



**Clifton Scannell Emerson**  
Associates

## **Approach to Foundations for New Structures Abbeylands Public Realm Cavan.**



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**Client: Cavan County Council**

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**Date: 7<sup>th</sup>. November 2022**

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**Job Number: 19\_134**

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Civil  
Engineering

Structural  
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and Safety

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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 30<sup>th</sup>. 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.



Signed: \_\_\_\_\_

Dated: 11<sup>th</sup>. November 2022

Aidan Smith BSc, MSc, C Eng, MIEI, F Cons EI.










Contract No: 5817		Trial Pit and Dynamic Probe Log					Trial Pit No: TP02	
Contract: Abbeylands		Easting:		Date: 06/05/2021		Excavator: 3T Tracked Excavator		
Location: Abbey Street, Cavan, Co. Cavan		Northing:		Logged By: P. McGonagle				
Client: Cavan County Council		Elevation:		Scale: 1:17				
Engineer: Clifton Scannell Emerson Associates		Dimensions (LxWxD) (m): 3.20 x 0.30 x 2.20						
Level (mbgl) Scale: Depth	Stratum Description	Legend	Level (MOD)		Samples		Probe	Water Strike
			Scale: Depth	Depth	Depth	Type		
0.08	MADE GROUND: cobble blocks.							
	MADE GROUND: light brown silty sandy gravel with some red brick fragments.							
0.5								
0.60	MADE GROUND: dark grey black slightly sandy slightly gravelly silty clay with some red brick and pottery fragments.							
1.0								
1.30	Firm grey sandy slightly gravelly silty 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.							
1.5								
2.0								
2.20	Obstruction - boulders. Pit terminated at 2.20m							
2.5								
3.0								
Termination: Obstruction - boulders.		Pit Wall Stability: Pit walls stable.	Groundwater Rate: 2.10 Medium	Remarks: Paving removed to 0.10mbgl for probe.		Key: B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Dynamic Probe 2.





Contract No: 5817		Trial Pit and Dynamic Probe Log				Trial Pit No: TP03	
Contract: Abbeylands		Easting:		Date: 07/05/2021			
Location: Abbey Street, Cavan, Co. Cavan		Northing:		Excavator: 3T Tracked Excavator			
Client: Cavan County Council		Elevation:		Logged By: P. McGonagle			
Engineer: Clifton Scannell Emerson Associates		Dimensions (LxWxD) (m):		3.10 x 0.30 x 2.80		Scale: 1:17	
Level (mbgl)	Stratum Description	Legend	Level (MOD)	Samples	Probe	Water Strike	
Scale: Depth			Scale: Depth:	Depth Type			
0.03	MADE GROUND: tarmacadam.						
0.10	MADE GROUND: concrete.						
	MADE GROUND: grey silty sandy gravel with some concrete block fragments.						
0.5			-0.5				
0.60	MADE GROUND: brown slightly sandy slightly gravelly silty clay with some red brick and pottery fragments.						
1.0			-1.0				
1.30	Stiff brown slightly sandy gravelly silty 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.		-1.5	1.50	B		
1.5							
2.0			-2.0				
2.40	Stiff grey sandy gravelly silty 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.		-2.5	2.50	B		
2.5							
2.80	Obstruction - boulders. Pit terminated at 2.80m						
3.0			-3.0				
 Termination: Obstruction - boulders.		Pit Wall Stability: Pit walls stable.	Groundwater Rate: 2.10 Medium	Remarks: Concrete removed to 0.10mbgl for probe.	Key: B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Dynamic Probe 3.



Contract No: 5817		<b>Trial Pit and Dynamic Probe Log</b>				Trial Pit No: TP04			
Contract: Abbeylands		Easting:		Date: 07/05/2021					
Location: Abbey Street, Cavan, Co. Cavan		Northing:		Excavator: 3T Tracked Excavator					
Client: Cavan County Council		Elevation:		Logged By: P. McGonagle					
Engineer: Clifton Scannell Emerson Associates		Dimensions (LxWxD) (m): 3.20 x 0.30 x 2.80		Scale: 1:17					
Level (mbgl)		Stratum Description	Legend	Level (MOD)		Samples		Probe	Water Strike
Scale:	Depth			Scale:	Depth:	Depth	Type		
	0.03	MADE GROUND: tarmacadam.							
	0.10	MADE GROUND: concrete.							
		MADE GROUND: grey silty sandy gravel.							
	0.30	MADE GROUND: dark brown slightly sandy slightly gravelly silty clay with some red brick fragments.							
	0.50	MADE GROUND: light brown slightly sandy slightly gravelly silty clay with some pottery fragments.		-0.5					
	1.0			-1.0					
	1.5			-1.5	1.50	B			
	2.0	Firm grey slightly sandy gravelly silty CLAY. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone.		-2.0					
	2.20				2.20	B			
	2.40	Firm becoming stiff brown slightly sandy slightly gravelly silty 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.		-2.5					
	2.50				2.50	B			
	2.60	Obstruction - boulders. <i>Pit terminated at 2.80m</i>							
	3.0			-3.0					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - boulders.	Pit walls stable.	2.50 Medium	Soil removed to 1.30mbgl for probe.		B = Bulk disturbed	D = Small disturbed	CBR = Undisturbed CBR

Dynamic Probe 4.



Contract No: 5817		<b>Trial Pit and Dynamic Probe Log</b>				Trial Pit No: TP05			
Contract: Abbeylands		Easting:		Date: 07/05/2021					
Location: Abbey Street, Cavan, Co. Cavan		Northing:		Excavator: 3T Tracked Excavator					
Client: Cavan County Council		Elevation:		Logged By: R. McGonagle					
Engineer: Clifton Scannell Emerson Associates		Dimensions (LxWxD) (m): 3.00 x 0.30 x 2.10		Scale: 1:17					
Level (mbgl)		Stratum Description	Legend	Level (MOD)		Samples		Probe	Water Strike
Scale	Depth			Scale	Depth	Depth	Type		
	0.08	MADE GROUND: tarmacadam.							
	0.20	MADE GROUND: grey silty sandy gravel.							
	0.5	MADE GROUND: dark grey black slightly sandy slightly gravelly silty clay with some red brick and concrete fragments.		-0.5	0.50	ES			
	0.80	Firm grey slightly sandy gravelly silty 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.		-1.0	1.00	B			
	1.90	Black silty very sandy fine to coarse, angular to subrounded GRAVEL of limestone and shale. Sand is fine to coarse.		-2.0	2.00	B			
	2.10	Obstruction - boulders. Pit terminated at 2.10m							
	2.5			-2.5					
	3.0			-3.0					
		Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:		Key:		
		Obstruction - boulders.	Pit walls stable.	2.00 Medium	Tarmacadam removed to 0.10mbgl for probe.		B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental		

Dynamic Probe 5.

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