

Optera Structural Solutions

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SOW 5353 Quotation for piled stabilization of the rear single storey addition to the left hand side.

Date

February 15, 2021

Services Performed By:

Optera Structural Solutions
48 Queens Road, Coventry, West
Midlands.CV1 3EH
tel: 02476 553776 fax: 08447 746370

Services Performed For:

McLarens
Pure offices, Cheltenham Office Park,
Hatherley Lane, Cheltenham,
Gloucestershire GL51 6SH

POLICY HOLDER:

POLICY HOLDER ADDRESS:

Beauchamp Lodge, Two Mile Lane, Highnam, GL2 8AB

CLIENT REFERENCE:

MUK196624

OUR REFERENCE:

5353

ANTICIPATED START DATE:

TBC

PROJECT MANAGER:

Spencer Caizley

This scope of works # 5353 (hereinafter called the "SOW"), effective as of February 15, 2021, on approval by McLarens is entered into by and between Contractor and Client.

Project Description

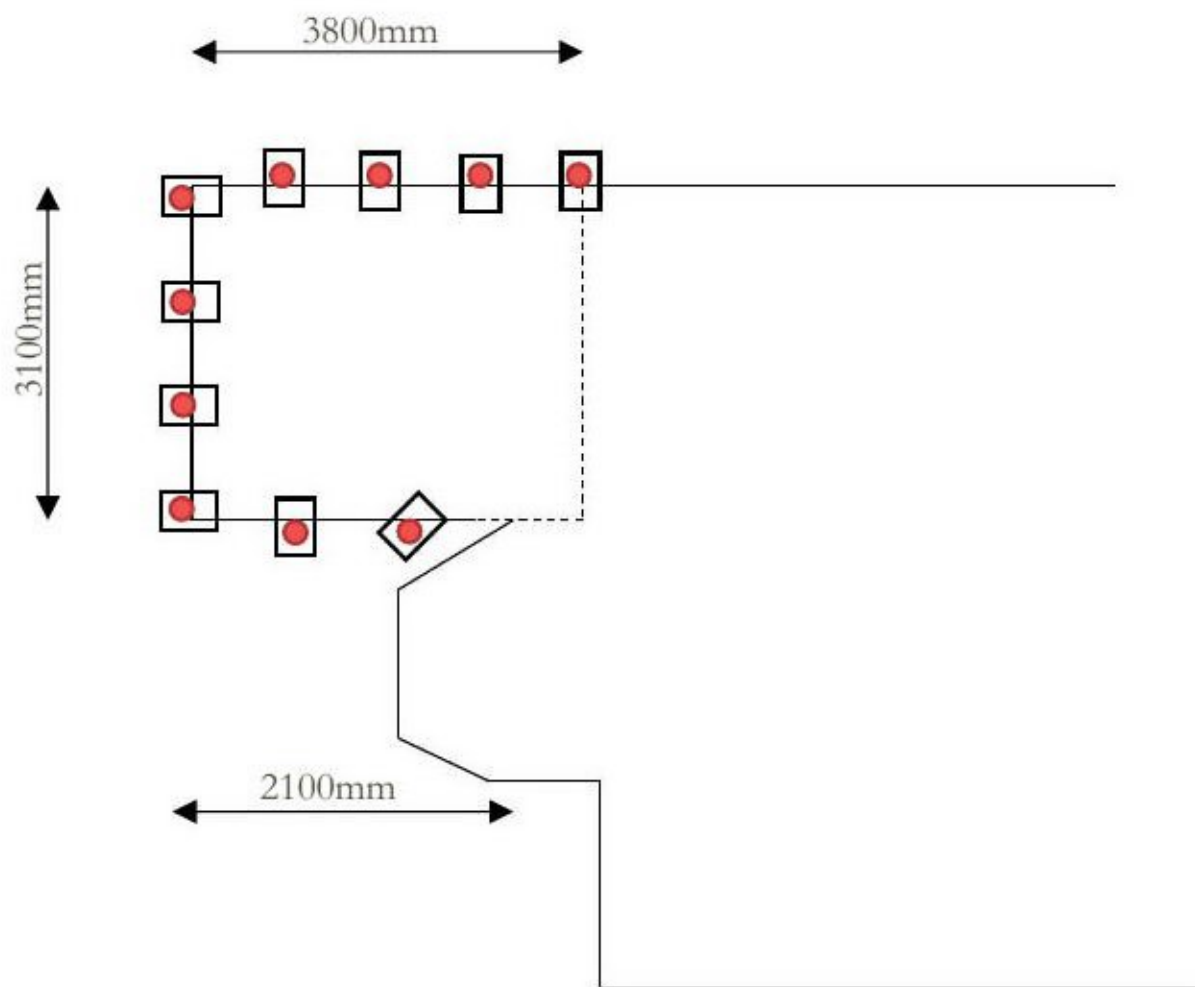
Optera attended the above property on Wednesday 10th February 2021 with a site crew from WHC to carry out investigations and prepare a quote for underpinning the single storey rear left hand extension which forms the subject of the claim.

The extension is a cavity constructed masonry structure of traditional construction with a dual pitched gable ended projection to the right-hand side which is the area most affected by downward movement. The property occupies an elevated position adjacent to the A40 and is accessed via an unmade road which is shared with an adjoining property and has a small parking area to the left-hand side of the property which is heavily vegetated, including a mature dominant redwood which is thought to be the catalyst for the claim.

Site investigations confirm the extension is founded on a concrete strip footing, 600mm thick at a depth of 1100mm BGL on to a stiff grey/brown CLAY with roots noted down the side of the footing and the underside.

Roots were noted to 3.4m BGL and ground water was encountered at 3.2m BGL. Whilst it was originally discussed and agreed that mass concrete underpinning would be the most appropriate form of repair, the depth of the roots and presence of ground water would make this proposal incredibly difficult and dangerous. It is industry accepted good practice to extend the footings 500mm past the last root and to that end, mass concrete underpinning would need to extend to 3.9m BGL. Given the restricted nature of the site, this would be very problematic and difficult to achieve. There is also the risk of collapse of the excavations with the ground water encountered. To that end, it is proposed the cantilevered knuckle piles are introduced around the structure to support the foundations. If the piles are installed before the onset of the growing season and given the degree of current distortion and damage, the risk of heave, given the proposal is unable to isolate the footing from natural ground is limited by virtue of the rehydration and recovery that would have occurred during the wetter winter period.

The schematic drawing below indicates the number and position of the proposed piles:



The works will involve taking down the picket fence to the right hand side of the house and set aside. This is in poor condition and will in all probability require replacement as it is unlikely to tolerate removal and replacement with the level of rot and decay within the existing timber.

We will board and protect the lawn around the works area and mobilise a 1.5 ton excavator and pecker to site and a 1 ton skip loading dumper. The path around the extension will be broken and removed and the surface water drain which is just below the path along the rear will be grubbed out to facilitate the works.

The ground will be CAT scanned to ensure that there are no existing services. We noted during the course of our investigations that the soil tank is located close to the extension but the exact location of the oil feed pipe is unknown. This needs to be determined prior to any piling works.

Once the ground is prepared, we will mobilise the T800 rig to site and we will commence drilling on each pile position. The piles will be drilled to 6m BGL with all arisings transferred to the spoil pile area. There is a hard

standing to the side of the unnamed road. This will be boarded, protected and fenced off for the duration of the works and used as the site compound which in turn will be used for the storage of spoil, materials and site welfare facilities.

Once each pile has been drilled to an estimated depth of 8m and the top 4m will be lined with a spun cardboard tube and filled with a cementitious grout. The grout is designed to displace the water which we noted to be standing at about 3m upon completion of the borehole.

The piles will be supplemented with 3 T16 bars to full depth and allowed to cure. The process will be repeated for all 10 piles. We will then dig down and around the piles to form knuckle connections. The excavations will extend down 610mm below the underside of the footing and all arisings will be placed on the spoil pile. Once to depth, the excavations will be extended under the footing, extending back 500mm from the face of the footing.

The base of the excavation will be lined with 160mm anti-heave board and a cage, comprising 3 T16 top and bottom with H10 links at 150mm centres will be fabricated and placed in each excavation, allowing 50mm cover to concrete.

The arrangement will be inspected by building control before casting with C35 concrete, agitating with a vibrating poker to remove air entrainment and allowed to cure.

The remaining excavations along the path will be backfilled to formation level of the path with compacted type 1 MOT stone and along the lawn area, to within 200mm of the surface. The top 200mm on the lawn will be filled with topsoil and the turf reinstated.

The surface water drainage pipe will be reconnected at either end with new 110mm underground pipe with flexi seal connections at either end and bedded and surrounded in pea gravel. The path will be shuttered and cast in new Pav1 concrete, poked and floated to match the existing finish.

The site will be cleaned down and left tidy upon completion.

Works in Brief

- Mobilise a team, plant and equipment to site and form a site compound on the parking area to the left hand side of the house and board and protect.
- Take down the picket fence between the house and parking area and set aside. Report on its condition. It is assumed for the purpose of the quote that this can be reinstated upon completion but note the comments above with respect to rot.
- CAT scan and determine the route of existing services. Special attention is to be paid to the oil tank and the feed which should be exposed.
- Using a 1.5 ton excavator and packer, break and remove the concrete path around extension and remove to the spoil pile in the compound.
- Mark out the pile positions and mobilise the T8000 piling rig to site and drill 10 no. 300mm open bored piles to 8m below ground level. All arisings are to be transferred to the spoil pile.
- Line each pile bore with a 4m spun cardboard tube and fill with grout to 1.4m BGL and place 3 T16 bars to full depth and allow to cure.
- Mark out the knuckle connections on the ground and form trnehc excavations in each pile position, digging down to 1710m BGL and remove all spoil from site. Continue excavations under the footing, by

500mm from the face of the footing. All arisings are to be removed to the spoil pile and collected by grab lorry.

- Once completed, the base of the knuckle trench is to be lined with 160mm clayboard and cages fabricated with 3 T16 bars top and bottom with H10 links at 150mm centres. The pile reinforcement is to be bent over and laved into the cages.
- The installation is to be examined and approved by building control before filling with C35 concrete to 100mm above the underside of the footing and agitated with a vibrating poker to remove air entrainment and allowed to cure.
- The remaining excavations are to be backfilled with type 1 MOT stone, compacted in layers to the formation level along the path and 200mm below the lawn area.
- On the lawn, the knuckles are to be topped up with compacted topsoil and the turf reinstated.
- The surface water pipe will be reformed with a section of 110mm underground pipe, laid to the correct fall and connected at either end with a flexi seal and bedded and surrounded with pea gravel.
- The remaining will be topped up with compacted type 1 MOT stone and graded.
- A single layer of A252 mesh will be laid over the path with 50mm cover and a new 100mm thick concrete path formed in Pav1 concrete and poked and troweled to match the existing finish.
- The remaining areas will be cleaned down.
- The fence will be reinstated, assuming this is in sufficient condition to allow it. IF it requires replacement, we will provide photos and a VO accordingly.
- The compound will be broken down with all waste, welfare, materials and waste cleared from site and the area left clean and tidy.

Proposed Plan of Works for 5353

START DATE: TBC

COMPLETION DATE. It is estimated that the works will be completed within 4 weeks of commencement.

Completion Criteria

Contractor shall have fulfilled its obligations when:

- Contractor accomplishes the Contractor activities described within this SOW
- The Policy Holder is in agreement that works have been carried out as per the agreed specification to an acceptable standard.
- Agreement that works have been carried out as per the agreed specification to an acceptable standard by the appropriate McLarens Representative
- Site has been vacated and all plant and materials removed for which Optera are responsible

Project Variation Procedure

The following process will be followed if a change to this SOW or a Variation of works is required:

- A project variation request will be submitted to McLarens. The variation must describe the change, the rationale for the change, and the effect the change will have on the project.
- The designated Technical Manager for OPTERA will review the proposed change and determine whether to submit the request to the other party.
- If variation works are agreed, works will be booked in at the request of the Mclarens representative and OPTERA will seek formal approval via McLarens.
- Upon completion of the variation works, these will be invoiced separately to the initial authorized project.

Appendix 1 Trial hole sheets

Borehole Log												
Project Name: - Beauchamp			Client: -			Date: 10/02/21						
Location: - Lodge			Contractor: - WHC			Drilling Equipment: HA						
Project No.: - 5309			Crew Name: AW/SH			Logged By: AW						
Borehole Number: EHZ		Hole Type: HA		Scale: 1:50		Page Number: Sheet 1 of 1						
Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Legend	Stratum Description					
		Depth (m)	Type	Results								
		1.20m	D		0.10		concrete					
		2.00m	D				MADEGROUND: Dark brown v. clayey sand & gravel, with a high cobbles content of SA concrete & brick.					
		3.00m	D									
		4.00m	D									
		No roots requested.			0.40					MC: v. soft brown silty granular sandy clay with a high cobbles content of SA concrete		
		EHZ comprised predom clay with roots visible to a maximum depth of 2.50m. Rootlets were noted to be v. rare. Clay appeared desiccated between 1.50m - 3.00m. A water strike was encountered at 2.20m, within the strata charge. EHZ was terminated due to a possible gravel obstruction					silt to v. stiff light brown with occ grey in places, silty sandy silty granular clay with very rare rootlets - Below also becoming stiff					
					1.20			3.70		firm to stiff orange brown silty sandy silty granular clay.		
					3.50m					v. stiff light brown with occ grey in places, silty sandy clay.		
					4.00m					EHZ terminated at 4.00m due to possible obstruction		
Remarks		- water strike at 2.20m!								AGS		

Borehole Log

Project Name: Beauchamp		Client:	Date: 10/02/21
Location: 1019E		Contractor: WHC	
Project No.: 5309		Crew Name: AW/SH	Drilling Equipment: HA
Borehole Number: EHI	Hole Type: UA	Logged By: AW	Scale: 1:50
			Page Number: Sheet 1 of 1

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Legend	Stratum Description
		Depth (m)	Type	Results			
		1.10m	D	MC, AT, SS			<p>TOPSOIL: v. soft dark brown sandy st granular clay with a high cobble content of st concrete & bricks, and many roots (up to 10mm in dia)</p> <p>MADEGROUND: soft brown st granular sandy clay with a medium cobble content of st concrete & bricks (up to 5mm in dia).</p> <p>v. soft light brown with occ grey in places, st sandy st granular clay with some roots. gravel is st to c challe.</p> <p>stiff to v. stiff orange brown st granular sandy clay with some roots.</p> <p>EHI terminated at 3.80m due to a refusal or possible gravel obstruction.</p>
		1.50m	D	MC			
		2.00m	D	MC, SS			
		2.50m	D	MC, AT			
		3.00m	D	MC, SS	0.40m		
		3.50m	D	MC			
		3.80m	D	MC, AT, SS			
		1.10m - 2.00m	RS				
		2.00m - 3.20m	RS		1.10		
		<p>EHI comprised predominantly clay with roots noted to a maximum depth of 2.70m, however were extremely rare. The soils were noted to be delineated between 1.70m - 3.00m. A water strike was backlogged at 3.20m, within the strata change. EHI was terminated due to a refusal or a possible obstruction.</p>					

Soil Sample		Soil Sample		Soil Sample		Soil Sample		Soil Sample		Soil Sample	
Depth (m)	Character	Depth (m)	Character	Depth (m)	Character	Depth (m)	Character	Depth (m)	Character	Depth (m)	Character

Remarks: Roots of tree appearance are visible to approximately 3.40m!
- water strike at approx 3.20m!

