

Optera Structural Solutions

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SOW 9774 Quotation to a mid terraced garage within a block for Crawford and Company

Date

March 24, 2025

Services Performed By:

Optera Structural Solutions
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Services Performed For:

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POLICY HOLDER:	Mr Peter Reed
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CLIENT REFERENCE:	1782526
OUR REFERENCE:	9774
ANTICIPATED START DATE:	TBC

PROJECT MANAGER:	Spencer Caizley

Report

The subject of this claim is a mid-terrace, single-skin garage situated within a continuous block of similar structures. The garage is constructed with masonry walls and a flat roof over, typical of older domestic ancillary buildings.

There is a documented history of foundation movement affecting this structure, which has resulted in multiple historic repair interventions. Despite these previous efforts, the garage continues to suffer from significant structural damage. The current extent of damage has been categorised as Severe (Category 5), with structural cracks exceeding 25mm in width, indicating a persistent and active mechanism of movement.

According to the geotechnical data provided, the garage currently sits on 400mm thick concrete strip foundations, bearing at approximately 600mm below ground level. The founding stratum is described as a brown, slightly clayey, silty, fine-to-medium gravelly sand, interpreted as an alluvial deposit.

In-situ shear strength testing, including shear vane tests, has returned values between 60–64 kPa, which are considered to be relatively soft and indicative of low bearing capacity. Complementary laboratory analysis characterises the soil as non-plastic, suggesting that typical shrink-swell behaviour is unlikely. However, the data

strongly points to an inability of the subsoil to adequately support the existing loads, hence contributing to ongoing differential settlement and structural distress.

The pattern and extent of damage, in conjunction with historical repairs, suggest that reinforced masonry techniques alone would be insufficient to arrest or remediate the movement. As such, a substructure strengthening scheme is recommended as the only viable and sustainable solution in this instance.

Recommendations

From a technical and logistical standpoint, the use of screw piles or driven piles would both be structurally appropriate. However, driven piles are not advised due to their vibratory nature, which could result in secondary damage to adjoining party structures. This presents a significant risk in a terraced context. Conversely, screw piles offer a non-percussive solution, ideal for sensitive or confined environments, and can be installed internally with minimal disruption.

It is proposed that screw pile installation be undertaken from within the garage footprint, mitigating the need for access beyond the subject property. It should be noted, however, that Party Wall Notices will be required to be served on neighbouring owners due to the proximity of shared walls.

Prior to works commencing, the garage must be fully cleared, and for the purposes of this claim and quotation, it is assumed that this will be carried out by others. During the works, pile pockets can be broken out from the existing slab and excavated down the inner face of the foundation, providing access for a hand-held screw pile rig to operate internally. The non-vibratory installation method will ensure minimal risk of disturbance to adjacent structures.

Once the screw piles are installed to the engineered set, they can be cut off at formation level, and foundation brackets installed to allow load transfer from the existing structure. The concrete slab will then be reinstated to match existing profiles, completing the remedial works with minimal visual or structural impact to the surrounding property.

Statement of works in brief

Design & Approval

- A full engineered design will be undertaken prior to commencement.
- A Building Notice will be submitted to the relevant Building Control authority for approval.

Site Preparation

- Upon arrival, a working compound will be established.
- The compound will be fenced and secured to ensure site safety.
- External hard landscaping around the garage will be boarded and protected from potential damage.
- It is assumed that garage contents will be removed and stored off-site by others prior to commencement.

Utility Clearance

- A CAT scan and hand excavation will be performed to locate and expose any buried utilities.
- Identified services will be clearly marked and protected as necessary.

Marking and Excavation

- Pile positions will be marked out in accordance with the structural design.
- The existing concrete floor slab will be cut and broken to expose piling positions.
- Resulting debris will be removed to the skip located within the compound.
- Pile pockets will be excavated down the inner face of the existing foundation to the required depth.

Installation of Screw piles

- Following completion of pile pocket excavations, the hand-held screwpile rig will be mobilised to site.
- R60 screw piles will be installed at each designated location.
- The quotation is based on achieving design set within 4.0 metres of ground level, although the site investigation is terminated at 1.5 metres.
- Additional charges may apply if piles require a deeper drive to achieve design set.

Load Transfer and Inspection

- On achieving the required torque/design set, piles will be cut off at formation level.
- Foundation brackets and jacking assemblies will be installed.
- Piles will be tensioned to accept the anticipated building load.
- Jacking assemblies will be cut off post-tensioning.
- An inspection by Building Control will be arranged and completed prior to concrete pour.

Concrete Works and Making Good

- Each pile pocket will be flooded with C35 concrete and vibrated using a poker to eliminate air pockets.
- After curing, pile pockets will be neatly cut back to match the surrounding slab and topped off with C35 concrete to match existing floor slab levels.

Demobilisation and Handover

- Site will be cleared of all plant, materials, and waste.
- Compound fencing will be dismantled.
- All working areas will be left clean, tidy, and safe.

Assumptions and Exclusions

- Contents of garage to be cleared and stored off-site by others.
- Design assumes access suitable for handheld piling rig and sufficient headroom.
- Quotation assumes no significant obstructions or ground contamination.
- No reinstatement of finishes or landscaping outside of pile pockets is included unless otherwise stated.

Project duration:

The works are estimated to be completed within 4 weeks of commencement. Our current lead times are 4 weeks from authorization and are subject to detailed design and statutory notice submissions