

62 MANSFIELD ROAD, NW3

STRUCTURAL REPORT

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1 Introduction

Constant Structural Design has been engaged by the owners of 62 Mansfield Road to advise on some aspects for a proposed development on that site. Primarily, this relates to planning stage input into the structural aspects of the basement elements of the project.

The following is a brief description of the site, proposal for the project, structural approach to the proposals, a possible method of construction and structural impact on adjacent structures.

2 Site Conditions & Existing Building

2.1 Site

The site is situated behind 62 Mansfield Road and is roughly rectangular on plan. 62 Mansfield Road is an end of terrace property on the corner of Mansfield Road and Culthorpe Road, with the site to be developed accessed from Culthorpe Road.

The site have previously been part of the rear garden of 62 Mansfield Road but has been separated off via a temporary stud wall. The site has not been built on but the ground has been concreted over at some time.

2.2 Adjacent Structures

To the north, the site is bounded by an electricity sub-station. This single storey building is approximately 3m high and formed from brick walls.

62 Mansfield Road abuts the site to the south. This is a four storey building comprising a retail premises at ground floor level and residential accommodation above. The top floor is within the roof space of the building.

The site is bounded to the east by the garden of 64 Mansfield Road. A solid brick garden wall separates the site from this garden.

The west side of the site is adjacent to Culthorpe Road with a solid brick wall incorporating double gates for access.

2.3 Ground Conditions

The British Geological Survey shows that London Clay underlies the site.

Boreholes drilled on the site confirm the presence of London Clay under a thin layer of made ground and the concrete topping.

The boreholes, which extended down over 4m, did not strike any ground water and subsequent return visits to monitor the situation also did not encounter any ground water.

3 Proposed Building

3.1 Architectural Proposals

The proposals for the site are for a new, two storey, private house – one storey at ground level and one basement level. The footprint of the house is to extend over the entire site.

To the north, the shared wall with the existing sub-station will be used to form the outer skin of the new building. The other three sides will have new walls, replacing the existing brick and stud walls.

The building will have a flat roof with a void and skylights to allow light to the ground floor level. A floor void, replicating the one at roof level, and a glass bridge at ground level bring natural light down to the basement level.

3.2 Structural Proposals

The basement walls will be formed from reinforced concrete. These will act both as the retaining walls around the perimeter of the basement and also to carry the vertical load of the floor, walls and roof above. These walls will be formed in underpinning sequence in order to allow the basement construction without undermining to be formed without undermining adjacent ground or structures.

The basement slab will be formed from reinforced concrete and will act as a raft slab foundation to the new building. This slab will also act as the base of the retaining walls surrounding the basement.

A reinforced concrete ring beam will be formed along the front, back and south side of the ground floor. This will assist with the temporary works during the basement construction and also form a link between the underpinned walls. The ring beam will also span laterally across the void at ground floor to transfer the horizontal forces from the ground to the return walls and ground floor slab that buttress the walls.

The ground floor structure is currently envisioned to be a reinforced concrete slab but as the detailed design is developed, a steel and timber structure may be deemed more appropriate.

Above ground floor level, a combination of load bearing walls and isolated steel columns will form the main superstructure. Steel beams and infill timber joists will form the main roof structure, with glass panels forming roof lights and the roof of the glazed entrance link.

Lateral and longitudinal stability will be achieved through the shear wall action of the perimeter and internal walls.

4 Construction Method Statement

The following is a preliminary Construction Method Statement, outlining one possible method for constructing the structure of the new basement. Ultimately, the contractor will be responsible for the final method of construction and temporary works so may well change this approach.

Construction Method Statement

1. Set up the site, hoarding and other facilities.
 2. Remove the stud wall to the south of the site on the boundary with 62 Mansfield Road, the brick wall to the east on the boundary of the garden to 64 Mansfield Road and the brick wall to the west.
 3. Break out the ground slab.
 4. Reduce the ground level to the level of the underside of the footing of the sub-station to the north of the site.
 5. Excavate a strip to the front, back and south side of the site.
 6. Pour the three sided RC ring beam to the front, back and side of the site. Reinforcing L-bars and U-bars are to be pushed down into the ground below the ring beam to act as starter bars for the retaining wall to be installed below.
 7. Install the reinforced concrete retaining wall and part of the basement slab to the north side of the site under the sub-station wall in a hit and miss underpinning sequence.
 - For all basement walls in and underpinning sequence, the following method should be used:
 - Barrier off the area of work to restrict access to unauthorised persons.
 - The access pit will be first excavated directly underneath the wall to be underpinned. The maximum width of any underpinning base will be no more than 1000mm.
 - The back face of the excavation will be shored with trench sheets or formwork as required to support the soil in the temporary condition.
 - Once the excavation is completed a compacted hardcore layer and blinding are to be laid on the base of the excavation.
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- The reinforcement for the toe section of slab will be fixed. Reinforcing bars are to be left projecting outside the end and side of the slab section to provide a lap for rebar from subsequent adjacent slab sections.
 - Concrete for the toe section of slab will then be poured.
 - Following the construction of the toe, the reinforcement for the wall section will be fixed.
 - Formwork for the inside face of the wall will be installed and propped if required.
 - Concrete for the retaining wall will be poured to 75mm from the underside of the wall/ring beam above.
 - Once the concrete has been allowed to cure, the formwork can be struck.
 - The gap between the top of the wall and structure over is dry packed.
 - The excavation for the pin can be backfilled.
 - The process is repeated for the next pin.
8. Install the reinforced concrete retaining wall and part of the basement slab to the south side of the site under the ring beam in a hit and miss underpinning sequence as outlined in item 7 above.
 9. Install the reinforced concrete retaining wall and part of the basement slab to the west side of the site under the ring beam in a hit and miss underpinning sequence as outlined in item 7 above.
 10. Install the reinforced concrete retaining wall and part of the basement slab to the east side of the site under the ring beam in a hit and miss underpinning sequence as outlined in item 7 above.
 11. The section of footing to the sub-station wall that projects into the site is to be carefully cut off.
 12. Install horizontal props from front to back and side to side between the ring beam and sub-station wall at ring beam level.
 13. Reduce the ground level across the whole site to approximately 500mm above basement slab level.
 14. Install horizontal props from front to back and side to side between the ring beam and sub-station wall at this level.
 15. Reduce the ground level across the site to formation level for the remaining area of the slab.
 16. Lay and compact a hardcore layer and blinding over the remaining area of slab.
 17. Form the reinforcement for the remaining area of slab.
 18. Pour the remaining area of slab.
 19. Once the final area of the basement slab has cured, the bottom level of props can be removed.
 20. Form the shuttering for the ground floor slab and fix the reinforcement.
 21. Pour the ground floor slab.
 22. Once the ground floor slab has cured the top level props can be removed.
 23. The superstructure can then be formed.

5 Construction Management Plan

The following is a preliminary Construction Management Plan, outlining one possible approach to the construction. Ultimately, the contractor will be responsible for the final management so may well change this approach.

5.1 Working Hours, Start & End Dates

The construction period has not yet been set and a start date cannot be predicted until the planning process is complete. Once the design has been progressed, realistic time frames can be assessed.

Working hours will be 8:00am to 6:00pm from Monday to Friday and 8:00am to 1:00pm on Saturdays. No noisy works is to be carried out on Sundays or Bank Holidays.

5.2 Site Access & Arrangement for Vehicles:

Access to the site for all vehicles will be from Culthorpe Road, which is a two way road, with access from both ends. The selected contractor will be required to set up a system where all site traffic approaches site from the Mansfield Road end and leaves via Savernake Road at the other end via Culthorpe Road so that a one way system is effectively enforced for construction traffic.

The selected contractor will have to develop their own programme and sequencing of the works in such a way that there is only one delivery to site at a time in order to help minimize congestion and allow sufficient space for the vehicle to enter Culthorpe Road safely, efficiently and easily.

This approach means that there should be no need for construction vehicles to pass each other on the road and no need for changes of direction. This will avoid congestion, speed up the process of deliveries and collections and improve safety on site.

The sequential nature of the construction (i.e. retaining walls formed in underpinning sequence) means that, until the basement construction is complete, only part of the site will ever be excavated for construction. This means that there will always be a significant part of the site that can be used for temporary storage of materials.

No vehicles will drive onto the site and materials will instead be delivered to a suspended parking bay, or onto site if equipment facilitates it, directly from the delivery vehicle.

The selected contractor will be required to have a full time banksman to manage traffic movements around the site during construction of the structural works.

Any skips required for disposal of waste material will be located in suspended parking bays adjacent to site.

5.3 Sizes Of Vehicles and Frequency Times of Day Etc.:

Frequency of delivery to and from site at various stages of the construction is, at this stage, impossible to accurately predict.

As part of the contractors tender submission, they will be required to provide a detailed programme, which will require the inclusion of frequency of vehicles travelling to and from site.

5.4 Highway Works Necessary to Enable Construction

Gas, water, electric and telephone to be excavated by hand to include trench sheets as the works proceed with traffic management control (Stop/ Go).

Suspension of parking bays as necessary for the duration of the highway works.

Services to be ducted where appropriate to afford flexibility for Statutory Undertakers and minimise window of the road opening.

5.5 Parking Bay Suspensions/Traffic Management Orders:

It is proposed that a number of parking spaces outside the site on Culthorpe Road will be suspended to allow space for a skip and deliveries.

It should also be noted here that, as mentioned above, a full time banksman will be employed to oversee the safety of site operatives and the public.

5.6 Temporary Buildings Outside of Site Boundary

It is not anticipated that any temporary buildings will be erected outside of the site boundary.

5.7 Hoardings Required

Hoarding will be installed to the front (Culthorpe Road side) of the site, the back (garden of 64 Mansfield Road) and to the south side (rear garden of 62 Mansfield Road).

The existing sub-station building lies to the north so no hoarding is required on that side of the site.

5.8 Pedestrian and Cyclist Safety

There is no dedicated cycle path on Mansfield Road, Culthorpe Road or Savernake in the vicinity of the site so there are no requirements to suspend any.

It is not anticipated that permanent obstruction of footpaths will occur. Pedestrians safety will be managed by the banksman at the roadside when off and on loading materials. If the pavement temporarily requires to be closed and signage is required, this will be discussed with the highways department in advance.

5.9 Dirt and Dust on the Highway:

All materials to be bagged, and roads and area around skips to be swept at all times. In dry conditions the site and roads will be dampened down to mitigate dust travel.

5.10 Impact on Neighbours & Construction Working Group:

The scale of the project, its location and the approach to construction traffic mentioned above, means that it should only have minimal impact on local businesses, residents and tenants. As such, the project does not appear to need a formally established Construction Working Group.

That said, the main contractor's site manager will visit neighbours prior to the start of the work to introduce themselves, explain the proposed works and timeframes and supply their contact details and other emergency telephone numbers to streamline communications.

When selecting the Principal Contractor the design team will place great importance on their previous experience in dealing with projects of a similar nature and site restraints.

5.11 Considerate Constructors Scheme (CCS):

The current intention is that the selected contractor will be registered under the CCS scheme and will have to demonstrate experience and previous good compliance levels under the above scheme.

5.12 Cumulative Effect of other Developments:

We are not currently aware of any other work is due to start at the same time in the vicinity of the site that would be relevant in terms of a cumulative effect. It is, however, a very early stage of the project and the timeframes for planning, design and construction cannot be accurately predicted so this situation will need to be readdressed by the selected contractor closer to the time of construction.

If any other developments arise that will be on site concurrently, the selected contractor will be required to liaise with the other developer to coordinate overall safety, traffic movements, minimise congestion, etc.

5.13 Monitoring of the Implementation of the CMP:

The selected contractor will be required to coordinate with the Council, providing reports/access for inspections where required to demonstrate compliance.

5.14 CMP statement:

The agreed contents of the CMP must be complied with unless otherwise agreed with the Council. The person responsible for implementing the CMP shall work with the Council to review this CMP if problems arise in relation to the construction of the development. Any future revised plan must be approved by the Council and complied with thereafter.

6 Movement of Adjacent Structures

6.1 Monitoring Adjacent Structures

During the construction of the basement elements of the project the existing structures adjacent to the site are to be routinely monitored for any settlement or movement.

The exact location, extent and regularity of this monitoring is to be agreed with the adjacent building owners during the Party Wall process prior to commencement of work on site but at present the following is envisioned:

- Monitoring points will be positioned in the following locations:
 - o Three points along the front (west) wall of the sub-station to the north of the site.
 - o Three points along the side (south) wall of the sub-station to the north of the site.
 - o Three points at first floor level along the rear (north) wall of 62 Mansfield Road
 - o Three points at first floor level along the rear (north) wall of 64 Mansfield Road
- Each check point will be checked daily for vertical movement and horizontally in two directions.
- Should any point move more than 3mm from the original position the structural engineer and CA are to be informed immediately.
- Regardless of movement, results of all measurements are to be submitted to the structural engineer and CA every week until construction has been completed.

6.2 Contingency

If movement in adjacent structures exceeds a 3mm, work on site is to stop immediately, the structural engineer and temporary works engineer are to be contacted so they can visit site and assess the movement. If deemed necessary, working procedures on site and the design for the temporary works will be amended to ensure the movement doesn't recur or worsen.

Once the situation has been stabilised, the area where movement has occurred will be examined and, if necessary, remedial/repair works will be carried out.

7 Impact of Basement – Impact on Adjacent Structures

The structural design, method statement and temporary works proposed are all designed to ensure that there is no adverse effect on the adjacent structures. In particular careful attention will be paid during the design of the permanent and temporary works to ensure the stability of the electricity sub-station on Culthorpe Road, 62 Mansfield Road, 64 Mansfield Road and Culthorpe Road itself.

This means that all existing buildings adjacent to the site, the pavement to the front, etc. will not experience any adverse effects as a result of the construction works.
