



# BASEMENT IMPACT ASSESSMENT

Northstead North End  
Avenue London NW3 7HP

18032

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**RM DMS**

Design and Management Studios



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## PROJECT BRIEF & DESCRIPTION

The project involves the construction of the property between two other properties.

The site topography is generally level although step up toward the woodland behind the location where the new structure is intended to be constructed.



Existing Driveway demonstrating the location of the proposal.

The Proposed building is detached but with neighboring properties within a meter of the boundary line and in the Proposed condition between 1.0 and 2.0m of the new foundation line. There is no information available at this stage with regard to the nature of the foundations of these properties thus at this stage it is assumed they are at 1m depth below the ground location and that they may step to in line with the changing ground levels.



### Proposed Development

To the rear of the ground slopes upward and this area to the very back of the structure is likely to require some kind of retaining structure above Ground Floor Level.

The Proposal is to form a small dwelling with a full basement the lower floor level will be 2700mm below the existing driveway thus a side wall to the drive which will offer access to the basement garage will also be required.



## CONSTRUCTION PROPOSAL

Due to the depth of the new excavation at the rear of the property and the proximity of the neighboring property to the side of the driveway the only credible solution to form the basement is to form a contiguous flight augured piled wall, the piles will be augured to reduce vibration effects to the structures nearby.

The construction process will require the removal of the existing foundations to the existing retaining structures, garage etc. and for care will be necessary to ensure the foundations of the adjoining properties are not disturbed or undermined during this process.



Existing Garage and Retaining Structures



Aerial View of Plot

It is recommended that the piles be designed to be maintained to within the prescribed levels of deflection as a cantilever in the temporary condition as well as when in the propped permanent condition to avoid the need for temporary propping.

Once on site the rig will install the piles sequentially around the site, it is recommended that the piles be positioned slightly away from the internal wall line to allow for any deviation in the verticality of the piles during construction impacting on the internal footprint, they will however be required to be at least 600mm from the boundary to prevent the rig effecting the boundary.

Once the complete arrangement of piles has been installed and have cured in accordance with the designer's specification (minimum 14 days) the excavation of the basement may be undertaken.



When the excavation is at formation level any below ground drainage and service ducts should be laid before a raft slab may be cast, starter bars will be left to the perimeter of the excavation in preparation for the piles to be lined using a 200mm thick liner wall keyed into to the cleaned off piles. Dependent upon the tanking design policy the concrete for the slab and liner wall may be formed using water proof concrete such as Caltite. In the case that a cavity drain tanking system will be employed any channel required to be cast into the slab should be installed.

It is felt that a pumped drainage system will be required due to the relative levels between the floor slab and road but in the event of them being required chambers for these should also be cast into the floor slab.

Monitoring of the deflection in the piles should be undertaken on a regular basis during construction of the Basement to the point the capping beam is installed and the Ground Floor slab is installed offering the permanent propped condition to the piles.

Once the basement is formed the construction of the rest of the project may continue in a traditional manner.



# EXAMPLE METHOD STATEMENT FOR INSTALLATION OF PILES.

## Plant and Equipment

<u>Quantity</u>	<u>Item</u>	<u>Comments</u>
1	Soilmec/Soiltek Piling Rig	Certificate will be provided
1	Compressor, hoses and tools	
1	1005 Concrete Pump	
1	Augers	
1	8x5' Storage Cabin	
1	Pressure Washer	
1	Fuel Bowser	

Regular weekly checks will be carried out by the foreman on all of the equipment listed above. Any immediate problems will be communicated directly by phone to the office.

No operative is permitted to operate any form of plant unless they have received appropriate training and have been authorised by NFS to do so.

## Mobilisation/Demobilisation

The Piling Rig will be delivered to site on a semi low loader, our own operatives will be with the machine to unload and supervise all traffic and pedestrians. Boards will be with the rig to lay under the tracks to prevent damage to the road surface when unloading. Delivery times will be dictated to Neil Foundations Systems (NFS) upon application to the authorities for a movement order but NFS will endeavour to deliver the rig after the morning work and school run, the Piling rig will be delivered prior to any other equipment to suit site situations.

All ancillary equipment will be delivered by hiab lorry which will drive directly onto site and unload under our supervision. Only the delivery drivers are allowed on the lorry beds when following their company rules, NFS Operatives are not allowed onto lorry beds unless safety guards are in place.

The rig will be tracked onto the piling platform and rigged up on the piling mat, it will be erected and rigged ready for use as per the manufacturers hand book.

A concrete pump and agitator will be set up at the front of the site just off the piling area so that ready mixed concrete can access with ease and stay on the haul road.



## Method of Working

NFS will seek authorisation to commence excavation/installation from the Main Contractor in the form of a Permit to Dig or equivalent. This will confirm that any known services on site have been made safe or have been positively marked, The Main Contractor will be responsible for CAT scanning the area and finding and moving all services along with capping off any drainage.

Prior to the commencement of piling works each day, the concrete pipeline will be adequately lubricated with a concrete/primer mix. The cement concrete/primer will be mixed with water in a tub to a fairly thick consistency. The lubricating mix will be poured directly into the pipeline, and the concrete will follow immediately. The concrete will be pumped slowly through the lines until it flows freely. All concrete pipes will be connected with couplings secured with safety clips and all metal to rubber and rubber to rubber joints must also be fitted with whip checks.

The piling rig will be set up over the pre-marked pile location, using datum's provided by others; Working from a firm, dry, level piling platform the piling rig is positioned over the pile location, defined by a length of reinforcing bar driven into the ground. The auger will then be brought onto position and checked by the use of reference points in two directions. Before auger penetration commences the mast will be checked for verticality by observing attached levelling aids. The verticality of the mast will be adjusted hydraulically using slewing rams. The pile will be checked for verticality when it has been drilled approximately 0.5m; any positional adjustments will be made now.

Drilling will commence and the operator will set the PL3000 to depth of the pile and the pile number. The PL3000 will record all pile depths, numbers and the amounts of concrete and pressures that were installed.

Hearing protection is to be worn by all operatives.

Once the auger has been confirmed to have attained its required depth on the operator's console, it will then be withdrawn slightly to allow the opening of the delivery valve on the base.

Concrete will then be pumped through the delivery lines and down the centre of the auger. Where applicable the rate of concrete delivery will be determined by the rig operator. Auger withdrawal will then commence and proceed until the bore has been fully concreted and the pile formed. The rate of auger withdrawal will be determined by NFS (being dependent on auger size, ground conditions etc.) to ensure an over-supply of concrete compared with theoretical pile volume.

Borespoil is removed from the auger by mechanical auger cleaner (where practicable) during extraction of the auger. Borespoil arisings and excess concrete is removed from the pile head by the attendant excavator.

The piling rig then moves to the next planned pile position which would generally be a minimum of 3 pile diameters away.

Steel reinforcement as specified in the pile design will be placed directly into the concreted pile bore by either the auxiliary winch line on the rig or by the attendant excavator or by hand (dependent on cage weight). The bottom 2m of any cage may be tapered for ease of installation.





The attendant excavator will be used to install the cages. Should the excavator require a lifting chain our operatives will supply one on site along with a copy of the test certificate. The excavator should be fitted with a lifting eye.

When using the attendant excavator to install cages then the bucket must always be removed first.

After removing the pile spoil and cleaning the pile head the bucket will be removed from the excavator and the drop chain attached to the pile cage approx. 1m from the top, the cage will then be lifted to the vertical position and the banksman will guide the excavator over the pile bore and signal to lower the cage into the bore. As the cage is lowered into the bore the banksman will guide and keep the cage central. When the cages comes to rest within the wet concrete the excavator will lower his arm to below the lifting point and take tension on the drop chain, at this point the banksman will stand clear of the cage to a safe point minimum of 3m away but still stay within view so as to be able to guide the excavator driver and ensure the cage is plum.

The excavator will then pull the cage into the pile under the direction of the banksman until the excavator arm reaches ground level (PPL). Tension will then be released and the banksman will remove the drop chain from the cage. The excavator will then reattach his bucket to enable pushing the cage to ground level (PPL). With the bucket reattached to the excavator the banksman will guide the bucket to above the cage and then stand clear min 3m to allow the excavator to push or tap the cage to ground level.

The banksman will also ensure that no other persons are allowed within 3m of the work in progress.

At No point should the banksman try to stand on the cage helical the assist with pushing in the cage and at No point should the banksman hold onto the cage while being pulled or pushed by the excavator.

If for any reason the cage seems too reluctant to enter the pile bore and excessive tension is required then the cage should be removed from the bore and the pile rebored and concreted and the cages reinstalled.

After the cage has been installed should the cage need to be centralised then either rebar caps or a short plank of wood should be placed on top of the rebar before the cage is trodden on. At the end of the process the pile should be highlighted or covered over.

Piles will be constructed to the following tolerances:-

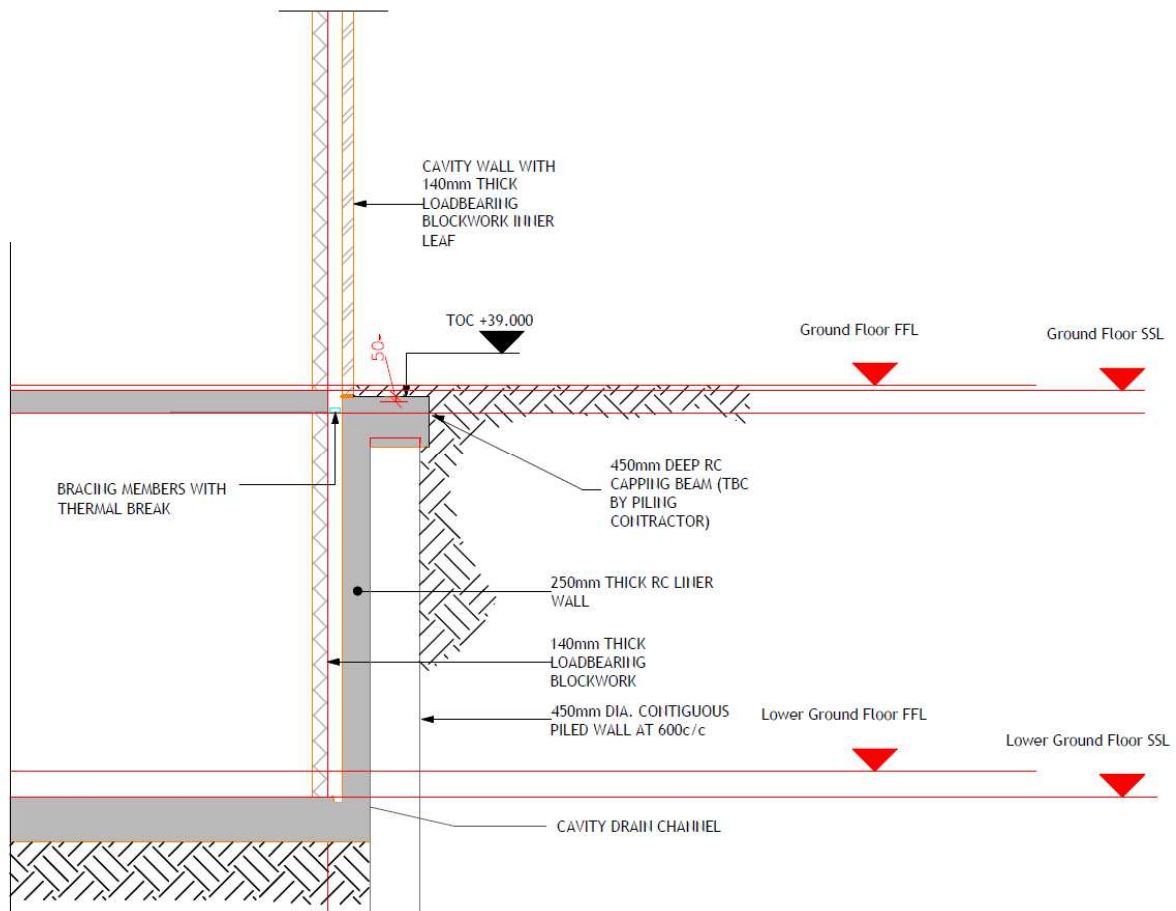
+/- 75mm on plan at piling platform level  
1:75 verticality

At the end of piling works each day the storage mixer drum and concrete pump are washed out using the diesel jet wash. Also the concrete pump line is 'blown out' using the compressor excess concrete will be blown into an empty hole that will be drill out daily, This is to prevent concrete from being splashed as the blow out ball exits the bottom of the auger.. All excess concrete is removed using the attendant excavator and will be removed from site along with the pile spoil by the main contractor.

If any of the concrete lines become blocked the use of the blowout launcher and catcher are essential to use on both ends of the hose. The concrete lines will need splitting and separating from the rig and pump. The concrete hoses should be tethered to the excavator parked at the opposite end of the concrete hose restraining the hose to prevent the concrete hose from whipping. Once the compressed air has been discharged into the concrete lines **ALL** air must be vented via the valve on the gun enabling the air and pressure to be released. **At no point must anyone remove the gun from the line until it has been proven that the air has been vented by the gun.**



## EXAMPLE DETAILS



SECTION THROUGH TYPICAL SIDE WALL



## EXAMPLE OF PILEING COMPLETE WITH REINFORCEMENT FOR RAFT PREPARED.

In terms of the flooding risk the design will not be affected by the presence of ground water although dewatering techniques may be required during excavation and upto tanking waters are complete. Small detail items like the introduction of a bund as part of the ring beam may be employed to prevent water running over the top of the tanking and into the basement.



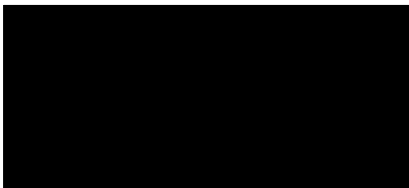
## CONCLUSION

The implementation of the formation of the basement adjacent to the neighboring properties is feasible by the implementation of the above methodology.

Variations on proposed methodology may be proposed by the contractor and variations may be checked and verified by Local Authority, party wall surveyors and the design team as necessary.

ALL NORMAL HEALTH AND SAFETY PRECAUTIONS ARE TO BE IMPLEMENTED DURING CONSTRUCTION A COPY OF THE CONTRACTORS HEALTH AND SAFETY POLICY SHOULD BE AVAILABLE ON REQUEST.

Author



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