

PRESSURE GROUTING SPECIFICATION
PHASE 3, BARNBURGH LANE, GOLDTHORPE
FOR
GLEESON DEVELOPMENTS LTD

ISSUE 3



39657-005

20 January 2023

PRESSURE GROUTING SPECIFICATION
PHASE 3, BARNBURGH LANE, GOLDTHORPE
FOR
GLEESON DEVELOPMENTS LTD
ISSUE 3

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Exploratory Hole Location Plan, drawing reference 39657/001C

Rotary Borehole Logs

1.0 GENERAL INFORMATION

1.1 Introduction

This Pressure Grouting Specification has been prepared by Eastwood & Partners (Consulting Engineers) Ltd, on behalf of Gleeson Developments Ltd, for the site at Barnburgh Lane in Goldthorpe. The purpose of this document is to detail the procedures for the drilling and grouting of shallow coal workings and any mine shafts which may be identified during the surface strip.

This document is a working publication and may need to be updated, in agreement with the relevant regulatory bodies, dependent on what is encountered. This document is also subject to the approval of the regulatory parties such as the Coal Authority and Local Authority. This version comprises [Issue 3](#). Please contact Eastwood & Partners if you are unsure of the current issue.

The role of 'Engineer' referred to in this document shall be taken to mean a suitably qualified geotechnical engineer employed by the developer for the purposes of checking compliance with the Pressure Grouting Specification and preparing the Completion Report if required.

1.2 Development

The approximately 2.2 hectare site is to be developed with [68](#) plots with associated areas of landscaping and hardstanding.

The specification will cover the drilling and grouting of all plots, adoptable highway, and pumping station.

1.3 Location

The site is located to the west of Phase 2 of the wider Gleeson Developments' site, which is in turn located south of Barnburgh Lane in Goldthorpe. It is centred on grid reference 446560, 403710.

At the time of the Phase 2 investigation, the site comprised rough grassland with areas of dense scrub vegetation. Vegetation consistent with seasonally wet or boggy ground is noted in the southern part of the site. A footpath crosses the site from the north east to south western corner. The site boundaries comprise hawthorn hedges with occasional elder and sycamore trees.

The site slopes at a gradient of around 1 in 30 from approximately 30 m AOD in the north to 20 m AOD in the south.

Gleesons' Phase 2 development lies to the east of the site, and further residential development is located to the north off Lindale Gardens. To the west of the site, allotment gardens are located adjacent to the northern half of the site, and overgrown grassland lies adjacent to the southern half. Rough grassland also lies to the south of the site, with agricultural fields located beyond.

1.4 Site Investigation

Eastwood & Partners have previously completed the following reports for the site for Gleeson Developments:

- A “Desk Study”, referenced CAT/KE/KLG/39657-001 and dated 18 March 2016; and
- A “Phase 2 Geotechnical and Geo-environmental Site Investigation, Issue 3”, referenced CAT/KE/LW/39657-003 dated 29 March 2022.

The solid geology comprises the Middle Carboniferous Coal Measures. Superficial alluvium is shown to extend up to the southern boundary, but not below the site. No fault lines cross the site. The Shafton coal underlies the site at shallow depth.

Ten rotary boreholes were completed as part of the Phase 2 site investigation. The base of the Shafton coal was encountered from around 6 m bgl in the south of the site (BH09), deepening to 18.5 m bgl in the north (BH01). Eight of the ten boreholes recorded evidence of workings (i.e. soft or broken ground); the workings were encountered from as shallow as 2.5 m depth in BH09.

In the boreholes where solid coal was encountered, the seam was recorded to be 1.4 m (BH02) and 2 m (BH08) thick. The seam was recorded to be 1.6 m thick below the adjacent Phase 2 development; this thickness was considered for the risk assessment in the Phase 2 report for this site.

Within the adjacent Phase 2 development, numerous mine features were identified at the surface, including a total of seven shafts and eight crown holes. Evidence of mine features were also recorded during the ground investigation for Phase 3 of the development, including a suspected crown hole in TP05 and reduced strength clays in TP3 (excavated close to BH09). Further unrecorded shafts and crown holes may be present on the site.

1.5 Object of the Grouting Works

The object of the grouting works is to substantially fill any old workings in the Shafton coal, in addition to any associated mine entries, voids or broken ground within influencing distance of the surface.

Where the thickness of competent strata, which does not include made ground or significantly weathered material, between the base of the foundation and the top of the worked seam is less than ten times seam thickness, it is considered that it will be appropriate to drill and grout the workings. It is proposed to only treat the shallow workings beneath houses and garages, as well as the adoptable highway, pumping station, rising main and surface water sewer.

An alternative solution to drilling and grouting within the footprint of the pumping station (e.g. excavation and replacement with stone) may prove to be more economical as long as groundwater is managed appropriately; drilling and grouting of this area is considered to be at Gleeson's discretion.

Grout holes spaced at 3 m centres have been deemed appropriate for the northern 75% of the site. For the southern 25% of the site, south of plots 15 and 34, an additional 'central' hole within the 3 m grid will be drilled (creating second off-set 3 m grid); this is where the thickness of competent cover is less than four times the workable seam thickness.

Gleesons have divided the site into Phase 1, comprising plots 1 to 14 and 37 to 68, and Phase 2 i.e. plots 15 to 36. The plans are attached, and show 1,184 grout holes for Phase 1 and 906 grout holes for Phase 2 (2,090 grout holes total for the grid).

Mine entries such as crown holes and mine shafts are also expected to be present which will also require grouting.

Tree protection zones are expected to be required on the periphery of the site. A live sewer is also known to cross the northern quarter of the site. Directional drilling will be required within these areas.

A Permit will need to be obtained from the Coal Authority to cover the treatment of workings.

The Shafton coal is recorded to be potentially combustible and housing is present along the northern and eastern boundaries. Water flush drilling medium is recommended for the proposed works.

An adequate water supply should be established for the grouting works prior to starting on site. Silt protection measures will be installed on site by the Contractor. Any water runoff from the grouting works will need to be controlled and it should be ensured that the silt protection measures will be protected during the works.

1.6 Hours of Working

The hours of working are 8 am to 5 pm Monday to Friday. Weekend working will not be allowed.

1.7 Existing Services

The sewer records indicate that there is a 450 mm diameter combined sewer crossing the north western corner of the site. The records also show a surface water sewer from offsite, discharging into a drain which runs parallel to the site's western boundary.

It will be the responsibility of the Contractor to accurately locate any existing services at the site (gas, water, electricity, sewerage and all forms of telecommunications including standard telephone as well as cables lines) to satisfy themselves that no damage will occur during the drilling and grouting works. This may involve acquiring additional service plans. The Employer will not hold themselves liable for

any expense incurred by the Contractor where repair or replacement of services is required due to damage occurring during works at the site.

1.8 Water and Electricity Supply

Provision for both services is at the expense of the Contractor.

2.0 GENERAL SPECIFICATION

2.1 General Items

2.1.1 Health and Safety

The Contractor must ensure that potential risks to public safety and any persons potentially affected by the work are identified and appropriately mitigated. Due consideration is to be given to the potential for mine gas emissions, spontaneous combustion, mine water emissions and collapse of shallow workings and shafts. The Contractor must be fully conversant with the Coal Authority's guidance. The Contractor shall monitor at least one of the boreholes on each working day for carbon dioxide, carbon monoxide, methane, hydrogen sulphide and oxygen.

The Contractor will be required to provide all necessary health and safety documentation for approval prior to commencing works.

2.1.2 Site Protection

The grouting plant shall be arranged so as to avoid spillage into existing drains or on to roadways and adjacent residential properties.

Care shall be taken to ensure that uplift pressures are not allowed to develop under any adjacent building or structure, including services, during grout injection. Where nearby building or structures might be affected by the grouting operations, the Contractor shall employ special supervision, and, unless otherwise specified, shall monitor ground levels by precise levelling at intervals, both prior to and during operations.

The Contractor shall take all reasonable steps to ensure that grout is not leaking into sewers, drains, ducts, basements, etc.

2.1.3 Noise and Dust

The Contractor shall take all reasonable steps to ensure that noise emissions are kept within acceptable levels and to control the release of dust and dirt from the working area.

2.1.4 Setting Out of Boreholes

The Contractor will be responsible for the setting out all boreholes.

Boreholes shall be drilled to within 150 mm of the positions shown on the drawings.

The Contractor shall ensure that setting out and survey points are maintained in an undisturbed state.

2.1.5 Welfare

The Contractor is to allow for providing amenities etc., in accordance with any agreement within the Industry, and in compliance with the requirements of any Statutory Orders or amendments thereto.

The Contractor shall take all necessary precautions to ensure safe working conditions.

2.2 Grout Materials and Mixing

2.2.1 Constituent Materials for Grouting

Water shall be from the mains supply or other source approved by the Engineer. The Contractor is to be responsible for sourcing an appropriate water supply.

Cement shall be Ordinary Portland cement complying with BS 12.

Pulverised Fuel Ash (PFA) shall be conditioned hopper ash, or dry powder ash, of a type suitable as a constituent for grout and obtained from an approved supplier.

Sand shall generally comply with BS 882, and be of a grading suitable for use in the Contractor's plant and approved by the Engineer.

Pea gravel shall comply with BS 882, and be of grading approved by the Engineer.

Thixotropic admixtures shall be bentonite or other admixture approved by the Engineer.

All material grading and details are to be submitted to the Engineer for approval prior to grouting works being undertaken.

Bulk materials, excluding mixing water, shall be paid for by weight, except that there shall be no payment for the excess weight if the moisture content exceeds 10% by weight of the dried material as determined in accordance with BS 1881.

2.2.2 Storage and Use of Materials

Storage of materials shall be such as to prevent contamination and deterioration.

Cement shall be kept in a dry location, and the sequence of deliveries recorded so that the cement can be used in rotation.

All materials which in the opinion of the Engineer are unsuitable, because of poor storage or otherwise shall be removed from site immediately.

At the completion of the Works, all unused materials shall be removed from site and the site shall be left in a clean and tidy condition.

2.2.3 Grouting Plant

The Contractor shall submit to the Engineer, for approval, details of the proposed method of mixing, batching and pumping of grout to the injection points, together with the means of monitoring grouting pressures and the quantities injected prior to grouting works being undertaken. The materials shall be introduced into the mixer via approved weight batching equipment. The grout mixer shall be capable of producing an intimate homogeneous mix, all particles being thoroughly wetted without segregation occurring.

2.2.4 Grout Mix

The grout mix shall be at the ratio of 1-part cement to 12 parts PFA. The water content should not exceed 40% of the total weight of the solid constituents of the grout.

The Engineer may alter the grout mix to suit the ground conditions.

2.2.5 Grout Testing

The Contractor shall make 150 mm test cubes according to BS 1881. These shall be tested at an independent testing laboratory and the result forwarded directly to the Engineer within 24 hours of the test being received by the Contractor.

The minimum strength at 28 days should be 0.7 N/mm².

The Contractor shall keep on site sufficient equipment for cubes to be taken at the rate of minimum three cubes per day.

The grout mix should flow within the limits of 300 to 400 mm, determined by a flow meter.

2.3 Procedures

2.3.1 Drilling Procedures

All holes, including any which strike mineral pillars, to be used for the injection of grout shall be drilled by rotary or rotary percussive techniques using water as the flushing medium.

The holes are to extend down to 1,000 mm below the level of the base of the old workings. The drilling system to be used shall be approved by the Engineer. The minimum diameter of holes shall be 50 mm unless otherwise specified by the Engineer. When it is impracticable to drill at the minimum diameter for the full depth, the diameter of the holes shall be increased in the upper lengths.

Some holes (i.e. in the vicinity of tree protection zones and existing services) will need to be drilled using directional drilling techniques. The surface position of the grout hole and the angle at which it will be drilled will be proposed by the Contractor and agreed with the Engineer.

During the drilling, the concentrations of carbon monoxide, methane, carbon dioxide, oxygen and hydrogen sulphide are to be measured and the results monitored to ensure that they are within acceptable limits. The means of measuring these shall be approved by the Engineer.

The holes shall be cased through weathered Coal Measures strata down to the rockhead, and if directed by the Engineer, down through the rock strata. The holes shall be kept open until grout injection into the workings and rock is complete.

Where a hole proves abortive because it becomes obstructed, or because of the Contractor's failure to progress the hole, it shall be re-drilled at a larger diameter and re-cased, or a new hole drilled and cased at the Contractor's expense.

Where a hole cannot be drilled due to the presence of services, the Contractor shall notify the Engineer. A new hole should be drilled as close to the original location as possible. Conditions set out in Section 1.7 'Existing Services' will still apply. Records of any new positions shall be kept in accordance with procedures set out in Section 2.

In order to allow the injection of pea gravel the Engineer may instruct that certain boreholes should be re-drilled to 150 mm diameter.

Drilling to former mine entries (if identified) will take place from a shaft safety platform. A platform appropriate to the type of rotary drill rig proposed for the works, and for the possible diameter of the zone of influence in the event of a collapse, is to be provided by the Contractor. All provision for moving and setting up the platform is to be allowed for by the Contractor. Harnesses and lanyards are to be provided for the drilling and grouting operative in accordance with current guidance / best practice.

2.3.2 Grouting Procedures

Immediately prior to grouting each hole, the Contractor shall check that it is unobstructed to the required depth to receive the tubing or pipes for grout. Obstructions shall be dealt with as described in 'Drilling Procedures' above.

Grout shall be tremmied into position down each hole via an approved connection and flexible tubing, or series of steel tubes, placed to the base of the hole or to such other depth as specified by the Engineer. Provision shall be made for monitoring the pressure of the grout and the quantity being delivered in the line.

The grout shall be injected at the approved rates until either a limited pressure of 10 kN/m² per metre of overburden or a maximum of 100 kN/m² is reached, or grout appears near the point of injection, when the hole shall be deemed complete. If one of these criteria is reached quickly, the grout tube or

pipes shall be lifted to check that a local obstruction is not preventing the flow of the grout into the strata.

If pressure is not achieved or grout has not appeared at the point of injection after **15 tonnes** of grout materials have been placed, injection should be suspended.

After a period of at least 12 hours, up to a further **10 tonnes** of material shall be injected. If there is still no result, injection shall again be suspended for at least 12 hours and the process shall be repeated with further quantities of **5 tonnes**.

If the hole is still accepting grout after a total of 25 tonnes of materials have been injected without any sign of the hole being completed, the Contractor shall consult the Engineer to determine whether the injection is to be continued or other measures such as secondary or test holes are required.

When holes have been cased through rock, grout injection shall continue at gauge pressures to be approved by the Engineer, subject to the maximum of 10 kN/m² per metre of overburden with an upper limit of 100 kN/m² whatever the depth, as the casing is withdrawn.

The sequence of grouting must be agreed with the Engineer before grouting commences. In general, the grouting holes shall proceed systematically from the deepest point of the workings.

Unless otherwise directed by the Engineer the Contractor shall attempt to inject grout into each exploratory hole irrespective of whether or not a cavity or old mine working is suspected.

Any shafts shall also be pressure grouted through the drill casing in one-meter stages from the base of the shaft to surface. One or more treatment holes will be required depending of the diameter of the shaft and the nature of any shaft infill materials. The Contractor is to propose an exact treatment methodology and pressure specification for shaft treatment with their tender submission.

On completion of pressure grouting any shafts, treatment shall be confirmed satisfactory by drilling and pressure testing one or two holes within the treated shaft no less than 48 hrs after completion of treatment.

2.3.3 In-situ Testing

If directed by the Engineer, the Contractor shall test the consolidated ground for permeability and strength. Permeability by grout acceptance testing shall be checked by drilling test holes in positions to be selected by the Engineer and injecting grout at pressures appropriate to the depth, all in accordance with the requirements for infill grouting. If the Engineer considers that the quantities of grout accepted are excessive, further holes shall be drilled and grouted.

After testing, holes shall be completed in accordance with the requirements for grouting infill holes.

2.4 Records

2.4.1 Records to be Kept on Site

The Contractor shall prepare, and keep available for inspection on site, plans showing the positions of all holes, together with the total amounts of grout injected for each hole. The plans shall be updated daily in conformity with the Records noted below. On completion of the Works, the Contractor shall give fair copies of the plans and sections to the Engineer.

As work proceeds, the Contractor shall maintain separate Daily Records for Drilling, for Grouting and for Materials and Plant Received in a form to be approved by the Engineer. The Daily Records, signed by the Contractor's agent, shall be submitted each day to the Engineer for their agreement. The Contractor shall provide one copy of the agreed Record for the Engineer's retention and keep a further copy available for inspection on site.

Daily Drilling Records shall be provided for each hole and contain the following information:

- 1 Job title and location
- 2 Hole reference number
- 3 Date
- 4 Contractor's name
- 5 Plant in use, crew members and hours worked
- 6 Method of boring or drilling, flushing medium (water) and type of drill bit
- 7 Type, diameter and depth of casing used
- 8 Diameter and depth of hole at the beginning and end of each working day or shift
- 9 Loss of any flushing medium during drilling
- 10 Standing time, with reason or time lost overcoming obstructions
- 11 Details of underground services located
- 12 Details of any settlement or ground heave
- 13 Daily and cumulative length drilled
- 14 Depth to each major change of stratum
- 15 Description, with identification, of the stratum and whether it is intact or broken

- 16 Gas monitoring results
- 17 Depths at which groundwater is encountered (if apparent)
- 18 Depths at which any samples are taken
- 19 Details of any voids or suspected workings
- 20 Details of any emissions of gas, water, etc
- 21 Depth of completed hole

Daily Grouting Records shall be provided for each hole and contain the following information:

- 1 Job title and location
- 2 Hole reference number
- 3 Date
- 4 Contractor's name
- 5 Plant in use, crew members and hours worked
- 6 Details of type of injection and grout-line dimensions (eg tremie injection through 25 mm diameter line)
- 7 Type of grout mix and volumetric quantity injected
- 8 Grout pressures recorded, with the corresponding depths
- 9 Details of casing abandoned
- 10 Any cube tests taken

The Daily Records of Materials and Plant received shall show in particular that day's quantities by weight and each type of material and the cumulative quantities. With the Daily Records, the Contractor shall submit to the Engineer copies of the consignment notes or receipts or invoices for all materials delivered, and the Contractor shall keep them on site until the Works are complete.

Notwithstanding the information listed above, the Contractor shall provide any other information required by the Engineer.

2.4.2 Information to be Given to the Engineer

The following information should be given to the Engineer or their representative at the time or frequency stated below.

A Before work begins on site

- 1 Details of the method of batching and mixing the grout
- 2 Details of the grout pump including its maximum operating pressure
- 3 Details of the injection tubes
- 4 Details of the metering of grout flow and pressure
- 5 Details of the proposed sequence of work
- 6 The supplier of the cement and the PFA
- 7 The source and grading of any sand or pea gravel to be used
- 8 The drilling system proposed and how the requisite gases will be monitored

B On every day when drilling or grouting is carried out

- 1 Daily drilling records
- 2 Daily grouting records
- 3 Copies of the consignment notes, receipts or invoices of all material delivered to site.

C At the completion of the contract

1. Fair copies of the plans and sections prepared on site described in Section 2.4.1 above.

APPENDIX

Grout Hole Layout Plan Plots 1 to 14, 37 to 68, drawing reference 39657/010A

Grout Hole Layout Plan Plots 15 to 36, drawing reference 39657/011A

Exploratory Hole Location Plan, drawing reference 39657/001C

Rotary Borehole Logs

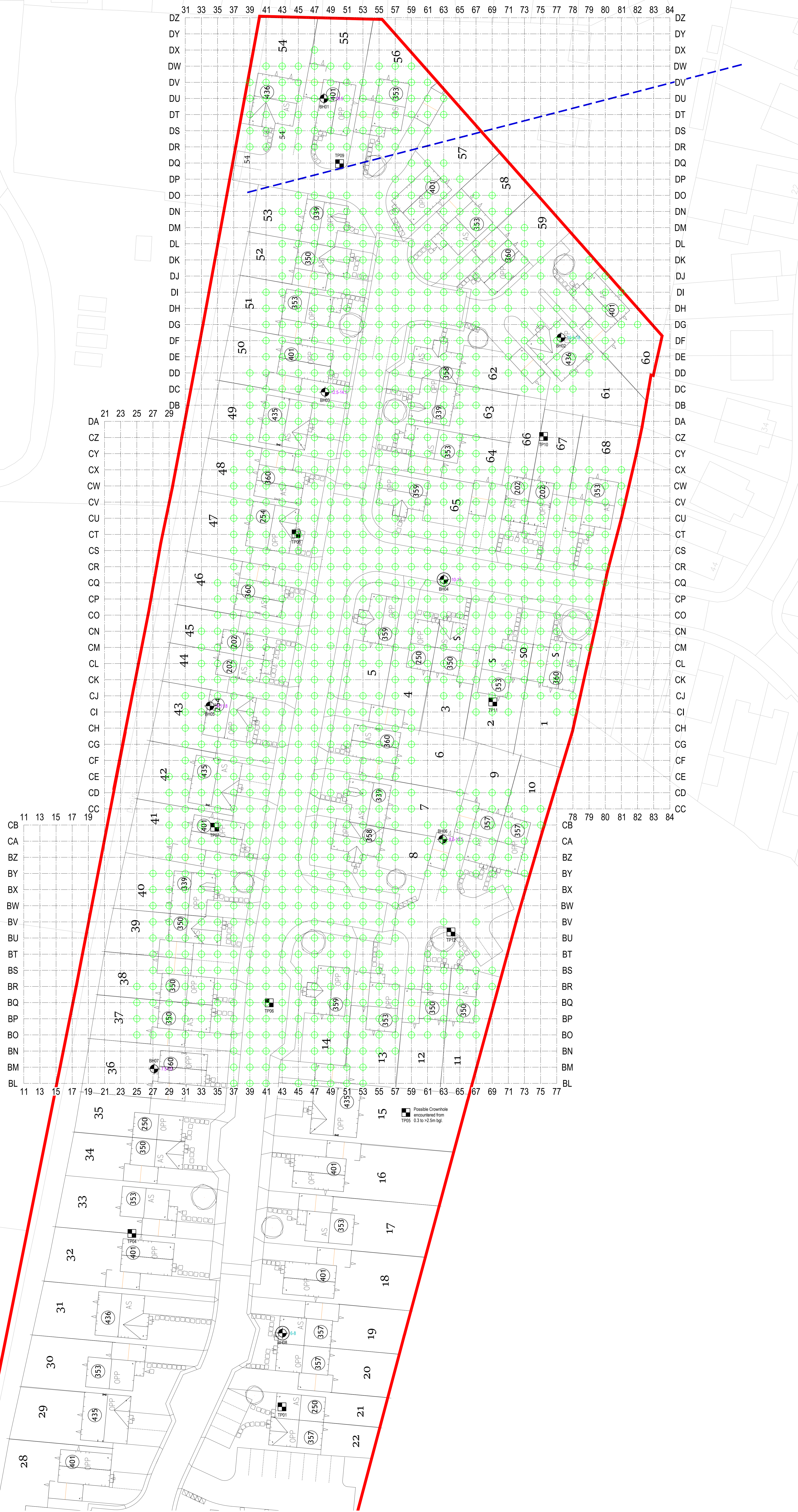


INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE
ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK

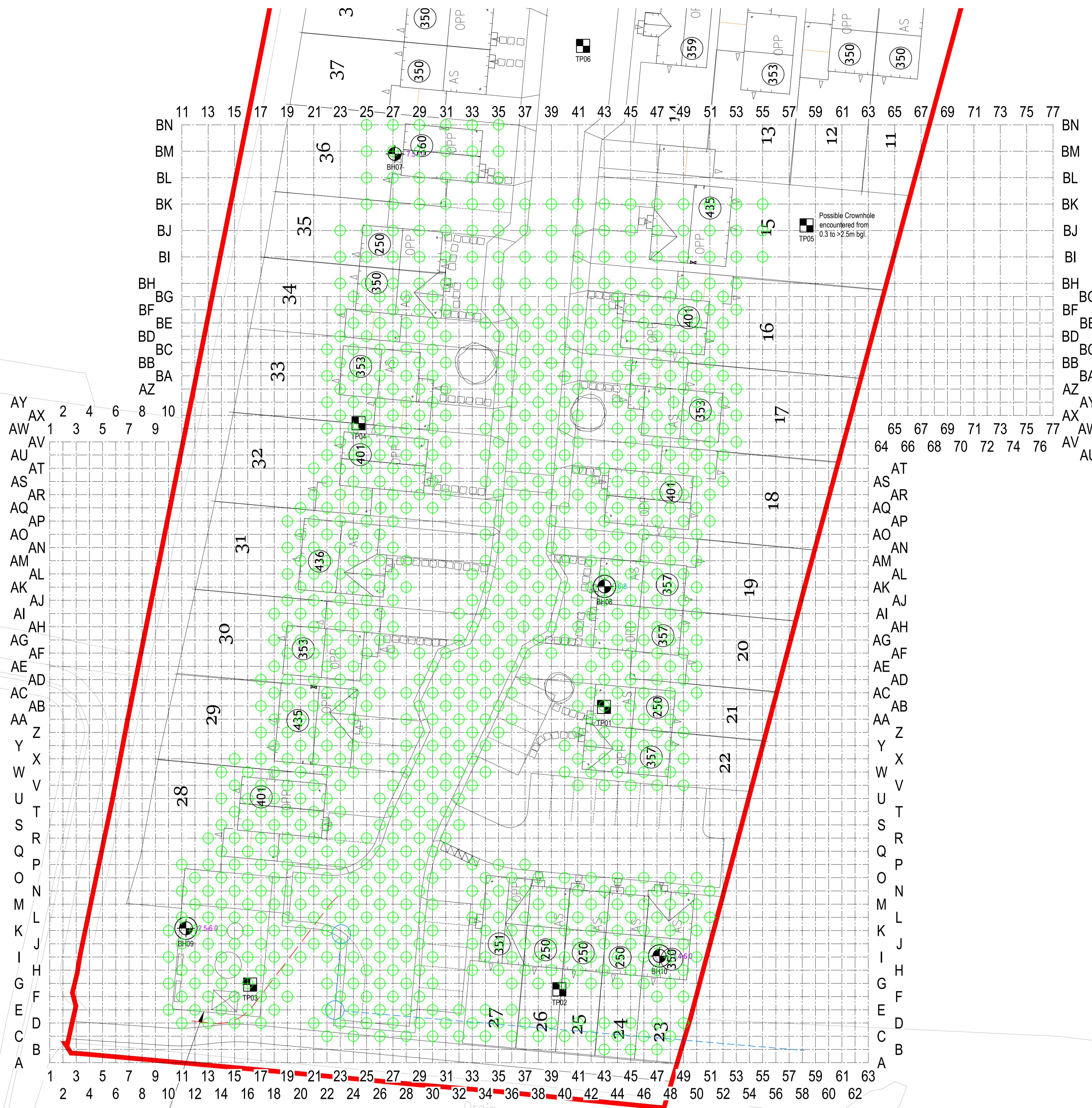
NOTES

- This drawing is to be read in conjunction with all relevant Eastwood & Partners drawings prefixed 39657 and Architect's drawings.
- The site layout is taken from Richard Ward Design, Planning Layout, drawing number 1014/3, revision L, dated 07.07.22.
- The topographical survey is taken from Haycock & Todd, Site Survey, drawing number S9901, dated February 2020.
- Shallow groundwater is expected particularly in southern half of site. Time of year to be kept in consideration when putting foundations. Pumping may be required.
- Unrecorded mine entries (shafts) and crown holes are expected.
- Drilling and grouting of workings required for all plots, garages and adoptable highways.
- Softer ground to be expected in south of site where workings are very shallow.
- Water flushing medium to be used.
- Should evidence of mining features be encountered Eastwood & Partners should be informed.
- Directional drilling may be required near live services and tree protection zones.

- Key:**
- Approximate location of trial pit excavated by Eastwood & Partners on 14.07.2020.
 - Approximate location of rotary borehole drilled by Eastwood & Partners on 14.15.07.2020.
 - Approximate location of rotary borehole with Gas & groundwater monitoring well installed by Eastwood & Partners on 14.15.07.2020.
 - 5-10 Depth of workings (m).
 - 5-10 Depth of intact coal (m).
 - Approximate location of sewer.
 - Grout Hole (Total = 1184).



A First Issue				
REV	DESCRIPTION	SIG	CHK	DATE
GLEESON DEVELOPMENTS LTD				
PHASE 3 BARNBURGH LANE, GOLDTHORPE				
GROUT HOLE PLAN PLOTS 1-14 & 37-68				
Eastwood & Partners CONSULTING ENGINEERS St. Andrew's House 23 Kingfield Road Sheffield S11 9AS Tel 0114 255 4554 mail@eastwoodandpartners.com Fax 0114 255 4330 www.eastwoodandpartners.com				
SCALE WHEN PLOTTED AT A0		DRAWING STATUS		
1:250		PRELIMINARY		
DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
JL	KE	20.01.23	39657/010	A



Note: Invert level assumed to be approximate 17.6m AOD. Workings found in BH09 between 18.0 and 14.4m AOD.

INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE. ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

NOTES

- This drawing is to be read in conjunction with all relevant Eastwood & Partners drawings prefixed 39657 and Architect's drawings.
- The site layout is taken from Richard Ward Design, Planning Layout, drawing number 1014/3, revision L, dated 07.07.22.
- The topographical survey is taken from Haycock & Todd, Site Survey, drawing number S9601, dated February 2020.
- Shallow groundwater is expected particularly in southern half of site. Time of year to be kept in consideration when pulling foundations. Pumping may be required.
- Unrecorded mine entries (shafts) and crown holes are expected.
- Drilling and grouting of workings required for all plots, garages and adoptable highways.
- Softer ground to be expected in south of site where workings are very shallow.
- Water flushing medium to be used.
- Should evidence of mining features be encountered Eastwood & Partners should be informed.
- Directional drilling may be required near live services and tree protection zones.

Key:

- Approximate location of trial pit excavated by Eastwood and Partners on 14.07.2020.
- Approximate location of rotary borehole drilled by Eastwood and Partners on 14/15.07.2020.
- Approximate location of rotary borehole with Gas & groundwater monitoring well installed by Eastwood and Partners on 14/15.07.2020.
- 5-10 Depth of workings (m).
- 5-10 Depth of intact coal (m).
- Grout Hole (Total = 906).

A	First Issue.			
REV	DESCRIPTION	SIG	CHK	DATE

GLEESON DEVELOPMENTS LTD

PHASE 3
BARNBURGH LANE, GOLDTHORPE

GROUT HOLE PLAN
PLOTS 15-36

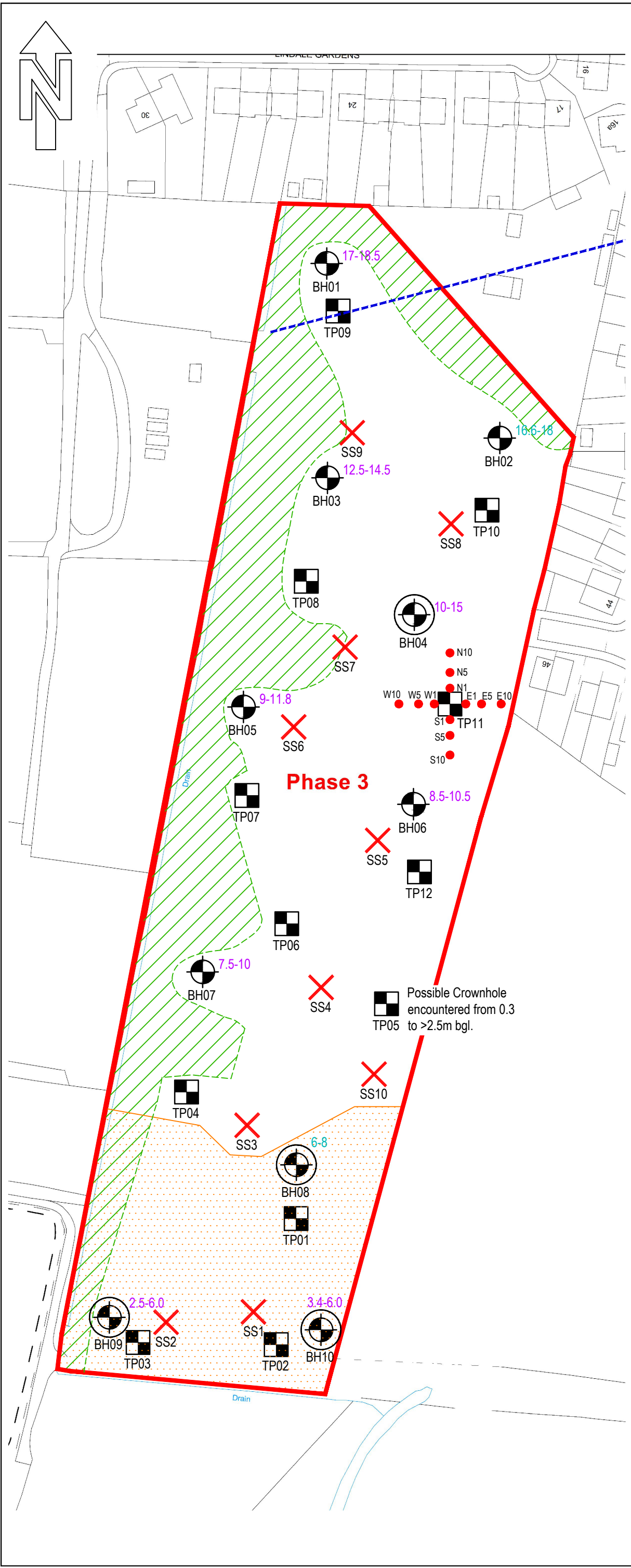
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SCALE WHEN PLOTTED AT A1	DRAWING STATUS
1:250	PRELIMINARY

DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
JL	KE	20.01.23	39657/011	A



INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE. ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

NOTES	
KEY:	
	Approximate location of trial pit excavated by Eastwood and Partners on 14.07.2020.
	Approximate location of rotary borehole drilled by Eastwood and Partners on 14/15.07.2020.
	Approximate location of rotary borehole with Gas & groundwater monitoring well installed by Eastwood and Partners on 14/15.07.2020.
5-10	Depth of workings.
5-10	Depth of intact coal.
	Dense Vegetation.
	Approximate location of sewer
	Approximate location of Topsoil Sample collected by Eastwood and Partners on 09.09.20.
	Topsoil contains elevated PAH concentrations; material to be excavated and placed below 300mm thick permeable cap in POS areas or 600mm permeable cap in gardens.
	Approximate location of topsoil sample collected by Eastwood and Partners on 03.03.22.

C	Topsoil samples added.	JRB	DD	25.03.22
B	SS1 - SS10 sample locations added & sewer position updated.	JL	KE	15.12.21
A	First Issue.			
REV	DESCRIPTION	SIG	CHK	DATE

GLEESON DEVELOPMENTS LTD

PHASE 3 SITE, BARNBURGH LANE, GOLDTHORPE

EXPLORATORY HOLE LOCATION PLAN

Eastwood & Partners
CONSULTING ENGINEERS

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EOP

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www.eastwoodandpartners.com

SCALE WHEN PLOTTED AT A3		DRAWING STATUS		
1:1000		INFORMATION		
DRAWN	CHECKED	DATE	DRAWING NUMBER	REV
JRB	GCB	04.09.20	39657/001	C

Project Name Phase 3 - Barnburgh Road, Goldthorpe		Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire			Level:	Scale 1:150
Client: Gleeson Developments Limited			Dates: 14/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.30		MADE GROUND. Brown SANDSTONE.	1	
					5.20		Grey MUDSTONE.	2	
					17.00		Soft strata.	3	
					18.50		Grey MUDSTONE.	4	
					30.00		End of Borehole at 30.000m	5	

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole complete at 30 m. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 13 m. Backfilled with arisings and bentonite seal upon completion.

Project Name Phase 3 - Barnburgh Road, Goldthorpe	Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire		Level:	Scale 1:150
Client: Gleeson Developments Limited		Dates: 14/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Brown CLAY.	1	
					1.50		Brown SANDSTONE.	2	
					3.50		Grey MUDSTONE.	3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	
								11	
	▼							12	
								13	
								14	
								15	
					16.60		Black COAL.	16	
					18.00		Grey MUDSTONE.	17	
								18	
								19	
					20.00		End of Borehole at 20.000m	20	
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole complete at 20 m. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 11.7 m. Backfilled with arisings and bentonite seal upon completion.

Project Name Phase 3 - Barnburgh Road, Goldthorpe	Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire		Level:	Scale 1:150
Client: Gleeson Developments Limited		Dates: 14/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					0.80		Brown CLAY.		
							Brown SANDSTONE.	1	
					3.40		Grey MUDSTONE.	2	
								3	
								4	
								5	
								6	
								7	
								8	
								9	
								10	
								11	
					12.50		Broken ground - no flush returns.	12	
								13	
					14.50		Hard strata - no flush returns.	14	
								15	
					15.50		End of Borehole at 15.500m	16	
								17	
								18	
								19	
								20	
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole terminated at 15.5 m due to loss of flush. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 11 m. Backfilled with arisings and bentonite seal upon completion.

Project Name Phase 3 - Barnburgh Road, Goldthorpe		Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire			Level:	Scale 1:150
Client: Gleeson Developments Limited			Dates: 14/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					1.40		Brown CLAY.	1	
					2.80		Brown SANDSTONE.	2	
							Grey MUDSTONE.	3	
								4	
								5	
								6	
								7	
								8	
								9	
						10.00		Broken ground - no flush returns.	10
									11
									12
									13
						15.00		Hard strata - no flush returns.	15
						16.00		End of Borehole at 16.000m	16
							17		
							18		
							19		
							20		
							21		
							22		
							23		
							24		
							25		
							26		
							27		
							28		
							29		

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole terminated at 16 m due to loss of flush. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 10 m. Gas and groundwater monitoring well installed.

Project Name Phase 3 - Barnburgh Road, Goldthorpe	Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire		Level:	Scale 1:150
Client: Gleeson Developments Limited		Dates: 14/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					2.00		Brown CLAY.	1	
							Grey MUDSTONE.	2	
								3	
								4	
								5	
								6	
								7	
								8	
	▼				9.00		Broken ground - no flush returns.	9	
								10	
								11	
					11.80		Hard strata - no flush returns.	12	
					12.80		End of Borehole at 12.800m	13	
								14	
								15	
								16	
								17	
								18	
								19	
								20	
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole terminated at 12.8 m due to loss of flush. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 9 m. Backfilled with arisings and bentonite seal upon completion.

Project Name Phase 3 - Barnburgh Road, Goldthorpe		Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire			Level:	Scale 1:150
Client: Gleeson Developments Limited			Dates: 14/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Brown CLAY.	1	
					2.50		Grey MUDSTONE.	2	
								3	
								4	
								5	
								6	
								7	
	▼				8.50		Soft strata with coal traces.	8	
								9	
					10.50		Grey MUDSTONE.	10	
								11	
								12	
								13	
								14	
								15	
								16	
								17	
								18	
								19	
								20	
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	
					30.00		End of Borehole at 30.000m		

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole complete at 30 m. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 8 m. Backfilled with arisings and bentonite seal upon completion.

Project Name Phase 3 - Barnburgh Road, Goldthorpe		Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire			Level:	Scale 1:150
Client: Gleeson Developments Limited			Dates: 15/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Brown CLAY.	1	
					2.50		Grey MUDSTONE.	2	
								3	
								4	
								5	
								6	
	▼				7.50		Broken ground - no flush returns.	7	
								8	
								9	
					10.00		Hard strata - no flush returns.	10	
								11	
					12.00		End of Borehole at 12.000m	12	
								13	
								14	
								15	
								16	
								17	
								18	
								19	
								20	
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	





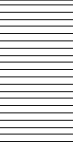
Remarks
Borehole drilled with open-hole techniques using water flush. Borehole terminated at 12 m due to loss of flush returns. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 7 m. Backfilled with arisings and bentonite seal upon completion.

Project Name Phase 3 - Barnburgh Road, Goldthorpe		Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire			Level:	Scale 1:150
Client: Gleeson Developments Limited			Dates: 15/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Brown CLAY.	1	
				2.50			Grey MUDSTONE.	2	
								3	
								4	
								5	
				6.00			Black COAL.	6	
								7	
				8.00			Grey MUDSTONE.	8	
								9	
				10.00			End of Borehole at 10.000m	10	
								11	
								12	
								13	
								14	
								15	
								16	
								17	
								18	
								19	
								20	
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole complete at 10 m. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater not recorded. Gas and groundwater monitoring well installed.

Project Name Phase 3 - Barnburgh Road, Goldthorpe	Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire		Level:	Scale 1:150
Client: Gleeson Developments Limited		Dates: 15/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
					2.50		Brown CLAY.	1	
							Broken ground - no flush returns.	2	
								3	
				6.00		Hard strata - no flush returns.	4		
							5		
							6		
				9.00		End of Borehole at 9.000m	7		
					8				
					9				
							10		
							11		
							12		
							13		
							14		
							15		
							16		
							17		
							18		
							19		
							20		
							21		
							22		
							23		
							24		
							25		
							26		
							27		
							28		
							29		

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole terminated at 9 m due to loss of flush returns. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 2 m. Gas and groundwater monitoring well installed.

Project Name Phase 3 - Barnburgh Road, Goldthorpe		Project No. 39657	Co-ords:	Hole Type BH
Location: South Yorkshire			Level:	Scale 1:150
Client: Gleeson Developments Limited			Dates: 15/07/2020	Logged By Drillers

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description	
		Depth (m)	Type	Results					
							Brown CLAY.	1	
					2.70				2
					3.40			Grey MUDSTONE.	3
								Broken ground.	4
				6.00			Grey MUDSTONE.	6	
								7	
								8	
								9	
								10	
								11	
								12	
								13	
								14	
								15	
								16	
								17	
								18	
								19	
								20	
								21	
								22	
								23	
								24	
								25	
								26	
								27	
								28	
								29	
		Type	Results	30.00			End of Borehole at 30.000m		

Remarks
Borehole drilled with open-hole techniques using water flush. Borehole complete at 30 m. Logs based off drillers description of chippings brought to surface within flush returns. Groundwater strike at 2.5 m. Gas and groundwater monitoring well installed.