the basement design studio

24 Eton Avenue, London, NW3 3HL

Method Statement – New Basement Construction

Date Issued : 7th July 2011

Revision :

Issued By : Terry Foulsham

Checked By :

Introduction

- This method statement should be read in conjunction with the architectural scheme Dwg. No.'s 11/021-01A (sheets 1-3) and 02B (sheets 1-5).
- This method statement should be read in conjunction with the structural engineering Dwg. No.'s upon issue.
- Please also refer to the attached LBC underpinning section drawing Sheet 4 (Reinforced Concrete Underpinning). This sketch details the underpinning construction method we are likely to adopt, based on the known ground conditions at the property consisting made ground over dry, stiff clay to depth (Refer to section B below).
- Please also refer to the attached hoarding and conveyor layout sketch (Sheet 5), which details a typical compound layout over the footpath and the highway.
- The key stages are as follows:-
    - Establish access, hoarding and conveyor
    - Investigatory works
    - Reinforced concrete underpinning
    - Construction of basement extension and roof slab
    - Steel frame installation
    - Excavation, drainage and basement slab construction
    - Internal waterproofing membrane and screed

Temporary Support to Excavated Faces

- Generally in all stages of the works excavations in clays, sands, gravels or other non-cohesive soils may on occasion require temporary shoring. At the discretion of The London Basement Company this may be implemented, depending on observed ground conditions and the surrounding structural environment. Please refer to the attached diagrams, which indicate the temporary works we may adopt during the underpinning works on this project.

A. Establish access, hoarding and conveyor

- The hoarding and conveyor will be positioned at the front of the property, which will be subject to any restrictions imposed by the local governing authority. The layout will be similar to the attached hoarding and conveyor layout sketch, which details a typical conveyor setup over the highway and footpath.
- Carefully protect and/or remove any internal or external fixtures and fittings affected by the works.
- Erect plywood hoarding with vertical standards, anchored to the ground. The hoarding will be fully secure with a lockable door for access.
- Provide protection to public where conveyor extends over footpath. Depending on the requirements of the local governing authority, construct a plywood bulkhead onto the pavement. Hoarding to have a plywood roof covering, night-lights and safety notices.
- Install conveyor at basement level. Ensure that the conveyor is adequately supported and secured to the hoarding using a temporary scaffold structure.
- Install temporary electrical and water supplies from Clients permanent connections.

B. Investigatory works

- Prior to any construction the London Basement Company will undertake the necessary trial pit investigation work to determine the foundation type, width and depth. Information will be reported to the structural engineer and incorporated into the detailed design.
- Based on our knowledge of working in the area and site investigations carried out locally, the subsoil is assumed to consist dry, stiff to very stiff London Clay to depth.
- For these ground conditions, it is likely that we will adopt the temporary works measures as detailed in the attached Sheet 4.
- Prior to any construction the London Basement Company will undertake the necessary trial pit investigation work to determine the foundation type, width and depth. Any discrepancies will be reported to the structural engineer in order that the detailed design can be modified.
- A desk study will also be undertaken to research any previous works to the property, or indeed neighbouring properties, which may have an impact of the design and construction of the basement works.
- Prior to installation of new structural beams in the superstructure, London Basement Company may undertake the local exploration of specific areas in the superstructure. This will confirm the exact form and location of the temporary works that are required. The permanent structural work can then be undertaken while ensuring that the full integrity of the structure above is maintained.

C. Reinforced concrete underpinning

- This stage consists the construction of the reinforced concrete underpinning.
- The sequence of construction of the underpinning will be determined by The London Basement Company, depending on the structural environment and access constraints.
- The sacrificial trench sheets (if required) are installed at the back of the excavation. The method adopted to prevent localised collapse of the soil is to install these progressively one at a time. The trench sheets are held in place with acrows, until such time as the full underpinning excavation is sheeted.
- Once the toe section is cast, the lower level propping to the trench sheets can be removed, prior to casting the stem section. 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.
- The access trench is first excavated, directly underneath the wall to be underpinned. The length of any base is individually assessed on site with due regard to the type and condition of the foundation, and structural geometry above. The maximum length of any underpinning base will be 1000mm.
- Break off projecting brick or concrete footing back to internal face of brick wall. Excavate using hand and compressed air tools removing spoil until the design depth is reached, and removed to muck away conveyor.
- Soils, where unstable in the temporary condition, will be shored. For clays or dense sands exhibiting effective cohesion, shoring may not be implemented. Shoring system design will be undertaken by London Basement if required.
- Once the excavation is completed to the design depth and width. The stratum at the proposed founding depth is confirmed as being appropriate by our engineers.
- The design steel reinforcement will be fixed in the toe section of the underpinning base. This will be checked by the engineer and building control inspector prior to concreting.
- Following construction of the toe, the design steel reinforcement will then be fixed in the stem (Or wall) section. This will be checked by the engineer and building control inspector prior to concreting.
- A single sided shutter is then erected, and concrete poured to form the underpinning base up to a maximum of 100mm below the underside of the existing foundation.
- After 24 hours the temporary wall shutters are removed. The void between the top of the underpin base and underside of the existing foundation will then be drypacked with a mixture of sharp sand and cement (Ratio 3:1 sharp sand:cement).
- A further 24 hours is allowed before adjacent sections can be excavated.

- Construction joints, if required, are formed using a suitable shear key or joggle joint. In exceptional circumstances, dowel bars are incorporated. Typically these are post drilled and resin fixed with specification as per structural design.
- A record will be kept of the sequence of construction, which will be in strict accordance with recognised industry procedures. The as-built records will be updated as necessary and issued to involved parties during the works.

D. Construction of basement extension and roof slab

- The reinforced concrete retaining walls to the extension area of the property will be constructed in three distinct stages.
- **Stage 1** - Firstly, the upper section of retaining wall stem will be excavated. The excavation will be carried out on a hit and miss basis along the line of the new basement perimeter wall. As the excavation progresses, suitable sheet piling will be installed with lateral bracing, to ensure that all sides of the excavation are fully supported. This will also ensure that the surrounding property boundaries are protected at all times, and structural integrity maintained. At no time will more than 1.2m length of excavation be unsupported, prior to installing temporary lateral shoring.
- Once the excavation is complete to a depth of approximately 1.5m, the upper section of steel reinforcement to the stem can be fixed and concrete poured. Continuity reinforcement will be placed so as to connect into the lower part of the stem (Yet to be constructed in "Stage 3").
- **Stage 2** - Secondly, once the entire upper section of retaining wall is cast as per the layouts, the lower toe base and remaining stem section can be cast.
- The access trench is first excavated, directly underneath the section of "upper stem" to be underpinned. The length of any base is individually assessed on site with due regard to the type and condition of the foundation, and structural geometry above. The maximum length of any underpinning base will be 1200mm.
- The ground will then be excavated removing spoil until the design depth is reached, and removed to the muck away conveyor. Soils, where unstable in the temporary condition, will be shored with sheet piles and lateral props.
- Once the excavation is completed to the design depth and width. The stratum at the proposed founding depth is confirmed as being appropriate by our engineers.
- The design steel reinforcement will be fixed in the toe section of the retaining wall base. This will be checked by the engineer and building control inspector prior to concreting.
- **Stage 3** – Thirdly, following construction of the toe, the design steel reinforcement will be fixed in the stem (Or upper wall) section. This will be checked by the engineer prior to concreting. The lower stem reinforcement will connect with the upper section of stem as cast in "Stage 1" above.

- A single sided shutter is then erected, and concrete poured to form the completed stem. After 24 hours the temporary wall shutters are removed. A further 24 hours is allowed before adjacent sections can be excavated.
- A record will be kept of the exact sequence of construction, which will be in strict accordance with the recognised industry procedures. The as-built records will be updated as necessary and issued to involved parties during the course of the works.
- Once the walls have been constructed and following an adequate curing period, it will then be possible to commence work to the RC ground floor suspended slab. Suitable falsework decks will be erected to allow for the design steel reinforcement to be fixed in the lid section. Continuity reinforcement will be placed as per the detailed design to connect the reinforced concrete lid to the perimeter walls. This will be checked by the engineer and building control inspector prior to concreting.

E. Steel frame installation

- The new steel frame is to be installed to provide the new openings as per the architectural layouts. The frame will consist a system of steel beams and columns that will bear at the new basement level.
- The new frame will be installed in a sequence to be determined by the London Basement Company, in conjunction with the district surveyor.
- Once full internal investigation of the property has been concluded, LBC will carry out a temporary works design for the steel beam installation.
- Temporary works design will be undertaken once the full extent of the structural design is known.

Supporting existing timber floors above basement excavation:

- The timber floor will remain in situ, and be supported by a series of steel beams that will support the floors, to provide the open areas in the basement.
- Position 100x100mm temporary timber beam lightly packed to underside of joists either side of existing sleeper wall and support with vertical acrow props @ 750 centres. Remove sleeper walls and insert steel beam as a replacement. Beams to bear at masonry walls onto concrete padstones (refer to Structural Engineer's details for padstone & beam sizes) Dismantle props and remove timber plates.

Supporting existing solid concrete floors above basement excavation:

- The support of the existing concrete floor will be undertaken in conjunction with the underpinning process. Two opposite pins are constructed and allowed to cure as described elsewhere. The pins will project proud of the above existing perimeter walls by approx 100mm, this will allow bearing for the steel joists/ beams spanning across & supporting the area of solid floor above. The area of solid floor exposed will be the approx width of the pin and generally accepted to be self-supporting during this process. However if the underside is found to be in poor shape then temporary boarding and props are to be introduced. This process is to continue one pin width at a time. Dry pack as described elsewhere.

Supporting existing walls above basement excavation

- Where steel beams need to be installed directly under load bearing walls, temporary works will be required to enable this work. Support consists the installation of steel needle beams at high level, supported on vertical props, to enable safe removal of brickwork below, and installation of the new beams and columns.
- Once the props are fully tightened, the brickwork will be broken out carefully by hand. All necessary platforms and crash decks will be provided during this operation.

- Decking and support platforms to enable handling of steel beams and columns will be provided as required.
- Once full structural bearing is provided via beams and columns 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 drypacked with a 1:3 (cement: sharp sand) drypack layer, 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 drypacking, to ensure continuity of the structural fabric.

F. Excavation, drainage and basement slab construction

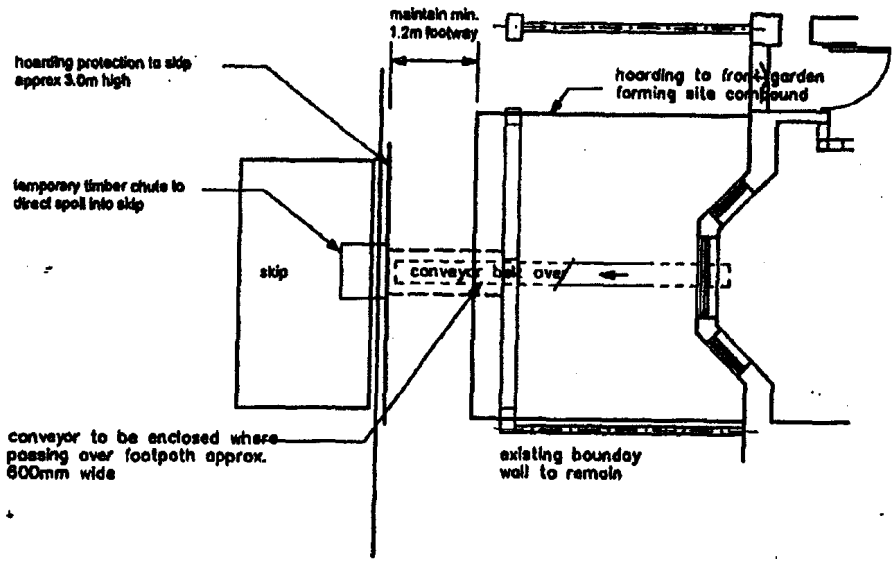
- Once the underpinning is complete to all walls, the bulk excavation can be completed.
- Depending on the structural design it may be a requirement to implement propping to resist sliding forces (As per structural engineering requirements) at the base of the underpins, prior to construction of the new basement slab, and to allow for excavation to formation level. Generally, the underpinning works

are completed around the perimeter walls, with the central soil mass (Dumpling) left intact as detailed on the attached sheets. This enables the earth mass to act as a firm support for the underpinning stem single sided shutters, and also to provide a prop force at the base of the pins.

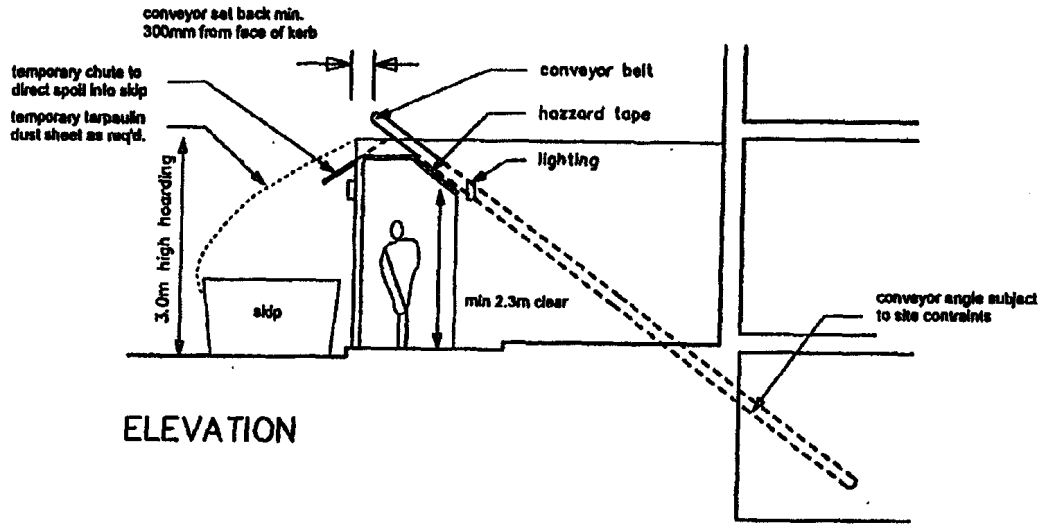
- The pump sump units and associated underground drainage will then be installed in conjunction with the mechanical and electrical details and architectural layouts.
- Once excavation to formation level has been completed, and the slab cast, any temporary shoring can be safely removed.
- The design steel reinforcement will then be fixed in the slab. This will be checked by the engineer and building control inspector prior to concreting.

G. Internal waterproofing membrane and screed

- Generally the waterproofing membrane will be in accordance with the attached sketch.
- Once the basement slab is complete, the DELTA internal waterproofing cavity membrane will be installed as per the architectural layouts and manufacturers technical specification.
- The floor finishes which may include insulation and under floor heating, can be laid as per the final architectural details.
- A cement and sand screed will be applied on the slab surface.
- This completes the structural work by the London Basement Company, in preparation for the fit out works.



PLAN AT PAVEMENT LEVEL



ELEVATION

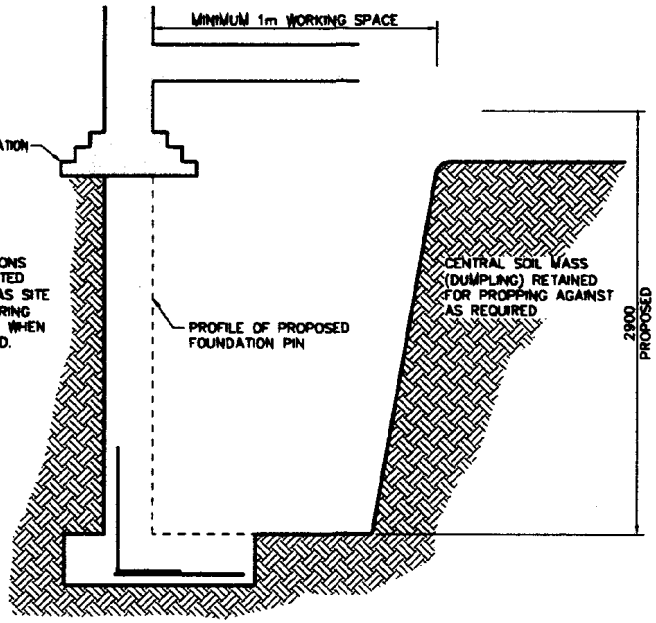
TYPICAL HOARDING & OVERHEAD CONVEYOR INSTALLATION

The London Basement Company
Innovation House
292 Worton Road, Isleworth. TW7 6EL
Tel. 020 8847 9449 Fax. 020 8380 4999
www.tlbc.co.uk

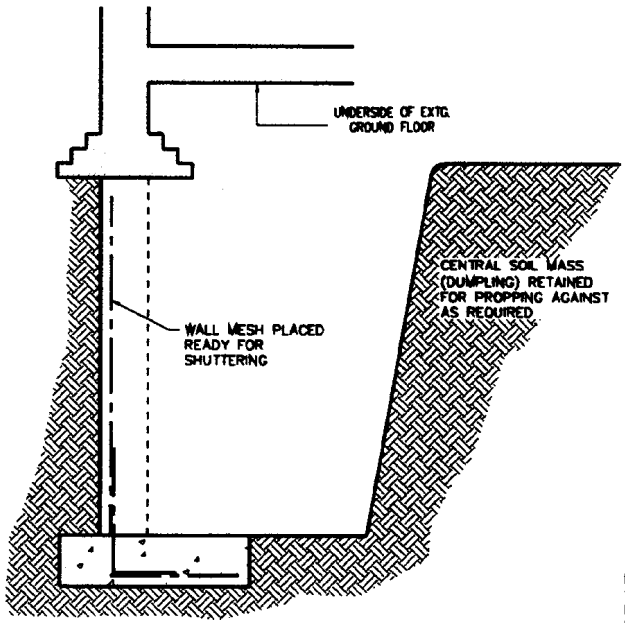
scale 1:100

the basement
design studio
Suite 17, Maple Court, Grove Park, White Waltham, SL6 3LW
tel. 01628-625055 www.basementdesignstudio.co.uk

SCALE : 1.50



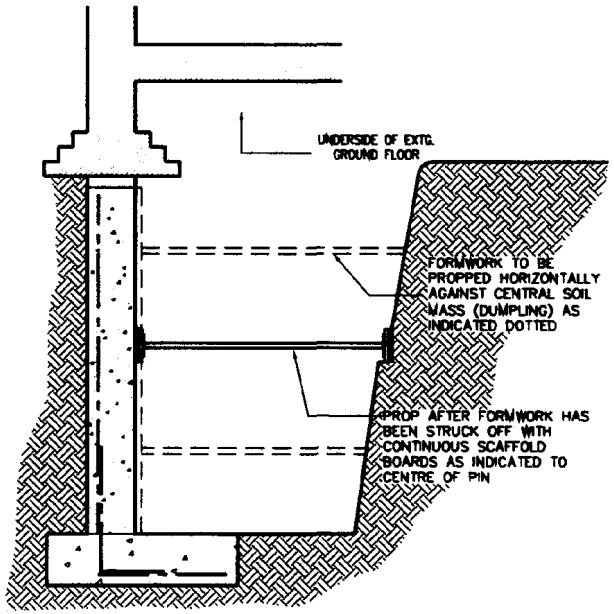
CLAY SOILS - STAGE 1



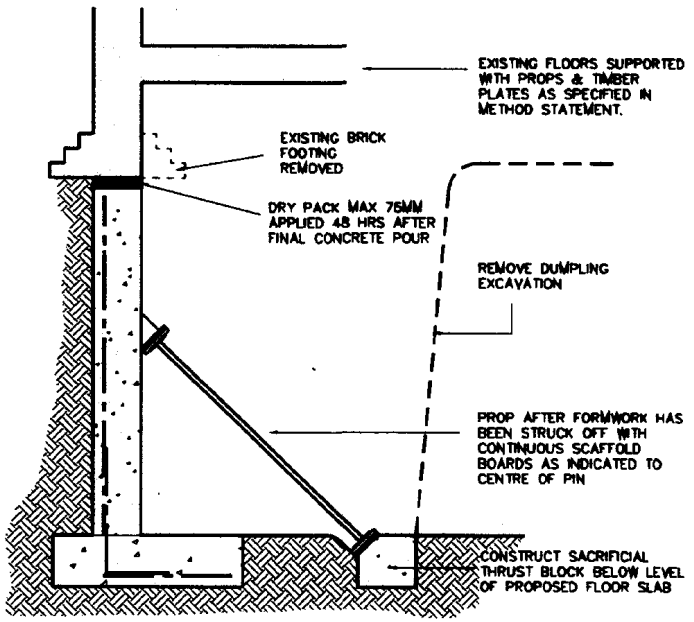
CLAY SOILS - STAGE 2

NOTE RE EXIST. FOUNDATIONS:
THE STAGING OF THE REMOVAL OF EXISTING FOUNDATIONS/CORBELS MAY VARY FROM THE DRAWING (FOLLOWING SITE INVESTIGATION) REFER TO METHOD STATEMENT.

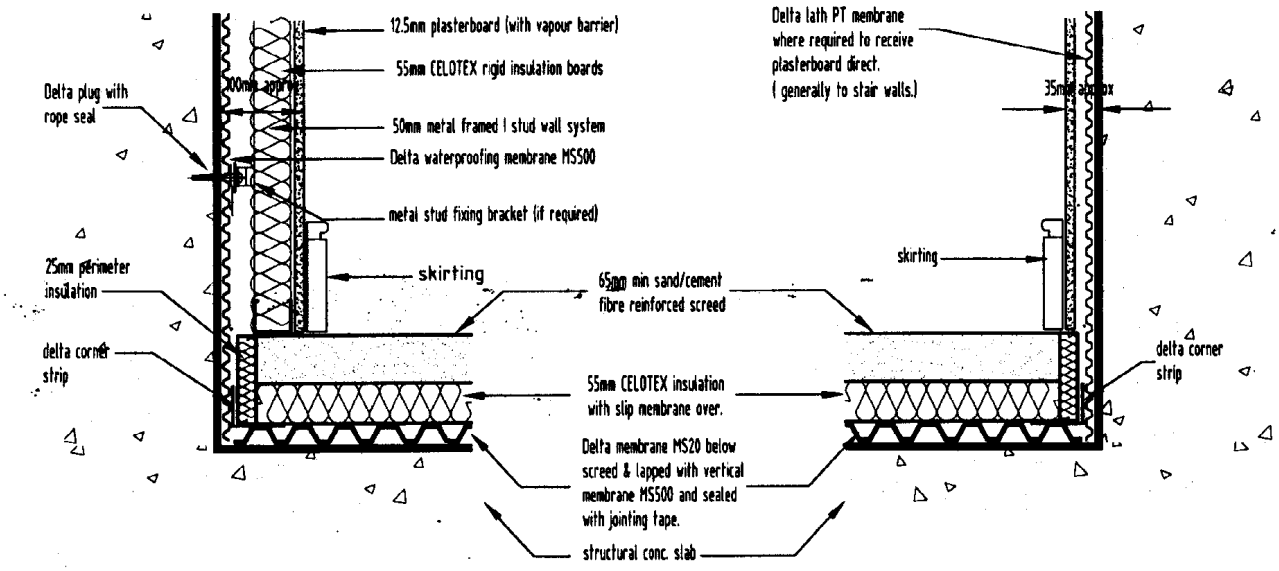
NOTE:
WHERE THE UNDERSIDE OF THE EXISTING FOOTINGS IS FOUND TO BE UNSTABLE IE. IN THE CASE OF LOOSE BRICKWORK AS OPPOSED TO CONCRETE FOUNDATIONS, THEN THE UNDERSIDE IS TO BE SUPPORTED AS NECESSARY WITH A SACRIFICIAL PROP IF REQUIRED.



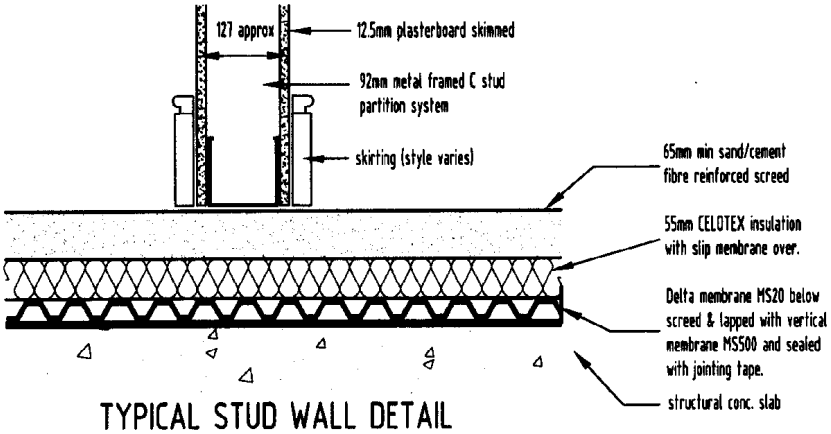
CLAY SOILS - STAGE 3



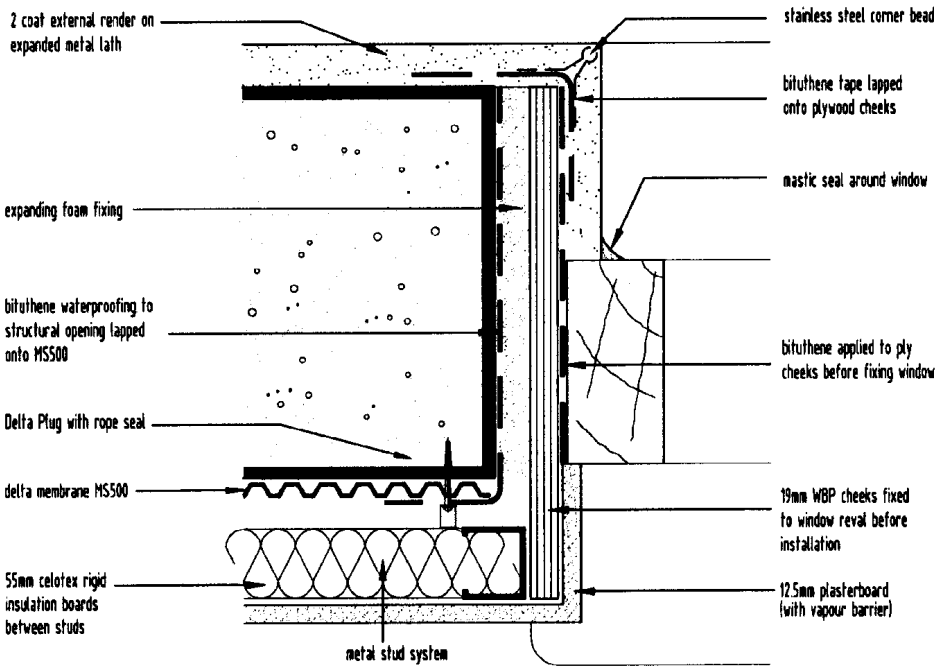
CLAY SOILS - STAGE 4



TYPICAL DETAIL FLOOR/ WALL JUNCTIONS



TYPICAL STUD WALL DETAIL



TYPICAL WINDOW JAMB DETAIL

REV.		
B	details updated	Sept 09
A	wall insulation revised	Sept 00

the london basement company	Project: Typical Waterproofing junction details	Client:	Scale: 1:10	Drawing Title: TYPICAL WALL/ FLOOR JUNCTION DETAILS
			Date: Sept. 00	Drawing No.: JD - 01 B