

Date: 26th July 2023

Olive Group (UK) Ltd
New London House
6 London Street
London
EC3R 7LP

INNINGS WAY, CASTLETON PRELIMINARY SUMMARY LETTER – GEO-ENVIRONMENTAL SITE ASSESSMENT

Further to the completion of our recent Ground Investigation works, review of historical data, geological mapping and environmental Site sensitivity information, E3P has prepared an initial Geo-Environmental Site Assessment summary that has been issued as a precursor to the full Interpretive Geo-Environmental Report.

Site Address	Innings Way, Castleton, Rochdale, OL11 3DE	
Grid Reference	E 387788 N 410746	
Site Area	0.06 Ha	
Current Site Use	The subject site is an irregularly shaped parcel of land located to the south of 3 Innings Way and northeast of 7 Innings Way, Castleton. The site is currently unoccupied and comprises soft standing with areas of brambles, semi-mature and mature trees. A steep vegetated slope approximately 2 m in height is located towards the central eastern boundary of the site and leads up to an area of off-site allotments.	
Proposed Development	Olive Group (UK) Limited intends to construct a low-rise residential development comprising 3 residential dwellings with associated gardens.	
Environmental Setting	Drift Geology	Glaciofluvial Deposits (Sand and Gravel) across the Site.
	Bedrock Geology	Pennine Lower Coal Measures (SANDSTONE, MUDSTONE and SILTSTONE) across the Site.
	Faults	BGS records show a geological fault located approximately 55 m southwest of the site boundary, trending northwest to southeast.
	Hydrogeology	Secondary A aquifer (drift) overlaying Secondary A aquifer (solid).
	Hydrology	Rochdale Canal is located approximately 580 m southeast of the site.
	Flood Risk	The Site is unaffected by flooding from rivers.



Natural Landform and Geomorphology	The Site topography is largely level in nature with an average elevation of 131 m AOD. The noted exception is the steep vegetated slope located in the central eastern part of the site, which rises up to an approximate elevation of 136 m AOD on the eastern site boundary.
Site History	Historical mapping indicates the site comprised part of Castleton Moor Cricket Ground (cricket pitch) from circa 1885 to circa 1913. Between circa 1937 and circa 1955, an old gravel pit was present on-site. Post 1955, the old gravel pit was no longer present, indicating it had been backfilled with unknown materials (potentially from an off-site source or development). At some point between 1955 and 2000, a mound was present along the eastern boundary of the site. It is not known where the mound materials were sourced from (potentially an off-site source or development). Post 2013, a residential development with associated gardens and infrastructure was constructed to the north, west and south of the site, with an area of allotments located to the east. No further changes have occurred on-site since 2013.
Utility Locations	A formal utility survey has not been completed; however, available records for the Site indicate the presence of a 90 mm low pressure gas main, BT telecoms cables, 63 mm distribution water main and a 900 mm surface water sewer within the footpath/road of Innings Way, located to the immediate southwest of the site. During the intrusive investigation, a manhole with surface water drainage was encountered at the centre of the northern boundary with an assumed directional flow to the northeastern corner of the site.
Landfill Sites and Ground Gases	No historical or current landfills have been identified on-site. A historical landfill (Land South of Chadwick Lane) is located approximately 550 m west of the site, and was operational between 1984 and 1986. The presence of peat / organic-rich pond-like material identified within the underlying natural strata during the ground investigation may be a potential source of ground gases.
Radon	The UK Radon website indicates the Site is situated in an area where 1-3% of homes are above the "Action Level" and that full radon protective measures are not necessary for the construction of new dwellings or extensions.
Coal Mining/Land Stability	The Site is located in a coal mining reporting area but not within a development high-risk area. The Site is located in an area at low risk from coal mining and is not located within an area at risk from ground instability arising from historic coal mining activities.
Hazardous Installations	No hazardous installations have been identified on-site or within the immediate vicinity of the site.



E3P GROUND INVESTIGATION

Ground Investigation Works	E3P has completed an intrusive ground investigation comprising 6nr window sample boreholes and 7nr trial pits. The spatial extent of window samples and mechanically excavated trial pits was limited by the dense vegetation and steep slope still present on-site. Further limitations included a manhole identified on-site with an assumed flow pathway traversing north potentially connecting to soakaway drainage on Innings Road to the west; a collapsed badger sett and a potential second badger sett located within the steep vegetated slope along the eastern site boundary.
Ground Conditions	MADE GROUND– 0.00 m bgl to 4.10 m bgl Both granular and cohesive types are encountered across the Site. Primarily comprised of light brown to black sandy gravel or sandy gravel with occasional cobbles and boulders. Made Ground inclusions comprised of brick, ash, concrete, metal, sandstone, mudstone, and fragments/pieces of wood, glass, textile, and ceramic. The deepest Made Ground deposits were encountered in the eastern part of the Site with max depths recorded at 4.10 m bgl (WS101), with the full depth of Made Ground not proven within 3nr of trial pits, particularly towards the southern and southeastern sector of the site adjacent to 7 no. Innings Way. Cohesive Made Ground deposits were generally encountered within exploratory holes towards the centre of the site, and towards the northern sector, at depths of 0.60 m bgl – 3.80 m bgl (WS104). Cohesive Made Ground deposits comprised soft to firm black silty very gravelly clay with gravel of brick, timber, mudstone, and sandstone, with occasional fragments of ash, plastic, and tile. DRIFT DEPOSITS – 2.30 m bgl to 5.45 m bgl. Drift deposits encountered within the intrusive investigation generally comprised grey very silty SAND at depths of 3.10 to 5.45 m bgl. Drift deposits were encountered within 10nr exploratory hole locations, with the full depth of Made Ground not proven within TP101 – TP103 towards the southwest of the site. Cohesive deposits were identified within WS104 at depths of 3.80 – 4.60 m bgl towards the centre of the site adjacent to the slope as a very stiff very high strength black mottled grey silty sandy CLAY. PEAT/Potential Pond Deposits – 2.30 m bgl to 5.45 m bgl PEAT deposits and potential pond material was identified across the site. Typically, it was encountered interbedded with a grey silty SAND as pockets of blackish brown fibrous PEAT, with a strong organic odour. Occasionally, the PEAT deposits were encountered interbedded with very soft very silty CLAY. Shallower deposits were identified within TP105 at 2.30 m bgl – 2.60 m bgl, however typically it was encountered at depths of > 3.00 m bgl. SOLID Not encountered during this phase of the investigation. No BGS borehole logs are located within 250 m of the site.



Ground Conditions Continued...	GROUNDWATER Groundwater was encountered within 7m of exploratory holes, typically at depths of 1.50 m to 3.80 m bgl within both natural and Made Ground stratum. Groundwater strikes were encountered as slow seepages within predominantly natural stratum with the exception of TP106, where a moderate ingress of groundwater pooling at the base of the exploratory hole was noted.
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PRELIMINARY CONTAMINATED LAND ASSESSMENT

Human Health	Chemical analysis results for soil classification are pending. Field Observations: ✿ Visual evidence of contamination was noted during the intrusive ground investigation within the shallow Made Ground deposits. Generally, evidence of contamination was limited to ashy deposits within shallow Made Ground across the site, however, no olfactory indicators of contamination were encountered. ✿ Slight to very strong organic odours were noted within the base of the Made Ground deposits and the natural strata (Peat deposits). ✿ Constituents of wood, glass, textile, and ceramic were encountered in numerous locations within the Made Ground across the Site. ✿ No visual evidence of asbestos-containing materials was encountered during the intrusive ground investigation.
Controlled Waters	Chemical analysis results for leachate classification, and a detailed controlled water risk assessment are pending. The underlying Secondary A aquifers (drift and bedrock) have been identified as the critical receptors for the Site. The desk study has enabled preliminary characterisation of the pollution risk and potential to impact the critical receptors. ✿ The primary controlled water receptors are identified as the underlying secondary A aquifers (drift and bedrock); ✿ Clay bands within the drift deposits will afford some protection of mobile contaminants vertically migrating toward the underlying aquifer; ✿ As the Site is currently undeveloped land, with soft standing cover, rainfall is not being intercepted and subsequently infiltrates freely into the underlying Made Ground, potentially mobilising any potential contaminants; ✿ However, the proposed development will create hardstanding cover across the site, thus reducing the amount of infiltration generated. This will, in turn, reduce the number of contaminants (if present) in leachate off the site and reduce the risk further to the underlying aquifers;



Controlled Waters <i>Continued...</i>	✿ The underlying Secondary A Aquifer within the drift and bedrock strata is considered a potential receptor, however, given the site is not located within a groundwater source protection zone and in the absence of any potable water abstractions within the locality, the overall risk is greatly reduced. There is not considered to be a significant risk to the aquifer. As such, there is unlikely to be a significant risk to controlled waters.
Ground Gas	It is probable that CS2 gas mitigation will be required for all proposed plots due to the nature and depth of Made Ground underlying the Site and the presence of Peat / pond-like materials identified within the underlying natural strata.
Potable Water Infrastructure	A UKWIR Risk Assessment will be required to confirm the most suitable potable water supply pipework. Post-remediation and enabling works ground conditions may be different from those identified during this phase of ground investigation.

PRELIMINARY GEOTECHNICAL ASSESSMENT

Underground Obstructions	Cobbles of brick were encountered within the Made Ground between 0.60 - 3.40 m bgl across the Site. No other significant obstructions were encountered. No previous structures have been recorded on-site, so underground obstructions are unlikely to be encountered. During a phase of cut-and-fill enabling works to create a developable platform, all below-ground obstructions will require grubbing out to the base of the Made Ground to enable the construction of proposed plots.
Geotechnical Hazards	The Site is underlain by Made Ground deposits ranging in depth from ground level to a proven depth of 4.10 m bgl. The full depth of Made Ground was not however recorded in three locations (TP101 to TP103, southern and southeastern sector of the site adjacent to 7 no. Innings Way) which likely extends to beyond this depth. The extensive ground investigation has facilitated the development of a robust ground model to assess the spatial distribution and nature of this material. Due to the significant and unacceptable risk of consolidation and thus settlement to structures and infrastructure, extensive ground remediation and engineering works will be required to facilitate the construction of a development platform that would be suitable for the intended low-rise residential development.
Allowable Bearing Pressure	The underlying natural granular drift deposits have been assessed as being loose trending to dense with an ABP ranging between 43.48 kN/m² and 315.26 kN/m². Suitable ABP across the site was generally found at 4.00 m bgl to 5.00 m bgl, with all granular material recorded as Medium Dense to Dense (WS106), with a recorded ABP in excess of 100 kN/m². The underlying natural cohesive drift deposits within WS104 have been assessed as being very stiff, very high strength with an allowable bearing pressure (ABP) 191.07 kN/m².



Allowable Bearing Pressure <i>Continued...</i>	No safe ABP can be attributed to the peat soils identified across much of the site.
Foundation Options	Based on the assessment of the relative in-situ densities and corresponding safe net allowable bearing pressure, the suitable target founding stratum has been identified as the underlying medium dense to dense sands and localised areas of very stiff glacial clays. However, it is noted that significant depths of Made Ground deposits are present on the Site. Made Ground deposits are not considered a suitable founding stratum due to the unquantifiable potential for long-term and differential settlement. Highly compressible Peat deposits were also encountered across the site. The extensive ground investigation has facilitated the development of a robust ground model to assess the spatial distribution and nature of this material. These deposits are not considered to be a suitable founding stratum due to the consolidation potential to induce settlement >25 mm. No safe ABP can be attributed to the peat soils across much of the site. Prior to the detailed design of suitable foundation solutions, a programme of remediation and enabling works will be required to remove any buried obstructions and cut/fill the Site to provide suitable development platform levels. At this time, it is not possible to accurately define the foundation types due to the absence of a detailed tree survey, finished floor levels (FFLs), structural loadings and final development levels; however, based on our extensive experience of similar sites, we would anticipate that the final foundation solution would comprise of driven piles foundations due to significant Made Ground and Peat deposits.
Infrastructure	No infrastructure is proposed to be constructed as part of the proposed development, as the existing Innings Way will be utilised.
Building Floor Slabs	Ground-bearing floor slabs are not viable given the anticipated depths of reworked Made Ground > 600 mm.
Heave Precautions	To be confirmed upon receipt of the geotechnical analysis.
Soakaway Drainage	The presence of significant depths of Made Ground deposits would preclude the use of infiltration drainage systems.
Sulphate Assessment	To be confirmed upon receipt of the chemical analysis.
Cut/Fill	Minimal cut-and-fill works will be required to prepare the development platform, with the exception of along the eastern site boundary, where a maximum proposed cut of 3.80 m will be required to remove the steep vegetated slope. A retaining wall will be required along the eastern site boundary. This will be subject to a specialist retainment design by a structural engineer, and as such, falls outside E3P's remit for comment in this report.
Civil Engineering Excavations	The E3P Intrusive Ground Investigation has identified the presence of cobbles and boulders of brick, within the Made Ground across the site between 0.60 -3.40 m bgl. Given the depths of these cobbles and boulders, it is unlikely that will impede the excavation materials to form sewerage and drainage infrastructure and foundations.



**Civil Engineering
Excavations**
Continued...

Groundwater was encountered within 7m of exploratory holes, typically at depths of 1.50 m to 3.80 m bgl within both natural and Made Ground stratum. Groundwater strikes were encountered as slow seepages within predominantly natural stratum with the exception of TP106, where a moderate ingress of groundwater pooling at the base of the exploratory hole was noted.

E3P would note that this is a preliminary assessment for initial high-level appraisal and will be supplemented and updated in due consideration of all data and the ongoing analysis.

I trust this information is satisfactory to your requirements, and should I be able to be of any further assistance, please do not hesitate to contact me.

Yours sincerely,

For and on behalf of E3P Ltd

Mark Wilson
Senior Geo-Environmental Consultant

Approved by:

Alex Smith
Associate Director

Enclosed:

Logs:

E3P Exploratory Hole Logs and Cross Section (Window Sample Probeholes and Trial Pits) – Innings Way, Castleton

Drawings:

17-011-002 – Proposed Development Plan

17-011-004 – Site Features Plan

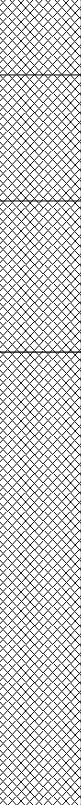
17-011-005 – Exploratory Hole Location Plan

17-011-006 – Depth to Made Ground Plan

17-011-015 – Development Constraints Plan

17-011-023 – Isopachyte from Topographical Survey to Proposed Plateau Plan



				Trial Pit Log			TrialPit No TP101 Sheet 1 of 1		
Project Name: Innings Way				Project No. 17011		Co-ords: 387786.00 - 410737.00 Level:		Date 05/07/2023	
Location: Castleton						Dimensions (m): 2.40 1.20		Scale 1:30	
Client: Olive Group (UK) Ltd						Depth 3.20		Logged I.Diack	
Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
	Depth	Type	Results						
 3.10	3.10	ES		0.30			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	1	
				0.80			MADE GROUND: Light brown very gravelly fine to medium sand with occasional cobbles. Gravel is fine to coarse angular to subrounded of brick, concrete, ash, plastic, sandstone, and mudstone. Cobbles are angular to subrounded of brick and concrete.		
				1.40			MADE GROUND: Dark grey slightly sandy gravel. Gravel is fine to coarse, angular to subrounded of granite and cloth. (Drainage Gravel).		2
							MADE GROUND: Black slightly clayey sandy gravel with occasional cobbles. Gravel is fine to coarse, angular to subrounded of ash, brick, plastic, glass, mudstone and sandstone. Cobbles are angular to subangular of glass, plastic and brick.		
							End of Pit at 3.20m		
		4							

Trial Pit Photographs



Trial Pit 101



Trial Pit 101 Spoil

Remarks: 1. Complete. 2. Stable. 3. Water strike encountered as slow seepage at 3.10 m bgl. 4. Full depth of Made Ground unproven.

Stability: **Stable**



Project Name: Innings Way	Project No. 17011	Co-ords: 387784.00 - 410743.00 Level:	Date 05/07/2023
Location: Castleton	Dimensions (m): Depth 1.80		Scale 1:30
Client: Olive Group (UK) Ltd	1.20 		Logged I.Diack

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
	1.20	ES					MADE GROUND: Light brown very gravelly fine to medium sand with frequent cobbles. Gravel is fine to coarse, angular to subrounded of plastic, glass, brick, mudstone, cloth, and sandstone. Cobbles are angular of plastic and brick.	1
	1.50	B						
				1.80			End of Pit at 1.80m	2
								3
								4

Trial Pit Photographs



Trial Pit 102

Trial Pit 102 Spoil

Remarks: 1. Terminated due to potential service. 2. Stable 3. No groundwater encountered. 4. Full depth of Made Ground unproven.

Stability: Stable

Project Name: Innings Way	Project No. 17011	Co-ords: 387788.00 - 410751.00 Level:	Date 05/07/2023
Location: Castleton	Dimensions (m): 2.40 1.20		Scale 1:30
Client: Olive Group (UK) Ltd	Depth 3.20		Logged I.Diack

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.10	ES		0.20			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
				0.70			MADE GROUND: Light brown very gravelly fine to medium sand with frequent cobbles. Gravel is fine to coarse, angular to subrounded of brick, tile, plastic, metal, mudstone, and sandstone. Cobbles are angular of plastic and brick.	
							MADE GROUND: Black sandy gravel with occasional cobbles. Gravel is fine to coarse, angular to rounded of brick, coal, plastic, metal, ash, timber, sandstone and mudstone. Cobbles are angular to subangular of brick. (Strong hydrocarbon odour from 2.60 m bgl).	1
	2.70	ES						2
				3.20			End of Pit at 3.20m	3
								4

Trial Pit Photographs



Trial Pit 103

Trial Pit 103 Spoil

Remarks: 1. Complete. 2. Stable. 3 Strong hydrocarbon odour encountered at 2.60 m bgl. 4. No groundwater encountered. 5. Full depth of Made Ground unproven.

Stability: Stable

Project Name: Innings Way

Project No.
17011

Co-ords: 387791.00 - 410754.00
Level:

Date
05/07/2023

Location: Castleton

Dimensions (m): 2.40

Scale
1:30

Client: Olive Group (UK) Ltd

Depth
3.60

Logged
I.Diack

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
				0.30			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
				0.60			MADE GROUND: Light brown very gravelly fine to medium sand with occasional cobbles. Gravel is fine to coarse, subangular to subrounded of brick, concrete, plastic, timber, tile, mudstone and sandstone.	
							MADE GROUND: Black very sandy very gravelly clay with occasional cobbles. Gravel is fine to coarse, subangular to subrounded of brick, coal, plastic, tile, mudstone, and sandstone. Cobbles are subangular of brick.	1
				2.40			MADE GROUND: Black very gravelly fine to medium sand with frequent cobbles. Gravel is fine to coarse, angular to subrounded of tile, ash, mudstone, sandstone, plastic, and coal. Cobbles are subangular of brick. (Slight organic odour encountered from 2.80 m bgl).	3
	3.40	ES		3.40			Grey very silty fine to medium SAND with pockets of blackish brown fibrous PEAT. (Very strong organic odour). (Potential Pond Material).	
				3.60			End of Pit at 3.60m	4

Trial Pit Photographs



Trial Pit 104



Trial Pit 104 Spoil

Remarks: 1. Complete. 2. Stable. 3. Slight organic odour encountered from 2.80 m bgl. 4. Very strong organic odour encountered from 3.40 m bgl. 5. No groundwater encountered.

Stability: Stable

Project Name: Innings Way	Project No. 17011	Co-ords: 387799.00 - 410759.00 Level:	Date 05/07/2023
Location: Castleton	Dimensions (m): 2.40 1.20		Scale 1:30
Client: Olive Group (UK) Ltd	Depth 2.60		Logged I.Diack

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.50	B		0.40			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
	0.90	ES					MADE GROUND: Light brown very gravelly fine to medium sand with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, coal, ash, glass, sandstone and mudstone. Cobbles are subangular of brick.	1
				1.30			MADE GROUND: Soft black silty very gravelly clay. Gravel is fine to coarse, angular to subrounded of ash, brick, concrete, timber, sandstone and mudstone.	2
				2.30			Very soft black very silty CLAY interbedded with blackish brown fibrous PEAT. (Strong organic odour)	
				2.60			End of Pit at 2.60m	3
								4

Trial Pit Photographs



Trial Pit 105



Trial Pit 105 Spoil

Remarks: 1. Complete. 2. Stable. 3. Strong organic odour encountered from 2.30 m bgl. 4. No groundwater encountered.

Stability: Stable

Project Name: Innings Way	Project No. 17011	Co-ords: 387802.00 - 410762.00 Level:	Date 05/07/2023
Location: Castleton	Dimensions (m): 2.40 1.20		Scale 1:30
Client: Olive Group (UK) Ltd	Depth 3.60		Logged I.Diack

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.20	ES		0.30			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
				0.90			MADE GROUND: Dark brown very clayey very gravelly sand with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, mudstone, plastic, tile, and sandstone. Cobbles are subangular of brick.	1
	1.30	ES		2.40			MADE GROUND: Black sandy very gravelly clay with frequent cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, tile, timber, plastic, sandstone and mudstone. Cobbles are angular to subangular of brick and concrete.	2
				3.30			MADE GROUND: Dark brown very clayey slightly sandy gravel with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, ash, timber, mudstone, and sandstone. Cobbles are subangular of brick.	3
				3.60			Grey very silty fine to medium SAND with pockets of blackish brown fibrous PEAT. (Very strong organic odour). (Potential Pond Material).	
							End of Pit at 3.60m	4

Trial Pit Photographs



Trial Pit 106



Trial Pit 106 Spoil

Remarks: 1. Complete. 2. Stable. 3. Very strong organic odour encountered from 3.30 m bgl. 4. Water strike encountered as moderate ingress at 3.40 m bgl (pooling at base of trial pit).

Stability: Stable

Project Name: Innings Way	Project No. 17011	Co-ords: 387809.00 - 410759.00 Level:	Date 05/07/2023
Location: Castleton	Dimensions (m): 2.40 1.20		Scale 1:30
Client: Olive Group (UK) Ltd	Depth 3.90		Logged I.Diack

Water Strike	Samples & In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
	Depth	Type	Results					
	0.70	ES		0.20			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
							MADE GROUND: Black very sandy gravel with frequent cobbles. Gravel is fine to coarse, angular to subrounded of metal, brick, concrete, plastic, sandstone, and mudstone.	1
								2
								3
	3.40 3.50	ES B		3.10			Grey very silty fine to medium SAND with pockets of blackish brown fibrous PEAT. (Very strong organic odour).	
				3.90			End of Pit at 3.90m	4

Trial Pit Photographs



Trial Pit 107



Trial Pit 107 Spoil

Remarks: 1. Complete. 2. Stable. 3. Very strong organic odour encountered from 3.10 m bgl. 4. No groundwater encountered.

Stability: Stable

Borehole Log

Borehole No.

WS101

Sheet 1 of 1

Project Name: Innings Way

Project No.
17011

Co-ords: 387808.00 - 410755.00

Hole Type
WS

Location: Castleton

Level:

Scale
1:50

Client: Olive Group (UK) Ltd

Dates: 05/07/2023 -

Logged By
I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
		1.00		N=9 (2,2/2,2,2,3)				MADE GROUND: Black very sandy gravel with frequent cobbles. Gravel is fine to coarse, angular to subrounded of metal, brick, concrete, plastic, sandstone, mudstone and ash. Cobbles are angular to subrounded of concrete and brick.	1
		2.00		N=4 (1,1/1,1,1,1)					2
		3.00		N=12 (3,4/4,3,3,2)					3
		4.00		N=24 (4,4/5,5,6,8)	3.60			MADE GROUND: Black very silty very gravelly fine to medium sand. Gravel is fine to coarse, angular to subrounded of brick, plastic, timber, sandstone and mudstone.	4
		4.40 4.50	ES D		4.10			Loose grey very silty fine to medium SAND with pockets of blackish brown fibrous PEAT. (Very strong organic odour).	4
		5.00		N=12 (2,2/2,3,3,4)					5
					5.45			End of borehole at 5.45 m	5
									6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered as slow seepage at 3.80 m bgl. 3. Very strong organic odour encountered from 4.10 m bgl.

Borehole Log

Borehole No.

WS102

Sheet 1 of 1

Project Name: Innings Way

Project No.
17011

Co-ords: 387801.00 - 410756.00

Hole Type
WS

Location: Castleton

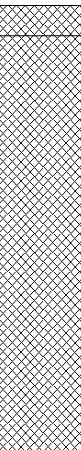
Level:

Scale
1:50

Client: Olive Group (UK) Ltd

Dates: 05/07/2023 -

Logged By
I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20						MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil). MADE GROUND: Light brown very gravelly fine to medium sand with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, tile, plastic, metal, mudstone and sandstone. Cobbles are angular of brick.	1
		1.00		N=5 (2,2/2,1,1,1)					
		2.00		N=4 (1,1/1,1,1,1)					2
		3.00		N=5 (1,1/1,1,1,2)	3.00			Firm dark brown fibrous PEAT. (Strong organic odour).	3
		4.00 4.20	ES	N=15 (4,3/3,4,4,4)	3.80			Medium dense grey very silty fine to medium SAND with pockets of blackish brown fibrous PEAT. (Very strong organic odour).	4
		5.00		N=17 (3,3/4,4,4,5)					5
					5.45			End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered as slow seepage at 2.00 m bgl. 3. Strong organic odour encountered from 3.00 m bgl. 4. Very strong organic odour encountered from 3.80 m bgl.

Borehole Log

Borehole No.

WS103

Sheet 1 of 1

Project Name: Innings Way

Project No.
17011

Co-ords: 387792.00 - 410758.00

Hole Type
WS

Location: Castleton

Level:

Scale
1:50

Client: Olive Group (UK) Ltd

Dates: 05/07/2023 -

Logged By
I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
		1.00		N=11 (4,4/4,3,2,2)				MADE GROUND: Light brown very gravelly fine to medium sand with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, metal, tile, plastic, sandstone and mudstone. Cobbles are subangular of brick.	1
		1.60	ES						
		2.00		N=10 (2,2/2,3,2,3)					2
					2.45			No Recovery.	
		3.00		N=13 (2,3/3,4,3,3)	3.00			MADE GROUND: Black very silty very sandy very gravelly clay with occasional cobbles. Gravel is fine to coarse, subangular to subrounded of concrete, brick, sandstone, mudstone and ash. Cobbles are subangular of brick.	3
					3.45				
		4.00	ES		4.00			MADE GROUND: Black slightly silty very sandy gravel. Gravel is fine to coarse, angular to subrounded of brick, concrete, sandstone, mudstone and ash.	4
		4.00		N=27 (12,12/8,8,5,6)					
					4.45			Medium dense black and grey very silty fine to medium SAND with pockets of dark brown fibrous PEAT. (Strong organic odour). End of borehole at 4.45 m	5

Remarks

1. Terminated at 4.45 m bgl, borehole collapse back to 3.00 m bgl. 2. Water strike encountered as slow seepage at 3.10 m bgl. 3. Strong organic odour encountered from 4.00 m bgl.

Borehole Log

Borehole No.

WS104

Sheet 1 of 1

Project Name: Innings Way

Project No.
17011

Co-ords: 387789.00 - 410747.00

Hole Type
WS

Location: Castleton

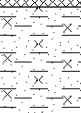
Level:

Scale
1:50

Client: Olive Group (UK) Ltd

Dates: 05/07/2023 -

Logged By
I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.20 0.30			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
					0.70			MADE GROUND: Light brown very gravelly fine to medium sand with occasional cobbles. Gravel is fine to coarse, angular to subrounded of brick, concrete, metal, tile, plastic, sandstone and mudstone. Cobbles are subangular of brick.	
		1.00		N=10 (1,2/2,3,2,3)				MADE GROUND: Grey slightly sandy gravel. Gravel is fine to coarse, subangular to subrounded of concrete, mudstone, and granite.	1
								MADE GROUND: Black very silty very gravelly clay. Gravel is fine to coarse, angular to subrounded of brick, timber, mudstone, and sandstone.	
		2.00		N=10 (2,2/2,2,2,4)					2
		3.00		N=4 (2,2/1,1,1,1)					3
		3.90 4.00	ES	N=22 (3,3/4,5,6,7)	3.80			Very stiff high strength black mottled grey very silty very sandy CLAY. (Slight organic odour).	4
		4.80 5.00	D	N=28 (4,4/5,6,8,9)	4.60			Medium dense grey very silty fine to medium SAND with pockets of blackish brown fibrous PEAT. (Very strong organic odour).	5
					5.45			End of borehole at 5.45 m	
									6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered as slow seepage at 3.00 m bgl. 3. Slight organic odour encountered from 3.80 m bgl. 4. Very strong organic odour encountered from 4.60 m bgl.



Borehole Log

Borehole No.

WS105

Sheet 1 of 1

Project Name: Innings Way

Project No.
17011

Co-ords: 387786.00 - 410732.00

Hole Type
WS

Location: Castleton

Level:

Scale
1:50

Client: Olive Group (UK) Ltd

Dates: 05/07/2023 -

Logged By
I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil).	
		1.00		N=5 (2,2/2,1,1,1)				MADE GROUND: Dark grey very silty very gravelly clay. Gravel is fine to coarse, subangular to subrounded of brick, concrete, cloth, timber, tile, sandstone and mudstone.	1
		2.00		N=6 (1,1/1,2,2,1)	2.10				2
		3.00		N=9 (2,2/2,3,2,2)					3
		4.00		N=13 (2,3/3,3,4,3)					4
		4.80 5.00	ES	N=24 (4,5/5,6,7,6)	5.45				5
								End of borehole at 5.45 m	6
									7
									8
									9
									10

Remarks

1. Complete. 2. Water strike encountered as slow seepage at 1.50 m bgl. 3. Strong organic odour encountered from 2.40 m bgl.





Borehole Log

Borehole No.

WS106

Sheet 1 of 1

Project Name: Innings Way

Project No.
17011

Co-ords: 387780.00 - 410739.00

Hole Type
WS

Location: Castleton

Level:

Scale
1:50

Client: Olive Group (UK) Ltd

Dates: 05/07/2023 -

Logged By
I.Diack

Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
		0.20			0.20			MADE GROUND: Dark brown sand with frequent roots and rootlets (Reworked Topsoil). MADE GROUND: Black clayey very sandy gravel. Gravel is fine to coarse, angular to subrounded of brick, glass, timber, sandstone, plastic and mudstone.	1
		1.00		N=10 (2,2/3,3,2,2)					2
		2.00		N=31 (6,7/8,9,7,7)					3
		3.00 3.20	ES	N=8 (3,3/2,2,2,2)					4
		4.00		N=36 (7,7/8,10,9,9)	4.30				5
		5.00		N=38 (5,6/8,8,9,13)	5.45			Dense dark grey very silty clayey fine to medium SAND with pockets of dark brown fibrous PEAT. (Strong organic odour).	6
								End of borehole at 5.45 m	7
									8
									9
									10

Remarks

1. Complete. 2. Strong organic odour encountered from 4.30 m bgl. 3. No groundwater encountered.

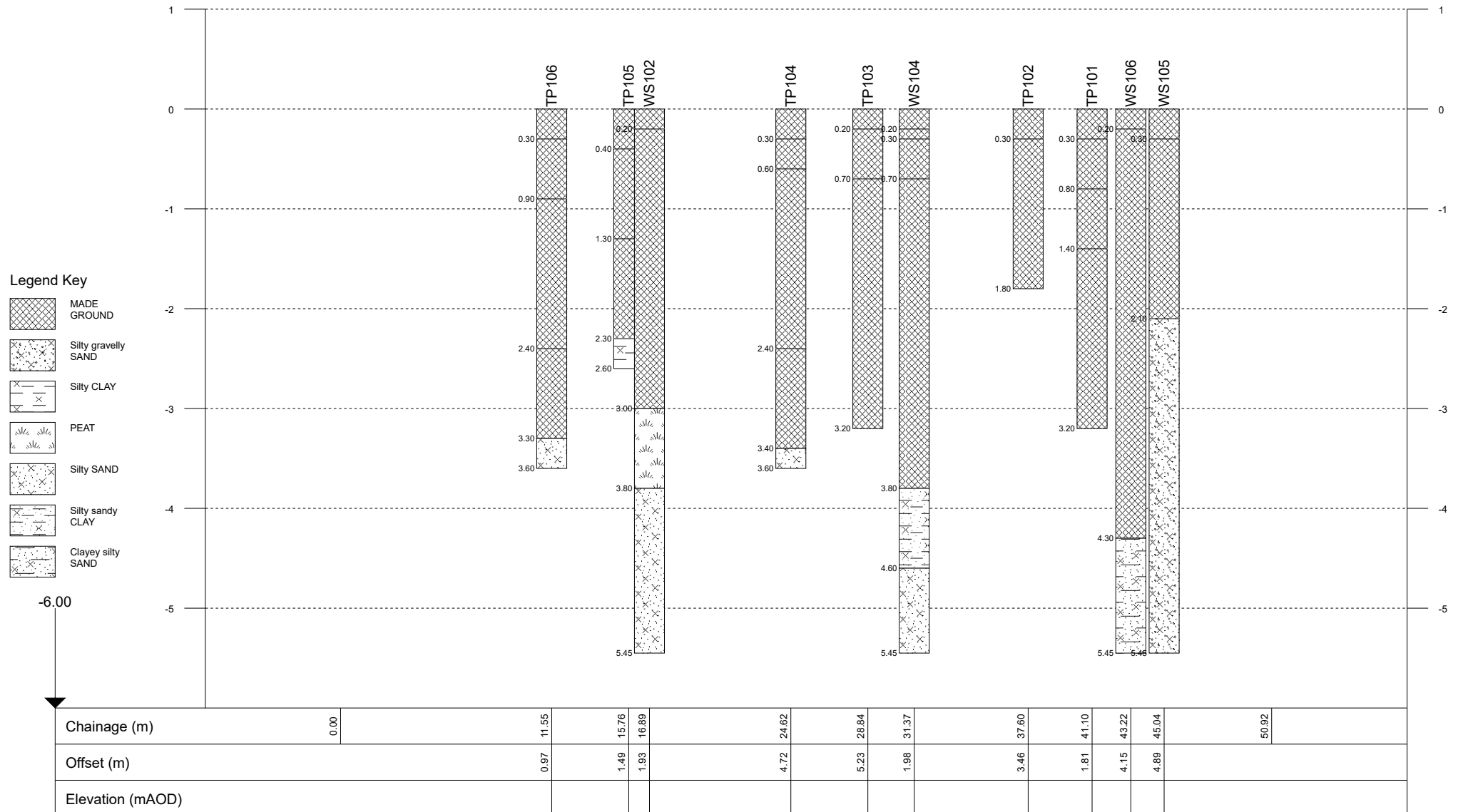


Title: Section Line 1 (N-S)

Vertical Scale: 1:54

Horizontal Scale: 1:295

Engineer:



Project Id: 17011
Project Title: Innings Way
Location: Castleton
Client: Olive Group (UK) Ltd

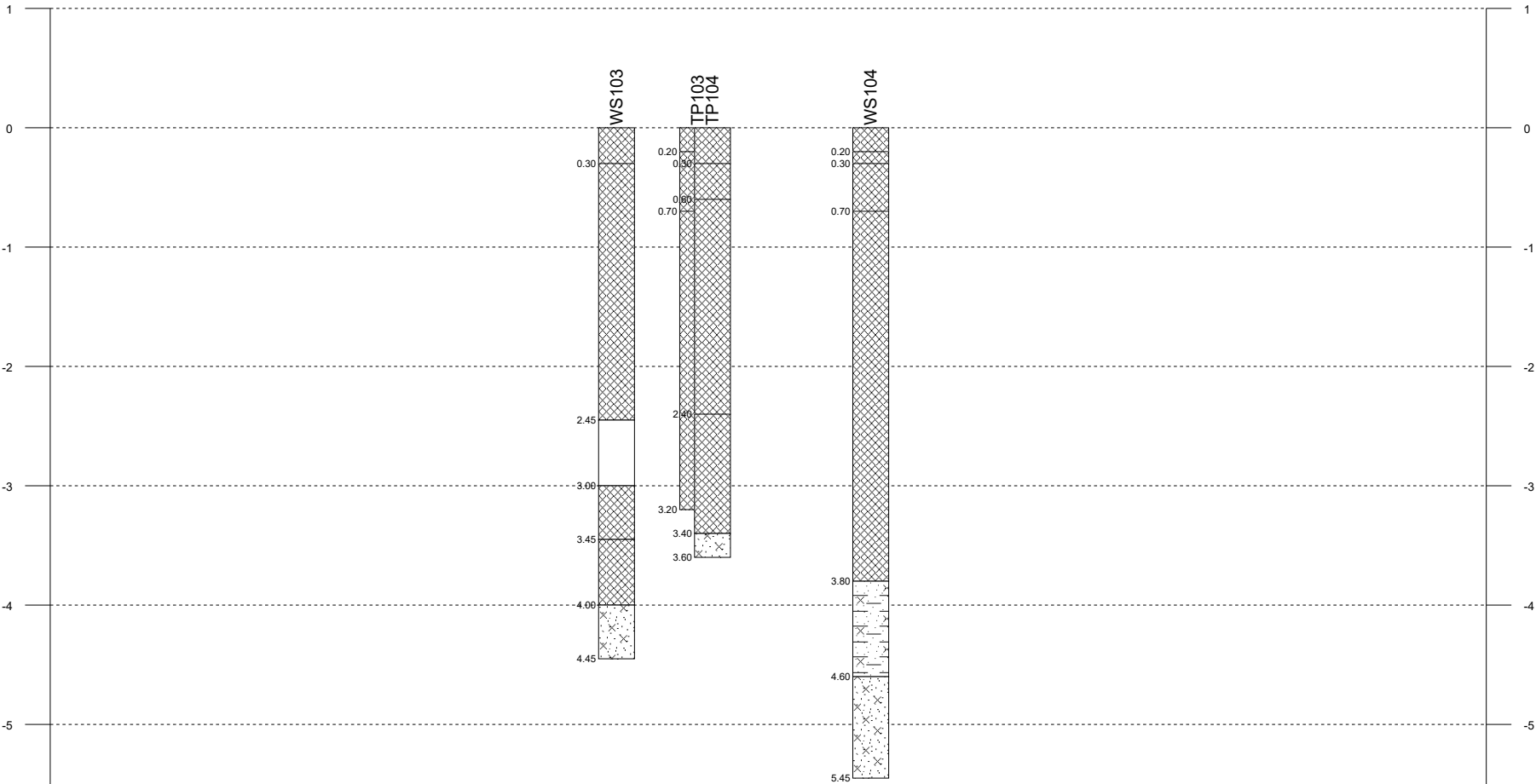
Title: Section Line 2 (W-E)
Vertical Scale: 1:54
Horizontal Scale: 1:126
Engineer:



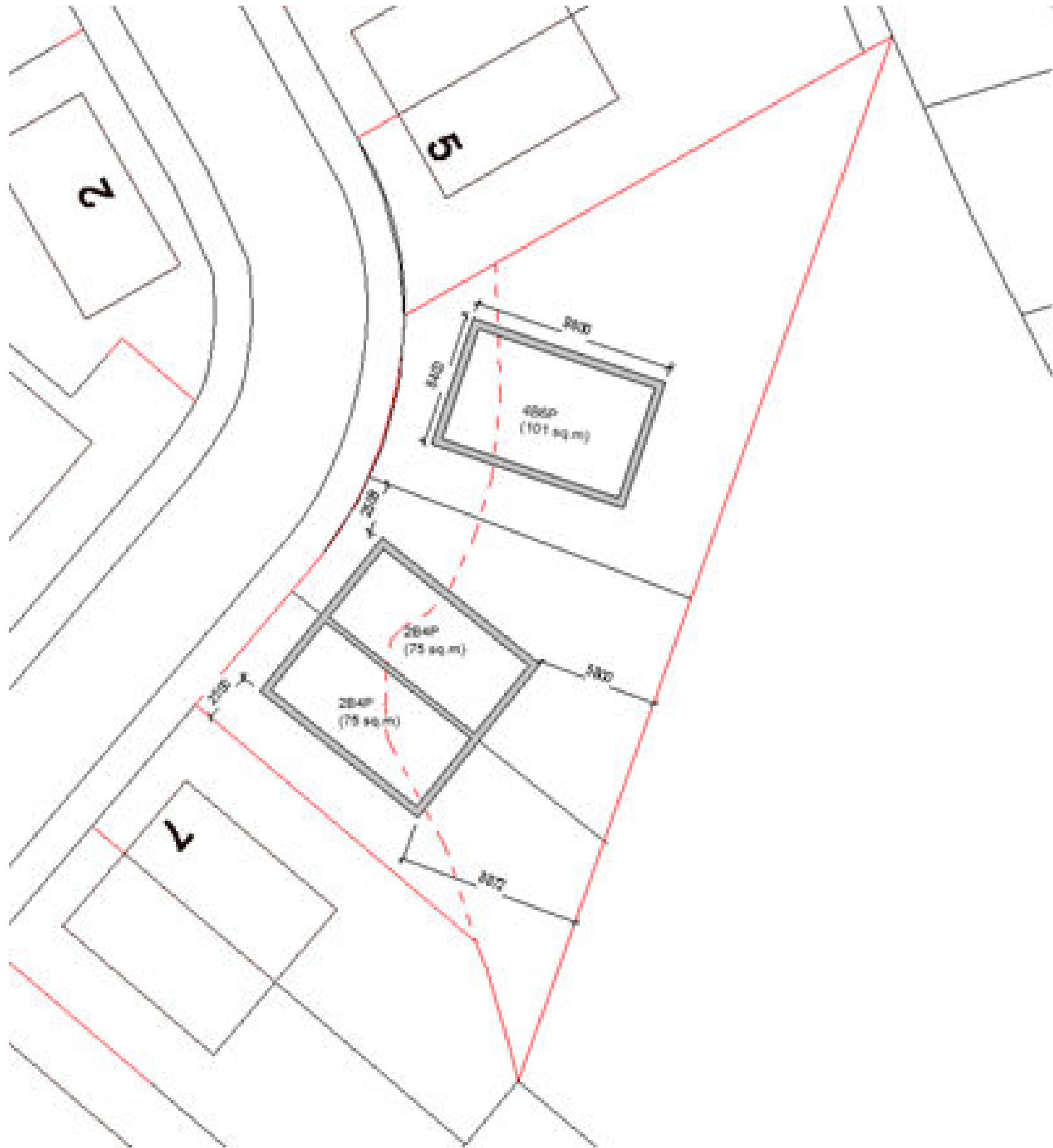
Legend Key

- MADE GROUND
- Void
- Silty SAND
- Silty sandy CLAY

-6.00



Chainage (m)	0.00	7.91	9.50	12.88	21.62
Offset (m)		4.56	3.35	5.71	
Elevation (mAOD)					



Client: Olive Group UK		Job No: 17-011	Date: 18.07.2023	 Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk
		Drawing No: 002	Scale: 1:1000 @ A3	
Job Title: Innings Way, Castleton		Drawing Title: Proposed Development Plan		The client must not amend any drawing, design or other intellectual property produced by E3P Ltd without permission in writing from E3P Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, E3P Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or intellectual property.

P1	REVA	18.07.2023	OW	ID
Phase	Issue	Date	Drawn	Checked



Site Features

- Dense Vegetation
- Filled Trees/Vegetation
- Manhole Cover
- Collapsed Badger Set
- Ash Pile

Notes:

P1	REVA	18.07.2023	OW	ID
Phase	Issue	Date	Drawn	Checked

Client:

Olive Group
UK

Job Title:

Innings Way, Castleton

Job No:

17-011

Drawing No:

004

Date:

18.07.2023

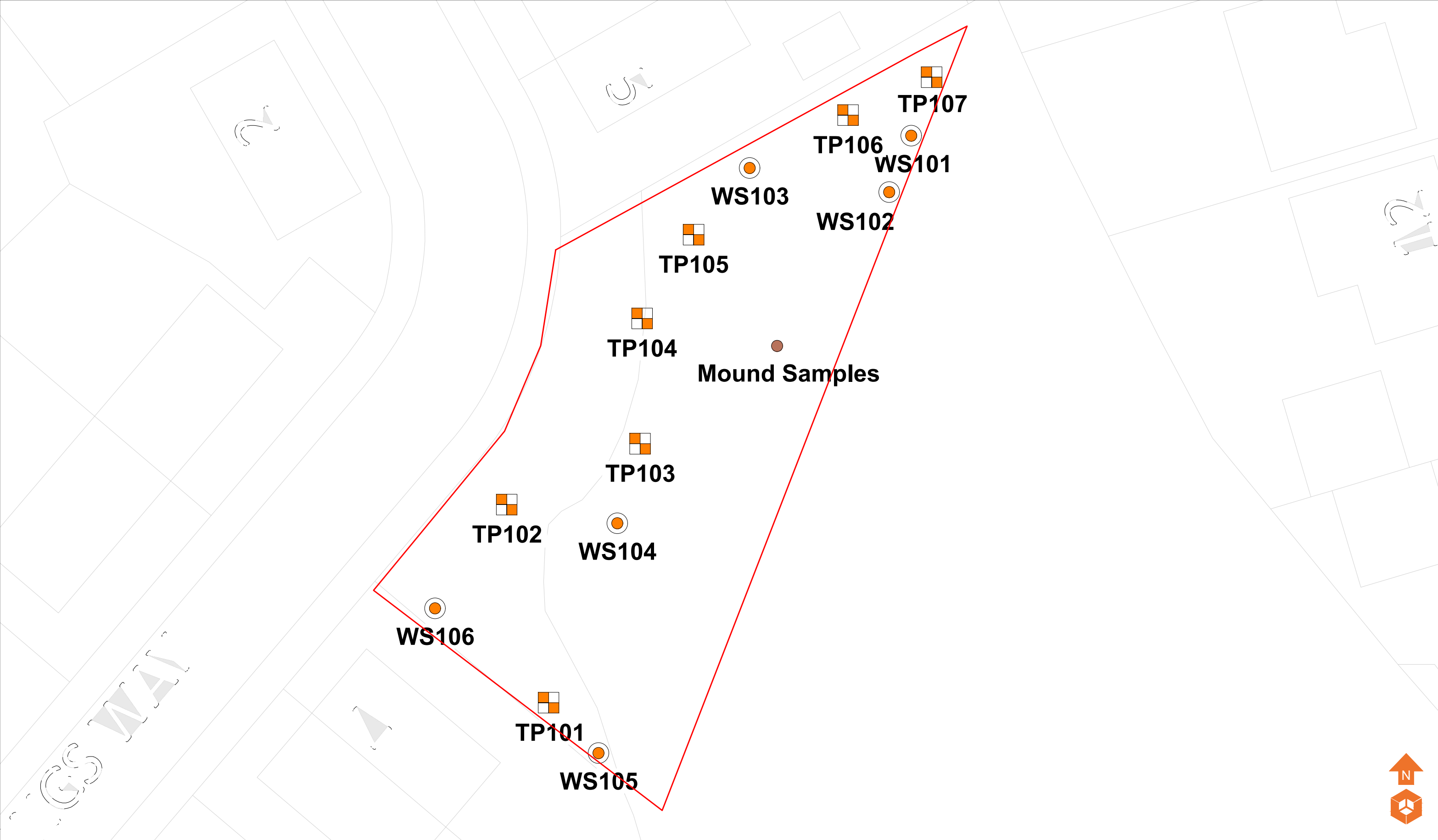
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1:1000 @ A3



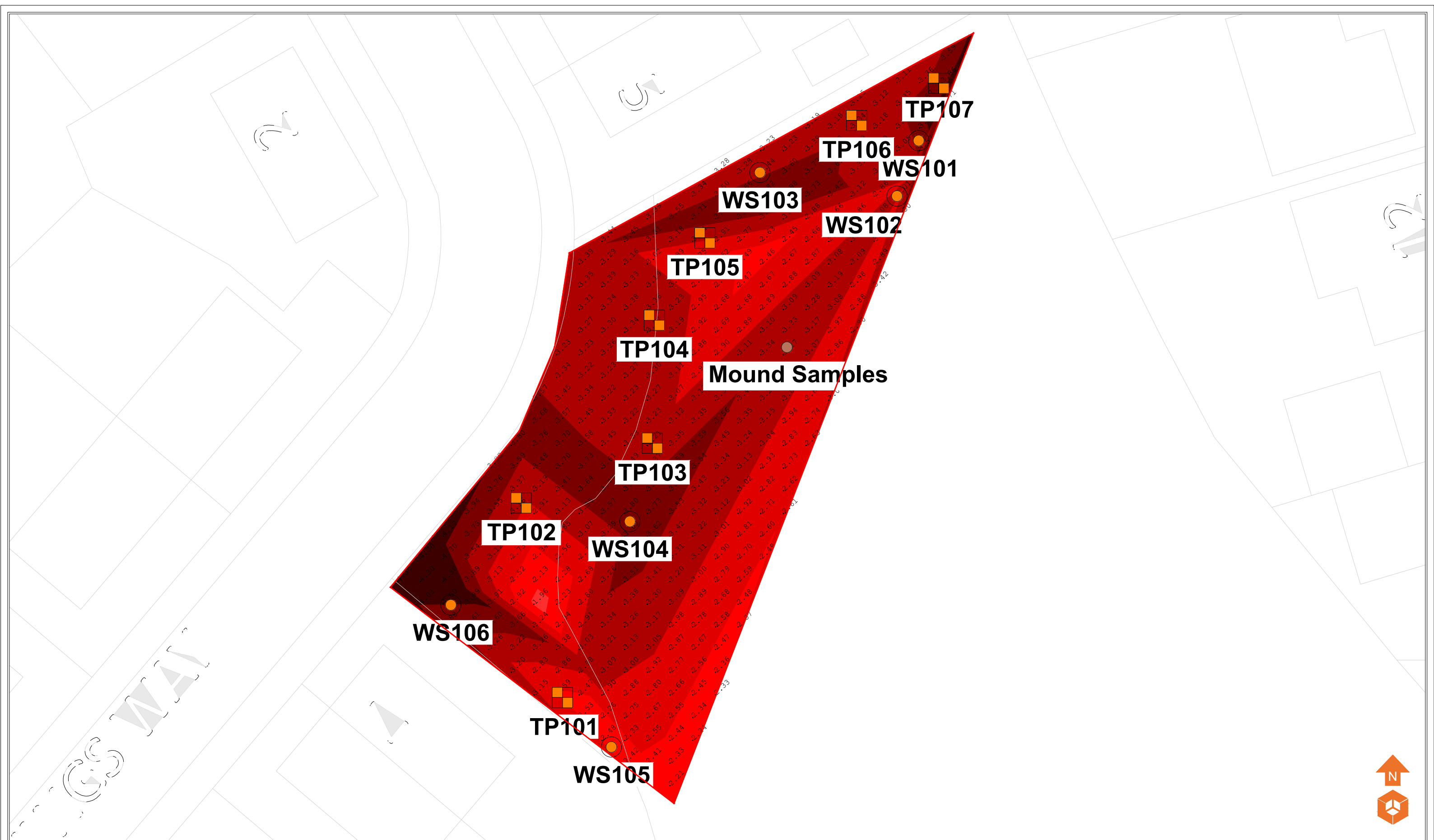
Environmental Engineering
Partnership Ltd
Taylor Road, Trafford Park
Urmston, Manchester, M41 7JQ
Tel: 0161 707 9612
E-mail: info@e3p.co.uk
Website: www.e3p.co.uk

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Location Symbols Approximate Window Sample Probehole Location Approximate Trial Pit Location Approximate Mound Sample Location	Notes:					Client: Olive Group UK	Job No: 17-011	Date: 18.07.2023	e3p Environmental Engineering Partnership Ltd Taylor Road, Trafford Park Urmston, Manchester, M41 7JQ Tel: 0161 707 9612 E-mail: info@e3p.co.uk Website: www.e3p.co.uk												
						Job Title: Innings Way, Castleton	Drawing No: 005	Scale: 1:1000 @ A3													
	<table><tr><td>P1</td><td>REVB</td><td>18.07.2023</td><td>OW</td><td>ID</td></tr><tr><td>P1</td><td>REVA</td><td>12.07.2023</td><td>OW</td><td>ID</td></tr><tr><td>Phase</td><td>Issue</td><td>Date</td><td>Drawn</td><td>Checked</td></tr></table>					P1	REVB	18.07.2023		OW	ID	P1	REVA	12.07.2023	OW	ID	Phase	Issue	Date	Drawn	Checked
P1	REVB	18.07.2023	OW	ID																	
P1	REVA	12.07.2023	OW	ID																	
Phase	Issue	Date	Drawn	Checked																	

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- Location Symbols**
- Approximate Window Sample Probehole Location
 - Approximate Trial Pit Location
 - Approximate Mound Sample Location

- Made Ground Depth (m)**
- Depth of Made Ground 1.80 - 2.04m
 - Depth of Made Ground 2.05 - 2.29m
 - Depth of Made Ground 2.30 - 2.54m
 - Depth of Made Ground 2.55 - 2.79m
 - Depth of Made Ground 2.80 - 3.04m
 - Depth of Made Ground < 3.05m

Notes:				
P1	REVA	25.07.2023	OW	ID
Phase	Issue	Date	Drawn	Checked

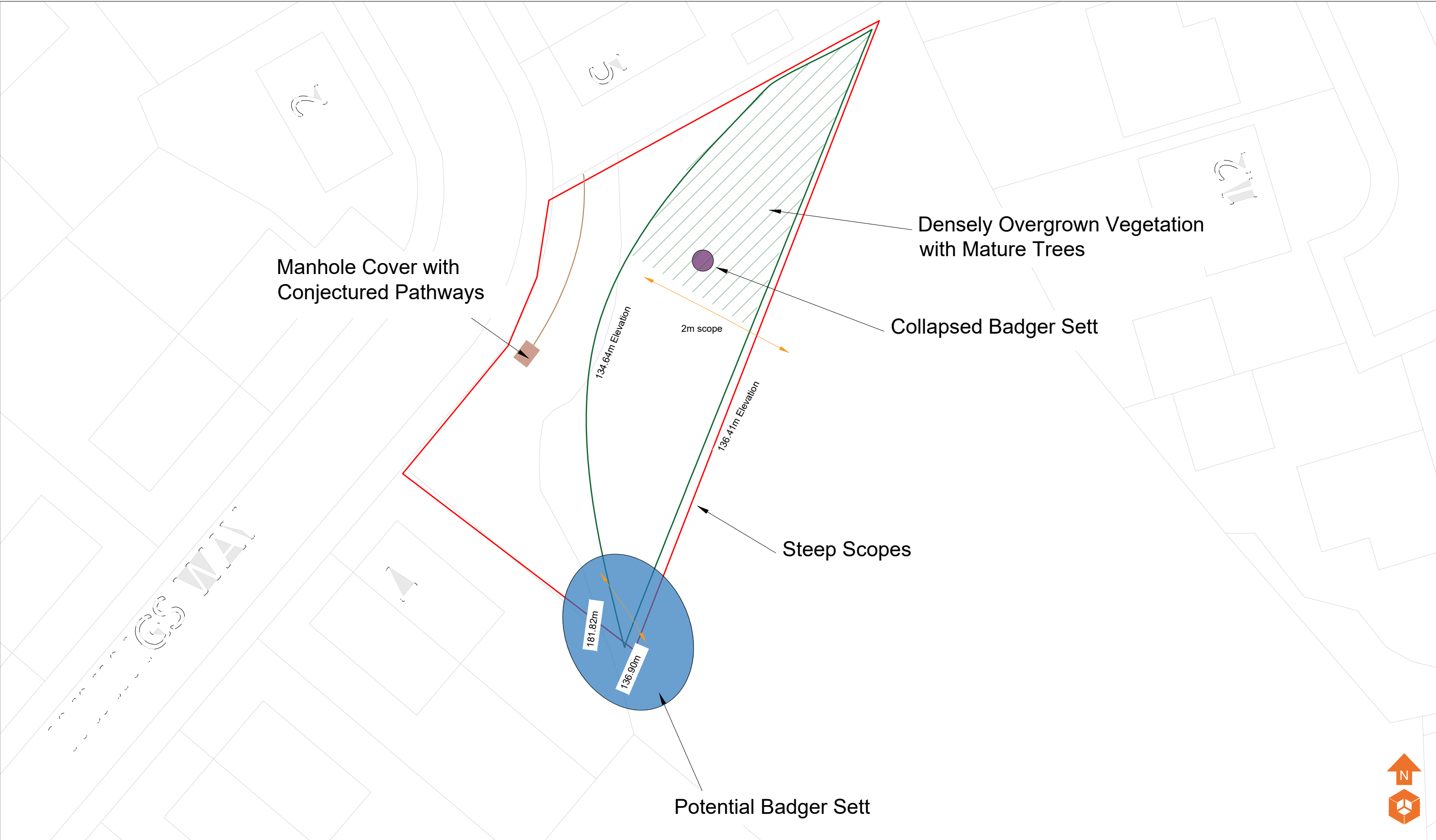
Client:	
Olive Group UK	
Job Title:	
Innings Way, Castleton	

Job No:	17-011
Drawing No:	006
Drawing Title:	
Depth of Made Ground Plan	

Date:	25.07.2023
Scale:	1:1000 @ A3

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Development Constraints Potential Badger Set Collapsed Badger Set Manhole Cover				

Notes:				
P1	REVA	25.07.2023	OW	ID
Phase	Issue	Date	Drawn	Checked

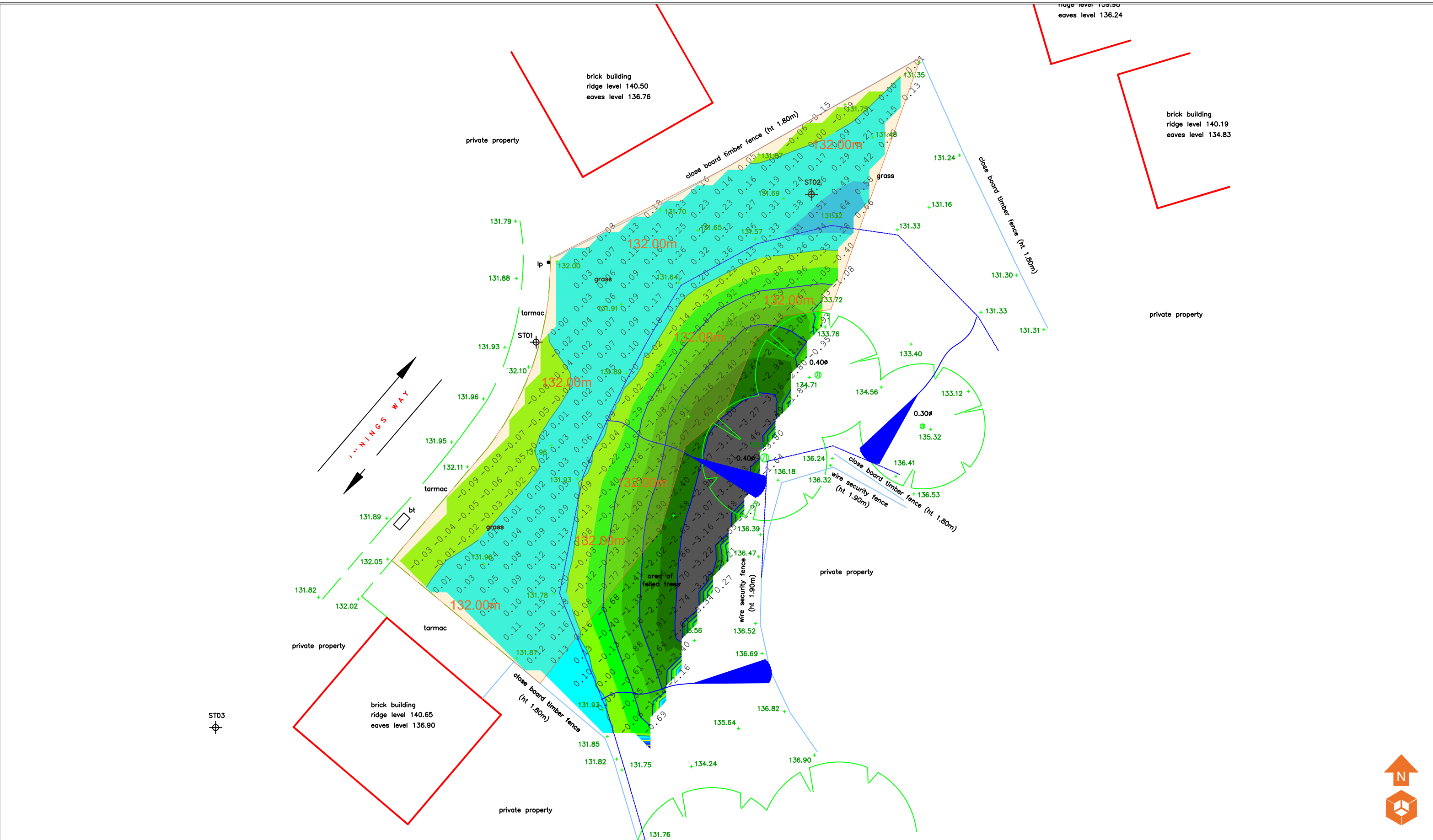
Client:	Olive Group UK
Job Title:	Innings Way, Castleton

Job No:	17-011
Drawing No:	015

Date:	25.07.2023
Scale:	1:1000 @ A3

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Volumetrics

>3.00m (Fill)	0.00 - 0.49m (Cut)
2.50 - 2.99m (Fill)	0.50 - 0.99m (Cut)
2.00 - 2.49m (Fill)	1.00 - 1.49m (Cut)
1.50 - 1.99m (Fill)	1.50 - 1.99m (Cut)
1.00 - 1.49m (Fill)	2.00 - 2.49m (Cut)
0.50 - 0.99m (Fill)	2.50 - 2.99m (Cut)
0.00 - 0.49m (Fill)	>3.00m (Cut)

Cut Fill Volumes					
Volumes (m³)			Areas (m²)		
Cut (Material)	Fill (Void)	Balance	Cut	Fill	Total
481.163	-49.95	431.213	337.98	286.215	624.2030
0	0	0	80		
481.1630	-49.9500	431.2130	337.9880	286.2150	624.2030

Notes:

A proposed plateau of 132.00m has been used for this model.

P1	REVB	20.06.2022	CB	MD
P1	REVA	06.06.2022	CB	MD
Phase	Issue	Date	Drawn	Checked

Client:

Olive Group

Job Title:

Innings Way, Rochdale

Job No:

17-011

Drawing No:

023

Date:

25.07.2023

Scale:

1:1000 @ A3



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