

18th April 2019

Rachael Fitton  
[rachael@civicingineers.com](mailto:rachael@civicingineers.com)

Dear Rachael,

## REVISED BUDGET QUOTATION

**Re: OPP063283 | The Old Infirmary, Stonyhurst College, Clitheroe, Lancashire BB7 9PZ**

Thank you for your invitation to quote for the Ground Improvement works at the above address. Please note that we can only offer a budget quotation at this stage, as the depth of treatment has not been proven on the Geo-environmental Appraisal report Ref: 19036/696, I have based our treatment depths on 4m below basement ground level. Our quotation is therefore subject to review / assessment of the required information once received and can only be confirmed once we have this information. The work will be completed within 1 week involving minimal site disruption. This proposal includes this letter, a summary of the solution with prices, important notes and our Terms and Conditions.

We note that the problem has been caused by settlement of the underlying soils and confirm that we can offer you a guaranteed solution. We provide an industry leading, design, workmanship and material warranty for a period of 10 years, as per our Terms and Conditions (please see attached). The design life of our material is 100 years.

Our budget quotation has been made in good faith and based on the following information:

- Groundtech - Geo-environmental Appraisal report Ref: 19036/696 dated 3rd April 2019
- Drawing No: 1093-02-CE-ZZ-B1-DR-0101
- Site visit 09.04.19

### Assumptions:

- **Welfare facilities will be provided**
- **Full access will be provided throughout our works**
- **Treatment depth based on injection depth of 4.0m BGL**
- **Full asbestos report will be provided, waste disposal costs and treatment methods may vary depending on this report.**

### Ground Improvement

The application of geopolymer injection can be categorised into two phases:

1. Surface consolidation
2. At depth consolidation

With regards to surface consolidation, geopolymer is injected into the shallow area beneath the floor slab, with the intent of fully re-establishing contact between the underside of the floor slab and the underlying soils by filling any voiding within the treated soil.

At depth consolidation relates to soils being treated at greater depth and thus most concerned with the forces provoked by loading. The objective of at depth treatment is to densify the ground via:

- Elimination of voids by filling and compacting/consolidating
- Expulsion of air and water
- Agglomeration of the soil (in granular cases)

Once injected, the geopolymer will move and expand both horizontally and vertically to a region that allows the material to take the path of least resistance, and thus has the greatest need to be reinforced.

Once this has taken place, the geopolymer will expand and place pressure on the underside of the floor slab, eventually ending its liquid phase and becoming solid.

Typically, each injection point will create a zone of influence of approximately 1.0m radius (depending upon the characteristics of the geopolymer utilised). Injection points are usually placed at 1.5m centres to make sure that the entirety of the area requiring treatment is impacted by the injection works. This spacing can be altered depending upon factors such as soil type, soil strength and loading.

Throughout the process, the area relevant to each injection will be monitored using laser levelling equipment with sensors placed on the relevant section of structure. During the works, each injection will be prolonged until movement is registered on the sensor (< 0.5mm). This movement will show when a degree of compaction and densification of the treated soil has been achieved. This will also show that the treated soil has been sufficiently treated as an upward force will be acting upon the underside of the foundation, causing the upward movement. It should be noted that this movement will not lift the structure cumulatively over the course of the proposed injections, and is merely a unsustained reaction.

By ceasing injections at the time that an upward force is registered on the structure, Geobear can make sure that the process does not cause any unwanted lifting to be experienced. This is also a time effective manner for the Geobear technicians to know when to move onto their next injection.

In instances such as this, geopolymer injection possesses many benefits when compared to alternative methods, these include:

- **Speed** - The Geobear solutions are the fastest way to resolve your problem.
- **Minimal disruption** - The Geobear solution involves a quick setup and extraction from site and does not require excavation or the need for alternative accommodation.

- **Efficiency** - Geobear solution is specifically tailored and targeted to the problem areas.
- **Minimal plant** - The vehicle used is a self contained specialist injection unit including technicians with all necessary plant and material stored on board.
- **Minimal environmental impact** - Geobear geopolymer used is environmentally neutral and the use of small plant means that the environmental impact is minimal.
- **Health and Safety** - Geobear has an excellent Health & Safety record due to a detailed Health & Safety management procedure that fully comply with the most stringent standards.

Leaking drains are frequently the cause of a problem and drains are often located in the treatment area. Geobear can offer a solution by employing a specialist to undertake a CCTV survey of the drainage system. The cost of this is £confidential plus VAT. The inspection will provide an accurate assessment of the condition of the drainage prior to the works. Drainage repairs should be carried out before the Geobear works. If necessary Geobear specialists can be present during the works to protect drains. The cost of this is £confidential plus VAT per day. These charges will be listed separately on the quotation if they are required.

Please return the Statement of Acceptance of Quotation (enclosed), alternatively an email can be sent to [info@geobear.co.uk](mailto:info@geobear.co.uk) stating acceptance of the quote (please quote Geobear Reference). A deposit invoice will then be sent to you.

Thank you for your interest in the Geobear process. We will call you in a week in case you have any queries.

Yours sincerely,

**Norman Saint**  
[norman.saint@geobear.com](mailto:norman.saint@geobear.com)  
**07891 768 431**

## REVISED BUDGET SUMMARY

**DATE:** 18.04.19

**CLIENT:** Civic Engineers

**CONTACT:** Rachael Fitton

**SITE:** The Old Infirmary  
Stonyhurst College  
Clitheroe  
Lancashire  
BB7 9PZ

**GEOBEAR REFERENCE:** OPP063283

**LENGTH/AREA TO BE TREATED:** 21 L/mt

**LOCATION OF TREATMENT:** Plan to follow

**GEOBEAR SOLUTION:** GI to 4m below basement ground level

**TIME REQUIRED:**

**BUDGET PRICE:** (confidential) plus VAT

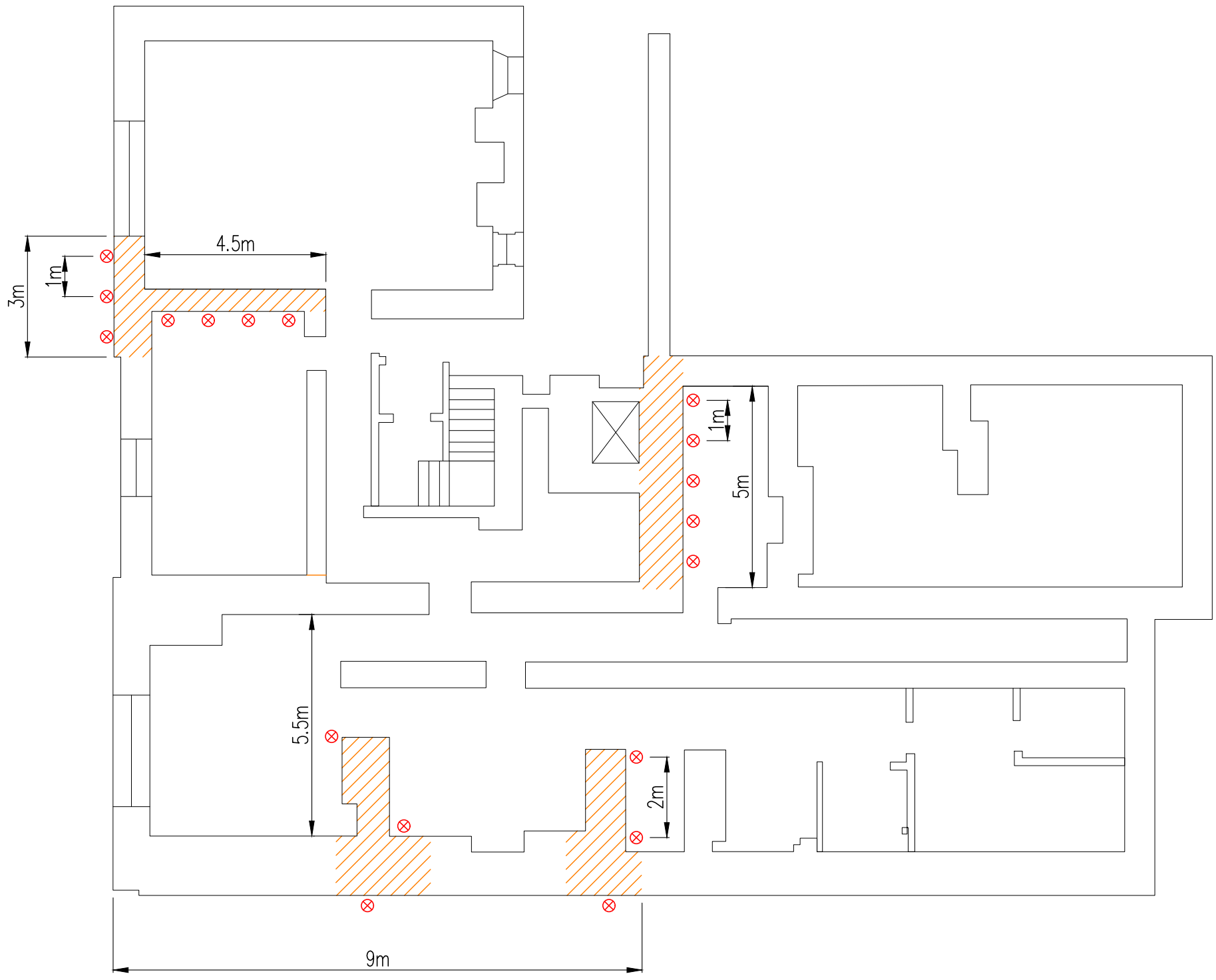
**DRAINAGE SURVEY:** (confidential) plus VAT

**DRAINAGE PROTECTION:** (confidential) plus VAT (2 days)



**A deposit of 40% (subject to availability) will be payable to:**

**Geobear Commercial Ltd - Sort Code: (confidential)**  
**Ref: OPP063283 number (shown above)**

Do not scale from this drawing. All dimensions, levels and such like are to be checked on site by the Contractor prior to preparation of shop drawings / commencement of work on site. This drawing is to be read in conjunction with all relevant Consultant's and / or Specialist's drawings / documents, and any discrepancies or variations are to be notified to Geobear before the affected work commences. This drawing and the copyrights and patents therein are the property of Geobear and may not be used or reproduced without consent.



Legend:

-  Area to be Treated
-  Injection Point

**PROPOSED TREATMENT PLAN**  
SCALE: NTS

Client -

Address Stonyhurst College

Project Stonyhurst College

Title Treatment Plan

Purpose of Issue Proposed Works

Drawn By: DJS	Date: 24.04.19
Checked By: NS	Scale: NTS Rev.: 1
Job No.: OPP063283	Dwg No.: 1

