

Approach to Foundations for New Structures Abbeylands Public Realm Cavan.



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Date: 7th. November 2022

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Civil

Structural

Transport

Environmental Project

Health



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Title: Approach to Foundations for New Structures

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1 Introduction.

Construction of two new buildings as well as alterations to existing buildings and structures is required as part of the Abbeylands Public realm project. A site investigation comprising assessment of ground conditions as well as an archaeological appraisal has been undertaken. The investigations have established the presence of archaeological items as well as poor ground conditions for foundations for some of the sites. This report sets out a proposal for addressing the provision of adequate foundations for the new structures as well as protecting the archaeological items. These proposals were developed by the Design Team, including Architect, Structural Engineer and Archaeologist during a workshop held on line on the 30th. September 2022.

2 Site Investigation,

2.1 Archaeological Test Trenches.

Five slit trenches, TP01 to TP05, were opened to assess the presence of items of archaeological interest and to identify soil types for foundation purposes. Archaeology was confirmed in all locations with made ground present up to 2m below ground level at the deepest. In parallel with these investigations Dynamic Probe tests were undertaken at each location to assess the bearing capacity of the soil. A site map with the trench locations relative to the new build proposals is attached in appendix.

2.2 Dynamic Probes.

Dynamic probes are a non invasive tool for assessing ground conditions. They are normally undertaken with sample trial pitting to identify soil types and consist of a 50mm steel probe driven into the ground by means of a standard weight dropped through a fixed height. The number of blows recorded per fixed distance is an indication of the soil strength. In the case of the Abbeylands site the results were generally poor with reasonable ground not reached until depths in the range of 2 to 3m. site investigation records are attached in appendix.

3 Foundations.

3.1 New Buildings.

Two new buildings are proposed in the current scheme one located at the McIntyre warehouse and a second in the vicinity of Donoghue's shop. TP01, 03,04 and 05 relate to these sites and an assessment of foundation options has been undertaken by the Design Team taking account of the archaeology and the allowable ground bearing pressures for up to three storey buildings.

3.2 McIntyres Warehouse

It is proposed to found the new building on this site using narrow mass concrete trench fill taken to about 2m below the existing ground level. The excavations will be undertaken with archaeological supervision during the procedure, although initial indications are that this site is less likely to have significant archaeological items present.

3.3 Donoghue's Shop.

This site offers more challenges due to the likelihood of extensive archaeological material combined with poor ground conditions. It is proposed to form a transfer structure consisting of a reinforced concrete raft, circa 500mm deep, at ground floor level. This raft will be supported by isolated reinforced concrete piers whose exact location will be confirmed on site as work proceeds under the

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supervision of the archaeologist and structural engineer. The 500mm depth is selected to avoid the zone of archaeological interest and therefore avoid any interference with it and follows guidance from the Archaeologist.

4 Conclusions.

Foundation solutions have been proposed taking account of poor ground conditions and the presence significant archaeology on the proposed new build sites. The approach has been developed in consultation with Architects and Archaeologist.

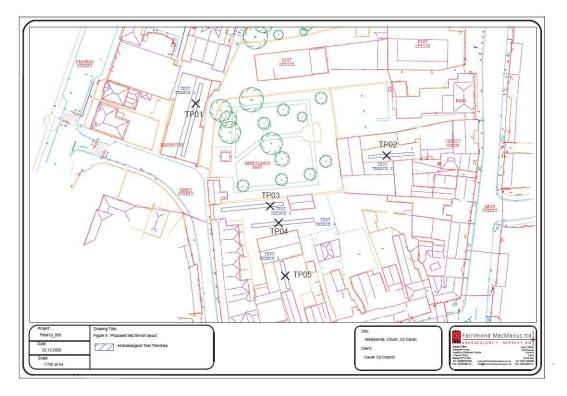
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Signed:		Dated: 11th. November 2022
	Aidan Smith BSc, MSc, C Eng, MIEI, F Cons El.	

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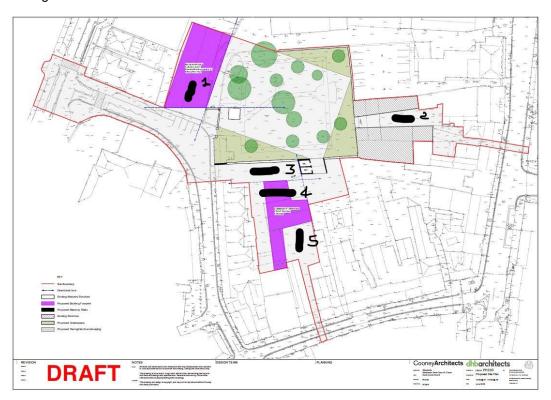
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4 Appendix 1. Site Plans.



Site Investigation.



Proposed Site Plan with Test Trenches.

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5 Appendix 2 Dynamic Probes.

avan, Co. Cavan ouncil Emerson Associates	Easting: Northing Elevatio	53			Date	ŝ	07/05/2021	9
ouncil	0.00000	1:			_			
	Elevatio				Ехса	evator:	1.5T Tracked Excavator	
Emerson Associates		n:			Logg	ged By:	P. McGonag	gle
	Dimensi (LxWxD		2.00 x 0	0.20 x 1.8	0 Scal	e:	1:17	
Stratum Description	Legend	Level	(mOD)	Sam	ples	P	Probe	Wate
tarmacadam.	a cog c ma	Scale:	Depth:	Depth	Туре	1	1000	Strike
: brown slightly sandy slightly with some red brick fragments.		-						
: light brown slightly sandy slightly with some pottery fragments.		-0.5				5		
dark brown slightly sandy slightly with some animal bone fragments.						3 3 4		
		-1.0				2 3		
		-1.5				3 3		
sandy gravelly slity CLAY with content. Sand is fine to coarse, coarse, subangular to subrounded of es are subangular to subrounded of				1.80	В	8	1	
ie to limit of excavator. Pit terminated af 1.80m		-2.0				5		
		-25				5		
		8				ŀ		5
		-3.0				-		
		-						
Dit Wall Stabille: County of	ter Rate: F		5:	153		Key:		Li.
	Pit Wall Stability: Groundwal	200	-	-	-		Pit Wall Stability: Groundwater Rate: Remarks: Key:	Pit Wall Stability: Groundwater Rate: Remarks: Key:

Dynamic Probe 1.

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Contra 58	ot No:	Trial Pit and Dyr	namio	Pr	obe	Log		Trial P	
Contra	ict:	Abbeylands	Easting				Date:	06/05/202	1
ocatio	on:	Abbey Street, Cavan, Co. Cavan			r: 3T Tracked Excavator	i			
allent:	8	Cavan County Council Elevation:		1	Logged B		gle		
Engineer:		Clifton Scannell Emerson Associates	Dimens (LxWx)		3.20 x (0.30 x 2.2	O Scale:	1:17	
Level	(mbgl)	Stratum Description	Legeno	Leve	(mOD)	Samp	iles	Probe	Water
Scale:	Depth	MADE GROUND: cobble blocks.	000000	Scale	: Depth:	Depth	Туре	0.000	Strike
4	0.08	MADE GROUND: light brown slity sandy gravel with some red brick fragments.			-			11 11	
0.5	0.60	MADE GROUND: dark grey black slightly sandy slightly gravelly slity clay with some red brick and pottery fragments.		-0.5			1 3	10	
1.0				-1.0-		1.00	ES 2 2 1		
1.5	1.30	Firm grey sandy slightly gravelly slity CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.		-15	-		2 1 1 1		
2.0	2.20	Obstruction - boulders. Pit terminated at 2.20m		-20-		2.00	B 1		×
25				-25	-				
3.0				-30-	- - - -				
		Termination: Pit Wall Stability: Groundwa	ter Rate	Remar	85		Key:		
(Obstruction - Pit walls stable. 2.10 Med boulders.	lum	200	removed	1 to 0.10m	bgl B = D = CBR	Bulk disturbed Small disturbed - Undisturbed CB Environmental	

Dynamic Probe 2.

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ontra 58	ot No:	Trial Pit and Dyna	amic	Pr	obe	Log		Trial P	
ontra	ct:	Abbeylands	Easting:			Date:	07/05/202	t:	
Location:		Abbey Street, Cavan, Co. Cavan	Northing	9			Excavato	r: 3T Tracke Excavator	
llent:	1	Cavan County Council	Elevatio	h:			Logged B	y: P. McGona	agle
Engineer:		Clifton Scannell Emerson Associates	Dimensi (LxWxD		3.10 x 0	0.30 x 2.8	Scale:	1:17	855
evel	(mbgl) Depth	Stratum Description	Legend		(mOD)	Samp	les Type	Probe	Wat Strik
scare.		MADE GROUND: tarmacadam.		ocare	. Бериі.	Depin	Type		1 (2000)
	0.10	MADE GROUND: concrete.			-				
0.5		MADE GROUND: grey silty sandy gravel with some concrete block fragments.		-05			3 1 1	5	
	0.60	MADE GROUND: brown slightly sandy slightly gravelly slity clay with some red brick and pottery fragments.					0		
1.0				-1.0-			ŀ	12	
334 334 334	1.30	Stiff brown slightly sandy gravelly slity CLAY with						B S	
1.5 -		medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.		-15	-	1.50	B 1	8	
				-20-			4 4 3		3
320	2.40						Ľ.		
5-		Stiff grey sandy gravelly slitly CLAY with medium cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are subangular to subrounded of limestone.		-25		2.50	В	5 5	
100	2.80	Obstruction basids	AND THE		1			8	
1000		Obstruction - boulders. Pit terminated at 2.80m	4					0	
387		95.534 S. C. STOCKOS 3552-2						8	
0-				-3.0-	1			11	
				-			15.0		96
					- 1				
									2-0
- 1		Termination: Pit Wall Stability: Groundwate	r Bata Is	Remark			IVa		
A	15		2000000	4.1	100		Key:		
(3	b)	Obstruction - Pit walls stable. 2.10 Mediu boulders.		oncre or prob		ed to 0.10	D-	Bulk disturbed Small disturbed • Undisturbed CB	

Dynamic Probe 3.

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Contra 58	117		Trial Pit ar	nd Dyna	amic	Pr	obe	Log			Trial Pi	
contra	ct:	Abbeylands			Easting:				Da	ite:	07/05/2021	
Location: Client: Engineer:		Abbey Street, Cavan, Co. Cavan			Northing:				Ex	cavator:	3T Tracked Excavator	
		Cavan County Council		Elevation:				Lo	gged By:	P. McGona	gle	
		Clifton Scannell E	merson Associates		Dimensi (LxWxD		3.20 x (0.30 x 2.	80 Sc	ale:	1:17	
Level	(mbgl)		Stratum Decedation		Langed	Level	(mod)	Sam	pies	T	Probe	Wat
Scale:			Stratum Description		Legend	Scale	Depth:	Depth	Тур	e	Probe	Strik
13	0.03	MADE GROUND: MADE GROUND:				- 53	8	1				3
	0.10		grey silty sandy graw	el.						1		
-	1		27, - 2,, 2,	324		= .	1			1		
3	0.30					=	9.3			1		
33	593673	made GROUND:	dark brown slightly so with some red brick fr	andy slightly		- 60	g e			1		
		graveny only only	mor come rea chou m	agineino.						1		
05 -	0.50	MADE GROUND:	light brown slightly sa	andy slightly		-0.5	1			1		
_			with some pottery frag			35	1			1		
_		C 08 28 28				39	ą.			1		
						- 12				1		
_	1					8.7	18			1		
-	1					3.5	-			1		
1.0						-1.0-	12			1		
						9.0				1		
	1					8.4	1"			1		
-						89	-8			1		
-						8	8			4		
						- 63				1		
							1			0		
1.5 -	1					-15-	1	1.50	В	1		
-	-					89	8					
_						103				0		
										0		
-	1					81	70			100		
-						- 89	8			h.		
2.0	2.00	Firm area eliablic	sandy gravelly slity Ci	AV Cand le		-2.0-	8			1		
			avel is fine to coarse,							1		
		subrounded of Ilm				33	4.5	18888	125	100		
-	1					- 33	12	2.20	В	Ъ		
-						3.5	3.5			Ь.		
_	2.40	Flore bearing and	When a stability and d	- II-EE	4 (4)					11		
25		orayelly silty CLA	ff brown slightly sand; Y with medium cobble	onnient Sand		0.0		2.50	В	4		•
25 -		is fine to coarse.	Gravel is fine to coarse	e, subangular	77.75	-25-	3 %	2.00		2		255
-		to subrounded of	limestone. Cobbles ar			33	- 5			in.		
-	-	to subrounded of	ilmestone.		1000	- 30						
_	2.80				- A 4 5 4 5						10	
10	2.00	Obstruction - bou	ders. Pit terminated at 2.80m		19	- 83	9				13	
	1					5					10	
3.0-	1					-30-					10	
0	-											
8						133				1		5
9						100	9.3					
- 10		Ø			3		8 3	(c - 1)				
(A	1	Termination:	Pit Wall Stability:	Groundwate		temark	98	3		Key:		50.
(8	1)	Obstruction - boulders.	Pit walls stable.	2.50 Mediur		oil ren robe.	noved to	1.30mbg	l for	D - S CBR - U	ulk disturbed mail disturbed Indisturbed CBi vironmental	R

Dynamic Probe 4.

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Contrac 58		1	rial Pit an	d Dyna	amic	Pr	obe	Log			Trial Pit	
Contra	ct:	Abbeylands		135.12	Easting:				Date	3	07/05/2021	
Location:		A Constitution of the Cons		Northing				Exca	vator:	3T Tracked Excavator		
Client:	y.	Cavan County Cou	ncli		Elevatio	n:			Logg	ed By:	P. McGonag	jie
Engineer:		Clifton Scannell En	nerson Associates		Dimensi (LxWxD		3.00 x l	0.30 x 2.	10 Scale		1:17	2.0
Level	(mbgl)		ratum Description		Legend		(mon)	Sam	ples		Probe	Wate
Bcale:	Depth				Legenu	Scale:	Depth:	Depth	Туре	<u> </u>	Pione	Strike
1	0.08	MADE GROUND: 1	armacadam. grey slity sandy grave	el.		33						
05	0.20	MADE GROUND: 0	lark grey black slight clay with some red	ly sandy		-05		0.50	ES	2 2 1		
2	0.80	Firm grey slightly s	andy gravelly sity CL	.AY with				0.50		t 2 2 2		
1.0		medium cobble cor Gravel is fine to co:	itent. Sand is fine to arse, subangular to s are subangular to si	coarse. ubrounded of		-1.0		1.00	В	† 2 2 3		
1.5 -	100					-1.5 -				5	56	5
20-	1.90	subrounded GRAVI fine to coarse.	dy fine to coarse, an EL of limestone and s	gular to shale. Sand is		-2.0		2.00	В			*
-	2.10	Obstruction - bould Pr	ers. I terminated at 2.10m			8						
- 5						- 23	18					
25 -						-25	8					
-						33	18					
2						33						
9						25						
1000						100						
3.0-						-3.0-				l		
5						33						
8						33						
		Termination:	Pit Wall Stability:	Groundwate	Rate: F	Remark	5:		- 1	(ey:		
		Obstruction - boulders.	Pit walls stable.	2.00 Mediur	n T	armac	5 61	moved to obe.	6	8 - Bu 0 - Sr 0BR - U	ik disturbed nali disturbed ndisturbed CBR ironmental	ı

Dynamic Probe 5.

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