activity L <sub>WA</sub> (11h)	#NUM!	TOTAL Noise at Receptor (stationary sources)
				Distance	Screening	Reflection											

Plant Type	BS 5228 Ref.	Average L <sub>WA</sub>	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant L <sub>WA</sub>	Distance Ratio	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 11hrs)	Correction to L <sub>WA</sub> (11h)	Activity L <sub>WA</sub> (11h)	#NUM!	TOTAL Noise at Receptor (mobile sources)
								Distance	Screening	Reflection									
Dozer	C2.13	78	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	53	6.0	0.666	12	72%	-1	52	55	
Dump Truck	C4.2	78	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	53	6.0	0.666	12	72%	-1	52		
Surfacing	D8.25	68	100	600	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	43	6.0	0.666	12	72%	-1	42		

TOTAL Noise at Receptor (ALL sources)

55

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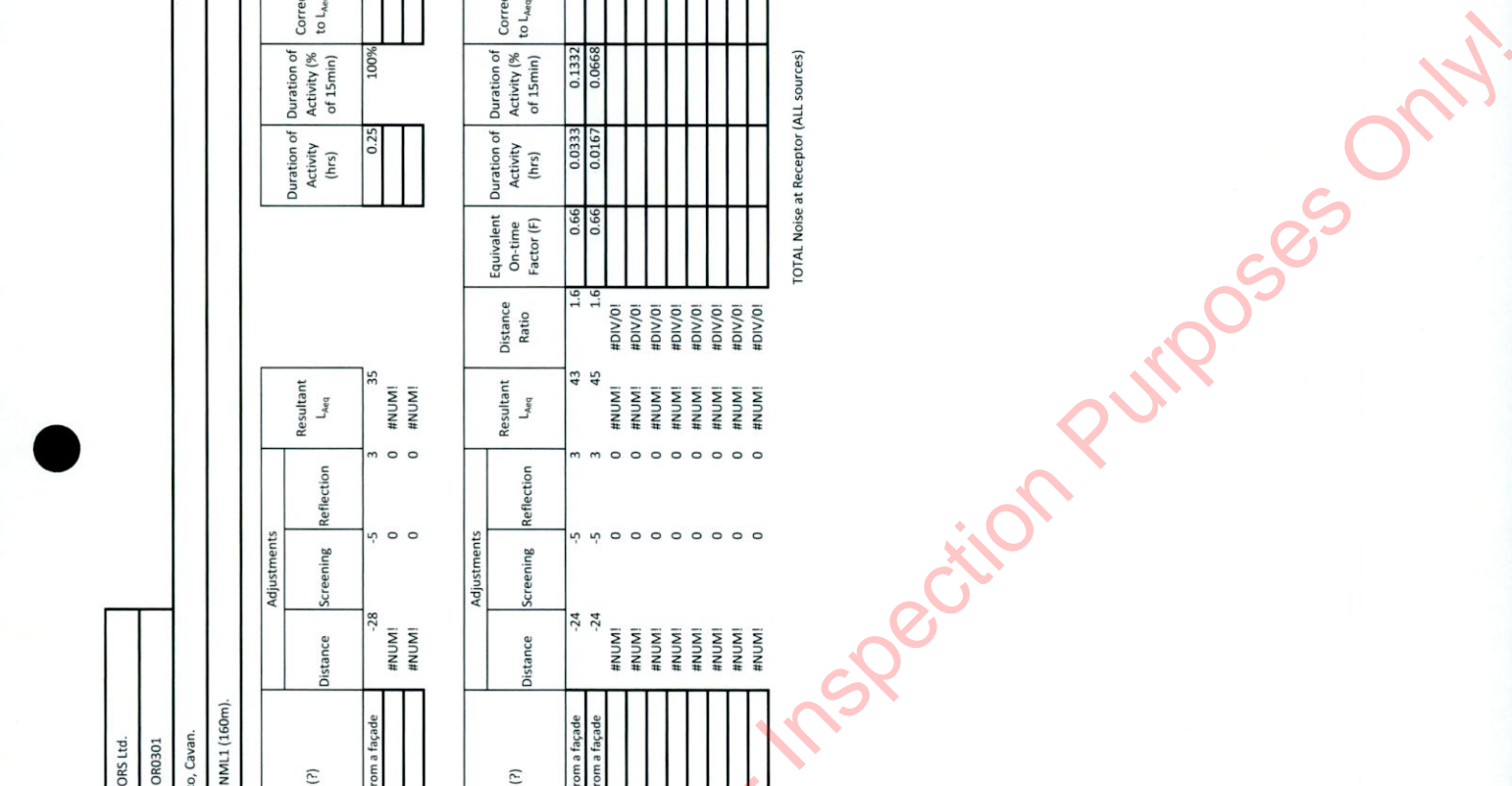


Client:	ORS Ltd.
Project Code:	OR0301
Project Description:	Development of Tesco, Cavan.
Scenario Description:	Deliveries, Impact at NML1 (160m).

Plant Type	BS 5228 Ref. $L_{Aeq}$ at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Duration of Activity (hrs)	Duration of Activity (% of 15min)	Correction to $L_{Aeq}(15min)$	Activity $L_{Aeq}(15min)$	TOTAL Noise at Receptor (stationary sources)
						Distance	Screening	Reflection						
Unloading	65	160	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-28	-5	3	35	0.25	100%	0	35	35
						#NUM!	0	0	#NUM!				#NUM!	
						#NUM!	0	0	#NUM!				#NUM!	

Plant Type	BS 5228 Ref. Average $L_{WA}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 15min)	Correction to $L_{Aeq}(15min)$	Activity $L_{Aeq}(15min)$	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection							
Arriving	69	160	250	100% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	43	0.66	0.0333	0.1332	-9	34	37
Departing	71	160	250	100% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-24	-5	3	45	0.66	0.0167	0.0668	-11	34	
							#NUM!	0	0	#NUM!					#NUM!	
							#NUM!	0	0	#NUM!					#NUM!	
							#NUM!	0	0	#NUM!					#NUM!	
							#NUM!	0	0	#NUM!					#NUM!	
							#NUM!	0	0	#NUM!					#NUM!	
							#NUM!	0	0	#NUM!					#NUM!	
							#NUM!	0	0	#NUM!					#NUM!	

TOTAL Noise at Receptor (ALL sources)





Client:	ORS Ltd.
Project Code:	OR0301
Project Description:	Development of Tesco, Cavan.
Scenario Description:	Deliveries, impact at NML2 (90m).

**NOISE FROM STATIONARY PLANT**

Plant Type	BS 5228 Ref. $L_{WA}$ at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Duration of Activity (hrs)	Duration of Activity (% of 15min)	Correction to $L_{Aeq}(15min)$	Activity $L_{Aeq}(15min)$	TOTAL Noise at Receptor (stationary sources)
						Distance	Screening	Reflection						
Unloading	65	90	50% Hard	Plant is completely hidden by barrier	Receiver is 1m or less from a facade	#NUM!	0	0	#NUM!	0.25	100%	0	36	36
						-22	-10	3	36					
						#NUM!	0	0	#NUM!					

**NOISE FROM MOBILE PLANT**

Plant Type	BS 5228 Ref. Average $L_{WA}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Equivalent On-time Factor (F)	Duration of Activity (hrs)	Duration of Activity (% of 15min)	Correction to $L_{Aeq}(15min)$	Activity $L_{Aeq}(15min)$	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection							
Arriving	69	90	250	100% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-19	-5	3	48	0.66	0.0333	0.1332	-9	39	39
Departing	71	90	250	100% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a facade	-19	-5	3	50	0.66	0.0167	0.0668	-11	#NUM!	#NUM!
							#NUM!	0	0	#NUM!					#NUM!	#NUM!
							#NUM!	0	0	#NUM!					#NUM!	#NUM!
							#NUM!	0	0	#NUM!					#NUM!	#NUM!
							#NUM!	0	0	#NUM!					#NUM!	#NUM!
							#NUM!	0	0	#NUM!					#NUM!	#NUM!
							#NUM!	0	0	#NUM!					#NUM!	#NUM!
							#NUM!	0	0	#NUM!					#NUM!	#NUM!

TOTAL Noise at Receptor (ALL sources)

36

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BS 5228-1:2009 Noise Predictions for Developments - Worksheet

Client:	ORS Ltd.
Project Code:	OR0301
Project Description:	Development of Tesco, Cavan.
Scenario Description:	Deliveries, impact at NML3 (280m).

Plant Type	B5 5228 Ref. $L_{Aeq}$ at 10m	Distance to Receptor (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Duration of Activity (hrs)	Duration of Activity (% of 15min)	Correction to $L_{Aeq}(15m)$	Activity $L_{Aeq}(15m)$	TOTAL Noise at Receptor (stationary sources)
						Distance	Screening	Reflection						
Unloading	65	280	50% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a façade	#NUM!	0	0	#NUM!	0.25	100%	0	29	29
					Receiver is 1m or less from a façade	#NUM!	-5	3	0					
						#NUM!	-34	3	29					
						#NUM!	0	0	#NUM!					

Plant Type	B5 5228 Ref. Average $L_{WA}$	Distance to Receptor at nearest point on route (m)	Distance of entire working route (m)	Ground Type (?)	Barriers (?)	Facades (?)	Adjustments			Resultant $L_{Aeq}$	Equivalent On-time Factor (F)	Distance Ratio	Duration of Activity (hrs)	Duration of Activity (% of 10hrs)	Correction to $L_{Aeq}(10h)$	Activity $L_{Aeq}(10h)$	TOTAL Noise at Receptor (mobile sources)
							Distance	Screening	Reflection								
Arriving	69	280	250	100% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a façade	-29	-5	3	38	0.9	0.0333	0.1332	-9	29	32	
Departing	71	280	250	100% Hard	Top of Plant can be seen behind barrier	Receiver is 1m or less from a façade	-29	-5	3	40	0.9	0.0167	0.0668	-11	29	29	
							#NUM!	0	0	#NUM!	#DIV/0!				#NUM!	#NUM!	
							#NUM!	0	0	#NUM!	#DIV/0!				#NUM!	#NUM!	
							#NUM!	0	0	#NUM!	#DIV/0!				#NUM!	#NUM!	
							#NUM!	0	0	#NUM!	#DIV/0!				#NUM!	#NUM!	
							#NUM!	0	0	#NUM!	#DIV/0!				#NUM!	#NUM!	
							#NUM!	0	0	#NUM!	#DIV/0!				#NUM!	#NUM!	
							#NUM!	0	0	#NUM!	#DIV/0!				#NUM!	#NUM!	

TOTAL Noise at Receptor (ALL sources)

34

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ID	Segment	Speed	%HGV	Receptor Distance (m)	AADT 2025			AADT 2040			AADT 2040		
					(Base)	(Base + Dev)	$L_{A10}$ (18-hr)	(Base)	(Base + Dev)	$L_{A10}$ (18-hr)	(Base)	(Base + Dev)	$L_{A10}$ (18-hr)
Site 1	Cock Hill (North)	50kph	1.9	120	5685	7662	54.4	6301	8279	55.8	55.8	1.2	
Site 2	Cock Hill (West)	50kph	1.0	45	3191	3350	56.5	3537	3696	57.1	57.1	0.2	
Site 3	Ardkeen East	50kph	1.0	420	6176	7420	47.5	6845	8089	48.7	48.7	0.7	
Site 4	Arkeen West	50kph	0.0	420	4104	4264	45.3	4549	4709	45.9	45.9	0.1	
Site 5	Cock Hill (South)	50kph	0.1	100	6757	7809	55.2	7489	8542	56.2	56.2	0.6	
Site 6	R212 East	50kph	1.5	645	15656	16357	49.5	17353	18055	50.0	50.0	0.2	
Site 7	R212 West	50kph	0.0	645	12505	12760	47.8	13861	14116	48.3	48.3	0.1	

$L_{A10,18hr}$  calculated for receptor in Lakeview Estate

CRTN calculated for: (a) impervious road surface, (b) gradient of 3%, (c) 50% absorbent ground cover, and (d) corrected for façade effect.

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## SAMPLING SHEET FOR NOISE

<b>Client:</b> ORS Ltd.		<b>Location:</b> Tesco, Cavan					
<b>Date:</b> 15/11/2022		<b>Time:</b> 11:00 – onward for the day					
<b>Project Ref:</b> OR0301		<b>Consultant(s):</b> CT					
<b>Survey Notes:</b> [1119] – dry, sunny, light breeze; rain – 0.0 mm; humidity – 76%; pressure – 989 hPa.							
Measuring Point Ref.	Sample No.	L <sub>Aeq</sub>	L <sub>A90</sub>	L <sub>A10</sub>	L <sub>Amax</sub>	L <sub>min</sub>	Additional Information
NML1 1114-1129 S899	1 of 3 Day	55.9	49.9	58.8	72.0	44.1	Wind Speed (m/s) <input type="text" value="2"/> Wind Direction <input type="text" value="S"/> Temperature (°C) <input type="text" value="8"/> Noise Sources: Construction to N of site (digger). Road traffic to E. Local traffic (occ.) onto construction site. Birdsong.
NML2 1132-1147 S900	1 of 3 Day	41.7	38.6	43.0	63.7	36.1	Wind Speed (m/s) <input type="text" value="2"/> Wind Direction <input type="text" value="S"/> Temperature (°C) <input type="text" value="8"/> Noise Sources: Distant construction noise (adj. site), distant traffic.
NML3 1153-1208 S901	1 of 3 Day	46.4	42.3	48.0	64.6	38.9	Wind Speed (m/s) <input type="text" value="2"/> Wind Direction <input type="text" value="S"/> Temperature (°C) <input type="text" value="8"/> Noise Sources: distant traffic, occ. local traffic (estate), birdsong.
NML1 1215-1230 S902	2 of 3 Day	67.6	51.6	67.8	94.2	46.8	Wind Speed (m/s) <input type="text" value="2"/> Wind Direction <input type="text" value="S"/> Temperature (°C) <input type="text" value="8"/> Noise Sources: construction noise adj. (digger & dumper), traffic noise on adj. rd., local construction site traffic.

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### SAMPLING SHEET FOR NOISE

<b>Client:</b> ORS Ltd.		<b>Location:</b> Tesco, Cavan					
<b>Date:</b> 15/11/2022		<b>Time:</b> 11:00 – onward for the day					
<b>Project Ref:</b> OR0301		<b>Consultant(s):</b> CT					
<b>Survey Notes:</b> [1235] – dry, sunny, light breeze; rain – 0.0 mm; humidity – 74%; pressure – 989 hPa.							
Measuring Point Ref.	Sample No.	L <sub>Aeq</sub>	L <sub>A90</sub>	L <sub>A10</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	Additional Information
NML2 1234-1249 S903	2 of 3 Day	44.1	40.3	45.8	57.9	38.0	Wind Speed (m/s) 3 Wind Direction S Temperature (°C) 9  Noise Sources: children in adj. school playground, distant construction noise, distant road traffic.
NML3 1255-1310 S904	2 of 3 Day	50.9	42.8	51.3	76.1	38.9	Wind Speed (m/s) 3 Wind Direction S Temperature (°C) 9  Noise Sources: traffic noise (local network), occ. local traffic, occ. pedestrians, birdsong.
NML1 1501-1516 S905	3 of 3 Day	62.8	54.5	62.8	86.8	48.9	Wind Speed (m/s) 2 Wind Direction SE Temperature (°C) 10  Noise Sources: construction noise (digger v. close to monitoring location), traffic on adj rd., occ. site traffic.
NML2 1519-1534 S906	3 of 3 Day	48.6	42.7	50.7	66.8	40.9	Wind Speed (m/s) 2 Wind Direction SE Temperature (°C) 9  Noise Sources: distant construction noise (digger), distant traffic noise.



**SAMPLING SHEET FOR NOISE**

<b>Client:</b> ORS Ltd.		<b>Location:</b> Tesco, Cavan										
<b>Date:</b> 15/11/2022		<b>Time:</b> 11:00 – onward for the day										
<b>Project Ref:</b> OR0301		<b>Consultant(s):</b> CT										
<b>Survey Notes:</b> [1543] – dry, sunny, light breeze; rain – 0.0 mm; humidity – 69%; pressure – 987 hPa.												
Measuring Point Ref.	Sample No.	L <sub>Aeq</sub>	L <sub>A90</sub>	L <sub>A10</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	Additional Information					
NML3 1541-1556 S907	3 of 3 Day	48.8	45.7	50.6	61.3	42.5	Wind Speed (m/s)	3	Wind Direction	SE	Temperature (°C)	9
<b>Noise Sources:</b> traffic noise (network), occ. local traffic, birdsong.												

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**SAMPLING SHEET FOR NOISE**

<b>Client:</b> ORS Ltd.		<b>Location:</b> Tesco, Cavan										
<b>Date:</b> 15/11/2022		<b>Time:</b> 21:00 – onward for the day										
<b>Project Ref:</b> OR0301		<b>Consultant(s):</b> CT										
<b>Survey Notes:</b> [2110] – dry, clear, light breeze; rain – 0.0 mm; humidity – 88%; pressure – 986 hPa.												
Measuring Point Ref.	Sample No.	L <sub>Aeq</sub>	L <sub>A90</sub>	L <sub>A10</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	Additional Information					
NML1 2108-2123 S908	1 of 1 Evening	52.1	44.7	56.0	64.7	42.4	Wind Speed (m/s)	2	Wind Direction	E	Temperature (°C)	5
Noise Sources: traffic noise (adj. rd.), distant traffic noise.												
NML2 2126-2141 S909	1 of 1 Evening	41.3	37.6	43.6	55.3	33.5	Wind Speed (m/s)	2	Wind Direction	E	Temperature (°C)	5
Noise Sources: distant traffic noise.												
NML3 2150-2210 S910	1 of 1 Evening	44.4	40.6	46.5	53.5	37.4	Wind Speed (m/s)	2	Wind Direction	E	Temperature (°C)	6
Noise Sources: distant traffic noise, occ. local traffic noise.												

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### SAMPLING SHEET FOR NOISE

<b>Client:</b> ORS Ltd.		<b>Location:</b> Tesco, Cavan					
<b>Date:</b> 15 & 16/11/2022		<b>Time:</b> 23:00 – onward for the day					
<b>Project Ref:</b> OR0301		<b>Consultant(s):</b> CT					
<b>Survey Notes:</b> [2302] – dry, clear, light breeze; rain – 0.0 mm; humidity – 89%; pressure – 986 hPa.							
Measuring Point Ref.	Sample No.	L <sub>Aeq</sub>	L <sub>A90</sub>	L <sub>A10</sub>	L <sub>Amax</sub>	L <sub>Amin</sub>	Additional Information
NML1 2300-2315 S911	1 of 3 Night	47.7	41.3	49.8	63.9	38.0	Wind Speed (m/s) <input type="text" value="3"/> Wind Direction <input type="text" value="SE"/> Temperature (°C) <input type="text" value="6"/> Noise Sources: traffic noise (adj. rd.), distant traffic noise.
NML2 2319-2334 S912	1 of 3 Night	39.1	34.2	41.4	55.0	31.9	Wind Speed (m/s) <input type="text" value="3"/> Wind Direction <input type="text" value="SE"/> Temperature (°C) <input type="text" value="5"/> Noise Sources: distant traffic noise.
NML3 2343-2358 S913	1 of 3 Night	39.2	35.7	41.3	49.4	33.0	Wind Speed (m/s) <input type="text" value="3"/> Wind Direction <input type="text" value="SE"/> Temperature (°C) <input type="text" value="5"/> Noise Sources: distant traffic noise.
NML1 0009-0024 S914	2 of 3 Night	44.3	36.2	44.9	62.4	33.0	Wind Speed (m/s) <input type="text" value="4"/> Wind Direction <input type="text" value="SE"/> Temperature (°C) <input type="text" value="4"/> Noise Sources: distant traffic noise.

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### SAMPLING SHEET FOR NOISE

<b>Client:</b> ORS Ltd.		<b>Location:</b> Tesco, Cavan										
<b>Date:</b> 15 & 16/11/2022		<b>Time:</b> 23:00 – onward for the day										
<b>Project Ref:</b> OR0301		<b>Consultant(s):</b> CT										
<b>Survey Notes:</b> [0030] – dry, clear, light breeze; rain – 0.0 mm; humidity – 89%; pressure – 985 hPa.												
Measuring Point Ref.	Sample No.	L <sub>Aeq</sub>	L <sub>A90</sub>	L <sub>A10</sub>	L <sub>Amax</sub> & L <sub>Amin</sub>	L <sub>den</sub>	Additional Information					
NML2 0027-0042 S915	2 of 3 Night	37.7	32.1	40.5	53.8	29.8	Wind Speed (m/s)	3	Wind Direction	SE	Temperature (°C)	5
Noise Sources: distant traffic noise.												
NML3 0051-0104 S916	2 of 3 Night	37.2	32.1	39.4	55.6	29.8	Wind Speed (m/s)	3	Wind Direction	SE	Temperature (°C)	4
Noise Sources: distant traffic noise.												
NML1 0114-0129 S917	3 of 3 Night	40.8	33.4	41.8	59.8	31.0	Wind Speed (m/s)	3	Wind Direction	SE	Temperature (°C)	4
Noise Sources: occ. adj. traffic noise, distant traffic noise.												
NML2 0132-0147 S918	3 of 3 Night	36.0	30.4	39.1	59.0	28.2	Wind Speed (m/s)	3	Wind Direction	SE	Temperature (°C)	4
Noise Sources: distant traffic noise.												

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**SAMPLING SHEET FOR NOISE**

<b>Client:</b> ORS Ltd.		<b>Location:</b> Tesco, Cavan										
<b>Date:</b> 15 & 16/11/2022		<b>Time:</b> 23:00 – onward for the day										
<b>Project Ref:</b> OR0301		<b>Consultant(s):</b> CT										
<b>Survey Notes:</b> [0158] – dry, clear, light breeze; rain – 0.0 mm; humidity – 88%; pressure – 985 hPa.												
Measuring Point Ref.	Sample No.	L <sub>Aeq</sub>	L <sub>A90</sub>	L <sub>A10</sub>	L <sub>Amax</sub> & L <sub>Amin</sub>	L <sub>den</sub>	Additional Information					
NML3 0155-0210 S919	3 of 3 Night	34.7	31.2	36.7	53.2	28.2	Wind Speed (m/s)	3	Wind Direction	S	Temperature (°C)	5
Noise Sources: distant traffic noise.												

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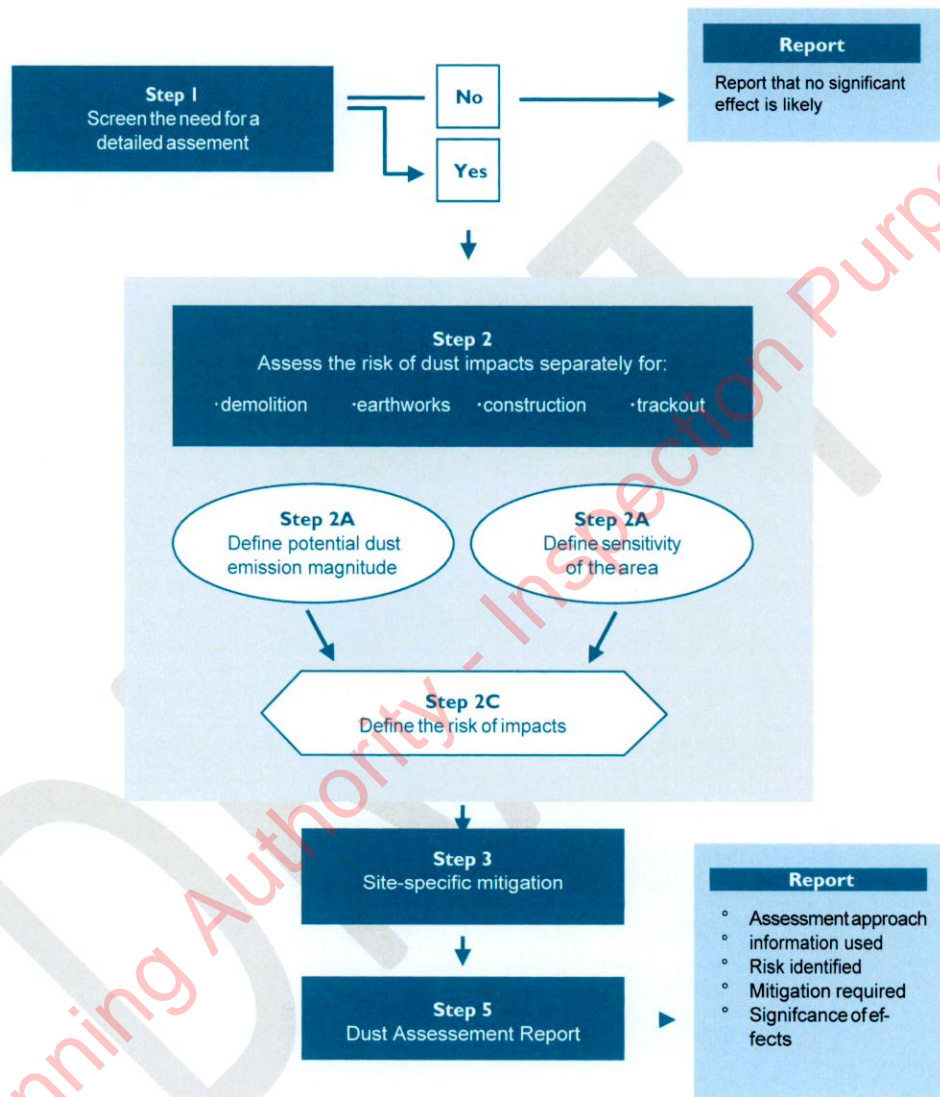
## 12.0 Air Quality and Climate

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Methodology for construction dust assessment to evaluate the potential impacts, construction activities are divided into demolition, earthworks, construction and track out. The factors are based upon the IAQM construction dust guidance. The assessment follows the steps proposed in the guidance as per **Appendix Figure 12.1** below.

**Appendix Figure 12.1: Steps to Perform a Dust Assessment (IAQM, 2014)**



Step 1 and Step 2 methods from the IAQM construction dust guidance are defined below to assign dust risk categories for each of the different construction actions.

**Step 1: Screen the requirement for assessment**

Step 1 is to screen out the necessity for construction dust assessment at all, this is usually a somewhat conservative level of screening. An assessment is usually necessary where there is;



**A human receptor within;**

- 350 m of the boundary of the site or
- 50m of the route used by construction vehicles on the public highway, up to 500 m from the site entrances.

**An ecological receptor;**

- 50m off the site boundary
- 50m of the route used by construction vehicles on the public highway, up to 500 m from the site entrances.

**Step 2A: Defining the potential dust emission magnitude**

**Demolition**

The dust emission magnitude classification for demolition is different for each site in terms of timing, building type, time period and size. Examples of the potential dust emission classes are provided in the guidance are as follows;

Large: total building volume > 50,000 m<sup>3</sup>, potentially dusty construction material, on site crushing and screening, demolition activities > 20m above ground level;

Medium: total building volume 20,000 m<sup>3</sup> to 50,000 m<sup>3</sup>, potentially dust creating construction material, demolition activities 10m to 20m above ground level

Small: total building volume < 20,000 m<sup>3</sup>, construction material with low potential for dust release, demolition activities less than 10 meters above ground, demolition during winter months.

**Earthworks**

The dust emission magnitude classification for earthworks is different for each site in terms of timing, geology, topography and time-scale. Examples of the potential dust emission classes are provided in the guidance as follows;

Large: total site area > 10,000 m<sup>2</sup>, potentially dusty soil type e.g. clay, greater than 10 heavy earth moving vehicles active at any one time, formation of bunds greater than 8m in height, total material moved > 100,000 tonnes;

Medium: total site area 2,500 to 10,000 m<sup>2</sup>, moderately dusty soil type e.g. silt, 5 to 10 heavy earth moving vehicles active at any one time, formation of bunds 4 to 8 m in height, total material moved 20,000 to 100,000 tonnes;

Small: total site area less than 2500 m<sup>2</sup>, soil type with large grain size e.g. sand, less than five heavy earth moving vehicles active at any one time, formation of bunds < 4 meters in height, total material moved < 10,000 tonnes, earthworks during wetter months.

## Construction

The dust emission magnitude classification for construction is varied for each site in terms of timing, building type, duration, and scale. Examples of the potential dust emissions classes are provided in the guidance as follows:

Large: total building volume > 100,000 m<sup>3</sup>, piling, on site concrete batching;

Medium: Total building volume 25,000 to 100,000 m<sup>3</sup>, potentially dusty construction material e.g. concrete, piling, on site concrete batching;

Small: total building volume less than 25,000 m<sup>3</sup>, construction material with low potential for dust release e.g. metal cladding or timber.

## Track out

Considerations which determine the dust emission magnitude class of trackout activities are vehicle size, vehicle speed, vehicle number, geology and duration. Examples of the potential dust emissions classes are provided in the guidance as follows;

Large: Greater than 50 HDV (>3.5 tons) trips in any one day, potentially dusty surface material e.g. high clay content, unpaved road length greater than 100 meters;

Medium: 10 to 50 HDV (>3.5 tons) trips in any one day, moderately dusty surface material e.g. high clay content, unpaved road length 50 to 100 meters;

Small: Less than 10 HDV greater (>3.5 tons) trips in any one day, surface material with low potential for dust release unpaved road length less than 50 meters.

## Step 2B: Defining the sensitivity of the area

The sensitivity of the area is specified for dust soiling, human health and ecosystems. The sensitivity of the area takes into account the following considerations;

- the specific sensitivities of receptors in the area
- the proximity and number of those receptors
- the local background concentration
- site specific factors, such as weather there are natural shelters such as trees, to reduce the risk of windblown dust.

**Appendix Table 12.1** has been used to describe the sensitivity of varying types of receptors, dust soiling, health effects and ecological effects.



**Appendix Table 12.1: Sensitivity of the Locality**

Sensitivity	Dust Soiling	Human Receptors	Ecological Receptors
<b>High</b>	<ul style="list-style-type: none"> <li>users can reasonably expect enjoyment of a high level of amenity; or</li> <li>the appearance, aesthetics or value of their property would be diminished by soiling; and</li> <li>the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.</li> <li>indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.</li> </ul>	<ul style="list-style-type: none"> <li>locations where members of the public are exposed over a period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).</li> <li>Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.</li> </ul>	<ul style="list-style-type: none"> <li>locations with an international or national designation and the designated features may be affected by dust soiling; or</li> <li>locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain.</li> <li>indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.</li> </ul>
<b>Medium</b>	<ul style="list-style-type: none"> <li>users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or</li> <li>the appearance, aesthetics or value of their property could be diminished by soiling; or</li> <li>the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.</li> <li>indicative examples include parks and places of work.</li> </ul>	<ul style="list-style-type: none"> <li>locations where the people exposed are workers, and exposure is over a time relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).</li> <li>indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work legislation.</li> </ul>	<ul style="list-style-type: none"> <li>locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or</li> <li>locations with a national designation where the features may be affected by dust deposition.</li> <li>indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.</li> </ul>
<b>Low</b>	<ul style="list-style-type: none"> <li>the enjoyment of amenity would not reasonably be expected; or</li> <li>property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or</li> <li>there is transient</li> </ul>	<ul style="list-style-type: none"> <li>locations where human exposure is transient.</li> <li>indicative examples include public footpaths, playing fields, parks and shopping streets.</li> </ul>	<ul style="list-style-type: none"> <li>locations with a local designation where the features may be affected by dust deposition.</li> <li>indicative example is a local Nature Reserve with dust sensitive features.</li> </ul>



	<p>exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.</p> <ul style="list-style-type: none"> <li>indicative examples include playing fields, farmland (unless commercially-sensitive horticultural), footpaths, short term car parks and roads.</li> </ul>		
--	--	--	--

Regarding the sensitivities assigned of the different types of receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification for the area can be defined for each. **Appendix Table 12.2** to a **Appendix Table 12.4** indicate the method used to determine the sensitivity of the area for dust soiling, human health and ecological impacts, respectively.

For trackout, as per the guidance, it is only considered necessary consider trackout impacts up to 50m from the edge of the road.

**Appendix Table 12.2: Sensitivity of the Area to Dust Soiling Effects on People and Property**

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Appendix Table 12.3: IAQM 2014 Sensitivity of the area to Human Health

Receptor Sensitivity	Annual Mean PM10 concentration	Number of Receptors	Distance from the Source (m)					
			<20	<50	<100	<200	<350	
High	>32 µg/m <sup>3</sup> (>18 µg/m <sup>3</sup> in Scotland)	>100	High	High	High	Medium	Low	
		10-100	High	High	Medium	Low	Low	
		1-10	High	Medium	Low	Low	Low	
	28-32 µg/m <sup>3</sup> (16-18 µg/m <sup>3</sup> in Scotland)	>100	High	High	Medium	Low	Low	
		10-100	High	Medium	Low	Low	Low	
		1-10	High	Medium	Low	Low	Low	
	24-28 µg/m <sup>3</sup> (14-16 µg/m <sup>3</sup> in Scotland)	>100	High	Medium	Low	Low	Low	
		10-100	High	Medium	Low	Low	Low	
		1-10	Medium	Low	Low	Low	Low	
	<24 µg/m <sup>3</sup> (<14 µg/m <sup>3</sup> in Scotland)	>100	Medium	Low	Low	Low	Low	
		10-100	Low	Low	Low	Low	Low	
		1-10	Low	Low	Low	Low	Low	
	Medium	>32 µg/m <sup>3</sup> (>18 µg/m <sup>3</sup> in Scotland)	>10	High	Medium	Low	Low	Low
			1-10	Medium	Low	Low	Low	Low
		28-32 µg/m <sup>3</sup> (16-18 µg/m <sup>3</sup> in Scotland)	>10	Medium	Low	Low	Low	Low
1-10			Low	Low	Low	Low	Low	
24-28 µg/m <sup>3</sup> (14-16 µg/m <sup>3</sup> in Scotland)		>10	Low	Low	Low	Low	Low	
		1-10	Low	Low	Low	Low	Low	
<24 µg/m <sup>3</sup> (<14 µg/m <sup>3</sup> in Scotland)		>10	Low	Low	Low	Low	Low	
		1-10	Low	Low	Low	Low	Low	
Low		-	≥1	Low	Low	Low	Low	Low



**Appendix Table 12.4: IAQM 2014 Sensitivity of the area to Ecological Impacts**

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

The final step is to use both the dust emission magnitude classification with the sensitivity of the area, to establish a potential risk of effects for each construction activity, before the use of mitigation.

Appendix Table 12.5 to Appendix Table 12.6 shows the method used to assign the level of risk for each construction activity.

**Appendix Table 12.5: IAQM 2014 Risk of Dust Impacts from Earthworks/Construction**

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

**Appendix Table 12.6: IAQM 2014 Risk of Dust Impacts from Trackout**

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

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**Appendix Table 12.7: Projected Traffic Data (SYSTRA)**

Site No.	Link	Speed (kph)	%HGV	DM 2025	DS 2025
1	Cavan Eastern Bypass North	50	5	5685	7662
2	Cock Hill	50	5	3191	3350
3	Ardkeen East	50	5	6176	7420
4	Arkeen West	50	5	4104	4264
5	Cavan Eastern Bypass South	50	5	6757	7809
6	R212 East	50	5	15656	16357
7	R212 West	50	5	12505	12760

**Appendix Table 12.8: DMRB Receptor Info R1**

Link	Distance from Link to Receptor (m)	DM	Annual Average Speed (km/hr)	Road Type	Total % LDV	Total % HGV
Cavan Eastern Bypass South	3	6757	50	A	95	5
Cock Hill	3	3191	50	A	95	5

**Appendix Table 12.9: DMRB Receptor Info R2**

Link	Distance from Link to Receptor (m)	DM	Annual Average Speed (km/hr)	Road Type	Total % LDV	Total % HGV
Cavan Eastern Bypass South	3	6757	50	A	95	5
R212 East	3	15656	50	A	95	5

Appendix Table 12.10: DMRB Receptor Info R3

Link	Distance from Link to Receptor (m)	DM	Annual Average Speed (km/hr)	Road Type	Total % LDV	Total % HGV
Cavan Eastern Bypass South	3	6757	50	A	95	5
Ardkeen East	3	6176	50	B	95	5

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## 13.0 Micro-Climate

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Appendix 13.1

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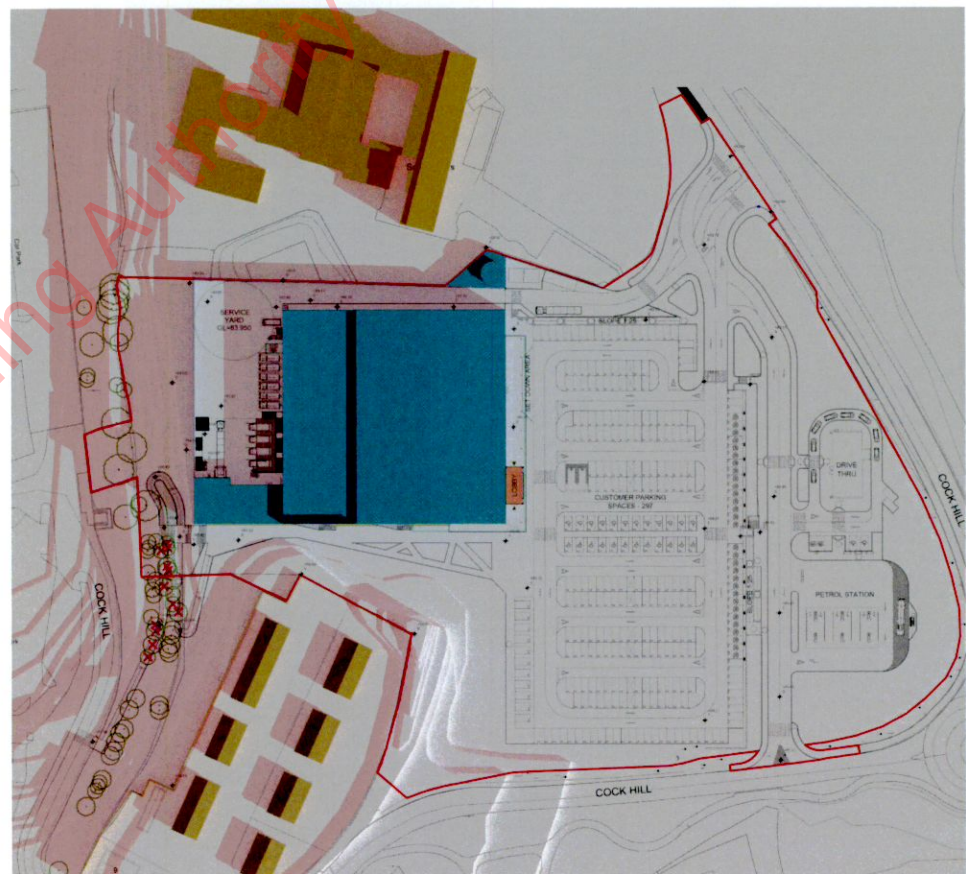
Figure 13.2.1: Shadow diagrams 21 March 09:00 UTC



Existing



Proposed



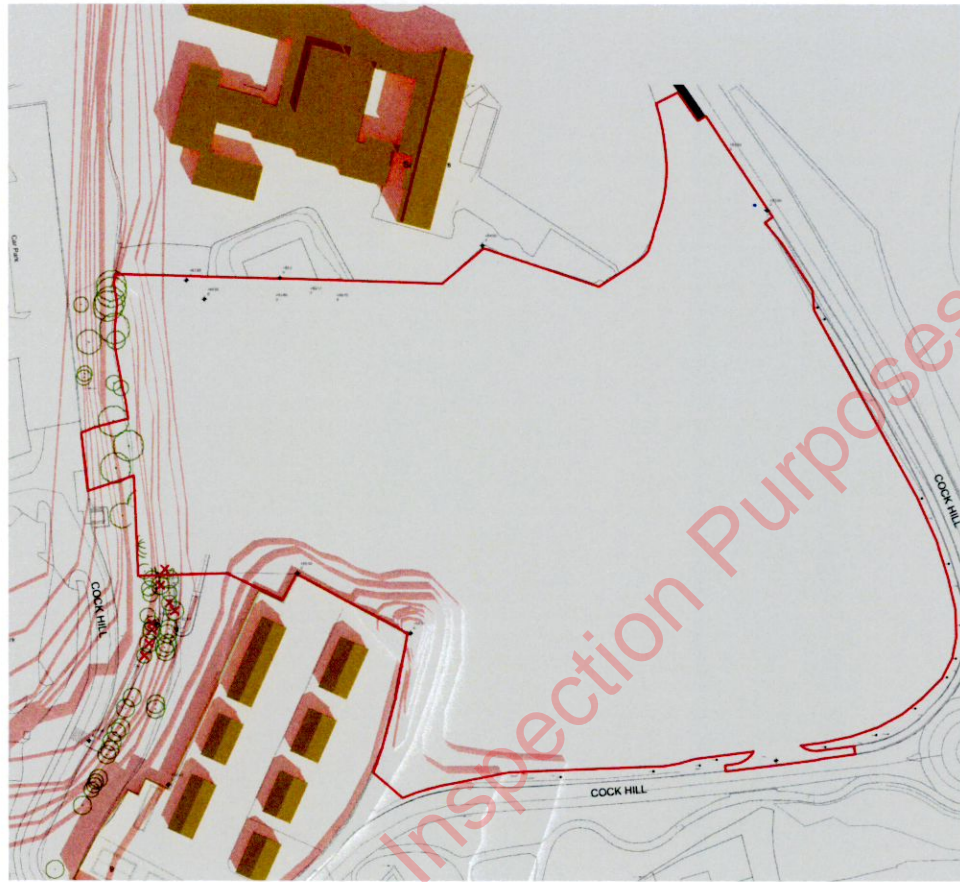
Cavan Planning Authority - Inspection Purposes Only!



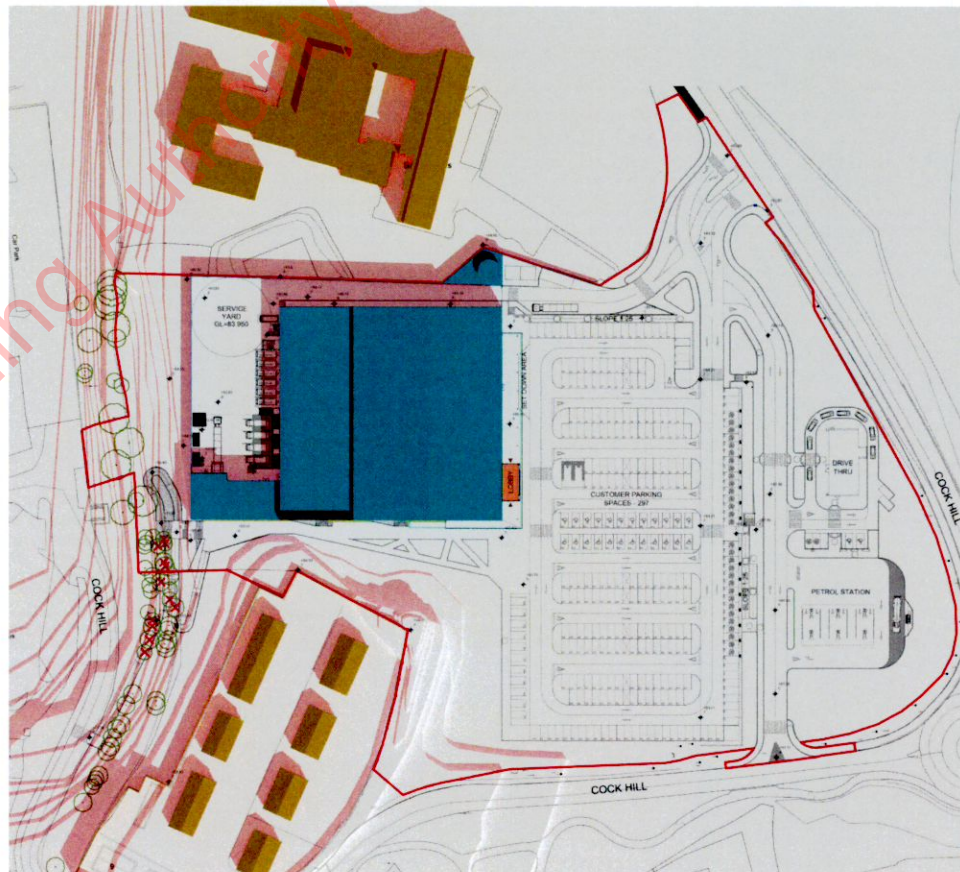
Figure 13.2.2: Shadow diagrams 21 March 11:00 UTC



Existing



Proposed



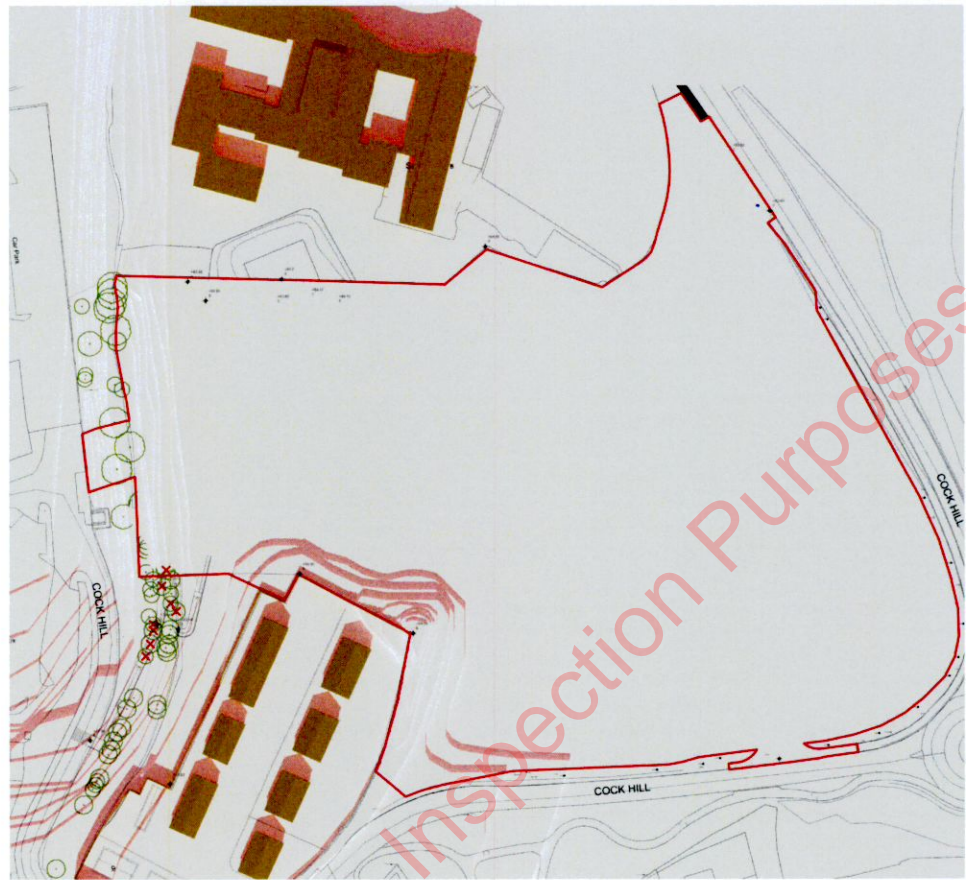
Cavan Planning Authority - Inspection Purposes Only!



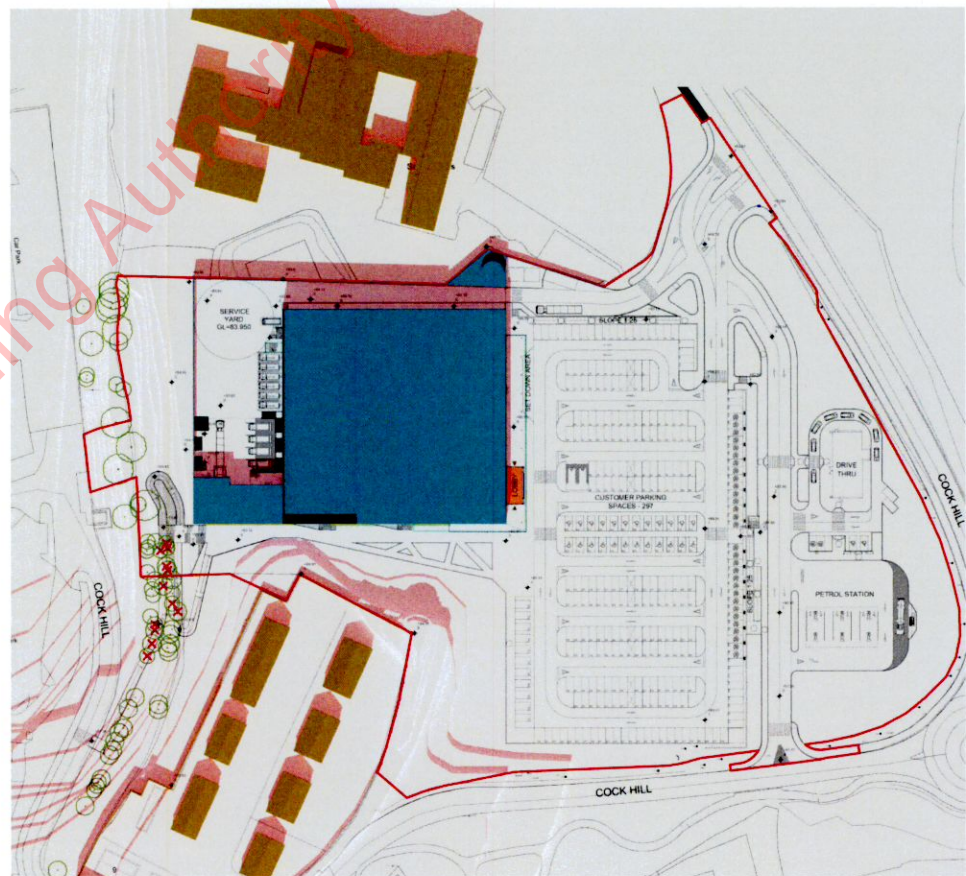
Figure 13.2.3: Shadow diagrams 21 March 13:00 UTC



Existing



Proposed



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Figure 13.2.4: Shadow diagrams 21 March 15:00 UTC



Existing



Proposed

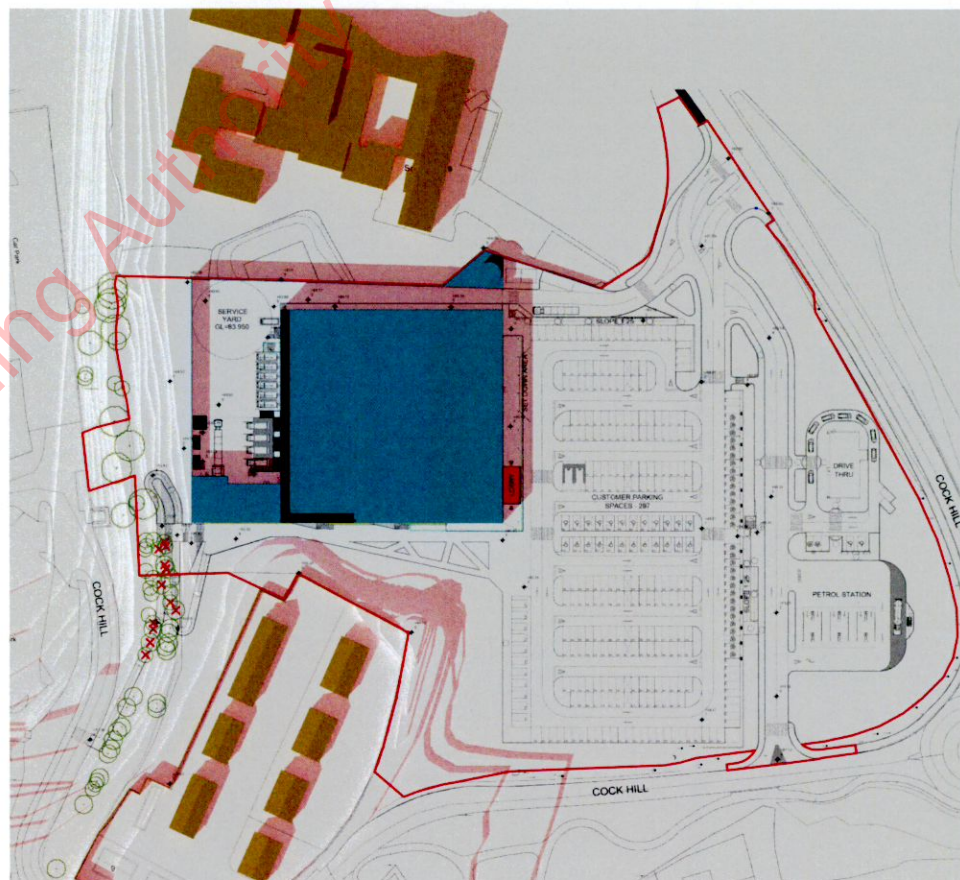




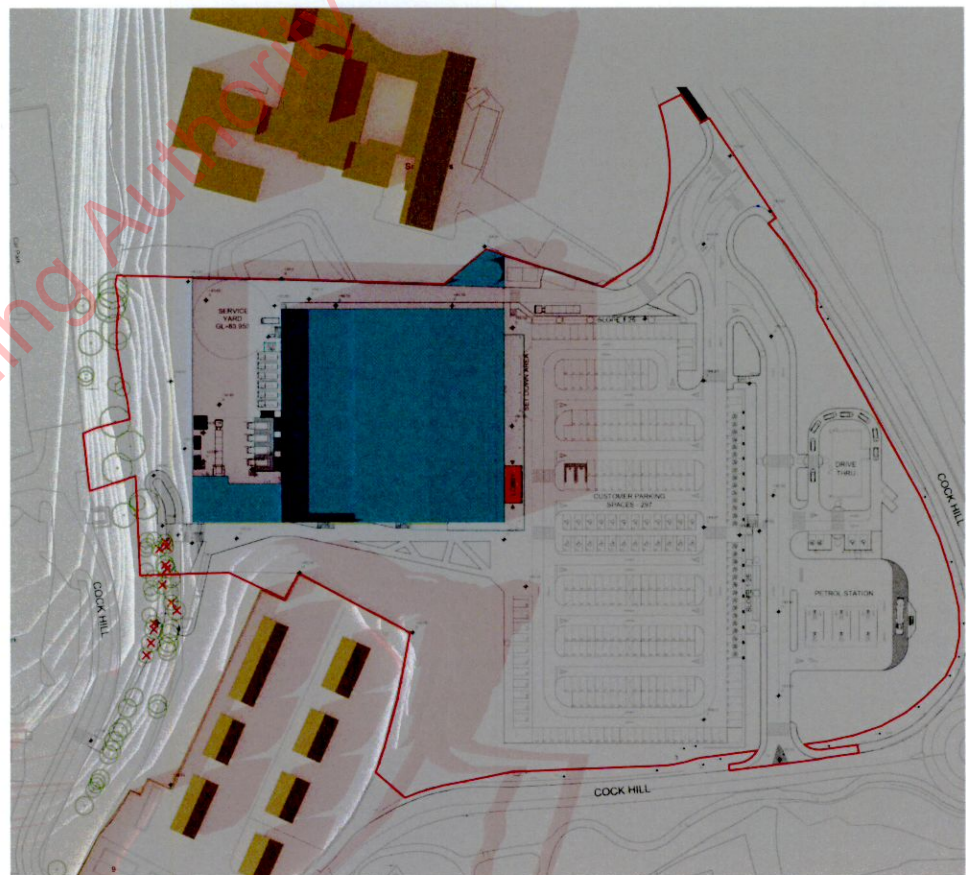
Figure 13.2.5: Shadow diagrams 21 March 5:00 UTC



Existing



Proposed



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Figure 13.2.6: Shadow diagrams 21 June 09:00 UTC+1



Existing



Proposed

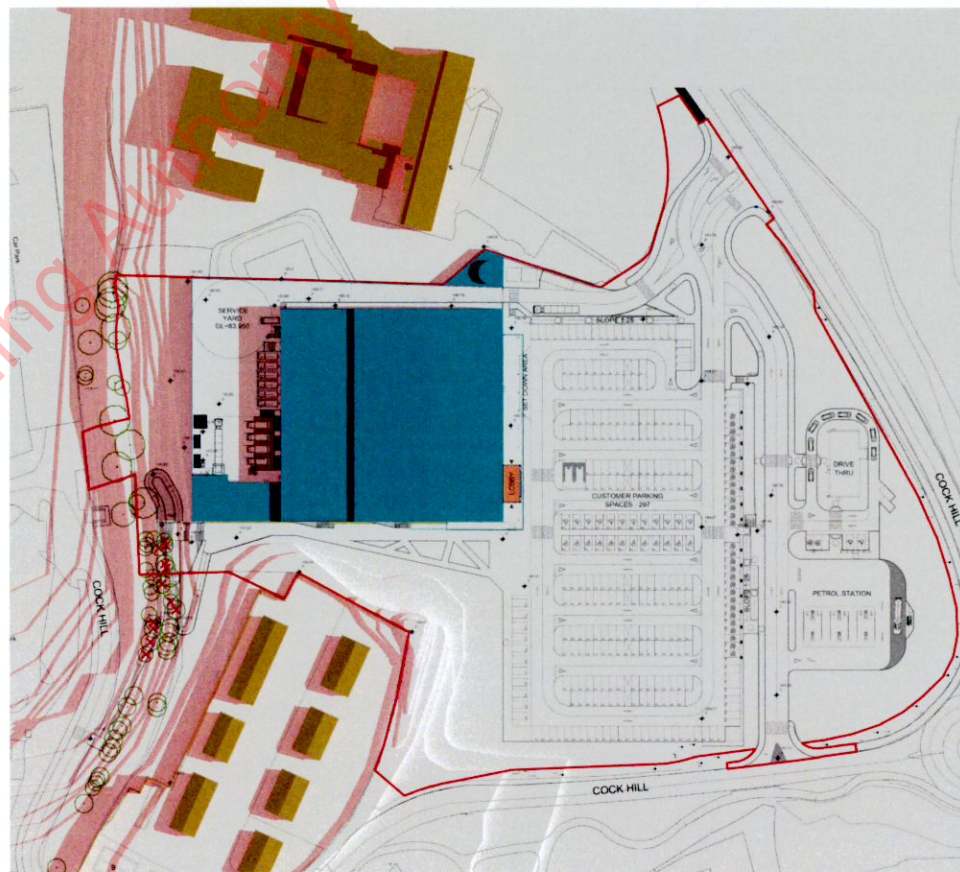
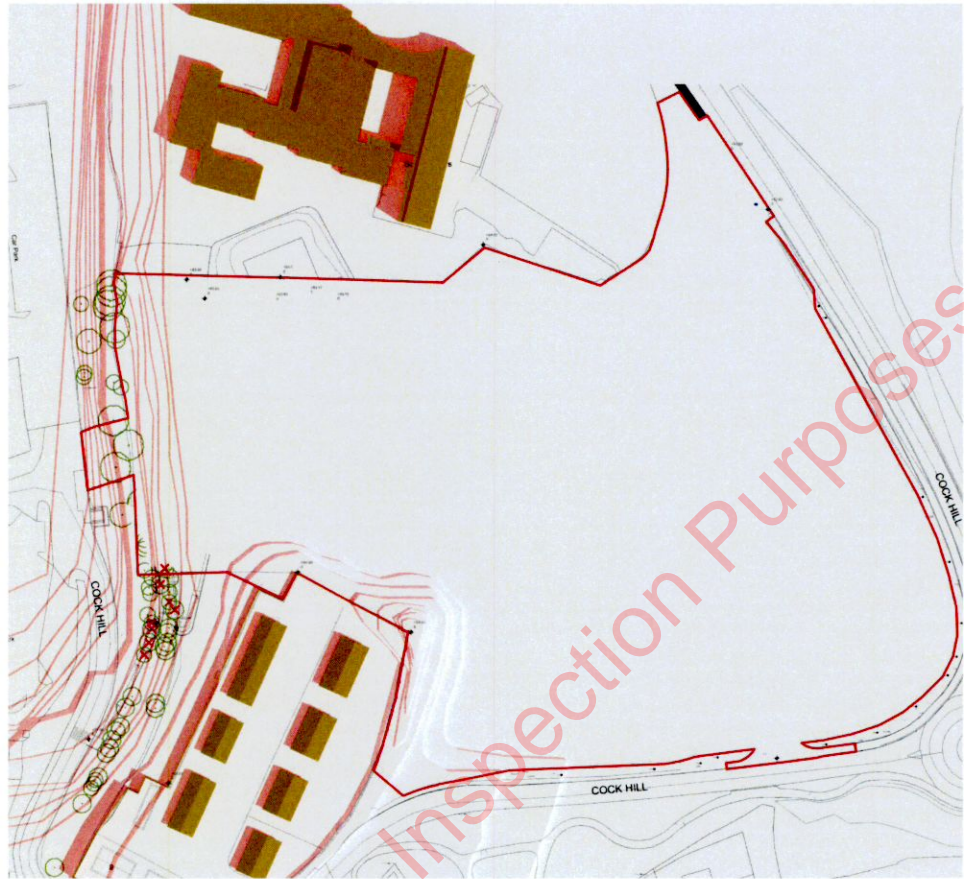




Figure 13.2.7: Shadow diagrams 21 June 11:00 UTC+1



Existing



Proposed

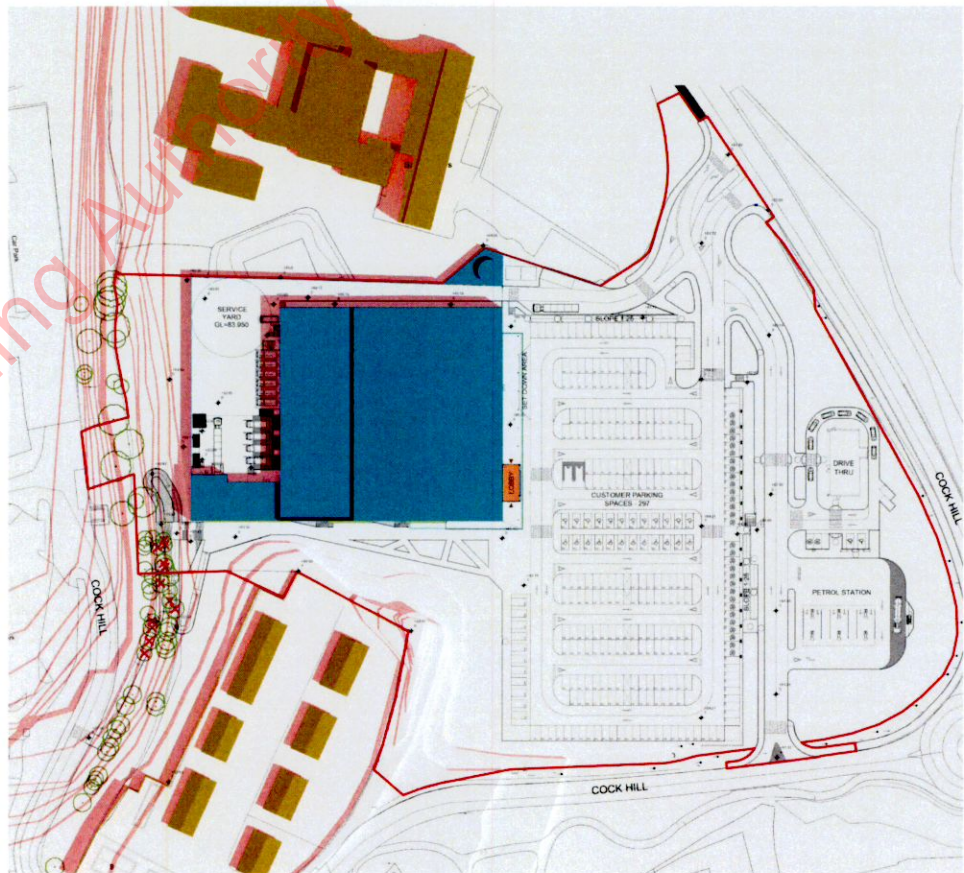
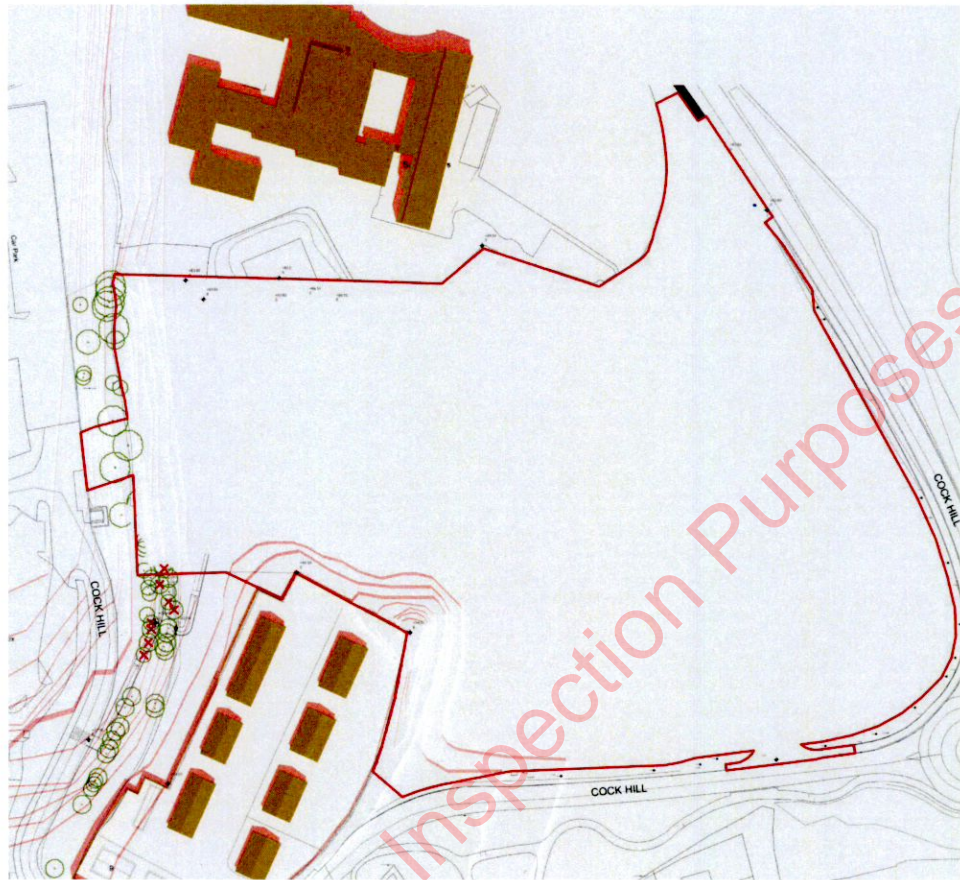




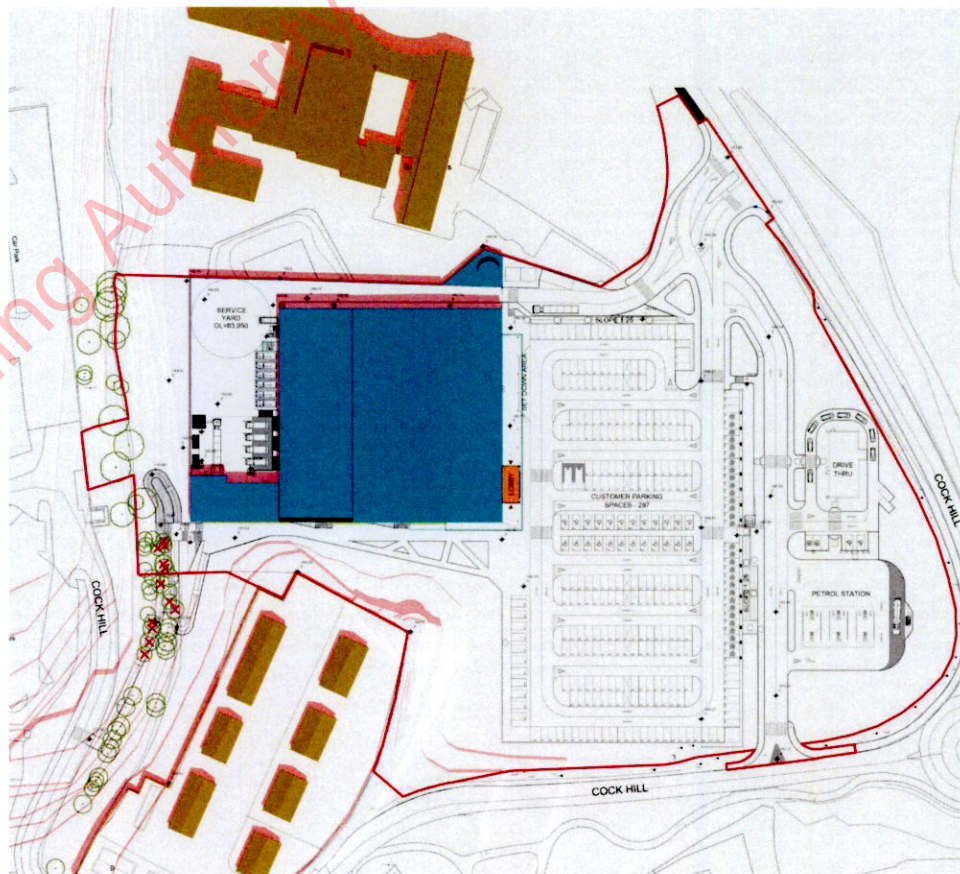
Figure 13.2.8: Shadow diagrams 21 June 13:00 UTC+1



Existing



Proposed



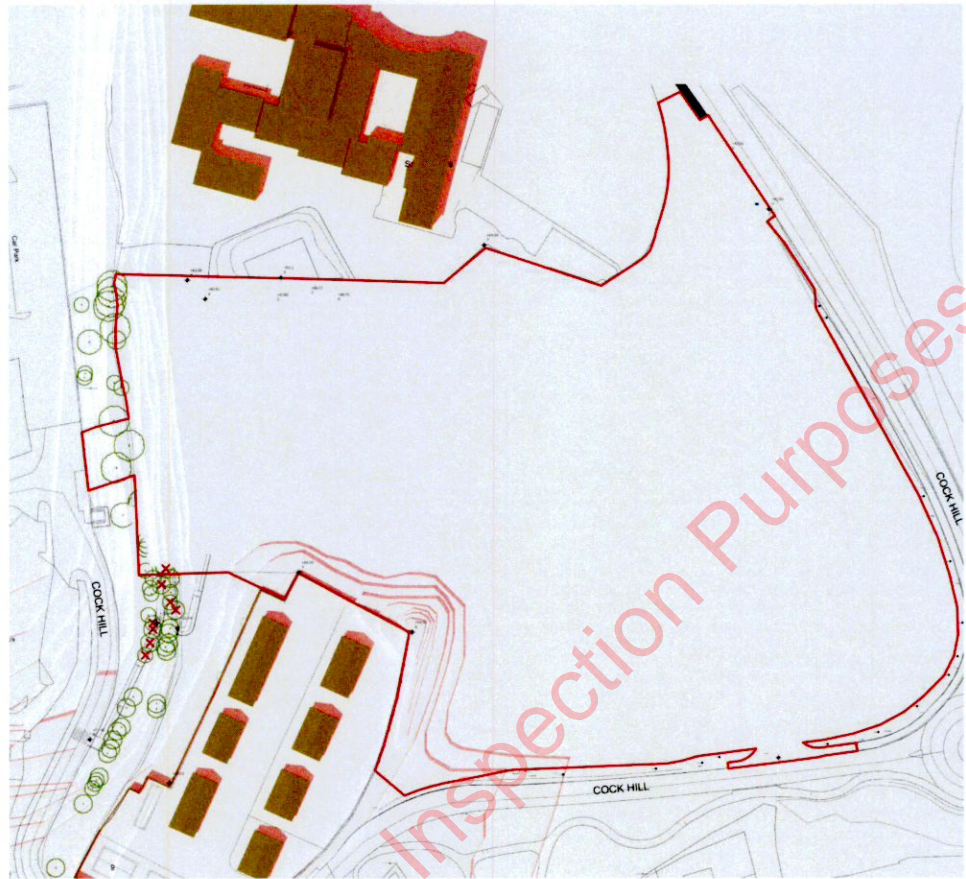
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Figure 13.2.9: Shadow diagrams 21 June 15:00 UTC+1



Existing



Proposed

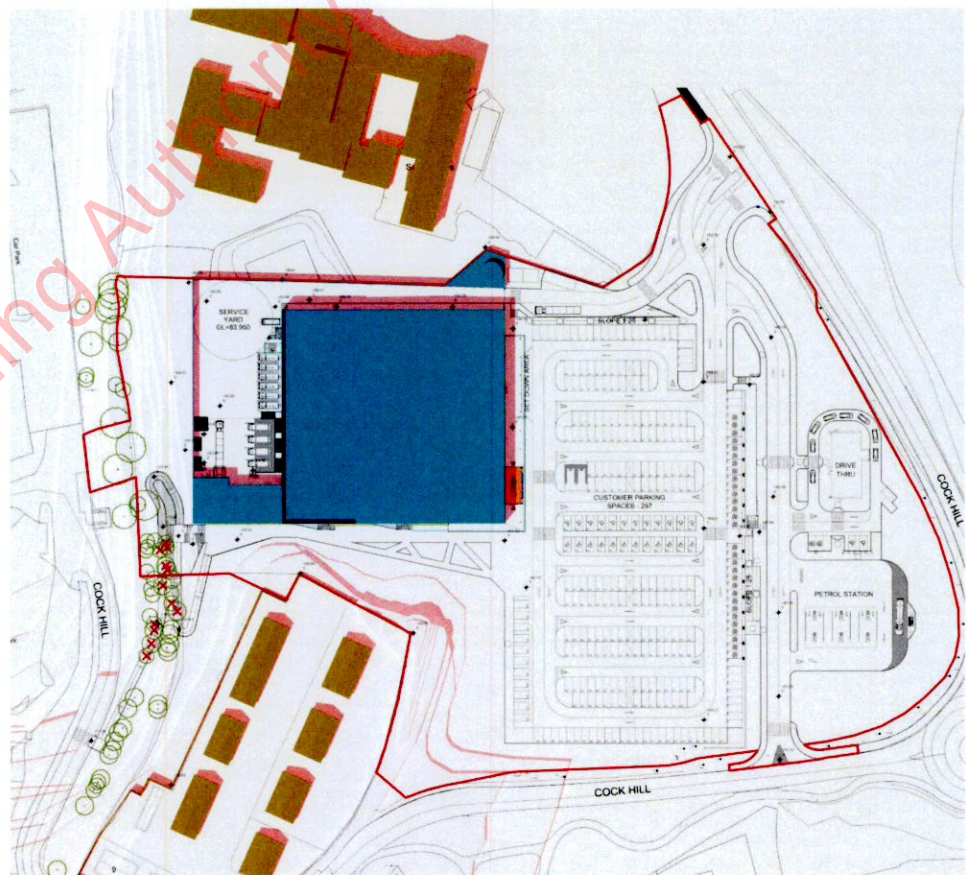




Figure 13.2.10: Shadow diagrams 21 June 10:00 UTC+1



Existing



Proposed

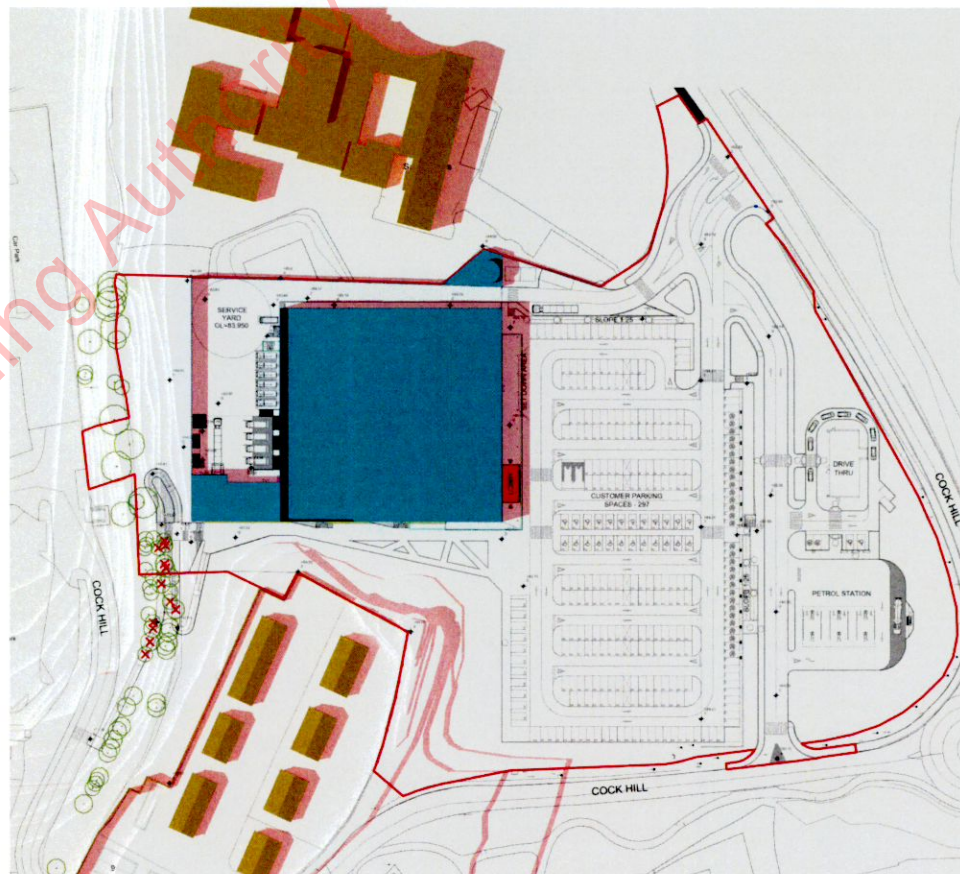




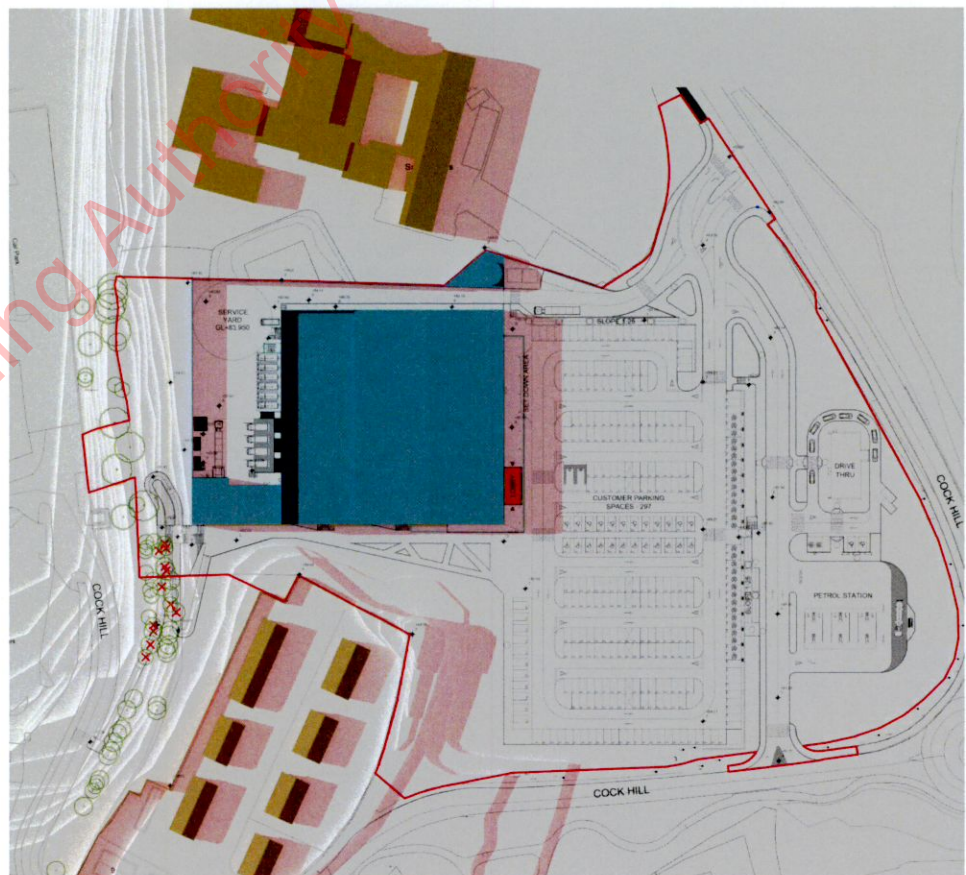
Figure 13.2.11: Shadow diagrams 21 June 11:00 UTC+1



Existing



Proposed



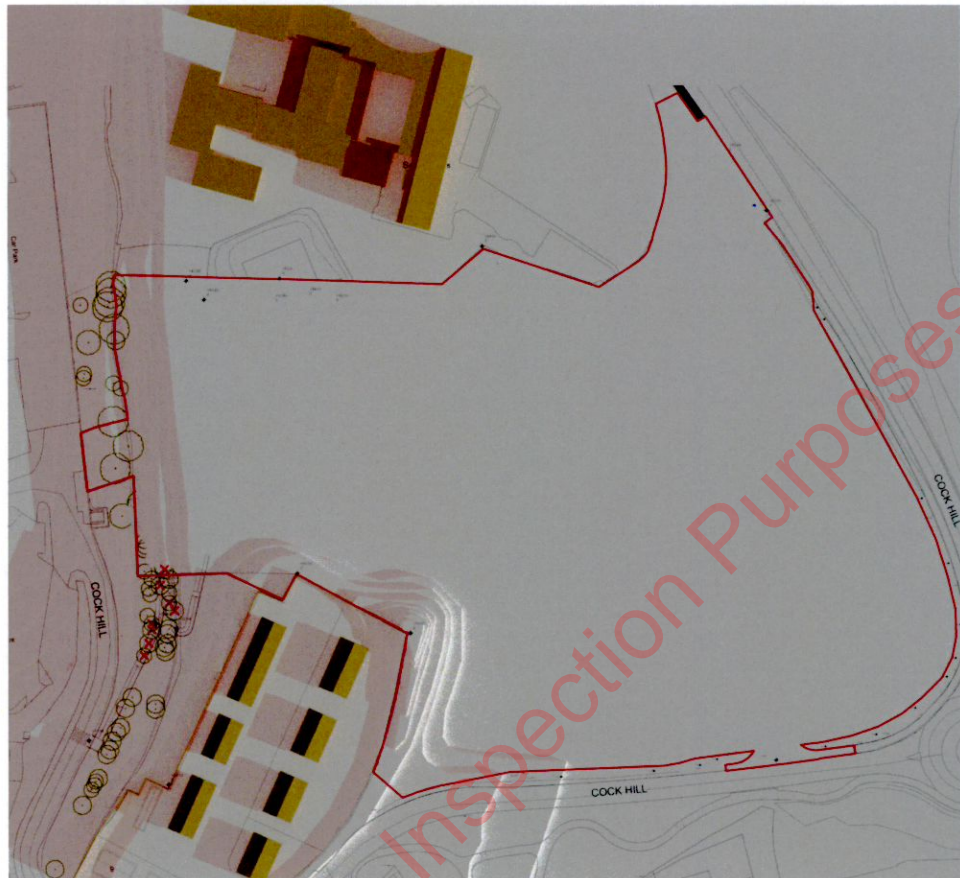
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Figure 13.2.12: Shadow diagrams 21 September 09:00 UTC+1



Existing



Proposed

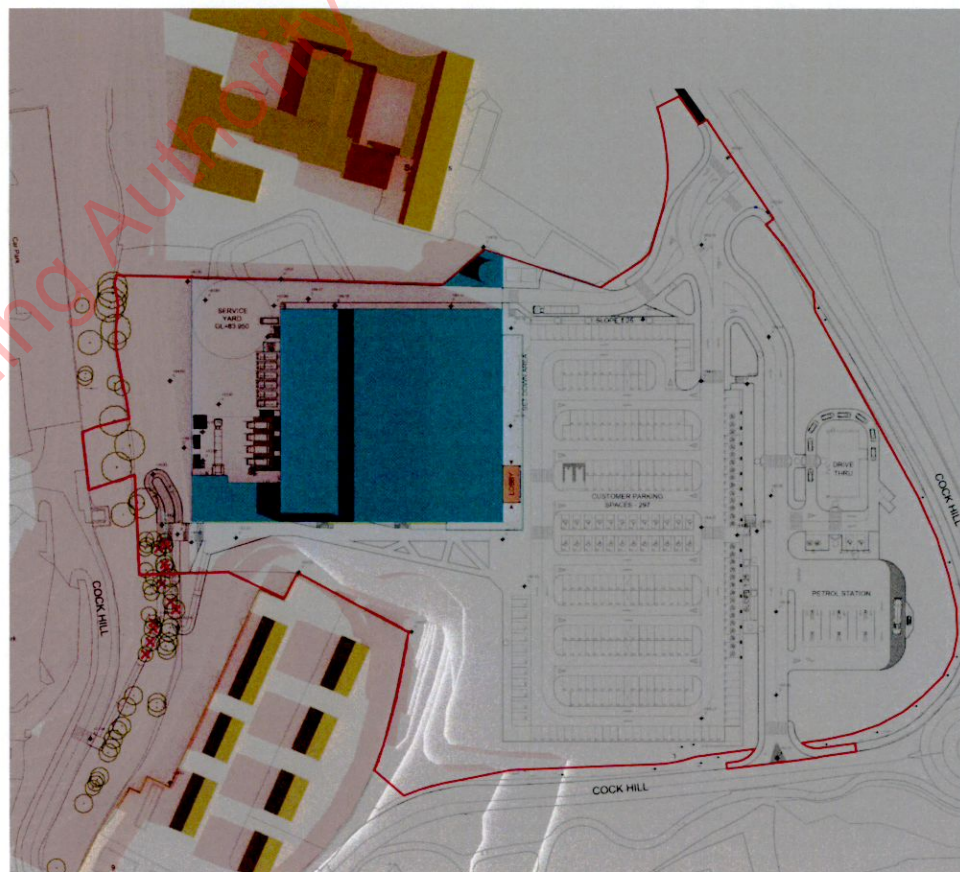
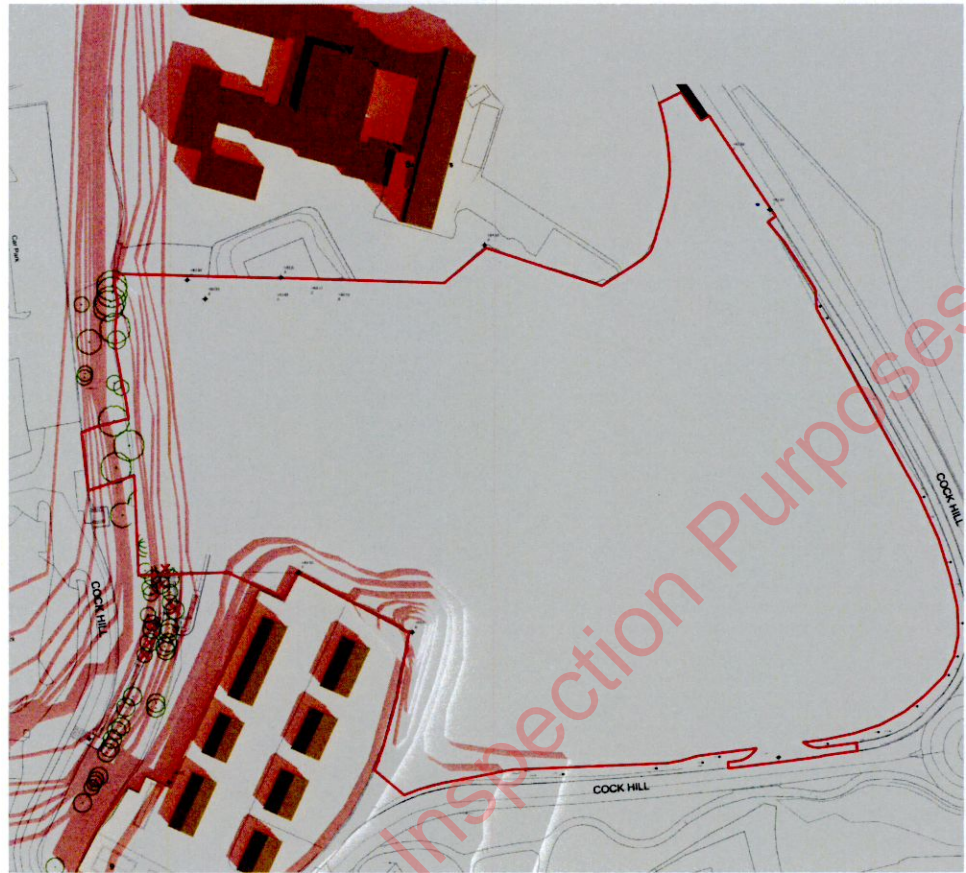




Figure 13.2.13: Shadow diagrams 21 September 11:00 UTC+1



Existing



Proposed

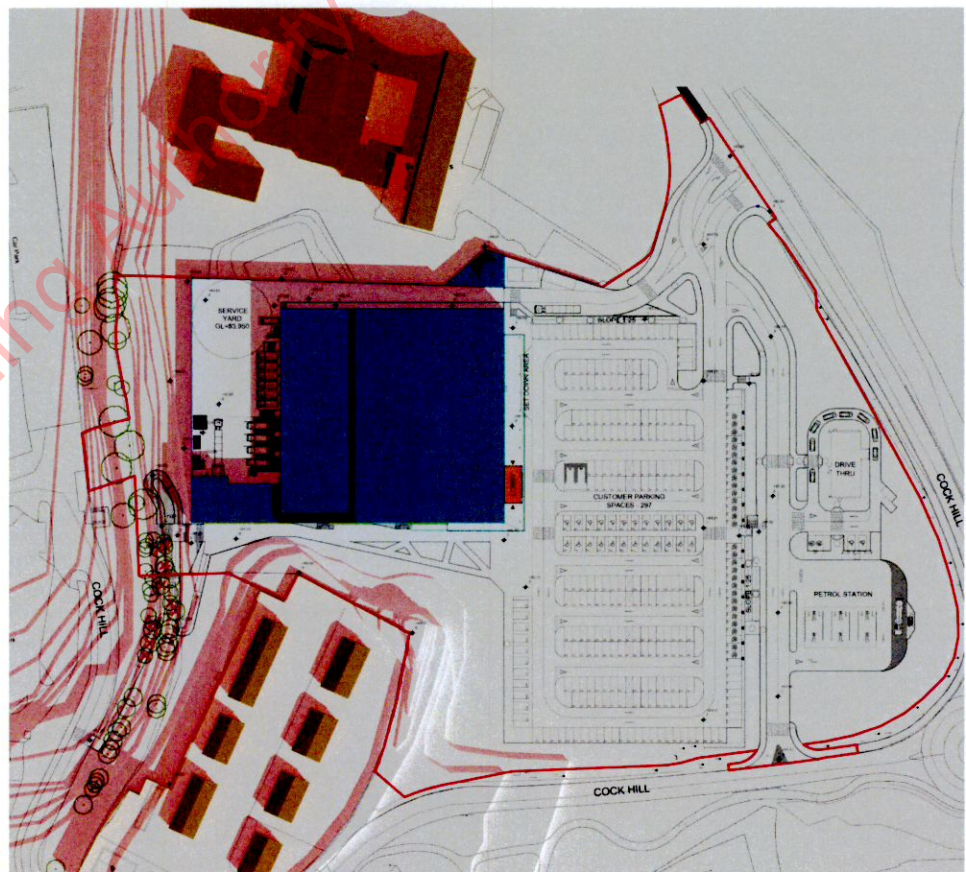
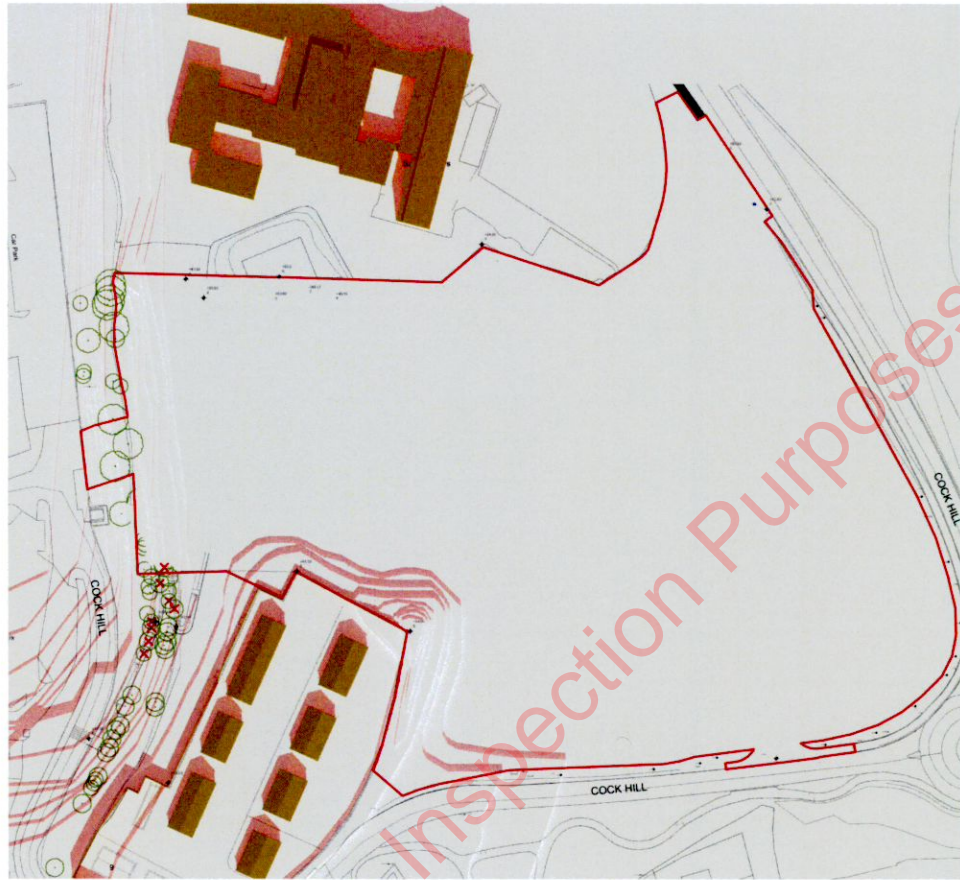




Figure 13.2.14: Shadow diagrams 21 September 13:00 UTC+1



Existing



Proposed

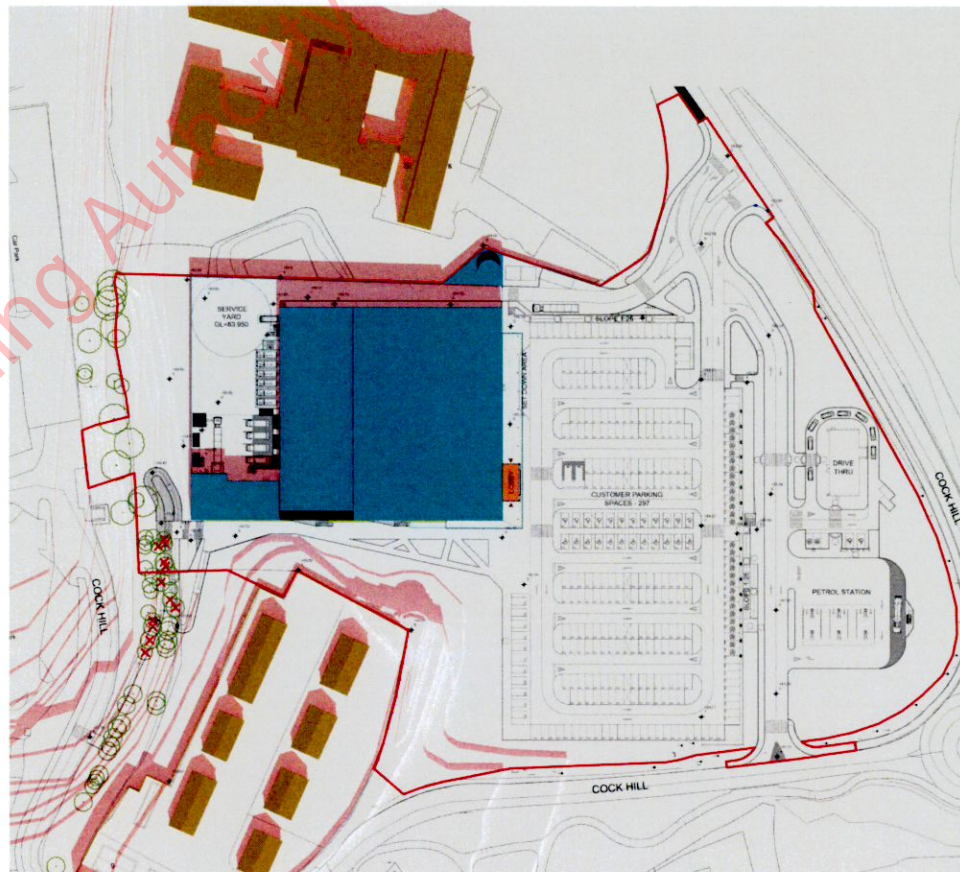




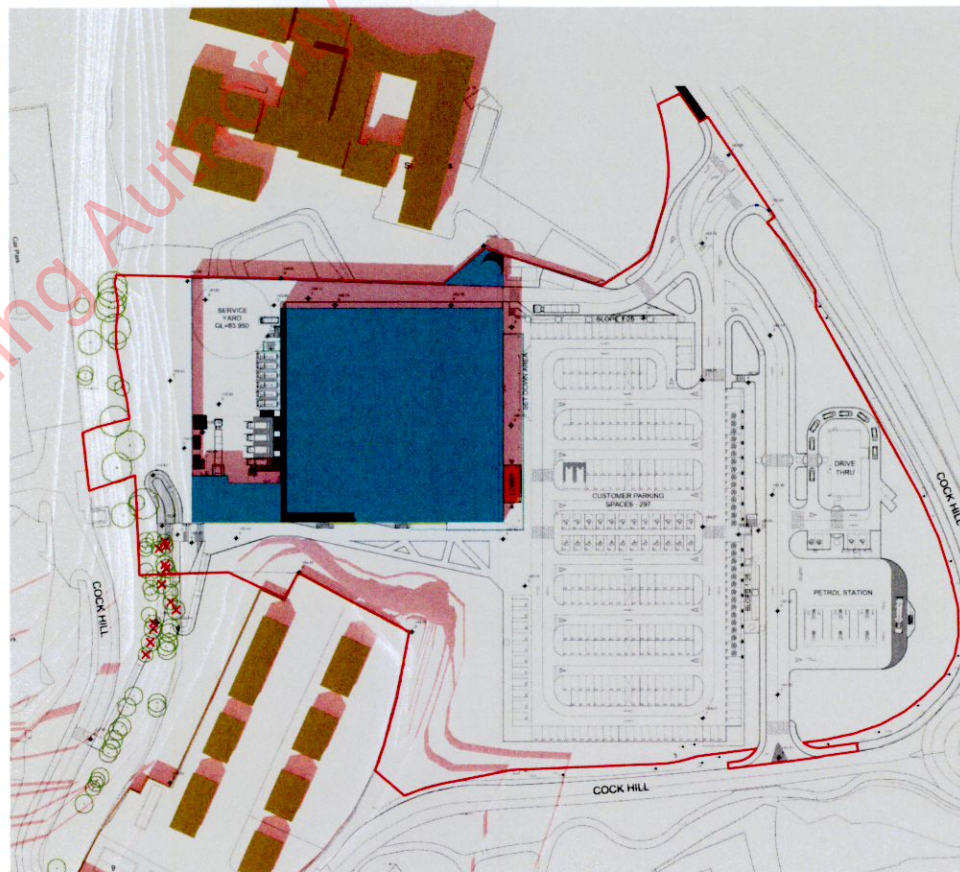
Figure 13.2.15: Shadow diagrams 21 September 15:00 UTC+1



Existing



Proposed



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Figure 13.2.16: Shadow diagrams 21 September 16:00 UTC+1



Existing



Proposed

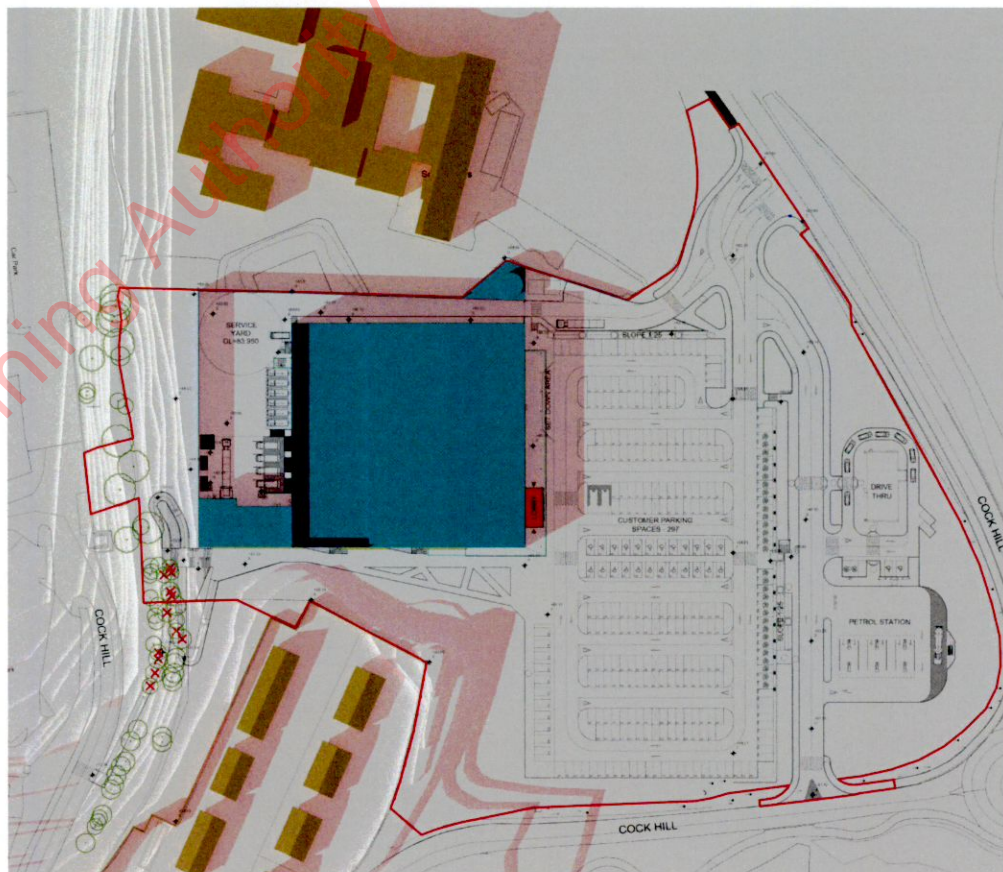




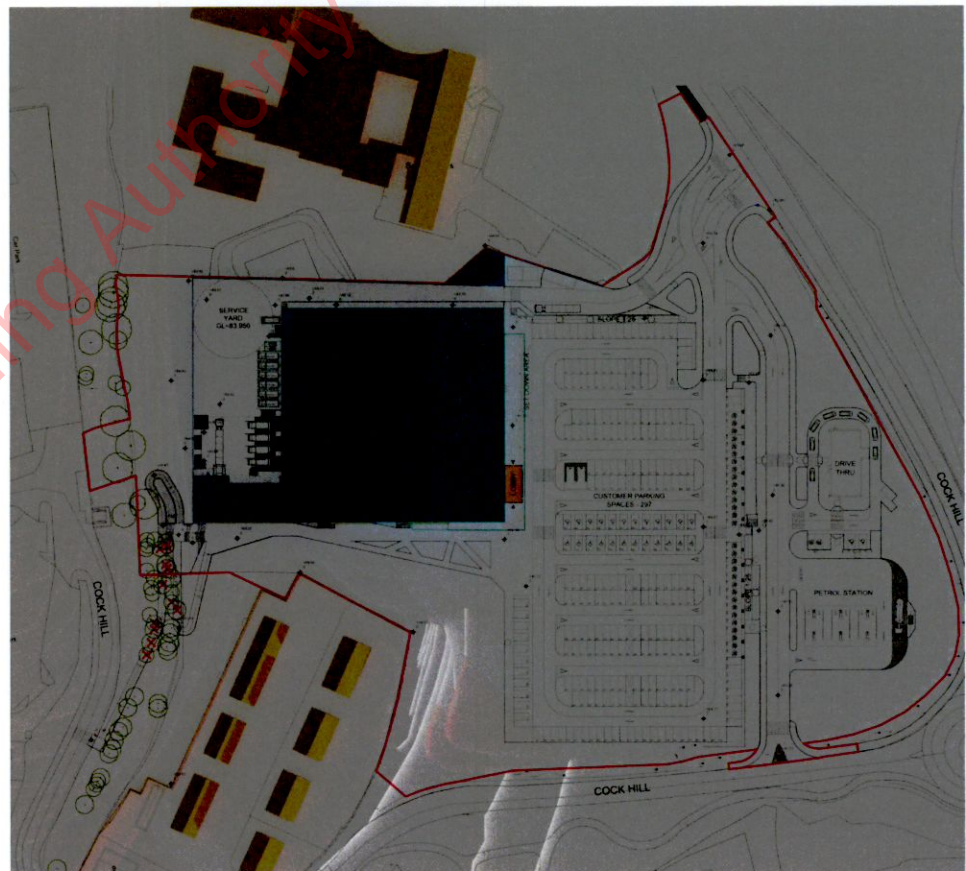
Figure 13.2.17: Shadow diagrams 21 December 09:00 UTC



Existing



Proposed



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Figure 13.2.18: Shadow diagrams 21 December 11:00 UTC



Existing



Proposed

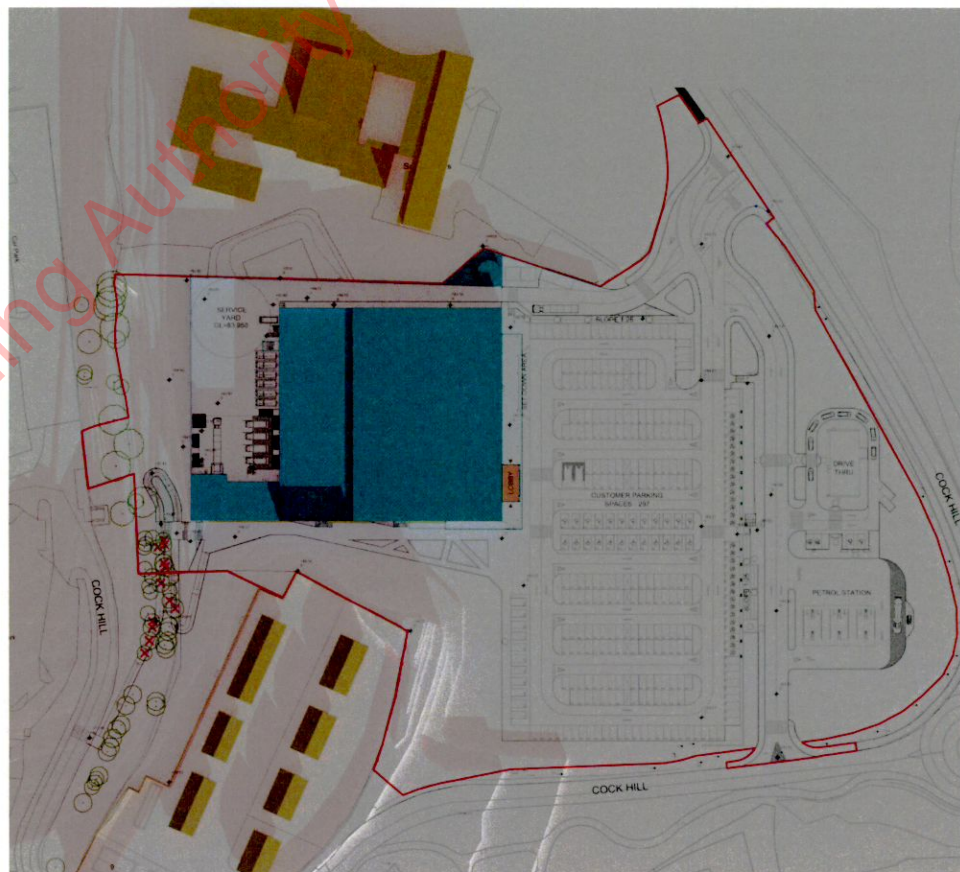




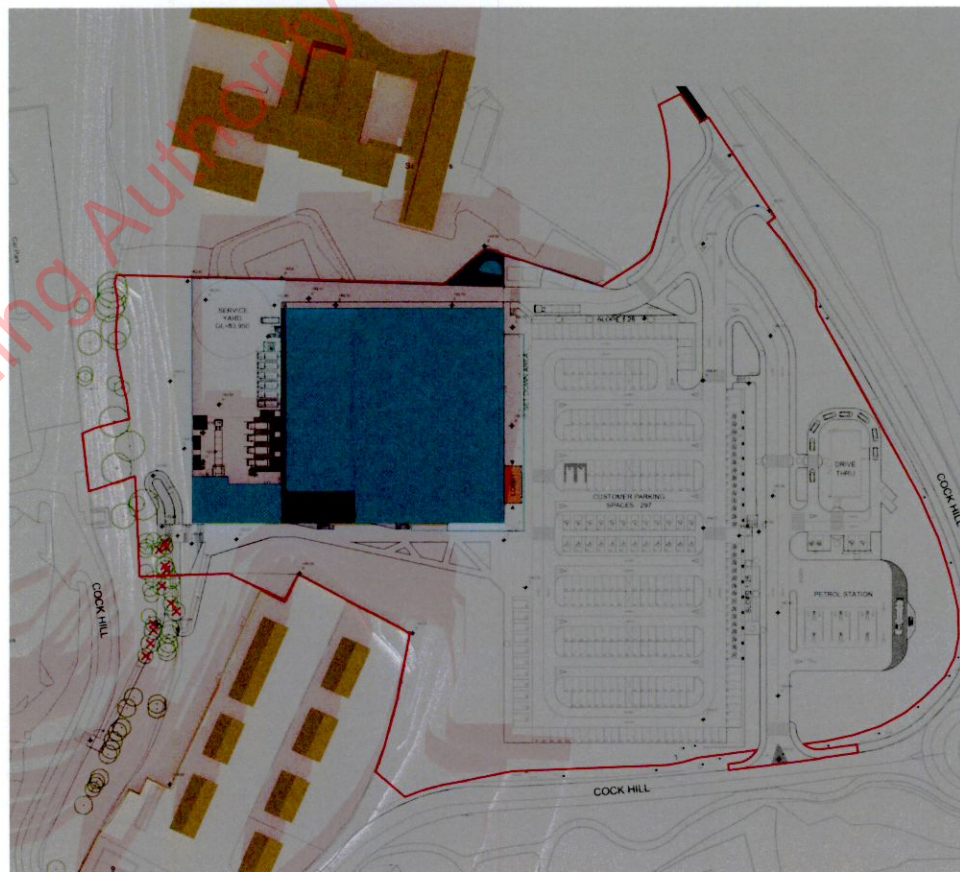
Figure 13.2.19: Shadow diagrams 21 December 13:00 UTC



Existing



Proposed



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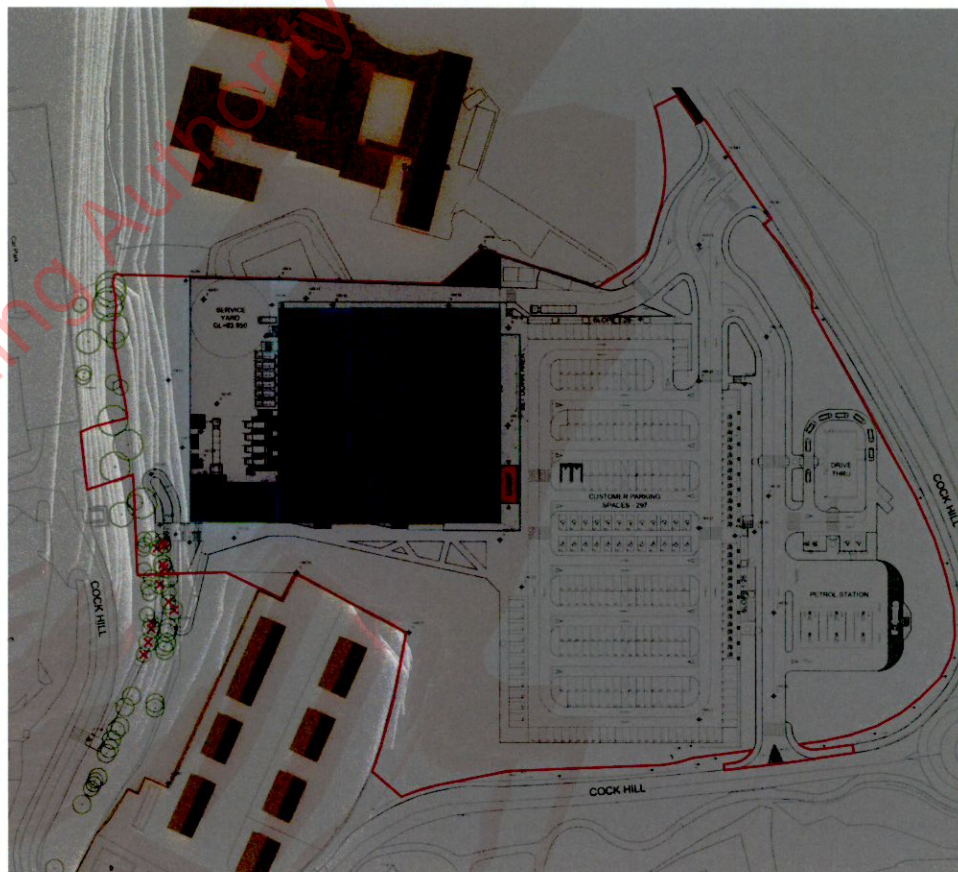
Figure 13.2.20: Shadow diagrams 21 December 15:00 UTC



Existing



Proposed



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## 14.0 Landscape and Visual Impact Assessment

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# Tesco Cavan Town

## LVIA Photomontages

December 2022



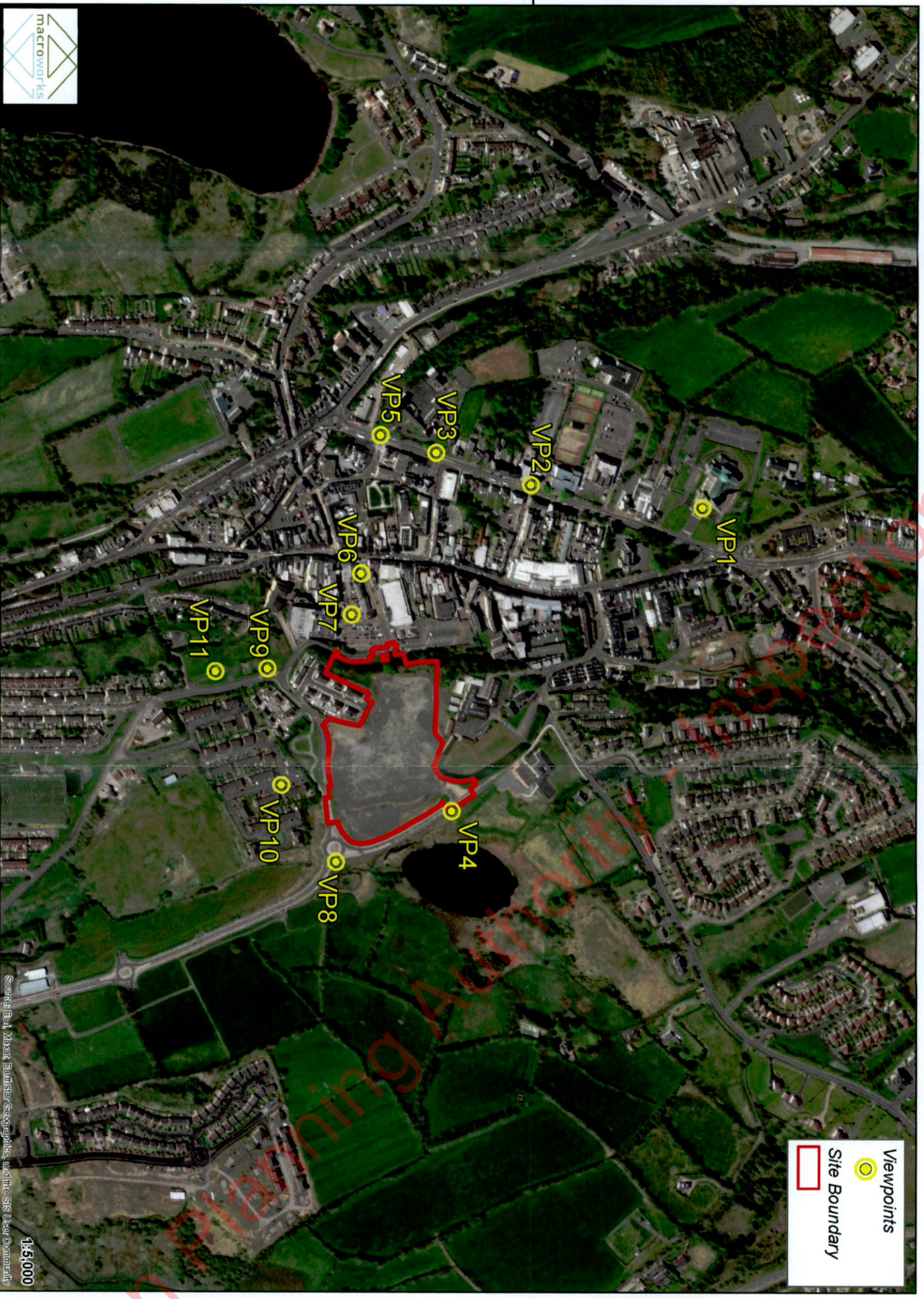
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**INDEX**

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Existing View + Outline View
- Viewpoint 2: Corner of R212 and Thomas Ashe Street  
Existing View + Outline View
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Existing View + Outline View
- Viewpoint 4: Cock Hill Road at entrance to Gaelscoil Bhréifne  
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Montage View- Established vegetation

**Viewpoint locations selected for the Tesco Retail Development project - Cavan Town**



642000

643000

Source: Esri, Maxar, Earthstar (Satellite Imagery), and the GIS User Community





**Outline View**  
 indicating physical position and scale of the proposed development irrespective of screening

Proposed development

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.  
 To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Eastings (ITM): 641871	Lens: 50mm / Full Frame Sensor	Date: 09/11/2022
Northing (ITM): 805255	Camera: Canon 1-D Mark II digital SLR	Time: 15:39
Direction of View: SE	Camera Height: 1.7m Above Ground Level	
Angle of View: 80°		







**Outline View**  
 indicating physical position and scale of the  
 proposed development irrespective of screening

Proposed development

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM): 641837  
 Northing (ITM): 804998  
 Direction of View: SE  
 Angle of View: 80°

Lens: 50mm / Full Frame Sensor  
 Camera: Canon 1-D Mark II digital SLR  
 Camera Height: 1.7m Above Ground Level

Date: 09/11/2022  
 Time: 15:27



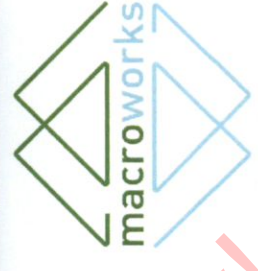


**Outline View**  
 indicating physical position and scale of the proposed development irrespective of screening

Proposed development

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.  
 To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	641789	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northing (ITM):	804856	Camera:	Canon 1-D Mark II digital SLR	Time:	15:22
Direction of View:	E	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				





Existing View



Montage View  
The implementation stage



These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.  
To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°.

Easting (ITM):	804879	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northing (ITM):	642327	Camera:	Canon 1-D Mark II digital SLR	Time:	14:03
Direction of View:	SW	Camera Height:	1.7m Above Ground Level		
Angle of View:	120°				



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Tesco Cavan Town

Imagery depicting the view towards the site (Montage View\_Established vegetation)

Cock Hill Road at entrance to Gaelscoil Bhreifne VP04 Page 2 of 2

Montage View  
Established vegetation

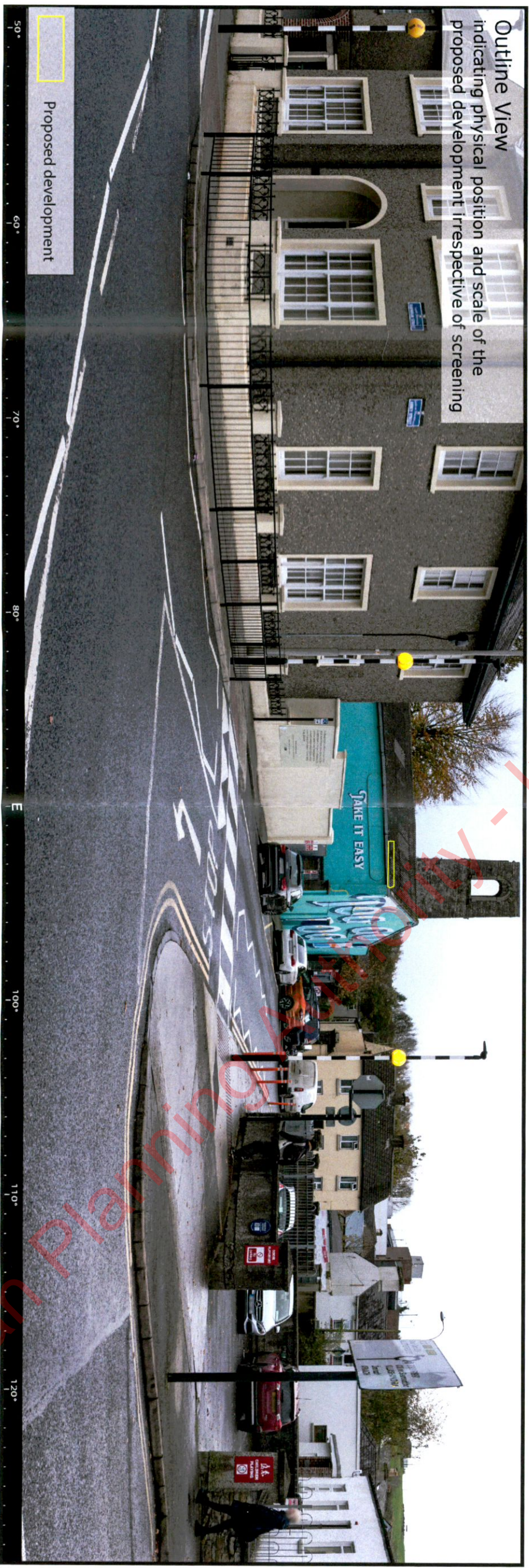


These are 120° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.  
 To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 80°.

Easting (ITM): Northing (ITM): Direction of View Angle of View:	804879 642327 SW 120°	Lens: Camera: Camera Height:	50mm / Full Frame Sensor Canon 1-D Mark II digital SLR 1.7m Above Ground Level	Date: Time:	09/11/2022 14:03
--	--------------------------------	------------------------------------	--	----------------	---------------------







Proposed development

Outline View  
indicating physical position and scale of the proposed development irrespective of screening

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	641763	Lens:	50mm / Full Frame Sensor
Northing (ITM):	804772	Camera:	Canon 1-D Mark II digital SLR
Direction of View:	E	Camera Height:	1.7m Above Ground Level
Angle of View:	80°	Date:	09/11/2022
		Time:	15:15







Existing View



Montage View  
The implementation stage

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):  
 Northing (ITM):  
 Direction of View:  
 Angle of View:

641970  
 804744  
 E  
 80°

Lens:  
 Camera:  
 Camera Height:

50mm / Full Frame Sensor  
 Canon 1-D Mark II digital SLR  
 1.7m Above Ground Level

Date:  
 Time:

09/11/2022  
 14:52







Montage View  
Established vegetation

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	641970	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northing (ITM):	804744	Camera:	Canon 1-D Mark II digital SLR	Time:	14:52
Direction of View:	E	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				







Existing View



Montage View  
The implementation stage

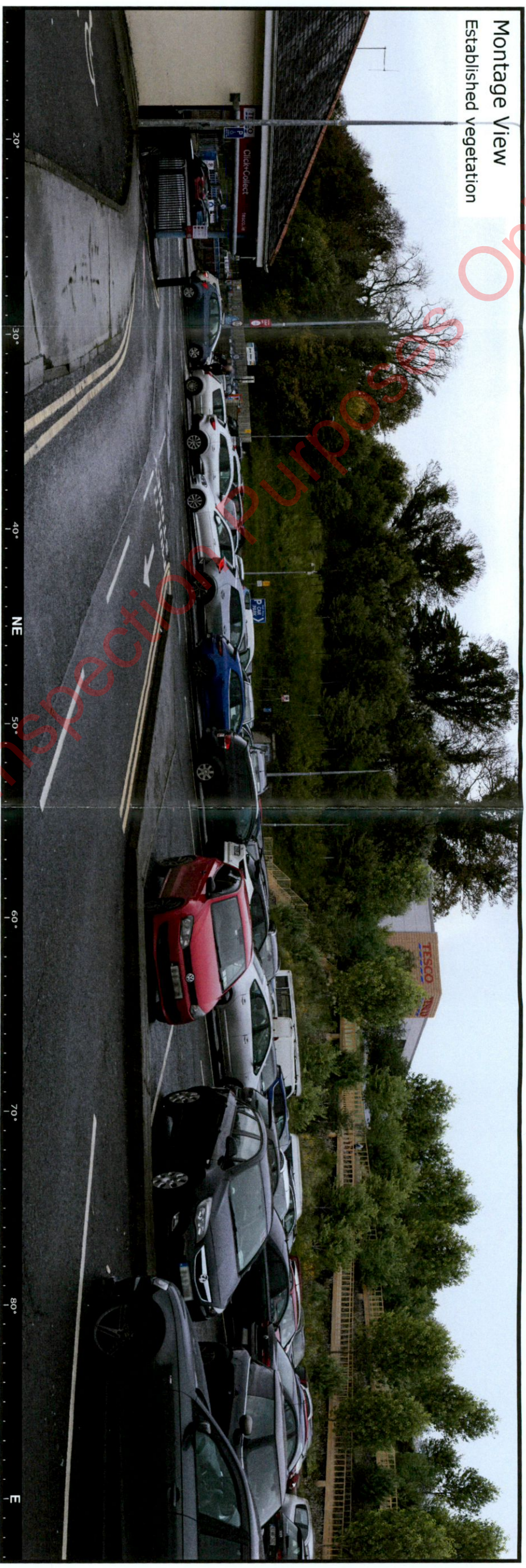
These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.  
To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	642404	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northing (ITM):	804706	Camera:	Canon 1-D Mark II digital SLR	Time:	14:30
Direction of View:	E	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				





Montage View  
Established vegetation



These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Eastings (ITM):	642404	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northings (ITM):	804706	Camera:	Canon 1-D Mark II digital SLR	Time:	14:30
Direction of View:	E	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				







These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.  
 To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	642404	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northing (ITM):	804706	Camera:	Canon 1-D Mark II digital SLR	Time:	13:42
Direction of View:	NW	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				







Montage View  
Established vegetation

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	642404	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northing (ITM):	804706	Camera:	Canon 1-D Mark II digital SLR	Time:	13:42
Direction of View:	NW	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				







Existing View



Montage View  
The implementation stage

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	642112	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northing (ITM):	804603	Camera:	Canon 1-D Mark II digital SLR	Time:	16:13
Direction of View:	NE	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				





Montage View  
Established vegetation



These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Eastings (ITM):	642112	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northings (ITM):	804603	Camera:	Canon 1-D Mark II digital SLR	Time:	16:13
Direction of View:	NE	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				







These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM): 642288	Lens: 50mm / Full Frame Sensor	Date: 09/11/2022
Northing (ITM): 804624	Camera: Canon 1-D Mark II digital SLR	Time: 16:21
Direction of View: E	Camera Height: 1.7m Above Ground Level	
Angle of View: 80°		





Existing View



Montage View  
The implementation stage



These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

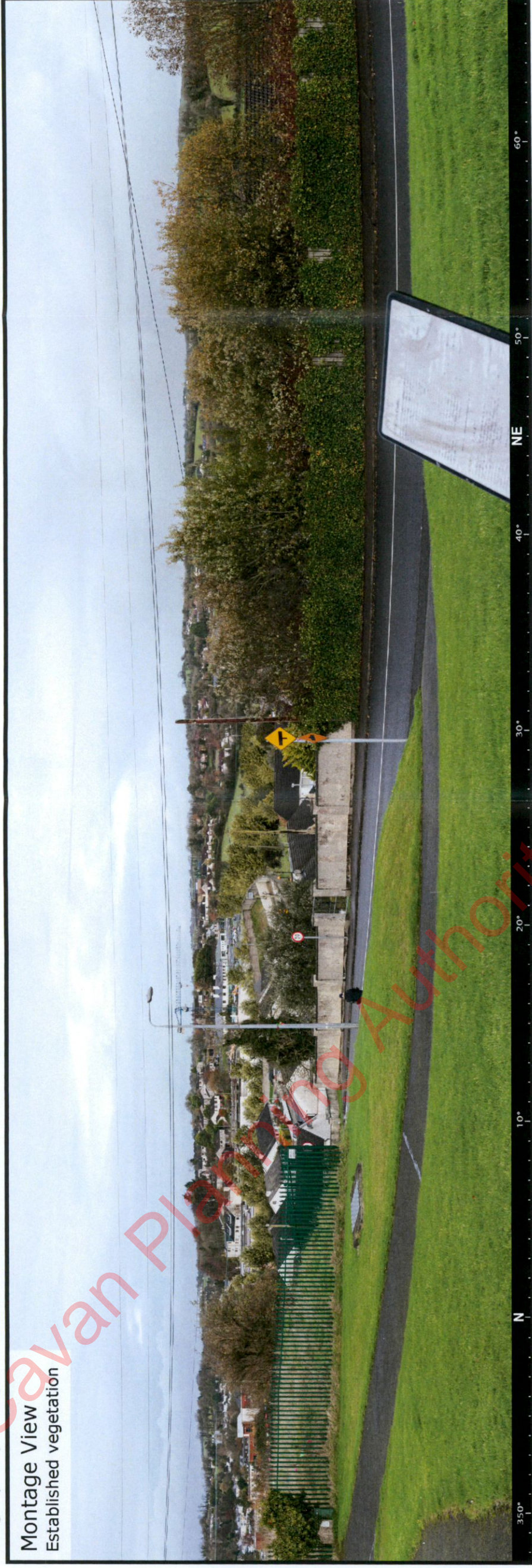
To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM):	642117	Lens:	50mm / Full Frame Sensor	Date:	09/11/2022
Northing (ITM):	804525	Camera:	Canon 1-D Mark II digital SLR	Time:	14:29
Direction of View:	NE	Camera Height:	1.7m Above Ground Level		
Angle of View:	80°				





Montage View  
Established vegetation



Authority - Inspection Purposes Only!

These are 80° panoramic montages captured and presented in accordance with the guidance set by the British Landscape Institute 2011 - Advice Note 01/11.

To view these panoramas on a flat surface one must move from left to right along its length whilst maintaining a perpendicular viewing direction and the specified correct viewing distance of 30cm. To see this entire panoramic scene in reality would necessitate turning one's head through 40°.

Easting (ITM): 642117  
 Northing (ITM): 804525  
 Direction of View: NE  
 Angle of View: 80°

Lens: 50mm / Full Frame Sensor  
 Camera: Canon 1-D Mark II digital SLR  
 Camera Height: 1.7m Above Ground Level

Date: 09/11/2022  
 Time: 14:29





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## 15.0 Archaeology, Architectural and Cultural Heritage

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## 15. Appendices

### Appendix 15.1 Archaeological Sites Within 250m of the Proposed Development Area

<b>SMR No.:</b>	CV020-055
<b>Townland:</b>	Abbey Land / Drumvanagh / Keadew (Cavan Rural and Urban) / Kinnypottle / Lurganboy (Upper Loughree By.) / Townparks (Cavan Urban D.) / Tullymongan Lower / Tullymongan Upper
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughree
<b>NGR:</b>	241990, 304774
<b>Classification:</b>	Cavan Town – historic town
<b>Dist. from development:</b>	0m
<b>Description:</b>	<p><b>002 – Religious House</b></p> <p>Depicted on Netherclift's plan of Cavan Town (c. 1593). Established c. 1300 (Gwynn and Hadcock 1970, 245). Demolished 1815 (O'Connell 1937, 335). All that survives is a three-storey square tower (ext. dims. 4.3m x 4.3m; H c. 16.7m) with 18th-century moulded apertures in the E and W walls and similar openings in all four walls at third-floor level (Field record updated: June 2007).</p> <p><b>003 – Market Cross</b></p> <p>Netherclift's plan of Cavan Town, (c. 1593) depicts a Latin cross mounted atop a stepped base. No surface remains. Original location was at the junction of modern day Main Street and Bridge Street (Bradley and Dunne 1989, 40; O'Connell 1937, 300-301).</p> <p><b>004 – Castle</b></p> <p>Marked 'Fort' on the OS 1836 ed. and 'Site of' on 1876 ed. Situated on the N end of a long drumlin ridge to SE of Cavan Town. Site is now occupied by a fair green. Davies (1947, 89) quoting historical sources recorded that this was an O'Reilly castle, probably of late 14th-century date, and noted that the first mention of the site is 1427 when it was demolished by the English. However, it was still standing in the early 17th century. He noted that it is depicted on a map dating to 1591 as 'a large square building with a door in its W wall, apparently an outside staircase on the south, and turrets rising above the roof at the northwest and southeast corners. The bawn enclosed several buildings. Bradley and Dunne quoted Lewis (1837, vol. 1, 318) who recorded vaults and parts of the foundations surviving in the 19th century. All that survived at the time of Davies' visit in 1946 were 'remains of banks about</p>



	<p>2.5feet high (c. 0.75m) which seem to indicate a roughly square enclosure some 32 yards across (dims. c. 29m). There are now no visible remains of castle at ground level. No surface remains (Date of field record: August 1990).</p> <p><b>005 – Castle</b></p> <p>A late 16th century account in the State Papers (CSPI 1592-6) noted two castles in Cavan town. The first was in all probability at Tullymongan (see CV055-054). Located on the Urban Survey map (Bradley and Dunne 1989, 42).</p> <p><b>006 – Castle</b></p> <p>Built by Walter, Patrick and Thomas before 1596 when it was destroyed by Phillip O'Reilly (CSPI 1592-6, 541-2) in 1596. Based on its description on Nethercliff's plan of Cavan (c. 1593) it would appear that this was a tower house. Rebuilt (CSPI 1600, 420) and referred to in 1601 as the castle of Walter and Thomas Brady (Hunter 1971, 68). No visible remains (Davies 1948, 101; Bradley and Dunne 1989, 41-42).</p> <p><b>007 – School</b></p> <p>In the early 17th century the Plantation commissioners decreed that Tullymongan Friary be converted into a parish church and school. The nearby castle was also to be used as a source of stone for these new buildings. The first schoolmaster was apparently appointed c. 1623 (Davies 1948, 101). It is possible that this is the same school as the mentioned in the <i>Calendar Patent Rolls James I</i> for 1622. No visible remains at ground level. (Bradley and Dunne 1989, 42).</p> <p><b>008 – Bridge</b></p> <p>Nethercliff's map of 1593 depicts a bridge on Bridge Street at the same location as the present day bridge (O'Connell 1937, 301; Bradley and Dunne 1989, 45).</p>
<b>Reference:</b>	RMP file, Nethercliff's plan of Cavan (c. 1593); O'Donovan 1995, 210-233, Bradley and Dunne 1989, 40-42; Hunter 1971, 68; Gwynn and Hadcock 1970, 245; O'Connell 1937, 300-335; Davies 1948, 101.

<b>SMR No.:</b>	CV020-087
<b>Townland:</b>	Tullymongan Lower
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>NGR:</b>	242262, 304561



<b>Classification:</b>	Ringditch
<b>Dist. from development:</b>	c.110m south
<b>Description:</b>	This site was excavated in 2003. The ringditch was located on the terrace above the reclaimed bog, and measured c. 8.5m in diameter. The ditch cut was 0.5–0.8m wide and 0.3–0.5m deep. The ditch was deepest at the western (uphill) side. Bronze Age coarse pottery was uncovered, along with large amounts of burnt grain and burnt animal bone. Remains of post-holes inside the ringditch suggested the remnants of a circular house.
<b>Reference:</b>	<a href="http://www.excavations.ie">www.excavations.ie</a> , Gilmore 2003

<b>SMR No.:</b>	CV020-088
<b>Townland:</b>	Tullymongan Lower
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>NGR:</b>	242219, 304499
<b>Classification:</b>	Burnt Mound
<b>Dist. from development:</b>	c. 175m south
<b>Description:</b>	This site was excavated in 2003. Burnt mound comprised 16m in length, 8m in width and up to 0.5m in thickness. It was situated in the east shore of a silted-up lake, now partially a marsh in an area of improved land. The mound partially lay on the basal clay of the bank and partially on the peat that had filled the lake. It was invisible on the surface and was uncovered during testing. The mound was irregular in shape and sloped downwards to the east, north and south. It was composed of burnt and shattered stone. There was no sign of a trough, either under the mound or close beside it.
<b>Reference:</b>	<a href="http://www.excavations.ie">www.excavations.ie</a> , Gilmore 2003



**Appendix 15. 2 Architectural Sites Within 250m of the Proposed Development Area**

<b>Built Heritage No.</b>	BH 1
<b>RPS No:</b>	CV0822
<b>Street / Townland:</b>	Main Street, Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Chapel
<b>Dist. from development:</b>	c. 130m north-northwest
<b>Description:</b>	St. Clare's Roman Catholic Chapel
<b>Categories of Special Interest:</b>	Architectural, Historical, Social
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

<b>Built Heritage No.</b>	BH 2
<b>RPS No:</b>	CV0823
<b>Street / Townland:</b>	Main Street, Kinnypottle/Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Various
<b>Dist. from development:</b>	c. 135m northwest
<b>Description:</b>	St Joseph's Convent of Poor Clares
<b>Categories of Special Interest:</b>	Architectural, Social
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028



<b>Built Heritage No.</b>	BH 3
<b>RPS No:</b>	CV0821
<b>Street / Townland:</b>	Main Street, Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Retail, Apartments
<b>Dist. from development:</b>	c. 120m northwest
<b>Description:</b>	Chapter One Café and Sports Shop
<b>Categories of Special Interest:</b>	Architectural, Historical, Social
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

<b>Built Heritage No.</b>	BH 4
<b>RPS No:</b>	CV0820
<b>Street / Townland:</b>	Main Street, Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Retail
<b>Dist. from development:</b>	c. 135m northwest
<b>Description:</b>	Cavan Sky
<b>Categories of Special Interest:</b>	Not specified
<b>Rating:</b>	Not specified



<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028
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<b>Built Heritage No.</b>	BH 5
<b>RPS No:</b>	CV0819
<b>Street / Townland:</b>	Main Street, Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Cavan Travel
<b>Dist. from development:</b>	c. 140m west
<b>Description:</b>	Retail
<b>Categories of Special Interest:</b>	Architectural, Technical
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

<b>Built Heritage No.</b>	BH 6
<b>RPS No:</b>	CV0818
<b>Street / Townland:</b>	Main Street, Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Bank
<b>Dist. from development:</b>	c. 140m west
<b>Description:</b>	Ulster Bank
<b>Categories of Special Interest:</b>	Architectural, Social



<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

<b>Built Heritage No.</b>	BH 7
<b>RPS No:</b>	-
<b>Street / Townland:</b>	Main Street, Keadew
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Bank
<b>Dist. from development:</b>	c. 160m west
<b>Description:</b>	Bank of Ireland
<b>Categories of Special Interest:</b>	Architectural, Social
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

<b>Built Heritage No.</b>	BH 8
<b>RPS No:</b>	-
<b>Street / Townland:</b>	Main Street, Abbeyland
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Retail
<b>Dist. from development:</b>	c. 185m southwest
<b>Description:</b>	Fox Footwear



<b>Categories of Special Interest:</b>	Architectural
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

<b>Built Heritage No.</b>	BH 9
<b>RPS No:</b>	CV0816
<b>Street / Townland:</b>	3 Bridge Street, Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Retail
<b>Dist. from development:</b>	c. 210m southwest
<b>Description:</b>	Infinitif Boutique & Hair Gallery
<b>Categories of Special Interest:</b>	Architectural
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

<b>Built Heritage No.</b>	BH 10
<b>RPS No:</b>	CV0815
<b>Street / Townland:</b>	4 Bridge Street, Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Retail
<b>Dist. from development:</b>	c. 215m southwest



<b>Description:</b>	Absolute Gifts
<b>Categories of Special Interest:</b>	Architectural
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

<b>Built Heritage No.</b>	BH 11
<b>RPS No:</b>	-
<b>Street / Townland:</b>	Main Street, Townparks
<b>Parish:</b>	Urney
<b>Barony:</b>	Upper Loughtee
<b>Classification:</b>	Retail
<b>Dist. from development:</b>	c. 140m west
<b>Description:</b>	Sally West & Mr James for Men
<b>Categories of Special Interest:</b>	Not specified
<b>Rating:</b>	Not specified
<b>Reference:</b>	Cavan County Development Plan, incorporating a Local Area Plan for Cavan Town 2022–2028

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## **Appendix 15.3 Legislation Protecting the Archaeological Resource**

### **Protection of Cultural Heritage**

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Arts, Heritage, Gaeltacht and the Islands 1999, 35). This is undertaken in accordance with the provisions of the *European Convention on the Protection of the Archaeological Heritage* (Valletta Convention), ratified by Ireland in 1997.

### **The Archaeological Resource**

The *National Monuments Act 1930 to 2014* and relevant provisions of the *National Cultural Institutions Act 1997* are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. A National Monument is described as 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto' (National Monuments Act 1930 Section 2). A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

### **Ownership and Guardianship of National Monuments**

The Minister may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

### **Register of Historic Monuments**

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months' notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

### **Preservation Orders and Temporary Preservation Orders**

Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

### **Record of Monuments and Places**



Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister for the Department of Housing, Local Government and Heritage) to establish and maintain a record of monuments and places where the Minister believes that such monuments exist. The record comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments Act 1994. All recorded monuments on the proposed development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that 'where the owner or occupier (other than the Minister for Arts, Heritage, Gaeltacht and the Islands) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Arts, Heritage, Gaeltacht and the Islands to carry out work and shall not, except in case of urgent necessity and with the consent of the Minister, commence the work until two months after giving of notice'.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to 6 months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to 5 years is the penalty. In addition, they are liable for costs for the repair of the damage caused.

In addition to this, under the *European Communities (Environmental Impact Assessment) Regulations 1989*, Environmental Impact Statements (EIS) are required for various classes and sizes of development project to assess the impact the proposed development will have on the existing environment, which includes the cultural, archaeological and built heritage resources. These document's recommendations are typically incorporated into the conditions under which the proposed development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

#### **The Planning and Development Act 2000, as amended**

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning and Development Act 2000 recognises that proper planning and sustainable development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.



## Appendix 15.4 Legislation Framework Protecting the Architectural Resource

The main laws protecting the built heritage are the *Architectural Heritage (National Inventory) and National Monuments (Miscellaneous Provisions) Act 1999* and the *Local Government (Planning and Development) Acts 1963-1999*, which has now been superseded by the *Planning and Development Act, 2000*. The Architectural Heritage Act requires the Minister to establish a survey to identify, record and assess the architectural heritage of the country. The background to this legislation derives from Article 2 of the 1985 Convention for the Protection of Architectural Heritage (Granada Convention). This states that:

*For the purpose of precise identification of the monuments, groups of structures and sites to be protected, each member state will undertake to maintain inventories of that architectural heritage.*

The National Inventory of Architectural Heritage (NIAH) was established in 1990 to fulfil Ireland's obligation under the Granada Convention, through the establishment and maintenance of a central record, documenting and evaluating the architecture of Ireland (NIAH Handbook 2005:2). As inclusion in the inventory does not provide statutory protection, the survey information is used in conjunction with the *Architectural Heritage Protection Guidelines for Planning Authorities* to advise local authorities on compilation of a Record of Protected Structures as required by the *Planning and Development Act, 2000*.

### Protection under the Record of Protected Structures and County Development Plan

Structures of architectural, cultural, social, scientific, historical, technical or archaeological interest can be protected under the Planning and Development Act, 2000, where the conditions relating to the protection of the architectural heritage are set out in Part IV of the act. This act superseded the Local Government (Planning and Development) Act, 1999, and came into force on 1<sup>st</sup> January 2000.

The act provides for the inclusion of Protected Structures into the planning authorities' development plans and sets out statutory regulations regarding works affecting such structures. Under new legislation, no distinction is made between buildings formerly classified under development plans as List 1 and List 2. Such buildings are now all regarded as 'Protected Structures' and enjoy equal statutory protection. Under the act the entire structure is protected, including a structure's interior, exterior, attendant grounds and also any structures within the attendant grounds.

The act defines a Protected Structure as (a) a structure, or (b) a specified part of a structure which is included in a Record of Protected Structures (RPS), and, where that record so indicates, includes any specified feature which is in the attendant grounds of the structure and which would not otherwise be included in this definition. Protection of the structure, or part thereof, includes conservation, preservation, and improvement compatible with maintaining its character and interest. Part IV of the act deals with architectural heritage, and Section 57 deals specifically with works affecting the character of Protected Structures or proposed Protected Structures and states that no works should materially affect the character of the structure or any element of the structure that contributes to its special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. The act does not



provide specific criteria for assigning a special interest to a structure. However, the National Inventory of Architectural Heritage (NIAH) offers guidelines to its field workers as to how to designate a building with a special interest, which are not mutually exclusive. This offers guidance by example rather than by definition:

### **Archaeological**

It is to be noted that the NIAH is biased towards post-1700 structures. Structures that have archaeological features may be recorded, providing the archaeological features are incorporated within post-1700 elements. Industrial fabric is considered to have technical significance, and should only be attributed archaeological significance if the structure has pre-1700 features.

### **Architectural**

A structure may be considered of special architectural interest under the following criteria:

- Good quality or well executed architectural design
- The work of a known and distinguished architect, engineer, designer, craftsman
- A structure that makes a positive contribution to a setting, such as a streetscape or rural setting
- Modest or vernacular structures may be considered to be of architectural interest, as they are part of the history of the built heritage of Ireland.
- Well designed decorative features, externally and/or internally

### **Historical**

A structure may be considered of special historical interest under the following criteria:

- A significant historical event associated with the structure
- An association with a significant historical figure
- Has a known interesting and/or unusual change of use, e.g. a former workhouse now in use as a hotel
- A memorial to a historical event.

### **Technical**

A structure may be considered of special technical interest under the following criteria:

- Incorporates building materials of particular interest, i.e. the materials or the technology used for construction
- It is the work of a known or distinguished engineer
- Incorporates innovative engineering design, e.g. bridges, canals or mill weirs



- A structure which has an architectural interest may also merit a technical interest due to the structural techniques used in its construction, e.g. a curvilinear glasshouse, early use of concrete, cast-iron prefabrication.
- Mechanical fixtures relating to a structure may be considered of technical significance.

### **Cultural**

A structure may be considered of special cultural interest under the following criteria:

- An association with a known fictitious character or event, e.g. Sandycove Martello Tower, which featured in Ulysses.
- Other structure that illustrate the development of society, such as early schoolhouses, swimming baths or printworks.

### **Scientific**

A structure may be considered of special scientific interest under the following criteria:

- A structure or place which is considered to be an extraordinary or pioneering scientific or technical achievement in the Irish context, e.g. Mizen Head Bridge, Birr Telescope.

### **Social**

A structure may be considered of special social interest under the following criteria:

- A focal point of spiritual, political, national or other cultural sentiment to a group of people, e.g. a place of worship, a meeting point, assembly rooms.
- Developed or constructed by a community or organisation, e.g. the construction of the railways or the building of a church through the patronage of the local community
- Illustrates a particular lifestyle, philosophy, or social condition of the past, e.g. the hierarchical accommodation in a country house, philanthropic housing, vernacular structures.

### **Artistic**

A structure may be considered of special artistic interest under the following criteria:

- Work of a skilled craftsman or artist, e.g. plasterwork, wrought-iron work, carved elements or details, stained glass, stations of the cross.
- Well designed mass produced structures or elements may also be considered of artistic interest.

(From the NIAH Handbook 2003 & 2005 pages 15-20)



The Local Authority has the power to order conservation and restoration works to be undertaken by the owner of the protected structure if it considers the building to be in need of repair. Similarly, an owner or developer must make a written request to the Local Authority to carry out any works on a protected structure and its environs, which will be reviewed within three months of application. Failure to do so may result in prosecution.

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## Appendix 15.5 Impact Assessment and the Cultural Heritage Resource

### Potential Impacts on Archaeological and Historical Remains

Impacts are defined as 'the degree of change in an environment resulting from a development' (Environmental Protection Agency 2022: 50). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways.

- Permanent and temporary land-take, associated structures, landscape mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape.
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation.
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits.
- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value.
- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow.
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits.
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

*Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.*

### Predicted Impacts

The severity of a given level of land-take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;
- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;



- Assessment of the levels of noise, visual and hydrological impacts, either in general or site-specific terms, as may be provided by other specialists.

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## Appendix 15.6 Mitigation Measures and the Cultural Heritage Resource

### Potential Mitigation Strategies for Cultural Heritage Remains

Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved *in situ*.

### Definition of Mitigation Strategies

#### Archaeological Resources

The ideal mitigation for all archaeological sites is preservation *in situ*. This is not always a practical solution, however. Therefore, a series of recommendations are offered to provide ameliorative measures where avoidance and preservation *in situ* are not possible.

*Archaeological Test Trenching* can be defined as 'a limited programme of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or underwater. If such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate' (ClfA 2020a).

*Full Archaeological Excavation* can be defined as 'a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains within a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design' (ClfA 2020b).

*Archaeological Monitoring* can be defined as 'a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (ClfA 2020c).



*Underwater Archaeological Assessment* consists of a programme of works carried out by a specialist underwater archaeologist, which can involve wade surveys, metal detection surveys and the excavation of test pits within the sea or riverbed. These assessments are able to access and assess the potential of an underwater environment to a much higher degree than terrestrial based assessments.

### **Architectural Resource**

The architectural resource is generally subject to a greater degree of change than archaeological sites, as structures may survive for many years but their usage may change continually. This can be reflected in the fabric of the building, with the addition and removal of doors, windows and extensions. Due to their often more visible presence within the landscape than archaeological sites, the removal of such structures can sometimes leave a discernible 'gap' with the cultural identity of a population. However, a number of mitigation measures are available to ensure a record is made of any structure that is deemed to be of special interest, which may be removed or altered as part of a proposed development.

*Conservation Assessment* consists of a detailed study of the history of a building and can include the surveying of elevations to define the exact condition of the structure. These assessments are carried out by Conservation Architects and would commonly be carried out in association with proposed alterations or renovations on a Recorded Structure.

*Building Survey* may involve making an accurate record of elevations (internal and external), internal floor plans and external sections. This is carried out using a EDM (Electronic Distance Measurer) and GPS technology to create scaled drawings that provide a full record of the appearance of a building at the time of the survey.

*Historic Building Assessment* is generally specific to one building, which may have historic significance, but is not a Protected Structure or listed within the NIAH. A full historical background for the structure is researched and the site is visited to assess the standing remains and make a record of any architectural features of special interest. These assessments can also be carried out in conjunction with a building survey.

*Written and Photographic* record provides a basic record of features such as stone walls, which may have a small amount of cultural heritage importance and are recorded for prosperity. Dimensions of the features are recorded with a written description and photographs as well as some cartographic reference, which may help to date a feature.



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