



CONSTRUCTION • WATERPROOFING • REPAIR

A1599 – 64 VICTORIA ROAD, LONDON, N22 7XF

METHOD STATEMENT

UNDERPINNING AND BASEMENT CONSTRUCTION **SEQUENCE REVISED**

General:

Abtech UK are commissioned to undertake the deepening of a single-story basement under at 64 Victoria Road, London, N22 7XF, along with new front light well in underpin sequence. All works will be completed in accordance with a site-specific safe system of work and Structural Engineers.

The basement is to be deepened but not itself underpinned as indicated in the engineers drawings.

When considering the stability of the retained loads during lightwell works excavation, we view the behavior of the construction as a sum of the completed structural elements. The following construction sequence is based upon a 3 dimension appraisal of the basement.

The underpinning and retaining walls will be installed in discrete 1.2m wide sections on a “hit and miss” sequence. Each excavation shall be shored in accordance with Abtech (UK) Ltd.’s temporary works design for excavated underpinning. The “L” shape of these bases is formed by part of the proposed basement slab being installed with the underpinning and retaining wall. This shape is designed to resist lateral forces from retained loads. The toe slab section resists sliding and overturning forces through surface friction with, as well as bearing on; the underlying soil.

It is our intention to install all the retaining wall sections in discrete excavations that shall be backfilled individually upon completion.

With this in mind; when the lightwell is excavated, we shall have a large reinforced concrete, L-shaped ring beam constituted from the individual underpinning/retaining wall and basement slab sections embedded into the undisturbed sub soils. Loadings will be shared and spread throughout this homogenous reinforced concrete structure. Retained loads will be stabilized from one side of the basement to the other and from the passive force provided by the in-situ soil against the embedded toe section.

It is our intention to excavate and install the lightwell slab between the opposite flanks of installed structure in discrete sections. This approach retains the passive force from the

embedded toes elsewhere and redistributes the retained loads through the completed underpinning/retaining walls without causing instability.

This excavation work will be completed using a mixture of <3t excavators and handheld electric breaking tools. Spoil shall be removed from site via grab lorry clearing a spoil bin located on the mews outside the site.

Spill kits, drip trays and fuel bunds shall be employed to control risk of contamination from plant and fuels.

In order to minimise the generation of dust during these works, a system of light watering will be employed to dampen down the existing structures and prevent dust becoming airborne where necessary.

Site specific health, safety and environmental documentation shall be prepared and adopted on site to include Noise and CoSHH procedures as well as task specific risk assessments and method statements.

Phase 1: Initial Excavation –

The site levels shall be reduced to a safe distance above the existing foundations.

Phase 2. Reinforced concrete retaining walls

1. Installation shall be undertaken in approximately 1.0-metre-wide bays and constructed in a “hit and miss two” fashion numbered 1, 2, 3, 4 & 5. (Construct all No.1 pins and dry pack, then move onto No. 2, then No. 3 etc.) These will be formed as underpins below the foundations of the perimeter walls.
 2. Using a small excavator (or similar) dig a discrete bay.
 3. Excavate stem section to depth specified by the Structural Engineer based upon the calculated bearing capacity of the soils at depth.
 4. The excavation shall be shored according to a temporary works design completed by Abtech (see Figure 1 for typical sequence of this work).
 5. The excavation shall be cleaned and cleared of any loose material using hand tools.
 6. Steel reinforcing bars shall be fixed to the toe section in accordance with the Structural Engineers design with continuity reinforcement projecting into stem.
 7. Concrete to be delivered to site and transported to the bases by wheelbarrow. The concrete will be placed to basement structural slab level and consolidated with electric vibrating pokers.
 8. Steel reinforcing bars shall be fixed for the stem section according to the Structural Engineers design and a timber shutter constructed as formwork.
 9. Concrete to be delivered to site and transported to the bases by wheelbarrow. The concrete will be placed to the level specified by the engineer or 75mm below the underside existing foundation above and consolidated with electric vibrating pokers.
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10. 24-hours after pouring an underpin, the shutter will be struck, and dry pack installed from the top of underpin to underside of existing footing.
11. Dry pack to consist of sharp sand, cement and anti-shrink additive rammed right within the 75mm void.
10. Allow 24 hours to cure. Remove shutter.
11. Backfill excavation.
12. Follow procedure for all sections ensuring adjacent underpins have been dry packed and cured at least 48 hours before excavating next to them.

Main Excavation Works.

Until this stage in the works the stability of adjoining ground and structures has been maintained by the discrete sectional completion of the underpinning retaining wall, temporary ground shoring and backfilled soil.

The full perimeter of the basement is underpinning and a continuous robust “L- shaped” retaining wall constructed from the strip of basement slab and stem of the underpinning.

The excavation works will be undertaken to basement floor through the permanent openings in the ground floor with spoil removed by conveyor to the spoil bin on the road.

Construction of Basement Floor Slab.

To preserve the passive restoring force provided by then undisturbed soil between the perimeter underpinning toe sections; the new basement floor slab will be constructed in 3 discrete sections. Each shall be excavated and constructed prior to the next being excavated and constructed. In this manner lateral stability of the perimeter underpinning is provided by either the passive restoring force or the new RC slab.

Figure 1. Typical Underpinning Excavation and Shoring Section

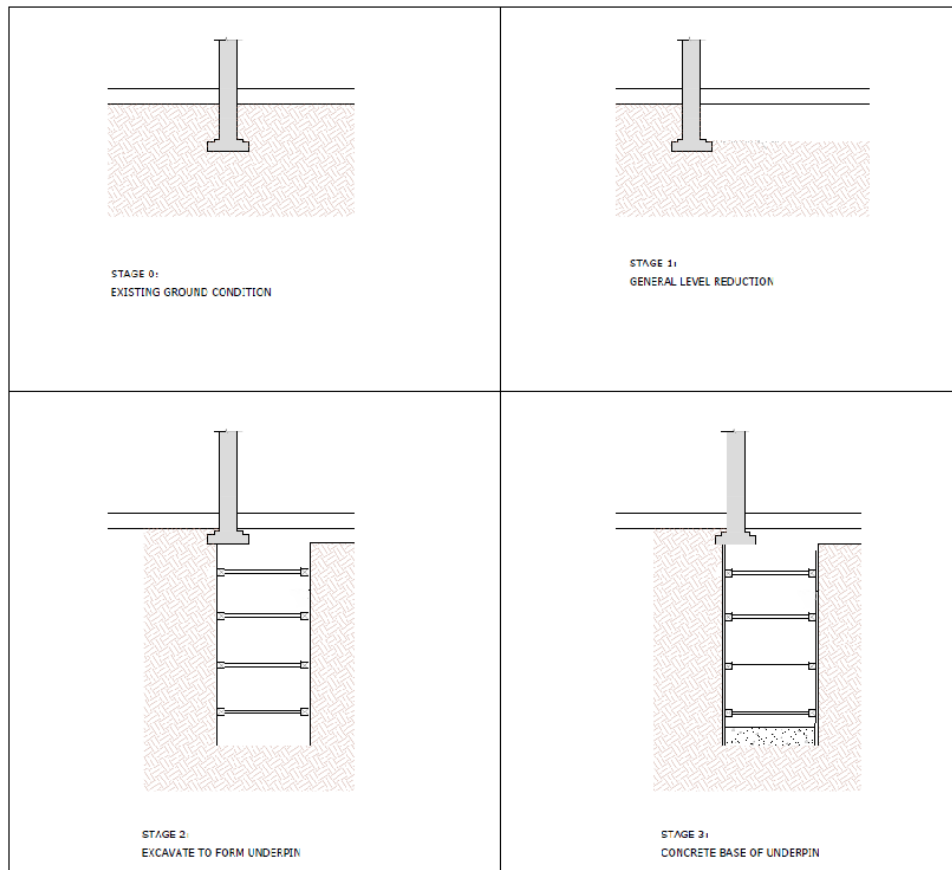
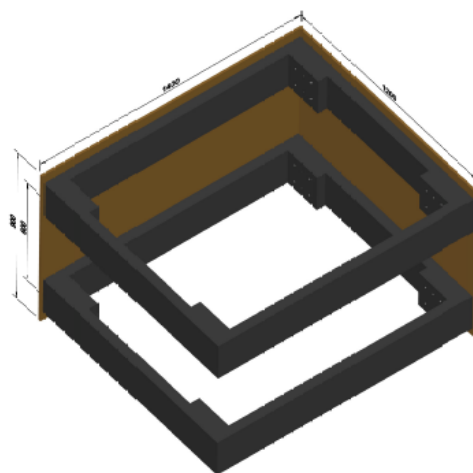
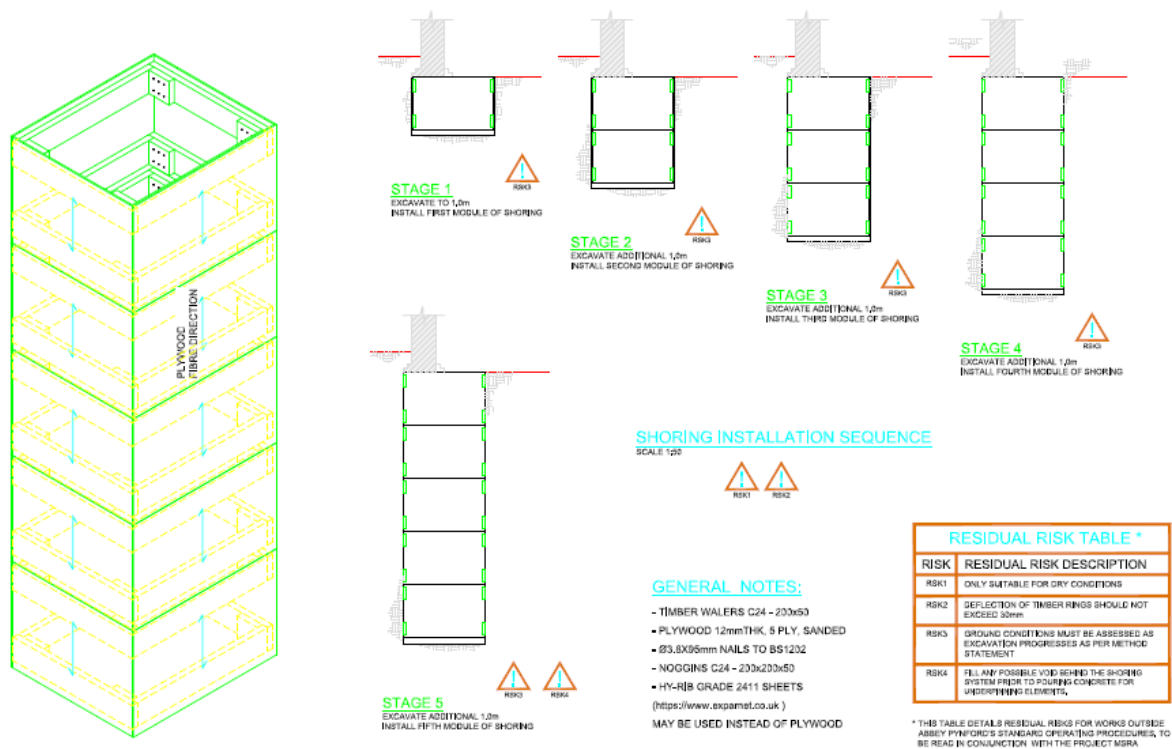


Figure 3. Temporary Shoring Design



MODULE 2 - 3D VIEW
FRONT & SIDE PLYWOOD PANEL
OMITTED FOR CLARITY
N/A

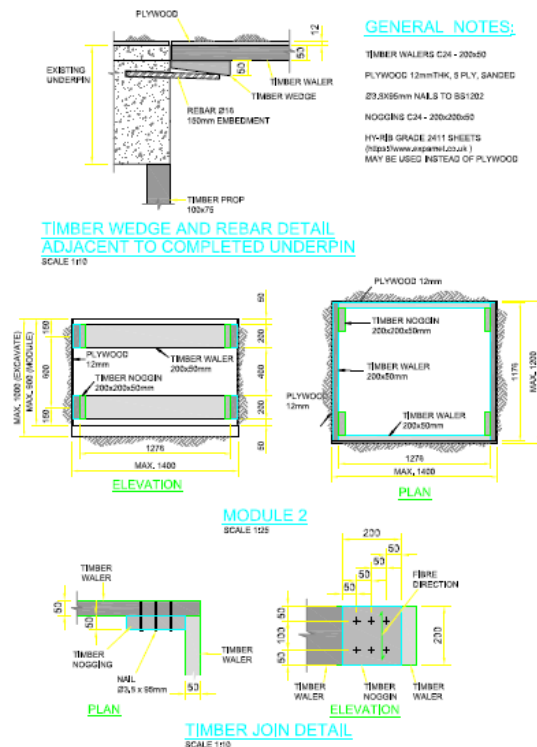
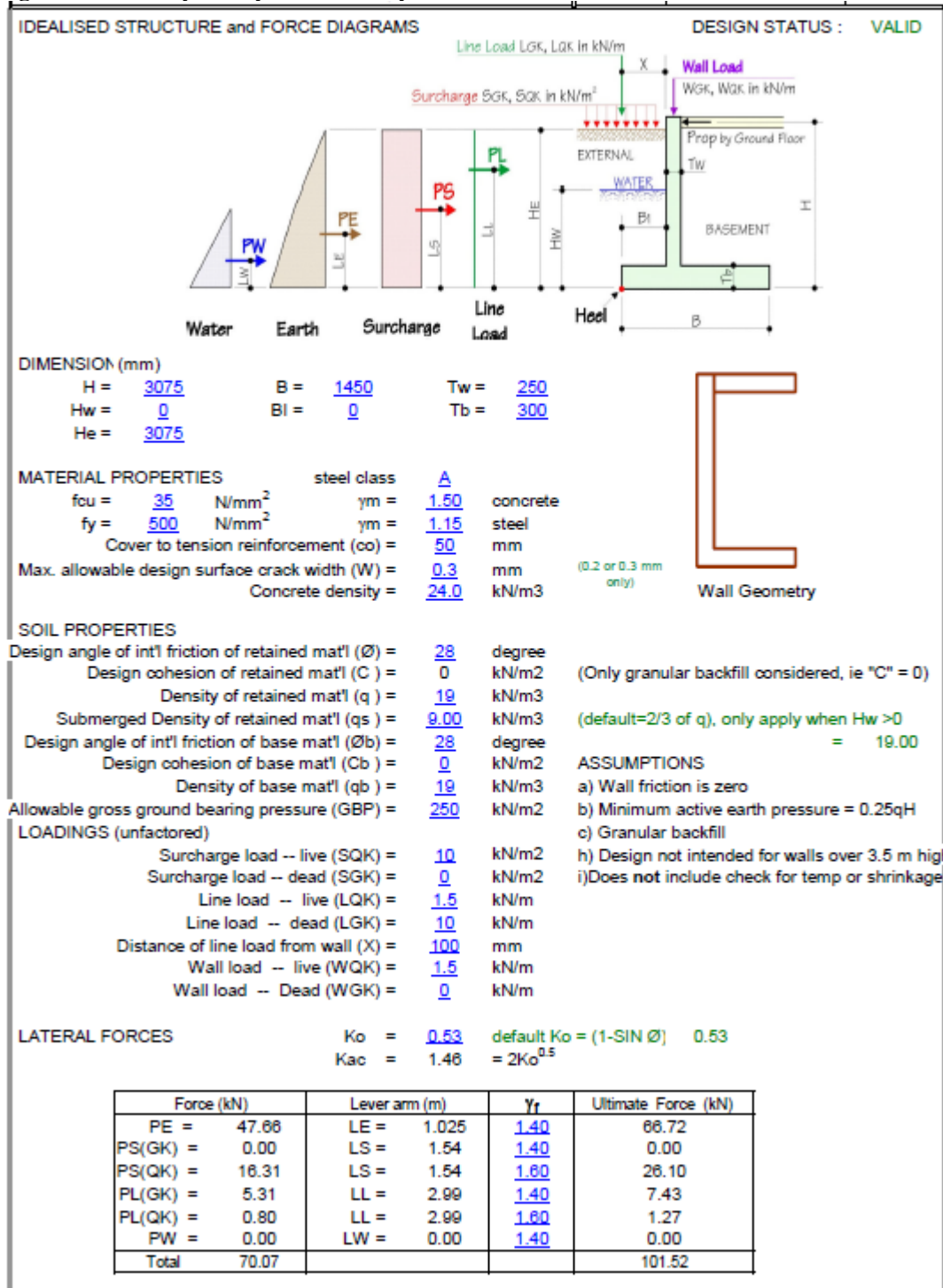
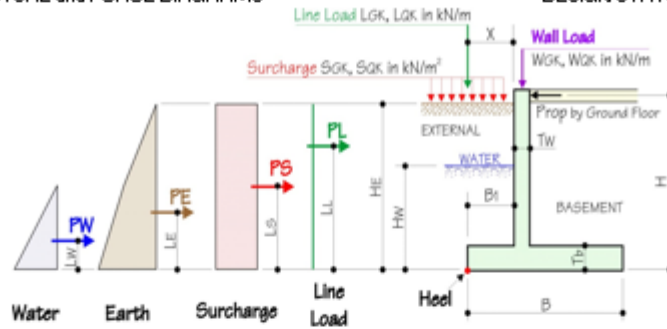


Figure 4. Stability Analysis Summary



IDEALISED STRUCTURE and FORCE DIAGRAMS

DESIGN STATUS: **VALID**



DIMENSIONS (mm)

H = 3075 B = 1550 Tw = 350
Hw = 0 Bl = 0 Tb = 300
He = 3075

MATERIAL PROPERTIES

steel class **A**
f_{cu} = 35 N/mm² γ_m = 1.50 concrete
f_y = 500 N/mm² γ_m = 1.15 steel
Cover to tension reinforcement (c_o) = 50 mm
Max. allowable design surface crack width (w) = 0.3 mm (0.2 or 0.3 mm only)
Concrete density = 24.0 kN/m³



Wall Geometry

SOIL PROPERTIES

Design angle of int'l friction of retained mat'l (Ø) = 28 degree
Design cohesion of retained mat'l (C) = 0 kN/m² (Only granular backfill considered, ie "C" = 0)
Density of retained mat'l (q) = 19 kN/m³
Submerged Density of retained mat'l (q_s) = 9.00 kN/m³ (default=2/3 of q, only apply when H_w > 0 = 19.00)
Design angle of int'l friction of base mat'l (Ø_b) = 28 degree
Design cohesion of base mat'l (C_b) = 0 kN/m²
Density of base mat'l (q_b) = 19 kN/m³
Allowable gross ground bearing pressure (GBP) = 250 kN/m²

LOADINGS (unfactored)

Surcharge load -- live (SQK) = 10 kN/m²
Surcharge load -- dead (SGK) = 0 kN/m²
Line load -- live (LQK) = 0 kN/m
Line load -- dead (LGK) = 7 kN/m
Distance of line load from wall (X) = 100 mm
Wall load -- live (wQK) = 15 kN/m
Wall load -- Dead (wGK) = 10 kN/m

LATERAL FORCES

K_o = 0.53 default K_o = (1-SIN Ø) 0.53
K_{ac} = 1.46 = 2K_o^{1.5}

Force (kN)	Lever arm (m)	γ _F	Ultimate Force (kN)
PE = 47.66	LE = 1.025	1.40	66.72
PS(GK) = 0.00	LS = 1.54	1.40	0.00
PS(QK) = 16.31	LS = 1.54	1.60	26.10
PL(GK) = 3.71	LL = 2.99	1.40	5.20
PL(QK) = 0.00	LL = 2.99	1.60	0.00
PW = 0.00	LW = 0.00	1.40	0.00
Total 67.68			98.02