



Heidelberg Materials

TYTHERINGTON QUARRY: 6 MILLION TONNES ADDITIONAL RESERVES

Environmental Statement: Appendix 9C Borehole Logs for
Piezometers 8_21 and 9_21 from GWP (2022)





Heidelberg Materials

TYTHERINGTON QUARRY: 6 MILLION TONNES ADDITIONAL RESERVES

Environmental Statement: Appendix 9C Borehole Logs
for Piezometers 8_21 and 9_21 from GWP (2022)

TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 62282762

**OUR REF. NO. 6MT ES / APPENDIX 9C BOREHOLE LOGS FOR PIEZOMETERS
8_21 AND 9_21 FROM GWP (2022)**

DATE: MAY 2024

WSP

Canon Court West

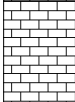
Abbey Lawn

Shrewsbury

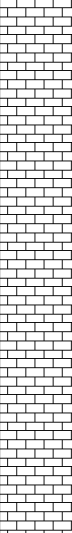
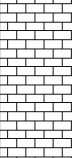
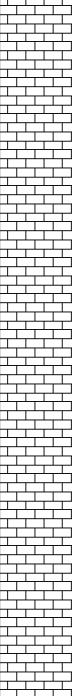
SY2 5DE

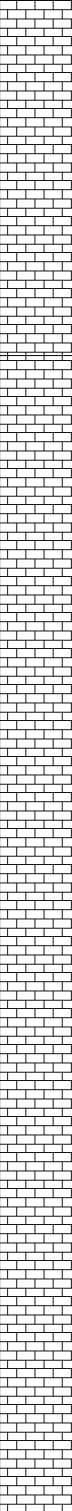
Phone: +44 1743 342 000

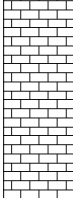
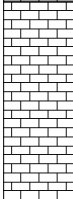
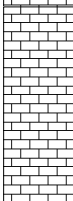
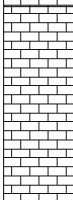
WSP.com

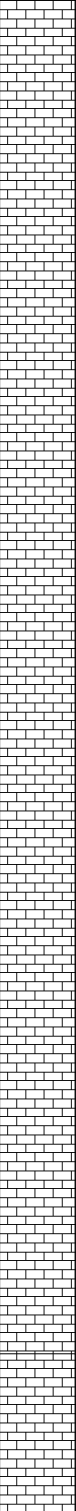
		GWP consultants		Rotary Core Log					Borehole No. 2021-8 Sheet 1 of 22					
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT			Co-ords: (NGR) 365121E - 187706N		Hole Type: RC					
Location: Tytherington				Hole Inclination: 90°			Collar Level: 89.4m AOD		Scale: 1:50					
Client: Hanson Aggregates				Hole Azimuth: 0°			Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR					
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description						
	TCR	SCR	RQD											
0.00 - 2.70	0	0	0	2.85	2.85	86.55		Not recovered.						
2.70 - 3.60	83	40	24					4.05	85.35	Pale grey and orangey brown, strong, perhaps very strong but broken, weathered LIMESTONE. Massive and very fine grained without banding, bioclasts or fossils. All core is fractured and broken. Orange brown colours from weathering, especially on fracture surfaces. Fractures close spaced, some fractures possibly derived from horizontal suture stylolites.				
3.60 - 5.20	100	61	33							4.80	84.60	Pale grey and very pale grey, strong, LIMESTONE. Massive, very fine grained, without fossils. Trace pyrite in small (<2mm across) irregular shaped blebs. No veining. Slightly weathered on medium to close spaced fractures		
5.20 - 5.50	100	83	83									Pale grey, moderately strong CALCAREOUS MUDSTONE. Gradational with limestones above and below. Very fine grained. Weakly laminated with bedding at 65 degrees to the core axis. Close spaced open fractures, often filled with soft, grey CLAY (forming c. 5% of the interval).		
5.50 - 6.50	100	90	63							5.50	83.90	Pale grey to grey, moderately strong, ARGILLACEOUS LIMESTONE. Gradational with calcareous mudstone. Massive, locally weakly laminated, very fine grained. No fossils. Trace small pyrite blebs. Locally somewhat reticulate hairline veinlets or bleaching (reduction) tracts. Medium spaced fractures.		
6.50 - 7.75	100	96	96					7.95	81.45			Not recovered.		
7.75...	83	53	40									8.10	81.30	Slightly brownish grey, moderately stiff CLAY.
8.00 - 9.50	93	51	39							8.35	81.05			Grey to pale grey, strong, LIMESTONE. Weakly banded (banding of slight grey colour contrasts), fine grained, with trace to minor bioclastic grains. Some bands contain occasional to common brachiopods. Near the top of the interval the limestone contains scatted lensoid or lenticular darker grey (micritic?) clasts up to 20mm long. <1% hairline and fine (<1mm wide) calcite veins. Medium, locally close, spaced fractures with trace slight brown discolouration. One fracture perhaps along a stylolite.
								9.30	80.10			@11.20 Planar interface between pale grey and grey limestone, presumed bedding, at 45 degrees to the core axis		
												Brown and pale brownish grey, moderately strong CALCAREOUS MUDSTONE. Massive to weakly banded or laminated, frequent bleaching (reduction) in irregular but rounded masses or along thin linear tracts.<1% calcite veins to 1mm wide. Medium to close spaced fractures		
Contractor: Apex				Remarks: 1m wide void at 141m.										
Rig Type: Wireline														
Core Diameter: HQ (63.5mm)														

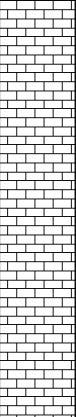
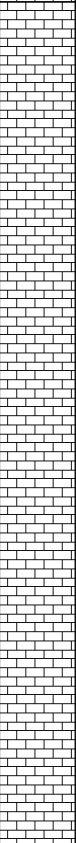
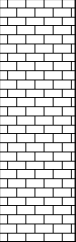
		GWP consultants		Rotary Core Log					Borehole No. 2021-8 Sheet 2 of 22	
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington				Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates				Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description		
	TCR	SCR	RQD							
9.50 - 11.00	100	90	47	10.40		79.00		Brown and pale brownish grey, moderately strong CALCAREOUS MUDSTONE. Massive to weakly banded or laminated, frequent bleaching (reduction) in irregular but rounded masses or along thin linear tracts.<1% calcite veins to 1mm wide. Medium to close spaced fractures		
					0.95			Pale slightly brownish grey. Moderately strong, ARGILLACEOUS LIMESTONE (Base of Clifton Down Mudstone). Massive and laminated, locally with thin fine grained bands, possibly with bioclastic grains, becoming less muddy (argillaceous) down-hole, <1% calcite veins. Medium spaced fractures. @11.20-11.35 breccia of brownish grey limestone in matrix of pale limestone or vein calcite with sharp slightly undulating (eroded?) contact at base at 65 degrees to core axis.		
11.00 - 12.50	100	92	75	11.35		78.05		Very pale grey to pale grey, strong, perhaps very strong, LIMESTONE (Top of Gully Oolite). Massive, fine grained to fine grained oolitic limestone without fossils. Trace hairline calcite veins. Medium to close spaced fractures, slight brown staining on some fracture surfaces, trace stylolitic fractures with trace pyrite. Some fractures orientated sub-parallel to the core axis (resulting in low RQD). Core rings when struck suggesting very strong rock.		
12.50 - 14.00	100	56	46							
14.00 - 15.50	100	57	49		5.75					
15.50 - 17.10	100	74	68							
17.10 - 18.65	100	100	96	17.10		72.30		Pale grey, strong, perhaps very strong, LIMESTONE. Massive, fine grained and fine grained oolitic limestone .No bedding. No fossils. Trace hairline and fine (<1mm wide) calcite veins often art c. 25 to 30 degrees to the core axis, perhaps perpendicular to bedding, Medium, locally close, spaced fractures. Core rings when struck suggesting very strong rock but breaks with a single hammer blow.		
18.65 - 20.10	100	100	90							
Contractor:		Apex					Remarks: 1m wide void at 141m.			
Rig Type:		Wireline								
Core Diameter:		HQ (63.5mm)								

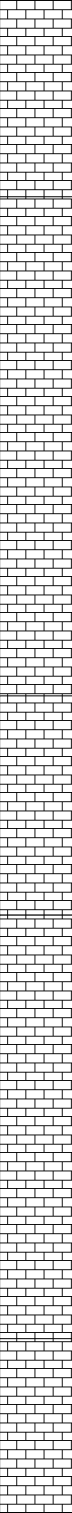
 GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 3 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
20.10 - 21.70	100	72	66	23.60	6.50	65.80		Pale grey, strong, perhaps very strong, LIMESTONE. Massive, fine grained and fine grained oolitic limestone. No bedding. No fossils. Trace hairline and fine (<1mm wide) calcite veins often at c. 25 to 30 degrees to the core axis, perhaps perpendicular to bedding, Medium, locally close, spaced fractures. Core rings when struck suggesting very strong rock but breaks with a single hammer blow.
21.70 - 23.30	100	86	68					
23.30 - 24.80	100	28	28	24.70	1.10	64.70		Pale grey, strong, LIMESTONE. As previous interval except the core is broken on close to very close spaced fractures
24.80 - 26.30	100	83	66	29.40	4.70	60.00		Pale grey and pale grey to grey, strong, locally only moderately strong, LIMESTONE. Massive, fine grained and not obviously oolitic, becoming slightly darker and coarser grained down-hole. No fossils or bioclastic grains. Trace hairline calcite veins. Medium and close spaced fractures, often both across the width of the core (presumed bedding parallel) and at low angles to the core axis (resulting in low RQD)
26.30 - 27.80	100	60	53					
27.80 - 29.40	100	38	38					
								Pale grey and grey, strong, perhaps very strong, LIMESTONE. Gradational with previous interval. Massive, fine grained and fine to medium grained, perhaps oolitic but not obviously so. Mostly unfossiliferous but one partial bivalve fossil found on broken core surface. <1% calcite veins with occasional reticulate hairline veining. variably wide to close spaced fractures but mainly medium spaced. Core rings when struck
Contractor: Apex		Remarks: 1m wide void at 141m.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

 GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 4 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
29.40 - 31.00	100	81	77	32.35	2.95	57.05		Pale grey and grey, strong, perhaps very strong, LIMESTONE. Gradational with previous interval. Massive, fine grained and fine to medium grained, perhaps oolitic but not obviously so. Mostly unfossiliferous but one partial bivalve fossil found on broken core surface. <1% calcite veins with occasional reticulate hairline veining. variably wide to close spaced fractures but mainly medium spaced. Core rings when struck suggesting very strong rock.
31.00 - 32.50	100	100	96					
32.50 - 34.10	100	92	92					
34.10 - 35.50	100	100	94					
35.50 - 37.10	100	87	87					
37.10 - 38.60	100	100	97					
38.60 - 40.10	100	100	100					
Contractor: Apex		Remarks: 1m wide void at 141m.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

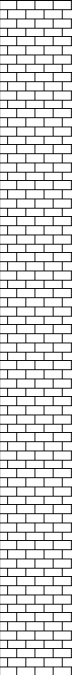
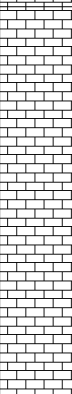
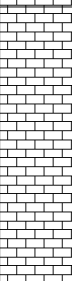
		Rotary Core Log					Borehole No. 2021-8 Sheet 5 of 22	
Project Name: Woodleaze Quarry extension			Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC	
Location: Tytherington			Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50	
Client: Hanson Aggregates			Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR	
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
40.10 - 41.20	100	97	92	41.40	2.35	48.00		'Pale grey to grey, strong, LIMESTONE. Massive, very fine and fine grained limestone, perhaps becoming coarser down-hole, not noticeably oolitic, with minor fine to medium grained bioclastic fragments, locally in weakly defined centimetric bands, occasional crinoid ossicles and local trace arcuate (presumed brachiopod) shells. Trace small rounded blebs of calcite 10 10mm across, possible poorly preserved macro fossils. Trace to <1% fine calcite veinlets. Variably wide to close spaced fractures (mostly medium spaced), occasionally weakly stylolitic in habit.
41.20 - 42.75	100	97	97					Pale grey or pale grey to grey, strong, perhaps moderately strong to strong, LIMESTONE (Top of the Crinoidal Sub-band of the Gully Oolite). Weakly banded to massive, locally crinoidal limestone, banding on scales of 20 to 50mm with faint grey colour contrasts or with density of crinoid debris, crinoid ossicles common in some bands. Banding parallel to bedding at c.70 degrees to the core axis. Locally irregular but rounded masses of pale grey limestone in grey matrix. Trace hairline calcite veins. Medium to wide spaced fractures.
42.75 - 44.30	100	100	100	43.75	2.10	45.65		Pale grey to grey, strong, CRINOIDAL LIMESTONE (Base of the Crinoidal Sub-band of the Gully Oolite). Weakly banded with much coarse grained bioclastic material, abundant crinoid ossicles and articulated stems to 30mm long, some bands with common to abundant arcuate shells in section, presumed brachiopods. <1% calcite veinlets, often hairline. Medium spaced fractures. At the base of the interval grey crinoidal limestone grades downhole into very pale grey and coarse grained bioclastic limestone with sharp basal contact at 45 degrees to the core axis to darker grey limestone below.
44.30 - 45.80	100	91	80					
45.80 - 47.40	100	94	92	45.85	2.20	43.55		Grey, strong LIMESTONE (Top of Black Rock Limestone). Massive, very fine grained micritic to fine grained bioclastic limestone. Faint and somewhat irregular or blotchy colour contrasts (not banding). Trace to <1% fine (<1mm wide) calcite veins. Medium to wide spaced fractures.
47.40 - 48.90	100	100	100	48.05				41.35
48.90 - 50.40	100	100	83					
Contractor: Apex			Remarks: 1m wide void at 141m.					
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

 GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 6 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
50.40 - 52.00	100	77	48	58.95	10.90	30.45		Grey, strong LIMESTONE. Massive, fine grained limestone with gradational wide-spaced decimetric bands with medium to coarse grained bioclastic fragments, mostly crinoid debris, crinoid ossicles locally common, and trace brachiopods. <1% fine and hairline calcite veins, locally veins to 3mm wide. Medium to wide spaced horizontal suture stylolites. Medium spaced fractures. @48.50-48.85 Distinct pale grey to grey band with crinoid fossils @50.10-50.70 Fracture with brown weathering staining along thin (2mm wide) calcite vein at low angle to the core axis with non-solid core and low RQD.
52.00 - 53.60	100	88	77					
53.60 - 55.10	100	100	87					
55.10 - 56.65	100	100	82					
56.65 - 58.20	100	100	95					
58.20 - 59.70	100	99	87					Grey, strong LIMESTONE. Weakly banded, fine grained, perhaps fine grained bioclastic with minor medium grained bioclastic fragments. No macro fossils except sparse crinoid ossicles. Banding (bedding) at c. 65 degrees to the core axis. Trace hairline calcite veins. Trace only of stylolites. Medium, locally close, spaced fractures.
Contractor: Apex		Remarks: 1m wide void at 141m.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

 GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 7 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
59.70 - 61.20	100	94	88	62.80	3.85	26.60		Grey, strong LIMESTONE. Weakly banded, fine grained, perhaps fine grained bioclastic with minor medium grained bioclastic fragments. No macro fossils except sparse crinoid ossicles. Banding (bedding) at c. 65 degrees to the core axis. Trace hairline calcite veins. Trace only of stylolites. Medium, locally close, spaced fractures.
61.20 - 62.70	100	100	98					
62.70 - 64.20	100	100	100					
64.20 - 65.70	100	100	96	68.40	5.60	21.00		Pale grey to grey, strong, LIMESTONE. Gradational from previous interval. Very weakly gradationally banded, mainly very fine grained with trace to minor bioclastic fragments, some obviously crinoidal debris often in bands or patches. Locally somewhat breccia textured limestone with rounded masses that are very fine grained and slightly darker than the matrix. Trace calcite veins. Medium and wide spaced horizontal suture stylolites, some very convoluted, some as open fractures containing trace smears of grey clay. Overall medium and wide spaced fractures.
65.70 - 67.20	100	100	100					
67.20 - 68.50	100	100	100					
68.50 - 70.05	100	97	78		2.90			Grey, strong LIMESTONE. Variably massive, weakly and moderately banded with bands with more or less medium to coarse grained bioclastic fragments, some bands with most bioclastic fragments have 1-2% fine (<1mm) pores, some crinoid or shelly fragments but no complete macro fossils. Trace hairline calcite veins. Trace horizontal suture stylolites. Medium to close spaced fractures.
Contractor:		Apex						Remarks: 1m wide void at 141m.
Rig Type:		Wireline						
Core Diameter:		HQ (63.5mm)						

 GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 8 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
70.05 - 71.60	100	100	75	71.30		18.10		Grey, strong LIMESTONE. Variably massive, weakly and moderately banded with bands with more or less medium to coarse grained bioclastic fragments, some bands with most bioclastic fragments have 1-2% fine (<1mm) pores, some crinoid or shelly fragments but no complete macro fossils. Trace hairline calcite veins. Trace horizontal suture stylolites. Medium to close spaced fractures.
					3.30			Pale grey to grey, strong LIMESTONE. Weakly banded coarse grained bioclastic limestone, common coarse fragments with some complete crinoid ossicles but no other macro fossils. Trace calcite veinlets. Trace stylolites. Variably wide to close spaced fractures. Very broken core at base of Run 50 (base of this interval) but no core loss.
71.60 - 77.60	100	100	99	74.60		14.80		Pale grey to grey, strong LIMESTONE. Generally massive with minor fine to coarse grained bioclastic fragments and trace crinoid ossicles. No calcite veins and one stylolitic fracture in this interval. Medium spaced fractures.
				76.05		13.35		Pale grey, strong LIMESTONE. Weakly banded, with some bands of coarse grained bioclastic limestone, locally fragments abundant, including some complete crinoid ossicles. Trace calcite veins. Trace stylolites. Medium and wide spaced fractures.
					2.80			
77.60 - 79.20	100	100	100	78.85		10.55		Pale grey and pale grey to grey, strong, locally moderately strong, LIMESTONE. Massive and weakly banded limestone with occasional lamellae of darker grey limestone. Minor quantities of medium to coarse grained bioclastic fragments, perhaps crinoidal debris but no complete ossicles or other macro fossils. Locally weakly porous. Weak banding and laminations at c. 65 degrees to the core axis. Trace calcite veinlets. No stylolites. Variably close to wide spaced fractures. Very broken core@83.4-83.60 (base of Run 56) but no core loss.
79.20 - 80.70	100	100	95					@85-85.45 annealed (syn-sedimentary?) breccia with angular pale grey limestone clasts matrix
Contractor: Apex Rig Type: Wireline Core Diameter: HQ (63.5mm)								Remarks: 1m wide void at 141m.

 GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 9 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
80.70 - 82.20	100	100	86	7.25				Pale grey and pale grey to grey, strong, locally moderately strong, LIMESTONE. Massive and weakly banded limestone with occasional lamellae of darker grey limestone. Minor quantities of medium to coarse grained bioclastic fragments, perhaps crinoidal debris but no complete ossicles or other macro fossils. Locally weakly porous. Weak banding and laminations at c. 65 degrees to the core axis. Trace calcite veinlets. No stylolites. Variably close to wide spaced fractures. Very broken core@83.4-83.60 (base of Run 56) but no core loss. @85-35-85.45 annealed (syn-sedimentary?) breccia with angular pale grey limestone clasts matrix supported in darker grey limestone matrix. 10cm down-hole from this sub-interval similar less well developed texture with fine/hairline calcite veining following the clast margins.
82.20 - 83.60	100	81	81					
83.60 - 85.20	100	100	100					
85.20 - 86.80	97	89	84	86.10	0.40	3.30		Ochre and grey, moderately strong to weak LIMESTONE BRECCIA. Rounded grey limestone clasts in ochrous calcareous somewhat sandy calcareous matrix with trace clay. Adjacent limestone cut by networks of ochre coloured veins Grey and beige, strong to moderately strong LIMESTONE. Grey limestone with minor medium grained bioclastic fragments cut by c 5% calcite veins. One 5mm calcite vein is complex zoned white and orange and weakly anastomosing. Veining mostly at c. 40 degrees to the core axis. Associated with veins @87.25-87.35 area of beige or greenish (reduced?) limestone with finely granular texture, perhaps clayey.
86.80 - 88.30	100	100	100	87.45		1.95		
88.30 - 89.70	100	98	98					
Contractor: Apex		Remarks: 1m wide void at 141m.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

 GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 10 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
89.70 - 91.30	100	100	100	94.50	7.05	-5.10		Grey to dark grey strong, locally perhaps strong to moderately strong, LIMESTONE. Massive, locally weakly laminated with slightly darker grey lamellae, very fine grained micritic with minor fine to medium grained bioclastic grains, perhaps crinoidal, and occasional bands of more obviously bioclastic limestone with coarse grains and trace crinoid and possible coral. Sparse blebby calcite masses to 5mm across possible poorly preserved macro fossils (also coral?). Trace calcite veinlets. Occasional wide spaced suture stylolites. Medium to wide spaced fractures, a few fractures having trace grey clay fill.
91.30 - 92.95	100	98	98					
92.95 - 94.40	100	95	92					
94.40 - 96.00	100	100	100	97.10	2.60	-7.70		Grey strong to very strong LIMESTONE. Much as previous interval but with occasional distinct crinoidal limestone bands 50 to 100mm wide with common to abundant crinoid ossicles and stem fragments. Elsewhere only faint banding or lamination. Trace to <1% fine and hairline calcite veins. Mostly wide spaced fractures in this interval
96.00 - 97.50	100	100	100					
97.50 - 98.95	97	97	96	97.10	4.40			Grey, strong LIMESTONE Much as interval 87.45-94.50, mostly massive limestone with local trace banding, and with minor bioclastic fragments. No obvious macro fossils. Trace to <1% calcite veins. Medium and wide spaced fractures
98.95 - 100.60	100	100	100					
Contractor: Apex		Remarks: 1m wide void at 141m.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

		GWP consultants		Rotary Core Log					Borehole No. 2021-8 Sheet 11 of 22	
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington				Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates				Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description		
	TCR	SCR	RQD							
									Grey, strong LIMESTONE Much as interval 87.45-94.50, mostly massive limestone with local trace banding, and with minor bioclastic fragments. No obvious macro fossils. Trace to <1% calcite veins. Medium and wide spaced fractures	
100.60 - 102.10	100	100	100	101.50		-12.10			Pale grey, strong LIMESTONE. Weakly to moderately banded, mostly very fine or fine grained with trace bioclastic fragments, with occasional decimetric scale bands with coarse grained bioclastic fragments and common macro fossils, mainly arcuate shell sections of brachiopods (locally abundant), crinoid ossicles and segments of crinoid stem. Trace calcite veins becoming more abundant (to <1%) down-hole, often at low angles to the core axis, cream and 1-3mm wide. Wide spaced stylolites, one occurring as an open fracture. Overall medium spaced fractures. Locally broken core.	
102.10 - 103.60	100	93	93		3.80					
103.60 - 105.10	100	79	67							
105.10 - 106.60	100	100	100	105.30		-15.90			Grey, strong LIMESTONE, massive without banding, fine grained, trace bioclastic fragments and no macro fossils. Trace fine calcite veins. Wide spaced horizontal suture stylolites. Medium, locally close, spaced fractures.	
106.60 - 108.10	100	100	100		2.80					
108.10 - 109.60	100	100	94	108.10		-18.70			Grey, strong, LIMESTONE. Weakly banded fine grained massive limestone gradational to bands a few centimetres wide with bioclastic fragments and often including minor crinoid ossicles. Limestone becoming slightly argillaceous down-hole with increasing proportions of bioclastic fragments and macro fossils. Medium spaced fractures.	
					2.80					
Contractor:		Apex					Remarks:			
Rig Type:		Wireline					1m wide void at 141m.			
Core Diameter:		HQ (63.5mm)								

Rotary Core Log

Borehole No.

2021-8

Sheet 12 of 22

Project Name:	Woodleaze Quarry extension
---------------	----------------------------

Project No.:	TYTHFXT
--------------	---------

Co-ords: (NGR)	365121E - 187706N
-------------------	-------------------

Hole Type:
RC

Location: Tytherington

Hole Inclination:	90°
-------------------	-----

Collar Level: 89.4m AOD

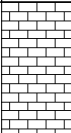
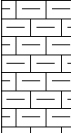
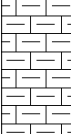
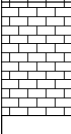
Scale:
1:50

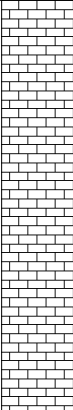
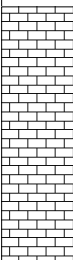
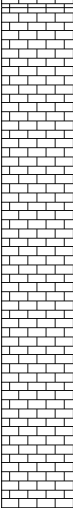
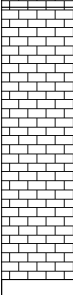
Client: Hanson Aggregates

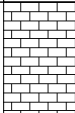
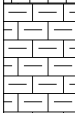
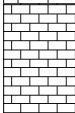
Hole Azimuth:	
---------------	--

Drilling Dates: 26/11/2021 - 05/01/2022

Logged By:
SJR

Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
109.60 - 111.10	100	99	93	110.90	3.00	-21.50		Grey, strong, LIMESTONE. Weakly banded fine grained massive limestone gradational to bands a few centimetres wide with bioclastic fragments and often including minor crinoid ossicles. Limestone becoming slightly argillaceous down-hole with increasing proportions of bioclastic fragments and macro fossils. Medium spaced fractures.
111.10 - 112.60	100	100	94					Grey and dark grey, strong to moderately strong, ARGILLACEOUS LIMESTONE. Banded and laminated grey and dark grey argillaceous limestone with limestone bands, locally with very dark grey to black lamellae of argillaceous limestone (tending to calcareous mudstone). Banding generally at 70 degrees to the core axis but sometimes wavy or undulating, locally with possible bioturbation. Abundant coarse bioclastic fragments and grains throughout. Crinoid and brachiopod macro fossils common, locally abundant, and occasional small (5 to 10mm across) solitary corals in cross section. No calcite veins or stylolites. Medium to wide, locally close, spaced fractures.
112.60 - 114.10	100	100	100	113.90	2.30	-24.50		Grey, strong LIMESTONE. Massive and weakly banded, fine grained with medium to coarse grained bioclastic limestone. Minor macro fossils, mainly crinoid ossicles but with trace coral. <1% calcite veins to 3mm across. Medium spaced fractures.
114.10 - 115.60	100	100	100					Grey and dark grey, strong, ARGILLACEOUS LIMESTONE. Weakly banded and laminated argillaceous and slightly argillaceous limestone with coarse grained bioclastic fragments, mostly crinoidal, and common macro fossils especially crinoid ossicles, locally abundant, with trace brachiopods and coral. No mudstone lamellae. Medium spaced fractures.
115.60 - 117.15	100	100	95	116.20	1.45	-26.80		Note: Run 79 labelled by drillers as 117.10-118.20 contains 1.55m of core. Run mislabelled by 0.5m. Depth of all subsequent runs re-calculated (in addition to slight over and under 0.05m measures due to core from imperial sized core barrel being measured in metres).
117.15 - 118.70	100	100	100					117.65
118.70 - 120.15	100	100	97	119.25		-29.85		Grey, locally dark grey, strong LIMESTONE, Banded, locally laminated, slightly argillaceous limestone, variably bioclastic, mostly crinoidal, in gradational bands, with trace argillaceous limestone lamellae. Bedding somewhat variable 55 to 70 degrees to the core axis, sometimes undulating, locally contorted (sedimentary structures, perhaps bioturbation), Minor complete crinoid ossicles and short stem pieces, trace brachiopods. Medium spaced fractures.
Contractor:			Apex					Remarks:
Rig Type:			Wireline					1m wide void at 141m.
Core Diameter:			HQ (63.5mm)					

		GWP consultants				Rotary Core Log				Borehole No. 2021-8 Sheet 13 of 22			
Project Name: Woodleaze Quarry extension						Project No.: TYTHEXT			Co-ords: (NGR) 365121E - 187706N			Hole Type: RC	
Location: Tytherington						Hole Inclination: 90°			Collar Level: 89.4m AOD			Scale: 1:50	
Client: Hanson Aggregates						Hole Azimuth: 0°			Drilling Dates: 26/11/2021 - 05/01/2022			Logged By: SJR	
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description					
	TCR	SCR	RQD										
120.15 - 121.70	100	100	91	122.75 - 123.00	3.50	-33.35		Grey, locally dark grey, strong LIMESTONE, Banded, locally laminated, slightly argillaceous limestone, variably bioclastic, mostly crinoidal, in gradational bands, with trace argillaceous limestone lamellae. Bedding somewhat variable 55 to 70 degrees to the core axis, sometimes undulating, locally contorted (sedimentary structures, perhaps bioturbation), Minor complete crinoid ossicles and short stem pieces, trace brachiopods. Medium spaced fractures.					
121.70 - 123.20	83	83	83										
123.20 - 124.70	100	100	96		1.85	-33.60		Not recovered: assumed location of core loss represented by gap in core box, Core on either side of gap don't fit mechanically or lithologically. No evidence of broken core or clay. Pale grey, locally pale grey to grey, strong, LIMESTONE. Banded and weakly banded bioclastic limestone, trace grey limestone lamellae, coarse grained bioclastic grains very common to abundant, mostly crinoidal with occasional complete ossicles. One 5-8mm wide calcite vein at c 20 degrees to the core axis and perpendicular to bedding. Medium, locally medium to wide, spaced fractures.					
124.70 - 126.25	100	99	99										
126.25 - 127.85	100	100	88		3.35	-35.45		Pale grey and grey, strong LIMESTONE. Weakly to moderately banded, very fine grained micritic and fine to coarse grained bioclastic limestone, with grey limestone lamellae, some wavy. Minor to common crinoid ossicles and trace brachiopods and solitary coral in bioclastic parts. <1% calcite veins, one calcite vein to 10mm wide at low angle to the core axis. Occasional (wide spaced) stylolites. Medium to close spaced fractures					
127.85 - 129.45	100	100	100										
				128.20		-38.80		Grey, strong, LIMESTONE. Weakly to moderately banded, locally laminated, slightly argillaceous limestone, medium to coarse grained bioclastic grains in a very fine grained matrix. Locally abundant crinoidal debris including whole ossicles and stem pieces, locally common. Possible trace brachiopods and coral. Banding at c 60 degrees to the core axis. <1% calcite veins, locally >5mm wide. Medium to wide spaced fractures. @129.05-129.30 bands of very fine grained micrite with rounded clasts of bioclastic limestone.					
Contractor:		Apex						Remarks: 1m wide void at 141m.					
Rig Type:		Wireline											
Core Diameter:		HQ (63.5mm)											

		GWP consultants		Rotary Core Log					Borehole No. 2021-8 Sheet 14 of 22		
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N			Hole Type: RC		
Location: Tytherington				Hole Inclination: 90°		Collar Level: 89.4m AOD			Scale: 1:50		
Client: Hanson Aggregates				Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022			Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description			
	TCR	SCR	RQD								
129.45 - 131.00	100	100	95	132.50	4.30	-43.10		Grey, strong, LIMESTONE. Weakly to moderately banded, locally laminated, slightly argillaceous limestone, medium to coarse grained bioclastic grains in a very fine grained matrix. Locally abundant crinoidal debris including whole ossicles and stem pieces, locally common. Possible trace brachiopods and coral. Banding at c 60 degrees to the core axis. <1% calcite veins, locally >5mm wide. Medium to wide spaced fractures. @129.05-129.30 bands of very fine grained micrite with rounded clasts of bioclastic limestone.			
131.00 - 132.50	100	100	94								
132.50 - 134.00	100	100	100	138.15	5.65	-48.75		Grey, locally dark grey, strong ARGILLACEOUS LIMESTONE. Banded or laminated, slightly argillaceous limestone with lamellae and thin (to 50mm wide) bands of dark grey to black argillaceous limestone, in places these tending to calcareous mudstone. Banding at c. 60 degrees to the core axis. Coarse grained bioclastic fragments abundant except in the dark grey lamellae and bands where they are absent. Crinoidal ossicles and short articulated stem fragments common to abundant. Occasional shell fragments (assumed brachiopods) and trace solitary coral. Medium to close spaced fractures			
134.00 - 135.50	100	100	95								
135.50 - 137.00	100	99	93								
137.00 - 138.55	100	100	100								
138.55 - 140.00	100	100	100	139.50	1.35	-50.10		Pale grey, locally grey, strong LIMESTONE, Pale grey transitional to grey at top and base of interval. Faintly banded without argillaceous lamellae. Fine to coarse grained bioclastic limestone, coarse grains common to abundant, often crinoidal. Minor bands (50 to 100m wide) with abundant arcuate shells of brachiopods in section. Banding at c. 60 degrees to the core axis. Trace calcite veins. Medium to wide spaced fractures			
Contractor: Apex				Remarks: 1m wide void at 141m.							
Rig Type: Wireline											
Core Diameter: HQ (63.5mm)											

Rotary Core Log

Borehole No.

2021-8

Sheet 15 of 22

Project Name:	Woodleaze Quarry extension
---------------	----------------------------

Project No.:	TYTHFXT
--------------	---------

Co-ords: (NGR)	365121E - 187706N
-------------------	-------------------

Hole Type:
RC

Location: Tytherington

Hole Inclination:	90°
-------------------	-----

Collar Level: 89.4m AOD

Scale:
1:50

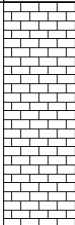
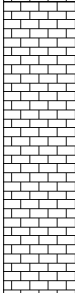
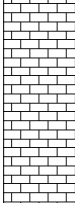
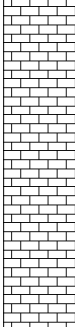
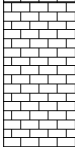
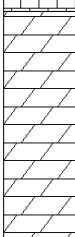
Client: Hanson Aggregates

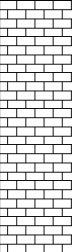
Hole Azimuth:	
---------------	--

Drilling Dates: 26/11/2021 - 05/01/2022

Logged By:
SJR

Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
140.00 - 140.30	100	70	70	140.55 - 140.65	1.05	-51.15 -51.25		Grey to pale grey, strong LIMESTONE. Fine grained micritic with minor bioclastic fragments, mainly crinoid debris, becoming more abundant down-hole. Trace macro fossils. 1% wide-spaced calcite veins 5-20mm wide associated with weak gradational zones of bleaching of the adjacent limestone. Trace fine calcite veinlets. Variably wide to close spaced fractures and local broken core.
140.30 - 141.50	27	15	11		0.10			Pale greyish brown soft CLAY with minor small rounded pieces of limestone.
141.50 - 143.00	93	74	74	141.45 - 141.80	0.80	-52.05 -52.10 -52.20 -52.40		Not recovered: void. Drillers report no resistance to advancing the drill bit. Assumed karstic cavity
					0.05			Grey, strong LIMESTONE, medium grained bioclastic without fossils. Re-drilled end. Fallen from cavity?
					0.10			Not recovered. Presumed continuation of cavity
					0.20			Pale ochre or yellowy brown, extremely soft to runny CLAY
143.00 - 144.50	93	77	77	143.00 - 144.35	1.20	-53.60		Pale grey to grey, strong LIMESTONE. Fine to medium grained bioclastic limestone with some large fragments and arcuate shell sections, locally common. c. 1% fine calcite veins, trace larger veins to 10mm wide. Medium spaced fractures.
					@142.80-142.90 dark grey, very fine grained irregular lobate masses of ?mudstone rimmed by white calcite veining. Possible small scale karstic void with vuggy calcite filled with mudstone?			
144.50 - 145.95	100	100	100	144.35 - 144.75	1.35	-54.95 -55.35		Grey, strong, LIMESTONE. Fine grained limestone with coarse grained bioclastic grains, mostly crinoidal debris with occasional complete crinoid ossicles. c. 2% calcite veins <1mm to 5mm wide, mostly fine, of several orientations, locally reticulate. Medium spaced fractures.
					0.40			Grey and white, strong, LIMESTONE BRECCIA. 50% grey limestone, as the previous interval, and 50% white calcite veining. Limestone with reticulate network veining grading to angular clasts of limestone in calcite matrix. Partially broken core. Medium to very close spaced fractures, some with ochre/orange staining.
145.95 - 147.50	100	100	100	147.50 - 149.00	4.10	-59.45		Grey, strong LIMESTONE. Weakly banded very fine grained limestone with fine to coarse bioclastic grains, variably slightly darker/paler bands, locally with non-argillaceous lamellae and sedimentary ?load structures, and trace to common, locally abundant, macro fossils with brachiopods especially common in bands near the top and base of interval, minor solitary coral to 15mm across in cross sections, and locally abundant crinoid ossicles. Trace to <1% fine calcite veins. Medium spaced fractures, trace stylolitic.
147.50 - 149.00	100	97	97					148.85
149.00 - 150.60	100	93	86					
Contractor: Apex								Remarks: 1m wide void at 141m.
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

						Rotary Core Log		Borehole No. 2021-8 Sheet 16 of 22	
Project Name: Woodleaze Quarry extension			Project No.: TYTHEXT			Co-ords: (NGR) 365121E - 187706N			Hole Type: RC
Location: Tytherington			Hole Inclination: 90°			Collar Level: 89.4m AOD			Scale: 1:50
Client: Hanson Aggregates			Hole Azimuth: 0°			Drilling Dates: 26/11/2021 - 05/01/2022			Logged By: SJR
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description	
	TCR	SCR	RQD						
									Grey to pale grey, strong LIMESTONE. Weakly banded with occasional bands, lenses or irregular angular and sub-angular clast-like masses of pale fine grained bioclastic limestone in massive grey limestone with variable fine to coarse bioclastic grains; perhaps syn-sedimentary rip-up features or bioturbation. Crinoid and brachiopod macro fossils variably occasional to common, locally abundant, with trace coral. Variably wide to close spaced fractures.
150.60 - 152.20	100	100	92	151.55	2.70	-62.15			
152.20 - 153.80	100	97	88	153.50	1.95	-64.10			Pale grey to grey, strong LIMESTONE, as previous interval but without the pale bands/clasts. Minor to common crinoid and brachiopod macro fossils. c. 1% calcite veins to 3mm wide, mostly at low angles to the core axis. Variable close to wide spaced fractures.
153.80 - 155.15	100	100	100	154.95	1.45	-65.55			Grey, strong, LIMESTONE. Massive with trace bedding, very fine grained micritic limestone with minor fine grained bioclastic fragments. No macro fossils. Trace calcite veins. Medium spaced fractures
155.15 - 156.70	100	100	100	157.20	2.25	-67.80			Pale grey, locally grey, strong LIMESTONE. Mostly weakly banded, pale grey fine grained limestone with variable distribution of medium grained bioclastic grains, and one well defined band of grey limestone at 60 degrees to the core axis. Trace to minor crinoid quantities of ossicles and trace brachiopods. <1% to 1% calcite veins to 4mm wide at very low angles to the core axis. Trace stylolites. Medium spaced fractures.
156.70 - 158.20	100	62	57	158.30	1.10	-68.90			Yellowish brown or ochre and yellowish grey, strong to moderately strong, locally moderately weak, ALTERED LIMESTONE, with 5% fine calcite veining, in places anastomosing, and one slightly vuggy 5mm wide ochre-coloured vein at low angle to the core axis with trace ochre coloured clay and sandy texture in adjacent limestone that above the vein is like the previous interval with yellow staining and minor small pores, below is like the next interval. Close spaced fractures and broken core in part. Possible minor fault.
158.20 - 159.80	100	100	94	159.80	1.50	-70.40			Slightly brownish grey, strong, DOLOMITIC LIMESTONE. Very fine grained, massive, locally with minor fine and medium grained bioclastic fragments but no macro fossils. Rock has weak reaction to cold HCl, typical limestone crystalline texture and no indication of mudstone content: assume dolomitised limestone. Trace calcite veins. Medium spaced fractures. @158.70-158.85 with sub-rounded masses of zoned coarse white calcite to 20mm across, assumed void fill. @159.45 irregular fracture, perhaps stylolitic, with c. 2mm fill of soft grey clay
									Pale grey, strong, LIMESTONE. Massive with only one gradational band with some fine to medium grained
Contractor: Apex			Remarks: 1m wide void at 141m.						
Rig Type: Wireline									
Core Diameter: HQ (63.5mm)									

 GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 17 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
159.80 - 161.30	100	100	100	161.70	1.90	-72.30		Pale grey, strong, LIMESTONE. Massive with only one gradational band with some fine to medium grained bioclastic fragments and no macro fossils. Gradational lower contact with next interval. <1% calcite veins to 3mm wide. Medium spaced, tight (closed) horizontal suture stylolites. Medium spaced fractures
161.30 - 162.80	100	85	77					8.90
162.80 - 164.35	100	100	95					
164.35 - 165.90	100	100	100					
165.90 - 167.45	100	100	95					
167.45 - 168.90	100	100	100					
168.90 - 170.50	100	100	100					
Contractor: Apex		Remarks: 1m wide void at 141m.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

		GWP consultants		Rotary Core Log				Borehole No. 2021-8 Sheet 18 of 22	
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC	
Location: Tytherington				Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50	
Client: Hanson Aggregates				Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR	
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description	
	TCR	SCR	RQD						
				170.60	4.90	-81.20		Grey and slightly brownish grey, strong, DOLOMITIC LIMESTONE. Weak reaction to cold HCl: assumed dolomitised limestone. Massive and very fine grained, locally with faint banding, no bioclastic fragments or fossils. Trace fine calcite veins. Trace horizontal suture stylolites. Medium and close spaced fractures, fracture at base of interval with trace grey clay fill. @164.55-164.60 Very pale grey fine grained limestone band with sharp but undulating contacts. @164.75-164.90 Very pale fine grained rounded mass of limestone with sharp contact, clast-like, elongate parallel to presumed bedding, almost full width of the core. @165.05 Somewhat irregular to sub-angular mass of calcite to 30mm across, possible void fill @166.40-166.60 zone with fine to 2mm wide somewhat reticulate reddish brown veins, perhaps haematite Pale grey, strong. LIMESTONE. Massive, fine to medium grained, only trace of bioclastic fragments, no macro fossils. <1% calcite veins, often cream coloured, <1mm to 5mm wide, mostly at low angles to the core axis. Trace stylolites. Medium and wide spaced fractures.	
170.50 - 172.00	100	92	89						
172.00 - 172.50	93	93	89						
172.50 - 175.00	100	100	100						
175.00 - 176.50	100	100	89						
				175.50	1.45	-86.10		Pale grey, locally pale grey to grey, strong LIMESTONE. Fine to medium grained, massive and weakly banded, with some bands with minor bioclastic fragments and minor macro fossils including crinoid ossicles and trace shell, presumed brachiopods.. Trace calcite veins. Medium spaced fractures	
176.50 - 178.00	100	92	86						
178.00 - 179.50	100	97	91						
Contractor:		Apex				Remarks:			
Rig Type:		Wireline				1m wide void at 141m.			
Core Diameter:		HQ (63.5mm)							

Rotary Core Log

Borehole No.

2021-8

Sheet 19 of 22

Project Name:	Woodleaze Quarry extension
---------------	----------------------------

Project No.:	TYTHFXT
--------------	---------

Co-ords: (NGR)	365121E - 187706N
-------------------	-------------------

Hole Type:
RC

Location: Tytherington

Hole Inclination:	90°
-------------------	-----

Collar Level: 89.4m AOD

Scale:
1:50

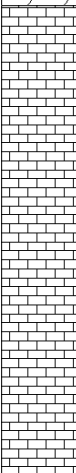
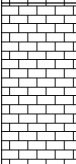
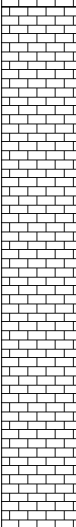
Client: Hanson Aggregates

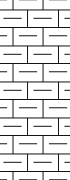
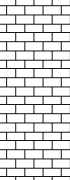
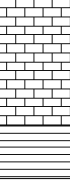
Hole Azimuth:	
---------------	--

Drilling Dates: 26/11/2021 - 05/01/2022

Logged By:
SJR

Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
179.50 - 181.00	100	100	79	182.75	4.75			Grey and pale grey, locally grey to dark grey, strong LIMESTONE. Massive and weakly to moderately banded limestone with occasional decimetric sized bands of darker grey weakly argillaceous limestone with minor bioclastic fragments and common macro fossils including crinoid, solitary coral and brachiopods, in paler grey limestone without bioclasts or fossils. Banding (bedding) at c 45 degrees to the core axis, unusually shallow,. <1% hairline and fine calcite veins, locally 1% in almost reticulate disposition accompanied, where most abundant, with weak bleaching of the host limestone. Medium and close spaced fractures.
181.00 - 182.60	100	100	98					
182.60 - 184.10	100	79	79					
184.10 - 185.60	90	90	78	188.65	5.90			@184.50-184.65. Break between unmatched core ends and small amount of light brown soft clay. Possible location of 150mm apparent non-recovery in Run 124 (184.10-185.60)
185.60 - 187.10	100	100	95					
187.10 - 188.70	100	98	95					
188.70 - 190.20	100	100	95		1.40			Slightly brownish dark grey, strong to very strong, DOLOMITIC LIMESTONE. Massive, very fine grained, crystalline texture, with very faint lamination in places, trace possible bioclastic fragments. Weak or zero reaction to cold HCl. <1% fine and hairline calcite veins. Medium spaced fractures.
Contractor:			Apex					Remarks: 1m wide void at 141m.
Rig Type:			Wireline					
Core Diameter:			HQ (63.5mm)					

		Rotary Core Log				Borehole No. 2021-8 Sheet 20 of 22		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
				190.05		-100.65		Slightly brownish dark grey, strong to very strong, DOLOMITIC LIMESTONE. Massive, very fine grained, crystalline texture, with very faint lamination in places, trace possible bioclastic fragments. Weak or zero reaction to cold HCl. <1% fine and hairline calcite veins. Medium spaced fractures. Pale grey and grey, strong LIMESTONE. Moderately banded or laminated, very fine grained with gradational bands of fine grained ?bioclastic limestone, some slightly argillaceous, one 20cm band of dolomitic limestone like the previous interval, and trace of argillaceous limestone lamellae. Some bands include coarse bioclastic grains and macro fossils, locally common, especially crinoid ossicles and brachiopod shells in section. <1% to 1% calcite veins to 3mm wide, variable orientations. Medium and close spaced fractures.
190.20 - 191.70	100	100	94		3.15			
191.70 - 193.20	100	95	89					
193.20 - 194.70	100	100	87	193.20	1.15	-103.80		Pale grey and dark grey, strong, locally moderately strong, LIMESTONE. Banded and laminated bioclastic limestone with common coarse bioclastic grains, occasional crinoid ossicles and short (<10mm) articulated stem sections, with lamellae and thin bands of fine grained argillaceous limestone and calcareous mudstone forming c 10% of the rock mass, individual bands a maximum of 40mm wide and breaking easily along bedding planes.. Bedding at c. 60 degrees to the core axis. <1% calcite veins. Medium spaced fractures.
				194.35		-104.95		
194.70 - 196.20	100	100	95		3.50			
196.20 - 197.85	97	97	72					
				197.85	3.45	-108.45		
197.85 - 199.30	93	93	60					
Contractor: Apex		Remarks: 1m wide void at 141m.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

		GWP consultants		Rotary Core Log					Borehole No. 2021-8 Sheet 21 of 22		
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT			Co-ords: (NGR) 365121E - 187706N		Hole Type: RC		
Location: Tytherington				Hole Inclination: 90°			Collar Level: 89.4m AOD		Scale: 1:50		
Client: Hanson Aggregates				Hole Azimuth: 0°			Drilling Dates: 26/11/2021 - 05/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description			
	TCR	SCR	RQD								
199.30 - 200.80	97	97	84	201.30	1.45	-111.90		Grey and dark grey, locally black, moderately strong, ARGILLACEOUS LIMESTONE (Base of Black Rock Limestone). Strongly banded and laminated with dark grey to black calcareous mudstone bands mostly <10mm thick, and occasional bands of non-argillaceous paler grey limestone. Coarse bioclastic grains common with some complete crinoid ossicles, trace crinoid stem segments, and trace bands with arcuate brachiopod shells to 30mm across in cross section. <1% calcite veins to 5mm wide. Medium and close spaced fractures, mostly bedding parallel, and core breaks easily along bedding planes at c. 60 degrees to the core axis			
200.80 - 202.30	100	99	74					Dark grey, strong, locally moderately strong, CALCAREOUS MUDSTONE (Top of Lower Limestone Shale). Very fine grained, homogenous, massive with local faint laminations and trace bands 10-30mm wide of pale grey limestone containing common crinoid ossicles and short stem segments. Some mudstone is non-calcareous (no reaction to HCl). No calcite veins. Fractures medium, close and very close spaced but all breaks are along spaced weaker bedding planes.			
202.30 - 203.80	100	100	93	202.75	1.40	-113.35		Pale grey and dark grey, strong, LIMESTONE. Pale grey, medium grained, homogenous limestone either without bioclastic grains or with bioclastic grains and occasional crinoid fossils; with bands and undulating lamellae of dark grey argillaceous limestone, some bands with common large arcuate sections of brachiopod shells, locally bands of limestone with small rip-up clasts of argillaceous limestone. Trace calcite veins. Medium spaced fractures.			
203.80 - 205.40	100	100	94	204.15				-114.75	Dark grey and grey, moderately strong CALCAREOUS MUDSTONE. Weakly banded and faintly laminated dark grey calcareous mudstone with local trace crinoid ossicles, with minor bands 10 to 120mm wide of grey, coarse grained bioclastic limestone, with sharp contacts to mudstone, some with minor to common crinoid debris including whole ossicles. One limestone band near top interval with brachiopods. No calcite veins. Fractures variably wide, medium or close spaced but all breaks are on bedding planes at c 60 degrees to the core axis: rock generally breaks along such planes.		
205.40 - 207.00	100	100	92	208.80	4.65	-119.40			Pale grey and dark grey, moderately strong LIMESTONE. Fine to medium grained pale grey limestone with c 20% bands and lamellae of dark grey argillaceous limestone and black calcareous mudstone. Minor bioclastic fragments and occasional crinoid ossicles. Trace calcite veins. Medium spaced fractures.		
207.00 - 208.50	100	99	78					Grey, moderately strong, CALCAREOUS MUDSTONE. Strongly laminated with lenticular and undulating laminations, bedding at 55-65 degrees to the core axis. Medium fractures. Core breaks on bedding planes			
208.50 - 210.00	97	97	97	209.65	0.35	-120.25					
				210.00		-120.60					
Contractor: Apex				Remarks: 1m wide void at 141m.							
Rig Type: Wireline											
Core Diameter: HQ (63.5mm)											

Rotary Core Log

Borehole No.

2021-8

Sheet 22 of 22

Project Name:	Woodleaze Quarry extension
---------------	----------------------------

Project No.: TYTHFXT

Co-ords: (NGR)	365121E - 187706N
-------------------	-------------------

Hole Type:
RC

Location: Tytherington

Hole Inclination:	90°
-------------------	-----

Collar Level: 89.4m AOD

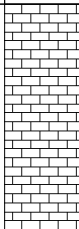
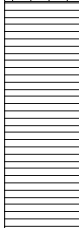
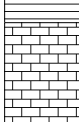
Scale:
1:50

Client: Hanson Aggregates

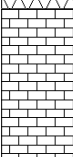
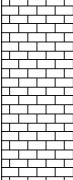
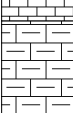
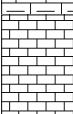
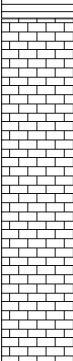
Hole Azimuth:	
---------------	--

Drilling Dates: 26/11/2021 - 05/01/2022

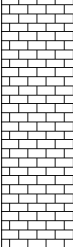
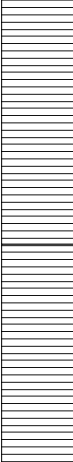
Logged By:
SJR

Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description	
	TCR	SCR	RQD						
210.00 - 211.50	97	96	81	211.55	1.55	-122.15		Pale grey and dark grey, strong and moderately strong LIMESTONE. Medium grained pale grey limestone with c 25% bands and lamellae of dark grey argillaceous limestone and calcareous mudstone some of which include minor bioclastic grains. Occasional macro fossils (crinoid, brachiopod) in discrete bands. Bedding at 60 degrees to the core axis. Trace calcite veins plus a 20mm wide vein at base of interval. Medium and close spaced fractures, mostly bedding parallel.	
211.50 - 213.10	100	100	98				1.70		Dark grey and pale grey, moderately strong CALCAREOUS MUDSTONE. Laminated mudstone with bands of pale grey medium grained limestone with bioclastic fragments. Occasional brachiopods in discrete bands. Trace calcite veins. Medium and close spaced fractures mostly bedding parallel
213.10 - 214.60	100	100	70		0.75				Pale grey, strong LIMESTONE. Medium grained, fairly massive limestone with trace bioclastic grains and trace brachiopods (only). Dark grey argillaceous limestone lamellae near top and base of interval. c 1% calcite veins to 5mm wide.
								0.40	
					214.60 - 216.10		100		100
0.95		-125.60	Dark grey, moderately strong to moderately weak CALCAREOUS MUDSTONE. Laminated, planar and lenticular bedding at c 60 degrees to the core axis. No fossils or bioclastic fragments. Medium and close spaced fractures all bedding parallel						
			0.15	-126.55		Pale grey, strong LIMESTONE, fine to medium grained, 2% calcite veins, no fossils, no fractures			
						-126.70		End of Borehole at 216.100m	
Contractor:			Apex					Remarks: 1m wide void at 141m.	
Rig Type:			Wireline						
Core Diameter:			HQ (63.5mm)						

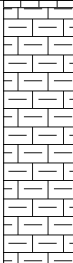
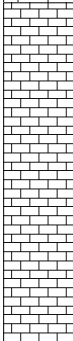
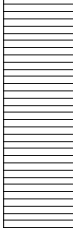
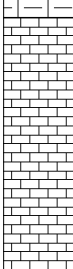
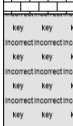
							Borehole No. 2021-9 Sheet 1 of 7	
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT		Co-ords: (NGR) 365054E - 187564N		Hole Type: RC
Location: Tytherington				Hole Inclination: 90°		Collar Level: 90.8m AOD		Scale: 1:50
Client: Hanson Aggregates				Hole Azimuth: 0°		Drilling Dates: 10/01/2022 - 13/01/2022		Logged By: SJR
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
0.00 - 2.70	0	0	0	2.70				Not recovered.
2.70 - 3.40	43	10	0	2.70	0.30	88.10		Pale grey, strong and moderately strong slightly weathered SANDSTONE. Fine grained, massive. Orange brown on fractures and in adjacent rock. Traces of orange-brown and pale grey soft clay. Much broken.
				3.00	0.40	87.80		Not recovered.
3.40 - 4.10	50	13	0	3.40	0.35	87.40		Pale yellow brown, moderately strong to weak weathered SILTSTONE. Massive, very fine to fine grained, no textures or bedding apparent, no reaction to HCl. In part weathered to clayey fine sand with orangey-brown weathered planes after residual fractures.
				3.75	0.35	87.05		Not recovered.
4.10 - 5.10	60	8	0	4.10	0.30	86.70		Pale yellowish brown. Moderately strong, weathered SANDSTONE. Fine grained, massive, with orangey-brown staining on very close spaced fractures: much broken core.
				4.40	0.30	86.40		Pale yellow-brown to yellowish grey, stiff and moderately soft SANDY CLAY with fragments of weathered fine grained sandstone or siltstone. 1 x 30mm core piece of dark grey argillaceous limestone not in situ!
				4.70	0.40	86.10		Not recovered.
				5.10	0.15	85.70		Pale grey, moderately stiff, slightly SANDY CLAY
5.10 - 6.60	100	61	35	5.25	0.95	85.55		Pale grey, strong SANDSTONE. Weakly to moderately banded on scales 5-10mm, gradational fine and coarser grained bands, unsorted but overall interval becomes coarse grained and slightly porous down-hole. Locally slightly calcareous in ground mass to sand grains. Close spaced fractures
				6.20	0.25	84.60		Pale grey and cream, strong and moderately strong CONGLOMERATE, gradational from coarse sandstone in previous interval, clast-supported sub-rounded and sub-angular very fine grained sandstone clasts in weakly calcareous matrix. Close spaced fractures
				6.45	0.15	84.35		Pale grey, moderately soft, slightly SANDY CLAY with minor sandstone fragments
				6.60	0.35	84.20		Pale grey, moderately strong CONGLOMERATE (Base of Cromhall Sandstone). As interval 5.25-6.20. Close spaced fractures.
6.60 - 8.10	87	44	10	6.95	0.35	83.85		Pale grey, very stiff CLAY locally transitional to very weak but indurated mudstone. (Top of Clifton Down Mudstone). No texture or bedding but tends to crumble on presumed residual bedding orientations.
				7.30	0.60	83.50		Pale greyish brown, moderately strong MUDSTONE. Massive, very fine grained. No bedding but locally angular breccia textures with grey sub-angular matrix supported clasts to 10mm across. Interval becomes very broken at base: broken but no fractures.
				7.90	0.20	82.90		Not recovered.
				8.10	1.40	82.70		Brown and pale grey, moderately strong, locally moderately weak, MUDSTONE BRECCIA. Variably mottled brown, organgey brown and grey, very fine grained, melange-like mudstone masses, sometimes as clast-supported sub-angular clasts, perhaps tectonic: some polished clay-planes. Weakly calcareous in part, perhaps from hairline calcite veinlets. All very broken core and mostly recovered as gravel sized pieces.
9.00 - 10.50	100	51	16	9.50		81.30		Pale grey, locally pale brown or grey, strong and moderately strong LIMESTONE BRECCIA. Pale grey, very fine grained, massive limestone, variably brecciated, textures from limestone with thin grey or brown ? mudstone veins to clast-supported sub-rounded clasts of grey or pale brown (argillaceous) limestone in a
Contractor: Apex		Remarks: Wireline drilling.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

		Rotary Core Log				Borehole No. 2021-9 Sheet 2 of 7			
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT		Co-ords: (NGR) 365054E - 187564N		Hole Type: RC	
Location: Tytherington				Hole Inclination: 90°		Collar Level: 90.8m AOD		Scale: 1:50	
Client: Hanson Aggregates				Hole Azimuth: 0°		Drilling Dates: 10/01/2022 - 13/01/2022		Logged By: SJR	
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description	
	TCR	SCR	RQD						
10.50 - 12.00	100	100	49	10.95	1.45	79.85		Pale grey, locally pale brown or grey, strong and moderately strong LIMESTONE BRECCIA. Pale grey, very fine grained, massive limestone, variably brecciated, textures from limestone with thin grey or brown ? mudstone veins to clast-supported sub-rounded clasts of grey or pale brown (argillaceous) limestone in a pale brown fine grained matrix. No calcite veins. Fractures close spaced, locally medium spaced.	
					1.05			Pale grey, strong and moderately strong LIMESTONE. Very fine grained, massive, locally incipient brecciation of style as previous interval or banded with thin muddy (argillaceous) lamellae at c 65 degrees to the core axis, some of the weaker lamellae with trace clay.	
12.00 - 13.50	100	100	98	12.00	0.10	78.80		Grey, strong ALGAL LIMESTONE, with finely laminated ?algal sub-botryoidal mats and ovoid masses	
				12.10	1.45	78.70		Pale grey, strong LIMESTONE. Very fine and fine grained, massive or faintly banded. Trace weak planes at 60 degrees to the core axis (presumed bedding) with trace clay in an otherwise strong limestone. Trace fine calcite veins. Medium spaced fractures. @12.70-12.75 zone with elongated rounded blebs of calcite to 5mm long, elongate parallel to bedding. Perhaps of bioclastic origin.	
13.50 - 15.00	100	91	73	13.55		0.70	77.25		Brown and greyish brown, strong, locally weak or very weak, ARGILLACEOUS LIMESTONE. Muddy strong limestone with minor thin bands of weak mudstone and very stiff clay at 60 degrees to the core axis. Medium to close spaced fractures: rock breaks easily along weak zones.
				14.25	0.75	76.55		Brownish grey, strong to moderately strong LIMESTONE, very fine and fine grained with minor medium or coarse grains, not obviously bioclastic, with weak alignment on presumed bedding. No grain size sorting or grading. Trace calcite veins. Medium spaced fractures	
15.00 - 16.50	87	79	63	15.00	0.20	75.80		Not recovered.	
				15.20	0.55	75.60		Brownish grey, moderately strong and moderately weak MUDSTONE. Massive, very fine grained, similar texturally to limestones, perhaps indurated. No reaction to HCl except bleaches brown colour. Trace calcite veins. Medium spaced fractures. Broken core and trace clay at top of interval.	
16.50 - 18.00	100	80	55	15.75	2.30	75.05		Pale grey to slightly brownish grey, strong and moderately strong LIMESTONE. Massive, very fine grained, with minor fine grained zones and trace medium grains, not bioclastic. <1% calcite veins. Medium to close spaced fractures.	
							18.05	72.75	
18.00 - 19.50	100	68	51						
Contractor:		Apex						Remarks:	
Rig Type:		Wireline						Wireline drilling.	
Core Diameter:		HQ (63.5mm)							

		GWP consultants					Rotary Core Log			Borehole No. 2021-9 Sheet 3 of 7	
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT			Co-ords: (NGR) 365054E - 187564N			Hole Type: RC	
Location: Tytherington				Hole Inclination: 90°			Collar Level: 90.8m AOD			Scale: 1:50	
Client: Hanson Aggregates				Hole Azimuth: 0°			Drilling Dates: 10/01/2022 - 13/01/2022			Logged By: SJR	
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description			
	TCR	SCR	RQD								
19.50 - 21.10	100	84	66	24.10	6.05	66.70		Brown, greyish brown and pale greyish brown, moderately weak and moderately strong MUDSTONE. Massive, very fine grained, trace bedding, locally with minor (<5mm wide) clay bands. Trace calcite veins. Medium and close spaced fractures with some broken core. @20.70-20.95 weak banding with minor lamellae and flat and small elongate (tabular) mudstone clasts parallel to bedding at 55 to 65 degrees to the core axis. @20.95-21.05 Limestone band with 60x10mm lensoid void lined with vuggy calcite. @23.90-24.05 zone with colonial coral, corallites c 1mm in diameter.			
21.10 - 22.60	100	84	62								
22.60 - 24.10	100	99	85								
24.10 - 25.60	100	99	85	25.00	0.90	65.80		Brown and greyish brown, moderately strong and moderately weak, MUDSTONE. Very fine grained, trace banding, locally with laminations at 60 degrees to the core axis. Trace calcite veins. Medium spaced fractures.			
25.60 - 27.20	100	71	66	25.60	0.60	65.20					
27.20 - 28.70	100	76	71	28.70	3.10	62.10		Grey and brownish grey, moderately strong, locally strong, ARGILLACEOUS LIMESTONE. Fine grained, massive or faintly banded. No fossils. Trace calcite veins. Medium and close spaced fractures, locally broken core. @26.55-26.70 Band of pale greyish brown stiff clay, adjacent limestone above and below gradationally bleached to pale grey in zones c 200mm wide. @26.65-26.70 Slightly orangey brown moderately stiff clay with slight bleaching of adjacent limestone above and below. @27.85 10mm wide band of grey, moderately stiff clay with adjacent bleaching in limestone above			
28.70 - 30.20	100	100	93								
				29.80	1.10	61.00		Brown and pale brown, moderately strong CALCAREOUS MUDSTONE. Very fine grained, weakly banded on decimetric scales. Weak reaction to HCl except locally in minor bands of mudstone. Trace calcite veins. @29.35-29.40 pale brown stiff clay @29.75 10mm wide band if pale brown, moderately stiff clay			
											
Contractor:		Apex						Remarks: Wireline drilling.			
Rig Type:		Wireline									
Core Diameter:		HQ (63.5mm)									

 GWP consultants		Rotary Core Log				Borehole No. 2021-9 Sheet 4 of 7		
Project Name: Woodleaze Quarry extension		Project No.: TYTHEXT		Co-ords: (NGR) 365054E - 187564N		Hole Type: RC		
Location: Tytherington		Hole Inclination: 90°		Collar Level: 90.8m AOD		Scale: 1:50		
Client: Hanson Aggregates		Hole Azimuth: 0°		Drilling Dates: 10/01/2022 - 13/01/2022		Logged By: SJR		
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
30.20 - 31.70	100	97	94	31.75	1.95	59.05		Pale grey to grey, strong LIMESTONE. Fine grained, massive, Trace possible arcuate shell pieces (perhaps brachiopods). <1% calcite veins. Medium spaced factures.
31.70 - 33.30	100	95	72					
33.30 - 34.85	100	100	59					
34.85 - 36.30	100	99	70					
36.30 - 37.90	97	84	79	36.90	1.65	53.90		Brown and greyish brown, moderately strong MUDSTONE. Very fine grained, massive to very weakly banded with trace bedding planes at c 70m degrees to the core axis. No reaction to cold HCl except surface colour bleaching, perhaps dolomitic mudstone. 1-2% calcite veining but locally to 5%, mostly 2-4mm wide, locally to 20mm, occasionally anastomosing and locally with weak bleaching of adjacent mudstone. Medium and close spaced fractures mostly crossing bedding, trace brown clay on a few fractures. @33.15-33.20 pale grey, fine to medium grained homogenous limestone band, includes small vuggy calcite lined void. 5mm weak and friable mudstone at base. @34.20-34.25 Weak band of crumbly mudstone
37.90 - 39.40	97	92	81					
39.40 - 40.40	100	88	88					
				38.55	1.50	52.25		Brown and dark brown, moderately strong to strong MUDSTONE. Very fine grained, massive (except as noted below). No reaction to HCl. <1% calcite veins. Medium spaced fractures. @37.55-37.70 finely laminated mudstone, including thin bands of breccia of small ?rip-up matrix-supported mudstone clasts.
Contractor: Apex		Remarks: Wireline drilling.						
Rig Type: Wireline								
Core Diameter: HQ (63.5mm)								

						Rotary Core Log		Borehole No. 2021-9 Sheet 5 of 7	
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT		Co-ords: (NGR) 365054E - 187564N		Hole Type: RC	
Location: Tytherington				Hole Inclination: 90°		Collar Level: 90.8m AOD		Scale: 1:50	
Client: Hanson Aggregates				Hole Azimuth: 0°		Drilling Dates: 10/01/2022 - 13/01/2022		Logged By: SJR	
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description	
	TCR	SCR	RQD						
				40.05	1.80	50.75		Brown, locally pale brown, moderately strong and moderately weak, locally weak, MUDSTONE. Very fine grained, massive. No reaction to HCl. <1% calcite veins, locally with blotchy reduction bleaching some of which is spatially associated with veining. Medium to close spaced fractures, many fractures are partings on bedding at c 65 degrees to the core axis. Greyish brown to pale greyish brown, strong and moderately strong MUDSTONE. Very fine grained and massive, trace calcite veins, minor irregular or blotchy reduction patches not obviously related to veining. Medium to close spaced fractures, some bedding parallel, some with trace grey clay.	
40.70 - 42.20	100	69	52						
				41.85		48.95			
42.20 - 43.70	100	94	70		1.75	Pale slightly brownish grey, strong MUDSTONE. Very fine grained, unusually strong, no reaction to cold HCl but perhaps dolomitic, massive or faintly laminated, with discrete well laminated bands @41.85-41.95 and @42.30-42.40 with planar and lenticular bedding at c 50 degrees to the core axis. Trace calcite veins, medium spaced fractures.			
				43.60	47.20				
43.70 - 45.10	100	94	84	43.70	47.10			Slightly brownish grey, very weak MUDSTONE with minor clay Pale brown and pale brownish grey, strong and moderately strong MUDSTONE. Laminated with well developed planar and undulating millimetric lamellae demarked by colour contrasts at 50 to 60 degrees to the core axis, mudstone gradational to bands c 100mm wide of fine to medium grained, massive argillaceous limestone forming 5 to 10% of the interval. Trace calcite veins. Medium to close spaced fractures	
				45.25	45.55				
45.10 - 46.60	100	77	67	45.50	45.30		Brown, moderately strong, MUDSTONE. Massive, not laminated, very fine grained, non-calcareous Pale brown, and pale brownish grey, strong to moderately strong MUDSTONE. Laminated with the same characteristics as interval 43.70-45.25 but without limestone bands. No calcite veins. Medium spaced fractures		
				46.70	44.10				
46.60 - 48.20	100	63	38		1.50	Brown, strong, moderately strong and moderately weak MUDSTONE. Massive very fine grained, non-calcareous, trace blotchy reduction to grey not spatially associated with the trace calcite veins in the interval. Medium to close spaced fractures, often bedding parallel, with broken core in c 300mm of moderately weak mudstone at base of interval and of Run 32.			
				48.20	42.60				
48.20 - 49.80	100	100	100	48.95	41.85				Pale slightly brownish grey to brownish grey, moderately strong Limestone. Massive, very fine grained, perhaps slightly argillaceous (muddy) or micritic, with trace thin (<5mm) brown calcareous mudstone bands of the same style as the mudstone in the previous interval.
Contractor:		Apex						Remarks: Wireline drilling.	
Rig Type:		Wireline							
Core Diameter:		HQ (63.5mm)							

		GWP consultants		Rotary Core Log				Borehole No. 2021-9 Sheet 6 of 7	
Project Name: Woodleaze Quarry extension				Project No.: TYTHEXT		Co-ords: (NGR) 365054E - 187564N		Hole Type: RC	
Location: Tytherington				Hole Inclination: 90°		Collar Level: 90.8m AOD		Scale: 1:50	
Client: Hanson Aggregates				Hole Azimuth: 0°		Drilling Dates: 10/01/2022 - 13/01/2022		Logged By: SJR	
Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description	
	TCR	SCR	RQD						
49.80 - 51.40	100	93	82	50.05	1.70	40.75		Pale slightly brownish grey to brownish grey, moderately strong LIMESTONE. Massive, very fine grained, perhaps slightly argillaceous (muddy) or micritic, with trace thin (<5mm) brown calcareous mudstone bands of the same style as the mudstone in the previous interval. Pale slightly brownish to greyish brown, moderately strong, ARGILLACEOUS LIMESTONE. Variably massive, weakly banded or weakly laminated, variably argillaceous/muddy, with bands 5 to 150mm wide of calcareous mudstone forming 5-10% of the interval. Bedding c 55 degrees to the core axis. Medium and close spaced fractures.	
51.40 - 53.00	100	89	70	51.75	2.30	39.05		Pale slightly brownish grey to pale greyish brown, strong to moderately strong LIMESTONE. Very fine or fine grained, laminated or banded with weak colour contrasts, brownish bands and lamellae probably argillaceous. Laminations at 45 degrees to the core axis near the top of the interval, 60 degrees near the base. c 2% veins of very coarse calcite, often vuggy, to 30mm wide and at c 30 degrees to the core axis. Medium and close spaced fractures, mostly bedding parallel partings.	
53.00 - 54.50	100	89	66	54.05	0.35	36.75		Brown and grey-brown, moderately weak and weak, CALCAREOUS MUDSTONE, weakly laminated. Close and medium spaced fractures, core breaks easily on bedding. @54.15 band 30mm wide grey-brown stiff clay.	
54.50 - 56.00	100	61	35	54.40	0.35	36.40		Brown and white, moderately strong and moderately weak CALCAREOUS MUDSTONE BRECCIA. Mudstone as previous interval with 50% coarse calcite veining at low angles to the core axis	
54.50 - 56.00	100	61	35	54.75	1.55	36.05		Brown, locally pale brownish grey, moderately weak and weak MUDSTONE. Very fine grained, massive, locally weakly laminated, non calcareous mudstone. One coarse calcite vein near the top of the interval otherwise calcite veining is absent. Medium and close spaced fractures, broken core in part, especially at the base of Run 37	
56.00 - 57.50	100	92	85	56.30	0.40	34.50		Pale grey, strong LIMESTONE. Very fine grained, massive, with a weakly brecciated texture with hairline and thin brown, presumed mudstone, partly anastomosing veinlets. Sharp basal contact at 60 degrees to the CA.	
56.00 - 57.50	100	92	85	56.70	0.15	34.10		Brown, weak MUDSTONE with beige reduction tracks along calcite veins and across bedding.	
56.00 - 57.50	100	92	85	56.85	0.65	33.95		Pale grey to pale brown, moderately strong ARGILLACEOUS LIMESTONE. Very weakly calcareous at top with colour bleaching with HCl, more strongly calcareous at base of interval. Perhaps dolomitic. c 10% is coarse slightly vuggy calcite vein 10-20mm wide at low angle to the core axis. Basal contact not apparent.	
57.50 - 59.00	100	86	81	57.50	1.75	33.30		Pale grey and slightly brownish pale grey, strong, LIMESTONE (Base of Clifton Down Mudstone). Very fine grained, non oolitic, massive, locally with weak brecciation of the style seen in interval 56.30-56.70, locally moderate brecciation by reticulate fine brown veinlets. 2% coarse and vuggy calcite veins. Base of interval marked by complex calcite veining at low angle to core axis forming contact with oolitic limestone below. Medium spaced fractures.	
59.00 - 60.60	100	98	89	59.25	1.35	31.55		Pale grey, strong LIMESTONE (Top of Gully Oolite). Fine grained and fine grained oolitic, massive, no banding or brecciation. c 1% calcite veins to 5mm wide sub-parallel to the core axis. Medium spaced fractures.	
Contractor: Apex				Remarks: Wireline drilling.					
Rig Type: Wireline									
Core Diameter: HQ (63.5mm)									

Rotary Core Log

Borehole No.

2021-9

Sheet 7 of 7

Project Name:	Woodleaze Quarry extension
---------------	----------------------------

Project No.: TYTHEXT

Co-ords: (NGR)	365054E - 187564N
-------------------	-------------------

Hole Type:
RC

Location: Tytherington

Hole Inclination:	90°
-------------------	-----

Collar Level: 90.8m AOD

Scale:
1:50

Client: Hanson Aggregates

Hole Azimuth:	0°
---------------	----

Drilling Dates: 10/01/2022 - 13/01/2022

Logged By:
SJR

Run Depth (m)	Coring Indices (%)			Drill Depth (m)	Drill Thickness (m)	Reduced Level (mAOD)	Legend	Stratum Description
	TCR	SCR	RQD					
				60.60		30.20	incorrect incorrect incorrect key key key incorrect incorrect incorrect key key key incorrect incorrect incorrect key key key	Pale grey, strong LIMESTONE (Top of Gully Oolite). Fine grained and fine grained oolitic, massive, no banding or brecciation. c 1% calcite veins to 5mm wide sub-parallel to the core axis. Medium spaced fractures.
Contractor:		Apex						Remarks: Wireline drilling.
Rig Type:		Wireline						
Core Diameter:		HQ (63.5mm)						

APEX

DAILY DRILLING LOG

E-mail: admin@apex-drilling.com

Sheet 1 of 1 Working Day

Rig Type

INSTALLATION DETAILS

[illegible]

Blue - Client's Copy	Yellow - QS Copy	White - Site Copy
----------------------	------------------	-------------------

Date _____

Signed
by Client

Signed
by Apex




Certificate No: 08750A