STS Structural Engineering Ltd
Web: www.sts-se.co.uk Email: sia@sts-se.co.uk

Winner of 2007 Camden Council Building Quality-Small Commercial Development Award
58 Crossway, Welwyn Garden City, Herts, AL8 7EE Tel: 01707 695466 Fax: 01707 692006

Construction Method Statement

For the

Construction of a Basement and Ground Floor Extensions

at 36A Courthope Road, London NW3 2LD

Client

Dr and Mrs A Patel

Status

Initial Issue

August 2010

Ref: 1006-547-CMS

STS Structural Engineering Ltd
Structural Engineering Project Management
Registered in England No. 02623959
Belgrade office: Senjacka 22 Belgrade 11000 Serbia
T: +381 11 369 2693 M: +381 63 894 1048

Siavash Sharif BEng, Managing Director
G A Fryer BSc, CEng, FICE, FCIWEM, Consultant
Lyn Heathcote Sharif, Financial Director
lyn@sts-se.co.uk
Marko Nesovic BEng, Technical Director
marko@sts-se.co.uk

36A Courthope Road, London NW3 2LD

Construction Method Statement

Document Issue Sheet

Ref: 1006-547-CMS

	Name	Signature	Date
Prepared	Marko Nesovic, BEng	Marko Nesovic	
Checked	Siavash Sharif, BEng	S. SHARIF	
Signed Off	Siavash Sharif, BEng	S. SHARIF	

Version No.	Pages	Description	Chkd	Date	Aprd	Date
-		Preliminary Issue	SS	06/08/10	SS	06/08/10

INDEX

Contents

1. INTRODUCTION

1.1 We were instructed by Dr A Patel to assess the engineering feasibility of constructing a basement extension to the ground floor flat at 36a Courthope Road, London NW3 2LD as well the construction of a single storey extension with associated structural openings. Mr Patel is the owner of the ground floor flat within a large four storey converted Victorian terraced house and the sole user of the back garden.

1.2 An architectural arrangement (see Appendix 1) has been prepared in-house by STS Structural Engineering Ltd. The proposed basement space would create two additional bedrooms with en-suites, and a single storey extension would enlarge the existing kitchen and dining room.

1.3 This Construction Method Statement presents the outcome of our investigations and presents our proposed methodology for forming the basement space.

1.4 Appendix 2 has a selection of photos taken of the site.

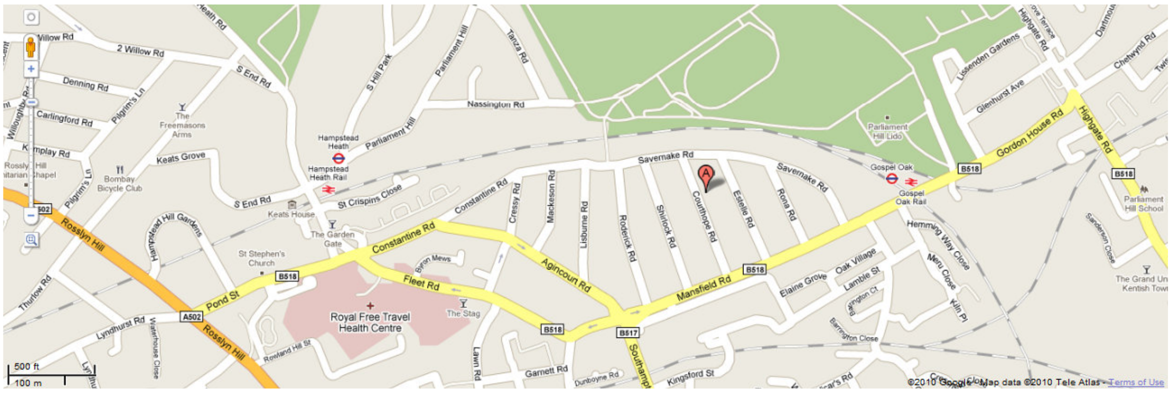


Fig 1: Location Plan

2.0 SITE DESCRIPTION AND THE DESCRIPTION OF THE PROPERTY

2.1 The existing building was likely constructed in the second half of the 19th Century. The house is a part of terrace, which in turn forms part of a large development of similar properties occupying this part of Belsize Park. The property is situated within the Mansfield Conservation Area.

2.2 The property covered by this proposal consists of the ground floor of a converted Victorian terraced house. The house features further 2 floors and a loft (4 storeys in total). The house remains mostly as it was originally constructed, although a front and rear roof dormers have been constructed in the 1990s. The house fronts the public pavement at Courthope Road. The residents of the ground floor flat are the sole users of the rear garden. The main access to the flat is from Courthope Road via a common hallway used by all the flats.

2.3 The house is of masonry construction with suspended timber floors and a timber framed pitched roof. The main loadbearing external walls at the basement and ground floor level have been surveyed as 13’’ thick, but are likely to be thinner on the upper floors. Both the front and the rear elevations are in exposed original yellow brickwork, and feature a number of door and window openings. The front elevation entrance door and windows feature stucco decorative surrounds.

2.4 The existing property is generally in good condition and is well maintained. The external survey of the property reveals no obvious structural defects or visible cracking indicating that the property is structurally sound and was well constructed. We have not found any signs of subsidence, or any abnormal deflections, or deformations, although we have not carried out a full structural survey of the entire building.

2.5 The internal layout is typical of the period and features a main front section, as well as a large back projection which is likely to be original to the property. A central spine wall, which runs parallel to the front and back walls, divides the main front section of the house into two rooms, with the staircase located in the rear RHS quadrant. A further, large room is situated within the rear projection on each floor. The rear projection is three storeys high and features a balcony at the top

2.6 Internally, the property is well maintained and is in a fair condition. The spine wall and the wall adjacent to the stairwell are of solid masonry construction at the ground floor level. We have not found any evidence of cracking or other major defects. The floors throughout the property are of suspended timber construction. The floorboards within the flat are generally exposed, and for the main part the floors were found to be level, firm to the tread and free from obvious defects. The ceiling lath and plaster is in a fair condition, and has recently been decorated, which somewhat limits the inspection. We have not yet carried out any internal intrusive investigations so there is a possibility that the finishes could be concealing some structural defects.

2.7 We have carried out initial trial pitting to establish the underlying ground conditions, and to identify the size and arrangement of the existing footing. The local geology of the area is characterised by the stiff London Clay stratum. Trial pits confirm the presence of stiff clay subsoil. A clay stratum is the preferred material for underpinning works as the cut face of the excavation will normally support itself long enough to allow the concrete works to be carried out and for the concrete to gain sufficient strength to retain the soil permanently. If sandy ground is encountered temporary support can be provided by timber boarding until the concrete has been placed.

2.8 We have inspected the existing cellar, and it appears to be entirely dry. There were no signs of dampness observed. For this reason we believe that the water table is well below the level of the existing and the proposed basement. Therefore, it can be assumed that there would be no requirement for dewatering of the soil during excavation. Likewise, we believe there is low or no risk of ground water displacement during construction and use of the proposed basement. Further trial pit investigations within the basement must include groundwater assessments.

2.9 We have not seen any records of utility services – it is possible that drains and other service pipes pass under the garden or the main house or from the gardens of the adjacent properties. These will need to be identified and accommodated in any basement works. In addition, a full and detailed utilities search of the public services should be carried out.

3.0 PARTY WALL MATTERS AND CONSTRUCTION TECHNIQUES

3.1 In this case the fact that the basement walls lie on the boundary of the plot creates Party Wall Act issues, namely:

3.1.1 Courthope Road is most probably a public highway which is the responsibility of the local highway authority (Camden Council) they have an interest in ensuring the stability of the road. Although the proposed front lightwell does not abutt the road, the excavation of the lightwell may be of some concern to ensure that for both the temporary (construction) and permanent cases the new lightwell walls are capable of withstanding any surcharge loading from the heaviest possible vehicles (typically fire engines/refuse vehicles/concrete lorries).

3.1.2 the party wall to no 34 Courthope Road has been constructed on the boundary with 36 Courthope Road and as such is considered to be a party wall. It is proposed to increase the available headroom in the existing basement by some 200mm. As such it will be necessary to excavate some 500mm to lay the new ground bearing slab, insulation and tanking. Both properties feature a cellar adjacent to this party wall, but further investigation is required to determine the party wall construction, as well as the depth of the footings. It may be possible to avoid any underpinning of the existing flank wall, which would remain largely unaffected by the works. Please see drawings for more information.

3.1.3 similarly, the party wall between nos 38 and 36 Courthope Road has been constructed on the boundary line between the two properties. At this stage it is assumed that the footings for this party wall are at a similar level as the back wall footings which were investigated, and not as deep as the other party wall. As such, it is certain that this wall will require underpinning. The construction technique used must enable the Works to be constructed from inside the land of 36 Courthope Road, and all works must be constructed subject to party wall agreement. The basement must be constructed in such a way, as to allow for the owners of 38 Courthope Road to construct a similar basement extension at a later date if they so desire.

3.2 For domestic scale works there are two techniques mainly used for creation of basement areas where it is not possible to create an oversized excavation in which conventional construction techniques can be used. These are:-

3.2.1 traditional underpinning – the ground underneath the existing foundations is excavated in short sections and mass concrete is cast into the hole to form a "pin". The length of the pin is typically around 1m. The pins are constructed in a "hit & miss" sequence which preserves the stability of the building above as the construction proceeds. The pins are normally connected by steel dowel bars – once the sequence of pin construction is complete the remaining soil can be excavated to create the basement.

3.2.2 Piling – two types exist: driven and bored. Driven piles are precast concrete or steel sections hammered into the ground. This type is not appropriate here because of very limited access and the vibrations are likely to damage the existing buildings and the noise would be likely to cause problems to neighbours. Bored piles are created by using a piling rig to drill a hole into the ground to a calculated depth – the hole is filled with concrete and steel reinforcement. The pile depth is calculated so that once the construction of piles is complete and the soil in the basement is excavated there is sufficient pile embedded into the underlying soil to ensure the wall created is stable. Because the piles are formed using a piling rig, if there is restricted headroom or difficult access piling may not be practicable. Compared to underpinning, more space is lost in the basement due to the thickness of the piled wall which needs to be set away from the existing walls of the house to allow sufficient room for the rig to operate.

3.2.3 New steel beams and frames are to be installed to create the structural openings into the new rear extensions. These works, as well as the proposed basement may require party floor agreement with the owners of the upper floor flats.

3.3 We enclose in Appendix 3 literature describing some of the specialist techniques and tanking systems required for this work:

3.3.1 underpinning
3.3.2 basement tanking systems
3.3.3 Mabey temporary strutting system

4.0 METHOD AND SEQUENCE OF WORKS

4.1 It is essential to adopt the correct construction method to ensure that stability and serviceability of the existing building as well as that of the neighbouring buildings is maintained at all stages of the construction. The structural scheme has been adopted considering the above constraints. It is shown on our enclosed sketches in Appendix 4. The new sections of basement wall would carry the horizontal retaining pressure from the retained soil, as well as the vertical loading of the new basement and wall and floors above down to a level beneath the adjacent and new basement:-

4.2 The majority of the basement walls would be formed using underpinning techniques. These new sections of wall would be formed as follows:

4.2.1 at the front and the rear walls the underpinning can extend under the full width of the existing footing

4.2.2 The party wall footings shall be constructed in such a way so that no space is lost in the basement internally on either side of the wall. Therefore, the thickness of the proposed pins should match the thickness of the party wall, with a wider base formed below the level of the basement floor. Temporary props may be necessary to ensure the stability of the pins against sliding and overturning during excavation and use.

4.2.3 Internal spine and stairwell walls will also require underpinning. It is to be determined at a later date which of the two methods above will be used for these walls.

4.2.4 The walls of the proposed lightwells are to be of reinforced concrete blockwork construction (stepoc or similar) to rest onto a new ground bearing slab. The walls are to be tied to the walls of the existing house to prevent overturning and sliding.

4.3 The sequencing of the underpinning works is critical in ensuring the stability of the buildings at all times. Underpinning is normally done in bays not exceeding 1.2m in length. Adequate support for at least two thirds of the length of the wall is to be maintained at all times. Sections of the work in progress at any one time are to be separated by a distance of at least 2.4m. The procedure is detailed in the previous chapter. All excavation of the pins is to be done by hand and with great care. A toe may be required at the bottom of the pins to prevent the bottom of the pin from sliding in. Temporary horizontal props will be required to provide a temporary restraint for the construction phase of the works to prevent the lateral movement of the top of the pins. Polystyrene sheets are to be installed to the back of the pins to provide a smooth surface should the neighbours at nos 34 and 38 decide to construct a similar basement extension at a later date.

4.4 The existing suspended ground floor joists are to remain throughout the duration of the construction works. These will provide a horizontal restraint to the existing walls and pins. Additional straps shall be installed to provide additional restraint to the walls running parallel to the floor joists. Upon completion of the excavation, it will be possible to install new drainage and cast the bottom slab. This will be followed by the installation of insulation and waterproofing and general fitting out works. An outline programme of works is listed in section 8 of this report.

4.5 The installation of new box-frames, beams and columns to create the structural openings is a fairly standard construction technique. Temporary pins (UC152x152x37 section) will be installed at maximum 1m spacing which would be supported by acrows. The acrows would be braced diagonally with scaffolding tube and supported onto the new extension footings. If the ground floor is of suspended timber construction, it may be necessary to cast temporary strip footings internally to support the acrows. Once the temporary supports are in place, it will be possible to remove the walls and install the new steels.

4.6 A part of the existing flat should be allocated for the use of the contractor to provide site office facilities, welfare facilities incl. Changing rooms, showers and W.C., as well as for the temporary storage of materials on-site and overnight storage of construction plant.

5.0 ENVIRONMENTAL ISSUES

5.1 By environmental issues we mean the potential for temporary and permanent impacts on the local environment from the works.

5.2 Noise – the majority will come from the operation of mechanical plant, particularly compressors, excavators, concrete pumps and hydraulic breakers. Normally conditions will be applied to any planning consent limiting the intensity and duration of noise arising. It may be necessary to restrict noisy operations to particular periods of the day.

5.3 The proposed underpinning methodology is generally not disruptive. Most of the works would be done by hand without the use of heavy plant. There may be some noise and disruption linked with breaking out and removal of the existing footings if necessary. The aim should be to perform these works quickly to minimise the disruption caused by these works.

5.4 Vibration – works which involve breaking out or drilling into existing hard structures has the risk of transmitting vibration to adjacent buildings. Again, the aim would be to minimize the duration of these works.

5.5 Dust – a planning condition may require the damping down of dusty activities.

5.6 Traffic – construction of a basement normally requires the removal of large quantities of soil. Careful traffic management is required to minimize disruption both to the public road and the pavement. In addition, a percentage of the excavated material is likely to be made ground, and may be contaminated. Such material must be adequately disposed of. Front courtyard is to be used for the temporary storage of excavated material in skips, subject to agreement with the other residents, and in order to avoid taking temporary possession of the pavement.

5.7 Archaeology - The site is located in Belsize Park area and the construction of the basement will involve the removal of shallow strata possibly containing archaeological material. Planning conditions may require archaeological assessment of the site.

5.8 Energy Use and CO2 Emissions - Great care must be taken in reducing the impact of buildings on the environment. It is considered that 25% of CO2 emissions come from the construction industry including the emissions associated with manufacturing materials, transport, construction and demolition of structures. Generally the excavation of basements requires moving large quantities of material, and installation of concrete. However, over the long term, basements are generally better insulated by the surrounding earth, providing savings in heating and cooling costs. In addition, above standard insulation, and low energy lighting should be installed to the building to reduce long term impact. To reduce the use of artificial lighting and mechanical ventilation, light wells are to be provided to bring natural light into the bedrooms. The contractor should also consider using recycled materials in the construction of this basement.

5.9 Permanent Impact - No permanent negative impact is to be expected of this development. The proposed basement will provide additional floor area within the developed land in line with current development policies. The proposed development will and the proposed lightwells will have very limited impact on the exterior appearance of the building, and as such would not have any negative impact on the street-scene.

6.0 HEALTH AND SAFETY ISSUES

6.1 The construction of basements is generally hazardous. A detailed health and safety plan must be prepared by a competent contractor and approved by the local authority prior to the commencement of work. It must include at least the following issues.

6.2 Access on site – Safe and adequate access must be provided to all parts of the site, and site must be kept tidy. All edges where people could fall from height must be provided with double guard rails and all holes must be safely covered. Adequate lighting must be provided, as this is a below-ground development.

6.3 Adequate welfare facilities must be provided and kept well maintained and clean. A section of the flat is to be allocated for welfare facilities. Welfare facilities are to include a site office, changing rooms, washing facilities, clothes storage, etc.

6.4 All temporary works must be carefully designed, constructed and inspected to ensure the stability of the structure during all stages of the construction. We believe that our preliminary design allows for this as described in previous chapters and as indicated in the attached drawings.

6.5 Excavations - Serious injury or even fatal injury could occur if a worker gets trapped in inadequately supported excavation as well as from falling objects and ingress of water/gases into excavation. Adequate safety procedures must be in place at all times. When the excavated material is likely to be sands, sheeting must be provided and adequately propped. Barriers must be provided at the edge of the excavation to prevent people falling in, and ladders provided for access. Materials, spoil and plant must be stored away from the edge of the excavation to reduce the chance of a collapse.

6.6 A detailed method statement and sequence of works must be prepared and approved in connection with the proposed underpinning works. Please see previous sections explaining the steps required to ensure the stability of the structures. All specified temporary horizontal and vertical propping must be provided as per the design. In addition, adequate emergency procedures need to be developed and put in place.

6.7 There is a risk associated with working in the vicinity of underground services to include damage to existing services, electrocution, gas, explosion/fire, release of sewer gases and contamination of water supplies. A utilities search must be performed, and all public utilities must be located and clearly marked on-site. The stability of these services must be maintained throughout the Works. In addition, private services must be identified and adequately marked, isolated and secured during the construction.

6.8 Standard procedures should be utilized for safe loading and unloading of goods and staff must be adequately trained for safe manual handling of materials and goods. In addition, staff should be trained to safely use and maintain tools, hoists and other machinery. Dangerous parts must guarded, eg gears, chain drives, projecting engine shafts. Adequate over-night storage must be provided to prevent theft and damage.

6.9 Loading and unloading goods and traffic management – There is a risk to both the workers and general public/pedestrians associated with loading and unloading goods. An exclusion zone must be set-up and a method of loading/unloading must be prepared. Adequate safety footwear and gloves must be utilized. Traffic management measures have been addressed in the previous chapters.

6.10 Emissions and Hazardous substances – The site must be kept well ventilated to prevent the build-up of hazardous gasses. Provide a high capacity ventilation system with backup. Finally, the soil should be inspected for the presence of radon, with measures taken to mitigate the risk if radon has been detected. Other hazardous substances such as asbestos, lead, solvents, paints, cement and silica dust must be identified at an early stage, and these should be adequately cared for and used in a safe manner.

6.11 Fire – To prevent burns or smoke inhalation injuries, adequate procedures must be put into place. Reduce the quantity of flammable materials, liquids and gases kept on site to a minimum, and store these properly. Flammable gas cylinders must be properly maintained, and always be returned to a ventilated store at the end of the shift and valves checked. Smoking and other ignition sources should be banned in areas where gases or flammable liquids are stored or used. Suitable fire extinguishers and fire blankets must be easily accessible and properly maintained.

6.12 Noise – some aspects of noise have already been dealt in the previous chapter. In addition to protecting the neighbours from excessive noise, further measures are required to protect the workers on site. All sources of noise should be identified and assessed. Workers using such plant should be trained and provided with ear protection. Investigate measures of reducing the amount of noise produced by existing plant, or consider replacing noisy plant.

6.13 Site must be properly fenced off and secured to prevent injury to general public. The skips must be lit. When the work has stopped for a day, the site must be secured, all ladders and access must be removed, the plant must be immobilised, and all dangerous materials must be safely stored.

6.14 A health and safety plan must describe the appropriate procedures for emergencies and for reporting accidents. All staff must be trained to know their role in the event of emergency. First aid provisions should be good enough. Suitable persons should be employed to work on site and must possess adequate training and experience for the job, and all staff and subcontractors should receive adequate health and safety training and be provided with the required safety equipment.

6.15 The information in this chapter is based on the "The absolutely essential health and safety toolkit for the smaller construction contractor"" published by HSE

7.0 CONTRACT STRATEGY

7.1 There are two options for the procurement and management of the project.

7.2 There is a clear difference in the skills and experience required of the contractor carrying out the basement construction compared to those needed for the general fit-out, superstructure and finishing works.

Option 1

7.3 The overall Contract Administrator would prepare a single contract specification. A standard RIBA JCT conditions of contract would be used. A main building contractor would be appointed following a competitive tender and he would be responsible for appointing and managing a specialist sub-contractor to carry out the basement groundworks.

Option 2

7.4 Two contract specifications would be prepared – one for the basement shell and one for the fitting out and superstructure works (to include alterations to existing building). Each contract would be tendered separately and managed sequentially. The basement contract could proceed before the other has been let (or even tendered). Appropriate JCT conditions of contract would be used, or, our preference, the Institution of Civil Engineers Minor Works Contract would be used for the structural basement works. The basement shell works would be performed first – when complete the groundworks contractor would leave site and the building works contractor would take over the site and complete his works. This allows for better cost-control of each contract. In addition, different phases of work require entirely different skills, and it may be prudent to hire specialist contractors for each phase of the works.

8.0 DISCUSSION

8.1 This Report is in Draft form and will be expanded as more information becomes available and the project brief is finalised once planning application has been obtained.

8.2 Our previous experience in the area as well as the preliminary trial pit inspection seems to indicate stiff clay subsoil down to a level below the proposed basement. A clay stratum is the preferred material for underpinning works as the cut face of the excavation will normally support itself long enough to allow the concrete works to be carried out and for the concrete to gain sufficient strength to retain the soil permanently.

8.3 It is our professional opinion that the formation of the basement can best be achieved by using traditional underpinning methods. Careful planning of the works is required to ensure that any necessary temporary props are in place as required. In addition, excavation must be carefully planned to ensure minimum disturbance.

8.4 If the proposed construction methodology and sequencing of works are carried out adequately, there is no risk to the stability of the adjacent properties, party walls or the boundary wall. The proposed works to 36 Courthope Road would not generate any movement in the structure of 34, 36 and 38 Courthope Road or other surrounding buildings and roads.

8.5 A full and detailed utilities search is required prior to commencement of any works. In addition, a detailed survey of the existing drainage runs within the site is required and all private services must be carefully identified and accommodated. Finally, further trial pitting is required to determine the depth and the formation of all existing footings, and to determine the ground water level.

8.6 It is necessary to provide adequate temporary supports to create the new structural openings at the rear of the property. Temporary pins are to be supported by acrows which are to rest onto new extension footings and may require temporary footings to be cast internally to provide adequate support.

8.7 Success will depend on proper planning and control of the construction process. We would recommend running the groundworks and building works contracts separately. We suggest that we should project manage the groundworks contract with assistance from an independent QS as necessary. We suggest the following timetable should be achievable:-

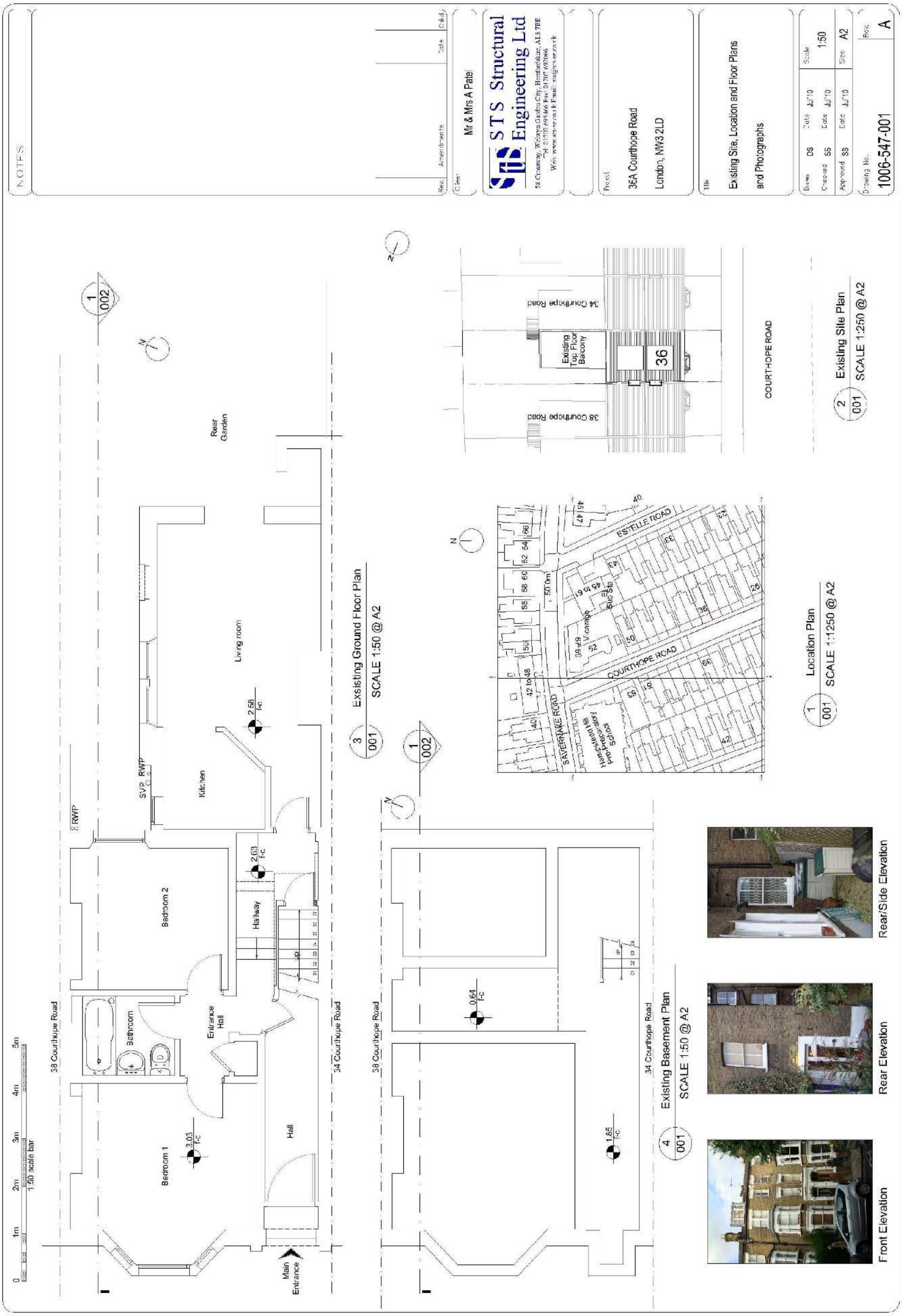
Further investigations / liaison with the local Authority re planning and working methods / start Party Wall procedures	4 to 6 weeks
Design to tender	2 to 3 weeks
Tender process	4 weeks
Finalise design, including submissions to Building Control	3 weeks but can overlap with site works
Groundworks package	7 weeks
Finishings package	3 weeks

8.8 The property has been inspected and considered in its present state and configuration as of July 2010.

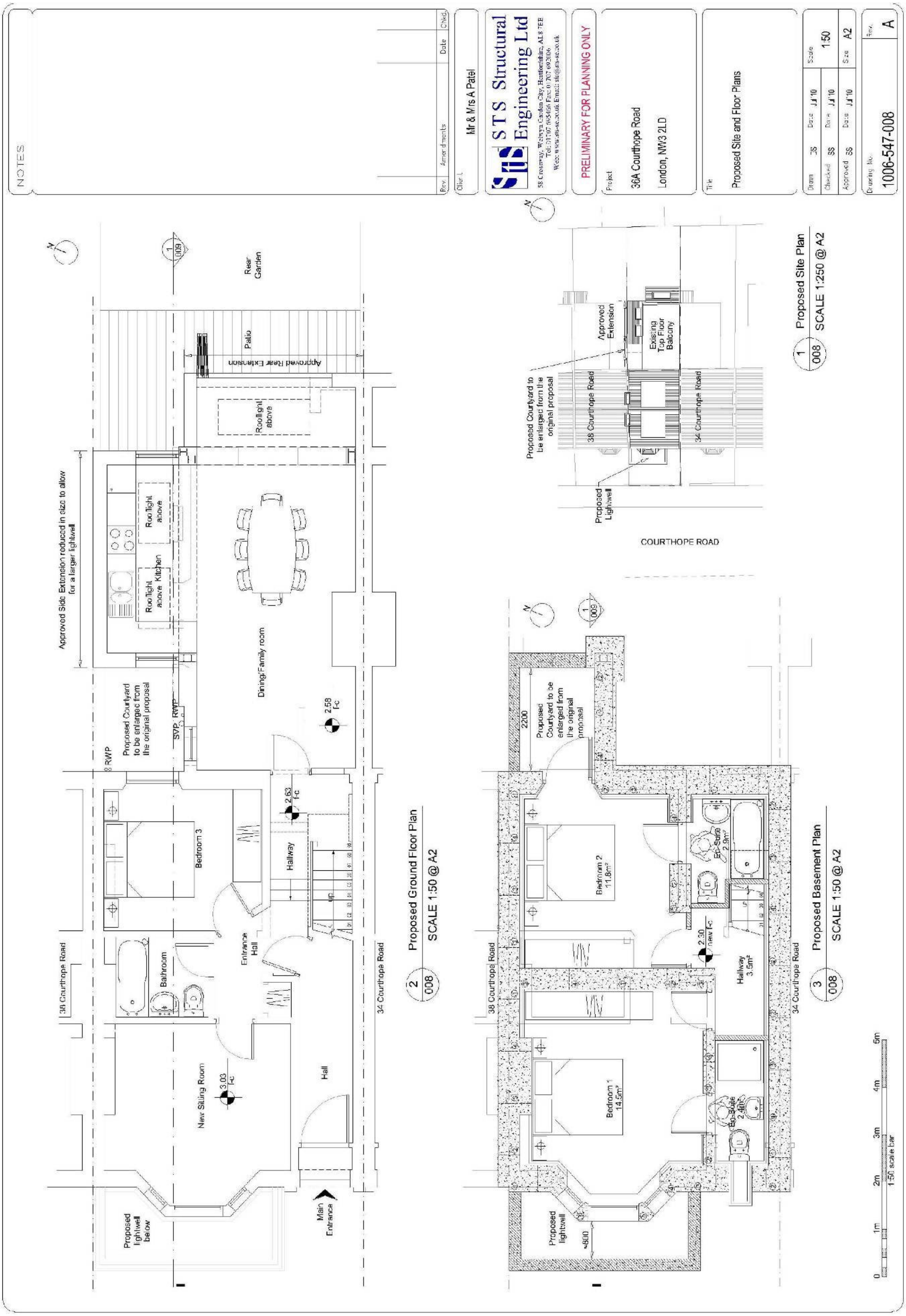
APPENDICES

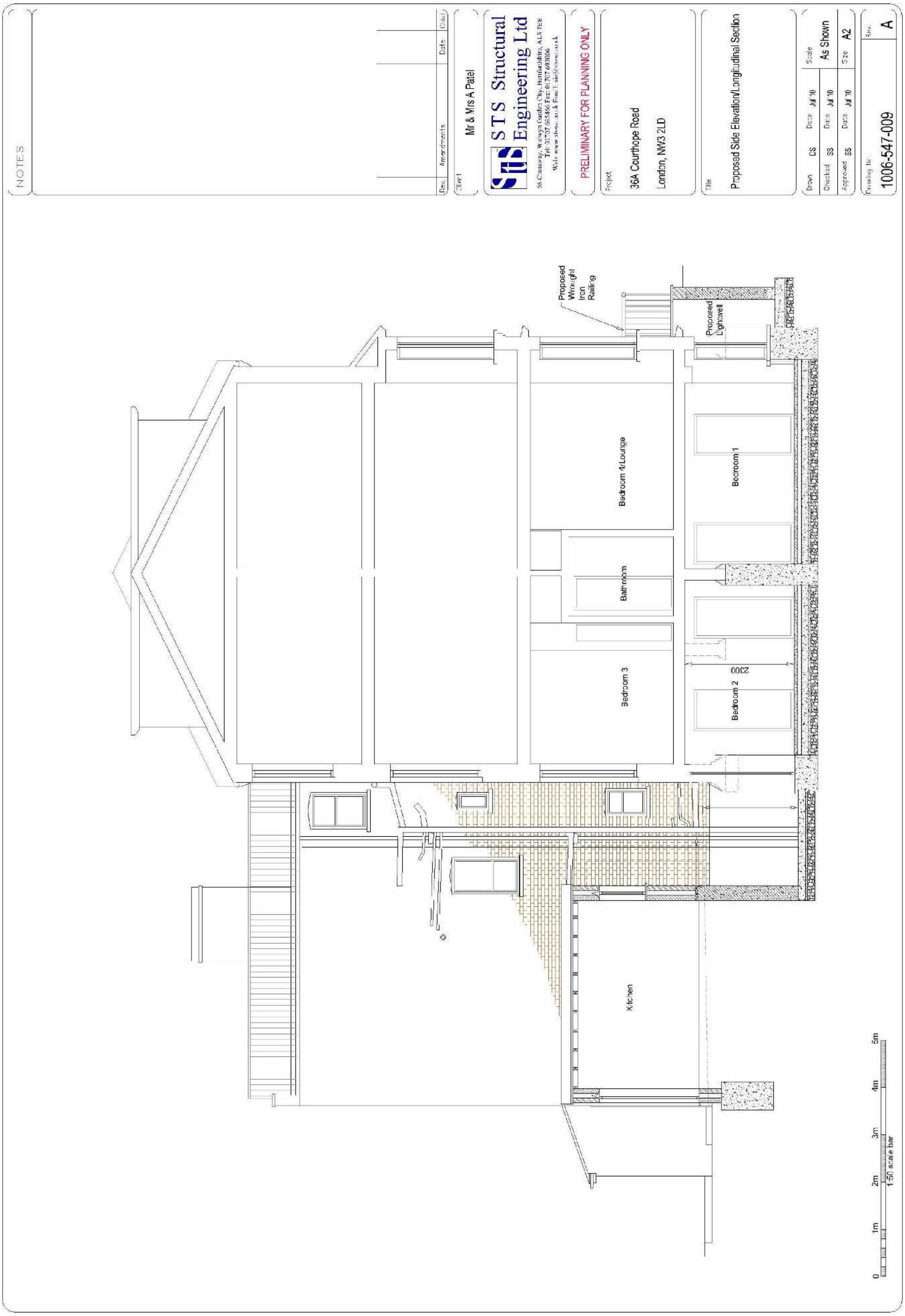
APPENDIX 1

A SELECTION OF THE ARCHITECTURAL PROPOSED DRAWINGS (REDUCED)


NOTES
Rev. Amendments Date Chk'd
Client
Mr & Mrs A Patel
STS Structural Engineering Ltd
Project
36A Courthope Road
London, NW3 2LD
Title
Existing Site, Location and Floor Plans
and Photographs
Drawn DS Date Jul'10
Checked SS Date Jul'10
Approved SS Date Jul'10
Scale 1:50
Size A2
Drawing No.
1006-547-001
Rev.
A
Existsing Ground Floor Plan
SCALE 1:50 @ A2
Existing Site Plan
SCALE 1:250 @ A2
Existing Top Floor Balcony
34 Courthope Road
38 Courthope Road
36
COURTHOPE ROAD
Location Plan
SCALE 1:1250 @ A2
ESTELLE ROAD
COURTHOPE ROAD
SAVERNAKE ROAD
Hampstead Hill Pre-Preparatory School
Vicarage
Existing Basement Plan
SCALE 1:50 @ A2
Rear Garden
Living room
Kitchen
Bedroom 2
Hallway
Bathroom
Entrance Hall
Hall
Bedroom 1
Main Entrance
1:50 scale bar
0 1m 2m 3m 4m 5m
Front Elevation
Rear Elevation
Rear/Side Elevation


NOTES
Rev. Amendments Date Chk'd
Client
Mr & Mrs A Patel
STS Structural Engineering Ltd
Project
36A Courthope Road
London, NW3 2LD
Title
Existing Front and Rear Elevations
Drawn DS Date Jul'10
Checked SS Date Jul'10
Approved SS Date Jul'10
Scale 1:50
Size A2
Drawing No. 1006-547-003
Rev. A
34 C.R.
36 Courthope Road
38 C.R.
Existing Rear Elevation
SCALE 1:50 @ A2
2
003
34 Courthope Road
36 Courthope Road
38 Courthope Road
Existing Front Elevation
SCALE 1:50 @ A2
1
003
0 1m 2m 3m 4m 5m
1:50 scale bar


NOTES
Rev. Amendments Date Chkd.
Client
Mr & Mrs A Patel
STS Structural Engineering Ltd
PRELIMINARY FOR PLANNING ONLY
Project
36A Courthope Road
London, NW3 2LD
Title
Proposed Site and Floor Plans
Scale 1:50
Size A2
Drawing No.
1006-547-008
Rev. A
Proposed Site Plan
SCALE 1:250 @ A2
Proposed Ground Floor Plan
SCALE 1:50 @ A2
Proposed Basement Plan
SCALE 1:50 @ A2
COURTHOPE ROAD
38 Courthope Road
34 Courthope Road
Rear Garden
Patio
Approved Rear Extension
Rooflight above
Dining/Family room
Kitchen
Approved Side Extension reduced in size to allow for a larger lightwell
Proposed Courtyard to be enlarged from the original proposal
Bedroom 3
Hallway
Entrance Hall
Bathroom
New Sitting Room
Hall
Main Entrance
Proposed lightwell below
Bedroom 2 11.8m²
Bedroom 1 14.5m²
En-Suite
Hallway 3.5m²
Proposed lightwell
Approved Extension
Existing Top Floor Balcony
Proposed Lightwell
1:50 scale bar


NOTES
Rev.
Amendments
Date
Chkd
Client
Mr & Mrs A Patel
STS Structural Engineering Ltd
PRELIMINARY FOR PLANNING ONLY
Project
36A Courthope Road
London, NW3 2LD
Title
Proposed Side Elevation/Longitudinal Section
Drawn CS Date Jul 10
Checked SS Date Jul 10
Approved SS Date Jul 10
Scale
As Shown
Size A2
Drawing No.
1006-547-009
Rev.
A
Proposed Wrought Iron Railing
Proposed Lightwell
Bedroom 4/Lounge
Bathroom
Bedroom 3
Bedroom 1
Bedroom 2
2300
Kitchen
0 1m 2m 3m 4m 5m
1:50 scale bar


NOTES
Mr & Mrs A Patel
S T S Structural Engineering Ltd
PRELIMINARY FOR PLANNING ONLY
36A Courthope Road
London, NW3 2LD
Proposed Front and Rear Elevations
Drawn DS Date Jul 10
Checked SS Date Jul 10
Approved SS Date Jul 10
Scale 1:50
Size A2
Drawing No. 1006-547-010
Rev. A
Proposed Rear Elevation
SCALE 1:50 @ A2
Approved Side Extension
Approved Rear Extension
Outline of the existing storage shown dotted
Fully glazed patio door in the basement (behind)
36 Courthope Road
Proposed Front Elevation
SCALE 1:50 @ A2
34 Courthope Road
38 Courthope Road
Proposed Lightwell
Proposed Wrought Iron Railing
Existing Brickwork front boundary shown dotted
Proposed Bay Windows to match existing
Level of the existing footing shown dotted
1:50 scale bar

APPENDIX 2

PHOTOGRAPHS

Photo No.	1	**Date:**	July 2010
Description:	Front Elevation of the Property		

Photo No.	2	**Date:**	July 2010
Description:	Partial Photograph of the Existing Rear Elevation		

Photo No.	3	**Date:**	July 2010
Description:	Internal Photograph of the Existing Cellar		

Photo No.	4	**Date:**	July 2010
Description:	Photograph of the existing floor void		

APPENDIX 3

LITERATURE ON SPECIALIST TECHNIQUES AND TANKING SYSTEMS

3.1 Underpinning general information:

In construction, **underpinning** is the process of strengthening and stabilising the foundation of an existing building or other structure. Underpinning may be necessary for a variety of reasons:

- The original foundation is simply not strong or stable enough, e.g. due to decay of wooden piles under the foundation.
- The usage of the structure has changed.
- The properties of the soil supporting the foundation may have changed (possibly through subsidence) or were mischaracterized during planning.
- The construction of nearby structures necessitates the excavation of soil supporting existing foundations.
- It is more economical, due to land price or otherwise, to work on the present structure's foundation than to build a new one.

Underpinning is accomplished by extending the foundation in depth or in breadth so it either rests on a stronger soil stratum or distributes its load across a greater area. Use of micropiles and jet grouting are common methods in underpinning. An alternative to underpinning is the strengthening of the soil by the introduction of a grout. All of these processes are generally expensive and elaborate.

-Underpinning bays are not to exceed 1.2m in length. Adequate support for at least two thirds of the length of the wall is to be maintained at all times. Sections of the work in progress at any one time are to be separated by a distance of at least 2.4m

-Excavation for underpinning shall be taken down to a level and stratum agreed with the engineer and local authority but in no case less than indicated on the drawings.

-The undersides of the existing footings are to be cleaned and hacked free of any dirt, soil or loose material before final pinning up.

-Mass concrete to underpinning to be 20n/mm mix (20mm maximum aggregate) using sulphate resisting portland cement.

-Drypack to be carried out with semi-dry fine concrete consisting of one part rapid hardening portland cement to one part fine aggregate from 10mm size down to fine sand.It is to be well rammed in, as soon as possible, after the foundation has set hard.

-Excavation to any section of underpinning shall not be commenced until at least 48 hours after completion of any adjacent bays.

-For each set of pins the contractor shall take a set of three test cubes in accordance with BS1881 and arrange to test one at 7 days. The 7 day cube shall attain a minimum crushing strength of 75% of the 28 day characteristic strength of the concrete. If this requirement is not met a second cube shall be crushed and the results compared. If this requirement is not met the contractor and engineer shall agree a course of action.

n.b. extracts taken from Wikipedia.

3.2 Newton drained tanking systems:

Article taken from the manufacturers web-site:

Below Ground Solutions:

Why Should I use Newton Systems in my Below Ground Structure?

When waterproofing structures below the ground, many options are available to clients and specifiers. Traditionally, New Build waterproofing has been performed externally using a water pressure resisting “tanking” membrane. These need to be fitted perfectly without defects for the installation to be effective. The landmark judgement 'Outwing V Thomas Weatherald' found that it is not feasible to expect the workmanship to be 100% defect free, meaning that that these tanking methods should have the water completely removed to be considered safe, which in effect is downgrading the system to just a damp proofing medium.

Those still wishing to use this method of waterproofing should consider the consequences of large scale water removal from what could be a significant area: calculation of the volumes to be removed is difficult, and the potential for surcharges to the storm water drainage should be anticipated. The risk to adjacent structures of removal of soil fines from the ground should also be considered.

If not dissuaded by the above, the reality of working on a building site makes external tanking highly impractical in practice. Many “tanking” systems require the structure to be “dry” for an adequate bond to be achieved and for the site conditions to be clean and the site accessible. Tanking needs to be installed to all external surfaces, including under the new concrete raft. Often installed by low quality site labour, the membrane is laid before the placing of the concrete raft, meaning the membrane is being walked over during this process.

The concrete is then pokered to remove air pockets, and often the poker will pierce the membrane. Laps are left ready for lapping to the wall membrane which cannot be fitted as yet as the walls have not being constructed. This process, often carried out in wet and muddy conditions required form-work to be fabricated and the concrete to be poured with the workers treading on the membrane laps for what maybe a period of weeks.

After all this abuse, the laps are then expected to be adhered neatly and cleanly to the membrane now stuck to the wall. The chances of the laps being dry and undamaged enough to effect the seal is probably zero, and unfortunately, these defective joints are at the point where the water pressure is highest. It is not surprising that we at John Newton put right hundreds of failed systems of this type every year!

Newton System 500

Newton 500 System is the most advanced cavity drainage membrane system available within the UK today. This system comprises a variety of high quality High Density Polyethylene (HDPE) membranes and associated drainage systems giving the specifier the safest method of new build waterproofing design.

“Newton 500 is the waterproofing professionals 'membrane of choice'”

Newton 508 HDPE membrane is the industry standard for all forms of vertical applications. Applied internally and held in place with the unique Newton MultiPlug, Newton 508 membrane creates an 8mm air void within the structure so that water entering the structure is depressurised allowing it to fall to the Basedrain drainage channel sited at the wall/floor junction. The inline profile of the 8mm studded membrane allows for professional water-proofers to install the membrane to “level” and the HDPE material allows the installer to easily and efficiently fold, and form the membrane around columns/footings. This is because the material has a memory and does not spring back into the original form.

Damp Proofing:

When choosing to Damp Proof a property many questions need to be addressed to assess the right solution for your structure.

- What is my structure made from?
- Do I have a damp proof course already present?
- Do I have high ground levels against the property?
- Do I have rising damp?
- Do I have penetrating damp?

The Problem – Why Do I have to damp proof my property?

Rising and penetrating damp, and discolouration caused by oils, salts, acids etc. are problems continually encountered in many buildings. Wind driven rain can enter exposed properties leading to dampness internally. Even slight damp penetration will cause discolouration to surface plaster, decorations and even affect the buildings structural integrity. This is not acceptable in living or storage accommodation, and a permanent solution must be found.

The Solution

NEWLATH 2000 and Newton 503 Mesh provide a firm key and impermeable barrier on any damp or deteriorating surface where direct bonding is not possible. Even poor and random substrates can easily receive these cavity drain membranes when using the COB PLUG that expands to gain a strong fixing.

‘Quick, clean and proven to work.’

NEWLATH 2000 and Newton 503 Mesh presents a physical barrier between the old surface and the new internal finish. It can be punctured when wall fixings are needed. Positive internal air pressure ‘pushes’ vapour, suspended within the air gap created by the studded membrane, through the external wall and out of the property. Quick, clean and proven to work. NEWLATH 2000 and Newton 503 Mesh truly are the modern, cost effective, damp-proofing solution.

Damp Proofing Membrane Applications

Newlath 2000 and Newton 503 Mesh have been extensively used within listed buildings throughout the UK and Ireland. Our membranes have been trusted to deal with damp in buildings since the late 1930’s. Air gap technology allows the structure to “breathe” and as such does not trap moisture within the walls of the property. In addition, the mechanical fixings used to secure our membranes can be removed if required making the system fully reversible. The ability to remove systems is a prerequisite from The National Heritage trust for dealing with listed properties.

Whether a building is listed or not our damp proof membranes offer superior protection against rising damp and water ingress acting a barrier to the penetration of damp spoiling interior finishes with mold, lime and salts. For Above Ground applications such as damp proofing

- a damp wall
- rising damp
- a gable end
- a barn conversion,
- timber frame building
- listed building

Cavity Membrane Vs Chemical Injection and Spray Coatings

Chemical injection and sprayed coatings are commonly used to solve this problem; however they are dependant upon the substrate being suitable. In many older buildings where cracked or varied materials are commonly found, these forms of damp-proofing are just not applicable. Even after injection of a damp-proof course, the old plaster should be removed because of salt contamination and the substrate preparation ready or the new plaster can be damaging and expensive.

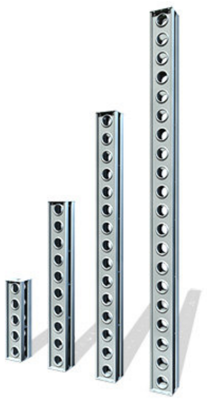
3.3 Mabey Props General Information

Props

Based on the high-strength System 160 Soldier, or an equivalent tubular section, **Mabey Push-Pull Props** are the ideal solution for high load vertical, horizontal and raking prop applications.

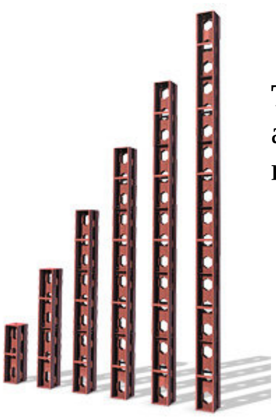
Adjustment is at the end unit, which means that the soldier always remains in the strongest orientation and allows ease of cross-bracing in multiple prop applications Three types of end detail are available to connect to:

• Mabey System 160 Soldiers
• Concrete, Timber etc. - direct bolting
• Mabey MkII Solders



System 160 soldier: The high-strength system for the most demanding formwork jobs. Higher load capacities throughout the system drastically reduce the number of components required, consequently reducing assembly and striking times. This can significantly increase the number of pours possible in a week and reduce overall job time to a minimum.

- A full range of accessories allows greater versatility in applications
- The 8 standard lengths available can closely match your requirements
- **System 160** strength characteristics enable greater spacing of cantilevered members whilst keeping deflection to a minimum



The MkII Soldier is a robust soldier which is available for use on all formwork schemes where the high strength of System 160 is not required.

Bracing Struts

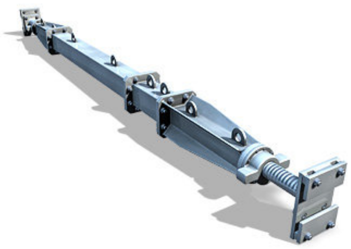
Bracing Struts will be required when the load imposed by the ground exceeds the load capacity of the leg for the full excavation length.

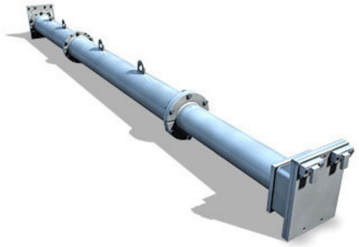
This can occur either for very large excavations or where higher loads are imposed. In all cases, **Mabey Hire** engineering must be consulted for advice and calculations if necessary.

Mabey Hire offers bracing struts of several types ranging in length up to 20m and working compression loads of up to 175 tonnes.

The mechanical struts retain the loads by mechanical methods so that the risk of in-service hydraulic failure is eliminated.

The prop bodies of the heavier mechanical struts are of square cross section to reduce the risks of rolling sideways during transportation, stacking and assembly.





APPENDIX 4

STS LTD PRELIMINARY STRUCTURAL DRAWINGS