Construction Method Statement

23 Lambolle Road
NW3 4HS

PROJECT NO: 2212

Rev1 24.08.2020

(Incorporated references from revised BIA LBH4481bia, August 2020 and

New rear extension)

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Contents

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Introduction

The following report sets out the design philosophy and methodology for the proposed construction works at 23 Lambolle Road NW3 4HS.

This consists of the extension, to lower ground floor flat by excavating the area underneath the ground floor footprint towards the front of the property as well as the creation of two light wells to front garden. In addition, a lower ground floor extension is planned to the rear of house in the area of the existing conservatory.

The property is a three-storey semi-detached house plus lower ground floor situated in the Belsize Conservation Area in the London Borough of Camden. The house is not a listed building. The house is currently divided into flats with nr 23 being the lower ground floor, garden flat.

The adjoining property an No. 21 Lambolle Road is understood to have a lower ground floor (constructed with RC underpinning) placed at a similar depth (3m) to the existing lower ground floor at No. 23 Lambolle Road. This lower ground floor wholly occupies the building footprint to No. 21 Lambolle Road and includes lightwells at a shallower depth of around 1.5m.

This document is to be read in conjunction with the LBHGEO Basement Impact Assessment LBH4481bia, August 2020' and Architects Drawings (P1.0 Rev C, P2.0 Rev D, P2.1 Rev A)

Site Establishment

On taking possession of the site, the area must be made secure and set up as a safe working environment.

Construction site safety signs will be displayed as well as personal protective equipment requirements. Before Commencement of any work we will carry out a CAT scan survey to note the location and routing of any services. Should any utilities pipe work or cables be found within the areas of our works, these will be reported to and dealt with by the appropriate bodies.

A temporary site electrical and water supply will be installed for the duration of the works.

A fixed datum should be provided before the works commence and that level transferred around the site, for the purpose of accurate setting out. At intervals, levels should be checked from this datum.

Excavated Soil

There are currently two options for the removal of excavated soil under consideration:

Option1

Operatives will manually fill rubble sacks with excavated soil then place into wheelbarrows then using dedicated ramps the operatives will transfer the loaded barrows into a skip located in the parking bay at the front of the property. The skips will be exchanged.

Option 2

A conveyor will be sited along the side access path from the flat entrance and extend up the garden over the footpath supported by scaffold gantry protected and lit, the conveyor will be enclosed in plywood sheeting. A parking bay will be suspended directly outside the property and a static skip will be placed in the bay to receive the excavated soil from the conveyor. A hoarding will be erected around the bay to enclose the skip. The excavated soil will be removed from the skip by a grab lorry and transported to designated waste disposal site.

Safety Requirements

Welfare and site safety will be dictated by the Construction (Design and Management) Regulations 2015.

Before commencement on site:

Site specific risk assessments will be carried out and fire evacuation plan will be established.

Site induction will be given to all operatives entering the site and tool box talks given as and when specific tools, plant and equipment are first used.

All operatives will wear high visibility vests with Basement Masters name clearly displayed.

An appropriate area will be established for the first aid box, fire extinguishers, site visitors' book, an accident book and operator's time record book should be present and a list of all relevant and important contact numbers displayed clearly on the site board as well as all relevant drawings and documents to assist with and maintain a safe working environment.

Temporary Works

The site foremen will act as TWS ensuring compliance at all times.

Temporary support to excavated faces, individual underpin excavations.

Ground conditions will be continuously assessed by a competent person to determine the means and method of supporting any face of any excavation. Our experienced operatives overseen by our Site Foreman shall ensure that every part of every excavation is inspected at the start of each shift.

LBHGEO Basement Impact Assessment refers to no ground water present but if perched water becomes present a filtered sump and pump system will be installed to ensure that no undue movement within the ground takes place.

Our temporary works proposal for underpinning is as follows:

Provide suitable edge protection including toe boards around the excavation to prevent falls from height.

Horizontal Propping

Where the use of the dumpling method cannot be employed for horizontal propping, we will consider the thrust block method subject to the structural engineer's final design for construction.

Sides of excavated pits

Hand excavate the pit to formation level of new reinforced concrete toe, provide at all times adequate lateral support and propping as excavations progress to maintain acceptable levels of safety. Insert to each side of the 1000mm wide excavated pit 3 x 300mm steel trench sheets.

The interlocking steel trench sheets (non-sacrificial) to the side of the excavation on either side of the dumplings are to be supported at top-, mid- and bottom-point with 4 No diagonal acrow props restrained onto double scaffold boards as spreaders, tightly packed with folding wedges against the steel trenching.

Back of excavated pits

Where required a cementitious sacrificial back shutter will be placed against the back face of the excavation under the existing foundation and in the event that the backs of the excavations require temporary propping then steel sacrificial trench sheets will be used. No sacrificial sheeting will extend beyond the adjoining owners wall. The sacrificial interlocking steel trench sheets will be supported by two diagonal sacrificial jack props restrained onto double scaffold boards as spreaders, tightly packed with folding wedges against the steel trenching.

The temporary propping will be left in place, until 24 hours after the completion of the underpins. This method ensures that at all times the excavation is controlled, and indeed the integrity of the surrounding soil and structure above is maintained, to enable permanent works construction.

In the event that the existing foundations to the wall are found to be unstable, sacrificial jack props will be installed underneath the foundation to prop the bottom few courses of bricks. These jack props will be left in place and will be incorporated into the concrete stem.

Temporary Support main excavation:

When all the underpins are complete, the main bulk can start to be reduced. The walls of the basement will not be stable in the temporary condition once the main bulk is removed horizontal forces may act to cause overturning, collapse or the bottom of walls to slide inwards.

A horizontal temporary propping scheme will be installed as previously mentioned.

The main horizontal temporary works should only be removed once the main structural elements for which they are acting have gained adequate strength specifically the RC base Slab.

Temporary support to floors and walls above basement excavation

Supporting existing timber floors and walls above basement excavation:

The existing external walls which are to remain but are within the new basement are to be supported on steel beams spanning onto columns and or the basement wall with padstones or steel plates. These walls are to be temporarily supported with steel needles and propping onto temporary foundations founded on London Clay.

Decking and support platforms to enable handling of steel beams will be provided as required. Proprietary lifting equipment will be used to place steels in position. Once full structural bearing is provided via beams down to the new basement floor level, the temporary works will be redundant and can be safely removed.

Any voids between the top of the permanent steel beams and the underside of the existing walls will be packed out as necessary. Voids will be dry-packed with proprietary non-shrinkable cement grout, between the top of the steel and underside of brickwork above.

Any voids in the brickwork left after removal of needle beams can at this point be repaired by bricking up and/or dry-packing, to ensure continuity of the structural fabric.

Dewatering

As excavation works commence should water be present within the area of the work a sump must be dug within a suitable position to a level well below the excavation approx 300mm and a submersible pump installed. The pump must operate continually and discharge to suitable distant location. This area should be shuttered off throughout the laying of the concrete. On no account must concrete be poured into lying water.

If pumping is required after 2 days of rainfall then the project engineer will be informed and will be asked to comment on potential of loss of fines and the party wall surveyors will be informed.

Reinforced Concrete Underpinning/Mass Concrete Foundations

The works listed should be carried out as a minimum two-man operation to a depth of 1.5 metres and a three man thereafter.

All concrete will be ready mixed and delivered to site and pumped to final location. Structural engineer to specify type and strength of concrete required for all operations.

Concrete mixing

All work to be carried out in accordance with BS8002 & BS8004.

When concrete is to be mixed on site rather than ordered from a ready-mixed concrete supplier, an estimate of the materials needed is necessary. Materials can be purchased as individual constituents with either the fine or coarse aggregate pre-blended (ballast/all-in aggregate) or separately. The underpinning concrete will be sulphate resisting, grade C35 prescribed mix to BS 8500, or designed mix. Max. Aggregate to size 20mm. Min. cement content to be 300kgs/cu.m. Mix ratio = 1Cem: 1.5 Sand: 2.5 Aggregate. Slump S3.

All batch mixed concrete to be cube tested.

Underpinning to be constructed as follows:-(Location Front Elevation)

Underpinning is to be carried out in short sections not exceeding 1.0 metre. The numbering sequence of underpinning is to follow the engineer's drawings and agreed with the Building Inspector prior to the works. Bases should be excavated and cast during the same working day.

Excavate working trench along internal face of wall to be underpinned, to a depth of approx. 300mm below the base of the proposed pin level. Width of excavation not to exceed 1 metre.

Side of the trench excavation should be adequately shored with trench sheets and trench props.

A 300mm thick concrete pad should be poured along the length at the base of the trench incorporating starter bars as specified, placed with the vertical bar at the approximate centre of the new pins.

The undersides of footings are to be cleaned of any dirt, soil or loose material before dry packing or shuttering. The mesh should be placed within the pin and tied to the starter bars at the base of pin, additional short lengths of bar should also be knocked into the soil/clay on either side of the cutting, to be used as a means of tying further sections of steel as work progresses to provide a sheer key

Form neat, vertical, and level shuttering to inside edge of underpinning to become walls and pour concrete to within 75mm of underside of existing footing.

All concrete to be vibrated during placement.

Allow concrete to cure for 24 hours then dry pack with 1:3, sharp sand mix with Cebex 100 additive.

Allow dry packing to cure for 24 hours prior to excavation of adjoining pins.

Upon completion of concrete underpinning and dry packing the existing corbel brick foundation is to be carefully removed.

Pre-cut at 75mm vertical centres using abrasive wheel followed by breaking off sideways with handheld hammer carefully removing the existing projected brickwork corbel so that it finishes flush with the face of the projecting underpinning.

Take care to ensure that no excessive force is used during the removal of the brick corbel and in circumstances where the existing masonry may be in poor condition use small hand held hammer and steel chisels for brickwork cutting.

Repeat all operations following sequence as specified until underpinning is completed.

The method can be subjected to variations in concrete design, reinforcing, or concrete type, subject to agreement with the engineer responsible for the design the building inspector and Party Wall Surveyor.

Mass Concrete Foundations; (Location Rear Extension)

The rear extension will be constructed on mass concrete foundations as per structural engineer's design. The walls will be formed using cavity wall or solid block construction to be confirmed by Architect.

Installation of new steel beams

The steel beams will be delivered and unloaded by the delivery lorry into the hoarded area. Materials will be checked off against delivery notes, and any discrepancies advised to the Contracts Manager.

Installation:

Primary steel beams span party wall to party wall with secondary beams below ground floor partitions.

1. Support wall and floors by super props and structural timber plates through the floor.

2. Lift and install new beam on bearings.

3. Measure gap when beam is resting in place.

4. Determine dead load deflection of beam.

5. Pack gap tightly with a stiff 1:3 cement sand mortar and leave 48 hours to cure.

*Steel beams will be erected progressively as the underpinning and excavation progresses.

Steels will be moved and erected by hand and installed by fitters working from secured platforms using dedicated lifting equipment.

Note: The steelwork will be installed after the underpinning section is complete.

Excavation, basement slab construction and Lightwell

This operation is carried out after the underpinning/retaining of structural walls.

The ground investigation indicates that the site is underlain by made ground over London clay formation.

Within most basements' excavation is carried out manually, this is mainly because of restricted working space and access, plus most conversion/retro works are carried out whilst the main property is still occupied. Small plant (Excavators) can be used as long they are fitted with exhaust filters and noise suppression equipment.

Where possible digging should start at the rear of the area for excavation and incorporate the temporary works design as specified. A light pneumatic air compressor with a demo hammer and clay spade is best used for breaking up the ground, hand held digging shovels are then used to lift the small broken up segments of soil/clay in preparation for removal.

RC Floor Slab

All work to be carried out in accordance with BS8004/1986.

On completion of excavation a minimum of 150 mm dry hard fill should be placed levelled and well compacted, over the entire floor area. this best done with aggregates such as M.O.T type1, which are hard stone to fine particles ranging from 40mm to 0mm. *(Further formation layers and thickness of RC slab to be instructed by Structural Engineer)*

Subject to the engineer's details', reinforcing steel mesh is laid and a hydrophilic water bar will be fitted between slab and toe of underpin.

During the above works a sump for the permanent works is installed, this maybe of a solid concrete construction or a pre-moulded plastic, selection is much dependent on-site groundwater conditions. Along with the sump service pipes/ducts for water ingress and discharge along with electricity supply ducts must be laid below the slab and a modular drainage system install for CDM ground water.

Premixed Concrete is then placed to the required thickness pumped to its point of placement, the mix should be spread to the required level vibrated with the use of a poker vibrator, then tamped to a reasonably flat finish.

Sumps if used must be fully drained, bunged with strong fastest concrete at its lowest point of pressure further filled with dry fill to the level of that already placed, concrete is then laid and finished as above.

Curing in temperatures exceeding 30 degrees Celsius curing should be assisted by means of the laying of a polyethylene sheet over the slab as soon as possible after laying, sealed at the edges.

Concrete must not be placed on frozen ground, or at temperatures below 5 degrees Celsius on a falling Thermometer.

Once the concrete is cured a lime inhibitor will be applied to all new works.

Lightwells

The lightwells will be formed using a top down method of construction. The top section of wall will be cast and then underpinned.

Gulley/drainage system for the removal of water from the light well must be incorporated, if gravity discharge is not possible discharge should be via the sump and pump system.

Bracing maybe carried out in a variety of methods depending the pressures likely to come to bear on the formwork, when pouring is been carried out. Suitable methods of bracing would range from timber trusses, Aluma Beams, Strongbacks, (soldiers,) trench props and hydraulic props. (In soil other than firm clay the design should be carried out by a specialist company.)

Retaining walls may also be constructed of other approved methods subject to design i.e. engineering bricks, concrete block work, hollow block work with reinforcing bars and concrete infill.

Light well should then be subjected to the agreed finishes, i.e. sand & cement render, finished brick or block work.

The installation of step irons/cat ladder. If required and agreed external iron stairs are fitted.

Finally, the light well must be secured; this can either be by means of a grid laid horizontal across the top of the light well or vertical metal railings fitted around the opening or covered /enclosed with sheet glass.

Cavity Drain Waterproofing System

Cavity drain systems are a comprehensive water control system; they should be installed in full, and not as part. They can only then offer total control of any water that may enter the structure then allow for control and discharge.

Cavity drain systems must comply with BS8102:2009

Before installing the membrane ensure that the basement is reasonably weather tight.

A modular drainage system will be installed consisting of trapped rainwater gulley's being fitted every 12m2 approx connected by 110mm pipe work terminating into surface water sump chamber. Alternatively, a base drain is laid in a continuous manner around the perimeter of the basement. This is laid with a slight fall to discharge outlets or at least level, on top of the slab.

The Base drain forms a void in which ground water can be picked up; it in turn is connected to the pipe work previously installed under the slab which allows for discharge back to the sump. Also jetting eye's can be installed within the system for cleaning purposes if required at a later date.

Around the perimeter walls and any other internal walls that must be treated as earth retaining the studded 7mm membrane is fixed by means of drilling and plugging with water seal plugs, abutting membranes are taped together with a water seal tape all as manufactures recommendations. On top of the membrane a high density closed cell insulation slab is laid, thickness to be determined by SE (it is important that the type of insulation is suitable for use in wet conditions.)

Note: Where heavy loading is to come to bear on the slab, such as, Stairs, solid walls, obtain the agreement of the engineer responsible for the design, and that of the building inspector.

Over this across the entire floor areas a floor membrane is laid. This is taped with a water seal tape at all joints, then turned up the walls against the studded membrane and taped.

A fibre reinforced sand and cement screed is laid to a minimum 65mm thickness over the insulation/membrane.

Care must be taken when sealing against incoming projections i.e. columns, service ducts, etc. The surfaces of the object/ structure must be cleaned and primed, gaps can then be filled with Polysulphide mastic filler, flanges should be made out of the membrane and taped over the existing membrane and onto the object/ structure. Internal & external corners at wall/floor junctions must also be secured with flange covers.

The system must allow for discharge of any water entering into the sump, this is commonly done by means of submersible pumps fitted within the sump chamber. And discharge pipe work up to surface level and discharging back into the main surface water drainage system. However there are instances where pumps may not be necessary i.e. the basement is sited on a hill and discharge pipe work can be routed to a much lower level away from the property, also on rear occasions soil/waste water main pipe runs are at a lower invert level than the base of the slab. In these circumstances a connection may be made, allowing for connection to comply with regulations and a non return valve should also be fitted into the system.

Where a pump is not to be provided the client should be advised in writing and agreement formally given, the proposal must also be agreed by the designer and building inspector.

The standard Basement Masters system allows for two pumps to be fitted with a back up alarm, so should the first pump fail to go off the client is aware of an impending. It is most important that pumps are serviced regularly and service contracts are offered with each instalment.

Potential impact on the adjoining properties and Monitoring

Damage to surrounding buildings and structures;

As previously mentioned, there is an existing basement construction at No. 21 and as the proposed lower ground floor extension will be set at the same level as the neighbouring property there will be no potential undermining of existing foundations and the only potential issue will be slight basement excavation heave. *(Structural Engineer to specify heave protection requirements)*

The risk of excessive movement has been assessed and minor movement accepted the structural design and construction methodology are the control measures. The contract engineer will conduct periodic site visits to ensure compliance. Visual monitoring will take place to the party walls every day by the site foreman and if any cracking hair line or greater is observed crack monitoring gauges will be installed and the project engineer and party wall surveyors will be informed. If cracking more than 1mm is observed works will be made safe and stopped and the project engineer and party wall surveyors will be informed, and the next steps will be confirmed prior to any further works.

The proposed basement under the existing property will be formed using an underpinning method, constructed in sections each no wider than 1000mm. The sequence of the placing of the underpinning will ensure that a minimum 48 hours will elapse before an adjacent bay is excavated.

This method of construction deals with the potential risks and ensures the excavation and construction of the proposed basement will not affect the structural integrity of the adjoining properties.

It is not expected to exceed 1mm crack (referring to Burland Category 1, Table 1) width of existing structure during construction process by using good working practice in accordance with the structural design and follows all agreed method statements, risk assessment and installing all necessary temporary vertical and lateral supports required.

In practice some constructional settlement is possible, but this should be no worse than 'aesthetic'. If these conditions are met, any settlement that occurs will be minimal and will be accommodated in the elasticity of the superstructure. This has been done in the past projects on similar properties.

Noise, vibration and dust

Noise dust and vibration will be controlled by employing Best Practicable Means (BPM) as prescribed in the following legislative documents and the approved code of practice BS 5228:

· The Control of Pollution Act 1972

· The Health & Safety at Work Act 1974

· The Environmental Protection Act 1990

· Construction (Design and Management) Regulations 2015

· The Clean Air Act 1993

General measures to be adopted by the Contractor to reduce noise, dust and vibration include:

· Site hoarding should encapsulate property boundary and be of acceptable height to ensure they act as visual screens within the rear and front garden spaces to keep work ‘separated’ from daily activity of inhabitants of neighbouring properties and to ensure necessary measures are put in place to protect neighbouring properties for the duration of the works .

· Erection of site hoarding to act as minor acoustic screen.

· Use of super silenced plant where feasible.

· Use of well-maintained modern plant.

· Site operatives to be well trained to ensure that noise minimisation and BPM’s are implemented.

· Effective noise and vibration monitoring to be implemented.

· Reducing the need to adopt percussive and vibrating machinery.

· Vehicles not to be left idling.

· Vehicles to be washed and cleaned effectively before leaving site.

· All loads entering and leaving the site to be covered.

· Measures to be adopted to prevent site runoff of water or mud.

· Water to be used as a dust suppressant.

· Cutting equipment to use water as suppressant or suitable local exhaust ventilation system.

· Skips to be covered

· Set up and monitor effective site monitoring of dust emissions.

· Working hours to be restricted as required by the Local Authority.

Dust – The following documents will be referred to 'Control of Dust from Construction and Demolition Activities' 2006, HSE CI36 rev2 guidance on the control of dust. Stock piles will be minimised and covered/damped down. A water supply/stand pipe will be available on site for dust suppression purposes. Vehicle movements: Any loads likely to produce dust shall be covered and wheel wash facilities where necessary will be provided at the exit to the site to prevent tracking of material off site. The contractor will monitor on a daily basis the areas immediately surrounding the site to ensure dust and dirt is minimised. All personnel working in a dusty area shall, where necessary, wear a dust mask deemed suitable by the HSE (Health and Safety Executive) General dust extraction will be used if required and local extraction used whilst wall chasing.

Noise - The Control of Noise (Codes of Practice for Construction and Open Site) Order 1984 gives legal approval for BS 5228, parts 1 & 2, 1984. This provides information on noise and noise control on Construction Sites. Every attempt shall be made to control noise at source. On sites where construction works are in progress everyone has a responsibility to see that activities are carried out in the quietest practicable manner. Where noisy activities are unavoidable the disturbance will be minimised/attenuated by choice of technique, timing, shielding or protection as appropriate. Where any person is liable to be exposed to noise levels greater than 80 dB (A), they will be informed and provided with suitable ear protection. The most likely protection, in ascending order of attenuation is ear plugs, ear muffs and noise attenuation helmets. Noise will be kept to a minimum at all times and any further restrictions imposed under the terms of the construction contract will be strictly adhered to.

Vibration - All works involving vibration will be minimized, where possible eradicated by design and the use of controlled mechanical equipment. Any operation involving vibration will have a HAVS risk assessment and procedures put into place to minimize the effects on personnel

Conclusion - it is our opinion that the proposed works can be carried out within a safe manner by a suitable contractor and that noise, dust and vibration can be sufficiently mitigated.

The working hours on site will be set by the local council. It is generally 8:00 to 17:30 hours Monday Friday and 8:30 to 13:00 hours Saturday. Generally, works will be carried out with less minimal noise and vibration impact on Saturday.

Traffic congestion

It is proposed to use hoarding set up within the road for skip and material storage which will be minimal. It is not always possible to store everything on site and in this instance the most efficient use of space will be considered.

Actions:

- Collection and spoil removal operations to low traffic volume times, between 9:30am and 15:00pm.
- Positioning banksman and traffic marshals to give local traffic the option of using alternative routes.
- Moving the delivery or collection vehicle when local traffic wants to pass.
- Using grabs lorries for spoil removal from skip.
- Coordinating deliveries and collection with any nearby construction sites.
- Organising the site efficiency to minimise traffic disturbance.

Neighbourhood liaison

The contractor will understand the sensitive nature of the site and recognise the importance of the neighbourhood liaison role in ensuring the smooth running of site activities and their relation to the local residents and general public's welfare.

During the excavation and construction works he will ensure that all works are carried out safely and in such a manner that it will not inconvenience pedestrians or other road users and with a positive consideration to the needs of the local residents, site personnel and visitors as well as the general public.

Footways and carriageways will be kept tidy and in a safe condition. Hoardings, safety barriers, lights and other features will be maintained in a safe and tidy condition. The site is to be kept clean and in good order at all times, with surplus materials and rubbish controlled within the site and not allowed to spill over into the surroundings.

Disturbance from site operations due to the effects of noise and dust emissions will be minimised by the use of plant and equipment fitted with suitable noise suppression facilities in accordance with the manufacturer's recommendations.

Programme

At this stage we are not able to provide a formal programme as we will require the structural engineers final design. We can provide an estimated time scale to carryout the works of 5 months. This is based on similar builds we have previously undertaken and constructing both the rear extension and basement concurrently.