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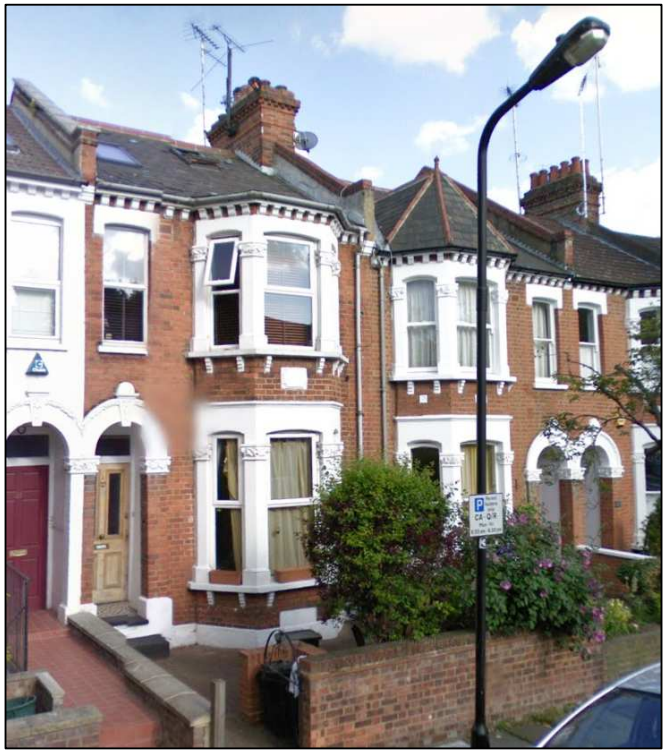

23 KYLEMORE ROAD LONDON NW6

Construction Method Statement for Proposed Underpinning Existing Basement

Structural Report December 2011

Preamble

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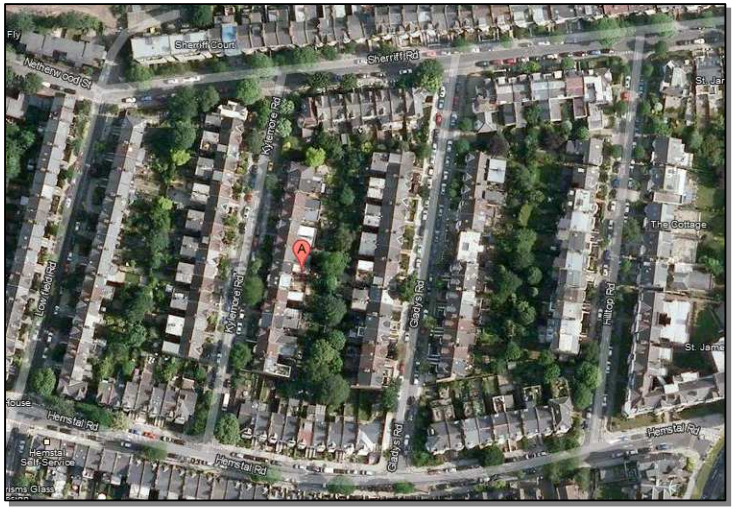


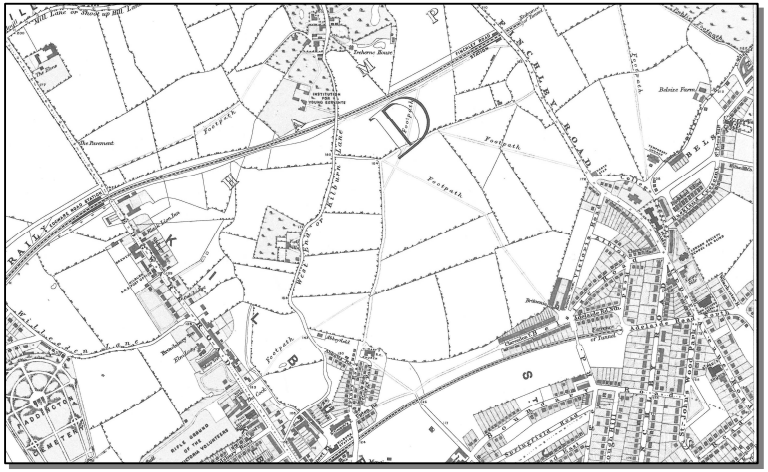
1.0 PREMIS

No 23 Kylemore Road is currently a mid-terrace townhouse arranged over three levels: cellar, ground & first, with further accommodation within the pitched roof. Under the proposed development the cellar will be deepened to create a basement with a floor-to-ceiling-height appropriate to accommodation and utility occupation.

This report describes the likely structural solution for constructing this development, the interaction of this with the local geology and its impact on surrounding buildings. Construction techniques are highlighted along with particular requirements for temporary works and excavations.

2.0 THE SITE AND AREA

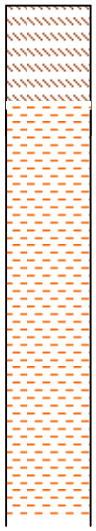
Kylemore Road appears to be the first development of this area, which is recorded as open land in Greenwood's Map of London dating from. Stanford's Map of 1862 and the Ordnance Survey Map of 1866 both show the area still as open land but also record the development surrounding and approaching it from Kilburn and the Finchley Road and the emergence of the railway lines.



Booth's poverty map records Kylemore Road and the surrounding streets as they are today and the immediate and surrounding population to be a mixture of "Well-To-Do", "Fairly Comfortable", which was a combination typical of areas such as this, i.e. early suburban ribbon developments, at the end of the 19th Century. Given that the houses are the first development and were intended for the professional and middle-class the build would have been to a good-to-high standard using good materials and experienced tradesmen. The present condition of No. 23 supports this.

These records suggest that the development of this area, generally, and of Kylemore Road in particular was undertaken with some consideration, using good practices and competent materials. The area was likely light agricultural, or grazing land before it was developed and has not been used in the past for industrial purposes, nor has it been repeatedly developed so the ground is likely to be relatively free from contamination and obstruction such as old foundations and cellars. It was common when the railway lines were built to disperse arising from cutting excavations over adjacent land, which was

EXTRACT FROM STAFORD'S MAP OF 1894



Up to 1.6m of Made Ground, over

London Clay to Depth

often poorly compacted and led to settlement problems when that land was developed: the tracks immediately to the North are not in substantial cutting so this this is unlikely to have happened here.

Geological records and site investigations in the vicinity of Kylemore Road record the near-surface geology to comprise up to 1.5m of made ground over London Clay, which is the prevailing profile in this area of London.

From an MBP Borehole in Queen's Grove:	**1 of made ground over London Clay to depth**
From an MBP Borehole in Millman Road:	**1 of made ground over a thin band of silty, sandy gravel, over London Clay to depth**
From an MBP Borehole in Swiss Cottage:	**0.5m of made ground London Clay to depth**

Each of these investigations is within 1km of Kylemore Road so the profiles established there can be adopted with some confidence for this location.

There are several trees of significance along the road, which will influence the underlying clays as they draw moisture from the ground and the clay changes volume. None are immediately outside No. 23 but their influence must be considered in the design and specification of the proposed development and its construction.

3.0 THE EXISTING BUILDING

The existing building is an original construction and part of a terrace running between Sherrif Road and Hemstal Road to the south, dating from the late 19th-Century period and is very likely to be the first and only development on the site. Its construction is as traditional as its style, and comprises loadbearing masonry walls, most likely built off a clinker or lean concrete, supporting timber floor joists and timber rafters for the pitched roof, which his tiled with clay rather than slate. The house shares a common, party wall with No. 21to one side and No. 25 to the. Its construction is common for its period and has not been dramatically adapted or modified since, other than:

- There have been redecorations and re-servicing;
- The opening in the loadbearing spine wall separating the front and rear rooms at ground level has been increased
- The rear pitch of the roof has been replaced with a mansard to create liveable space in the loft, and the ceiling joists upgraded to reflect this change in accommodation requirement

The building is in very good condition as are the neighbouring houses. Its construction is sound and there are no obvious defects or faults within the structural material or building fabric that suggests movement, subsidence, element failure, poor maintenance, poor building materials or techniques or other actions that housing stock can succumb to.

UNDERPINNING TO A PARTY WALL

TWO-STAGE, TOP-DOWN CONSTRUCTION OF A RETAINING WALL TO A LIGHTWELL

4.0 THE PROPOSED CONSTRUCTION

The proposed development will extend the depth of the current cellar by around 1000mm, and will be achieved by underpinning the existing party and elevation walls in mass concrete. The new lightwell in the front requires completely new walls from basement to ground level at the junction with the footpath and on the two boundary sides, and these will be constructed in reinforced concrete: formation for these will be around 250-300mm deeper to allow for preparation of the ground. The underpinning will be constructed following a hit-&-miss sequence, a common method, while the new lightwell walls will be cast in hit-&-miss sections and in two top-down, vertical stages to control the excavations and to avoid extensive temporary works. Drawings MBP-5045-300 to 302 detail the sequencing and construction of these elements.

Although a lengthy process, underpinning is a low-impact technique that permits the maximum space to be achieved and has the least impact on existing constructions. Casting the wall in pins controls the extent of soil exposed, avoids extensive temporary works and they can be controlled in size and sequence to reflect and accommodate the condition and capability of the walls they will be built beneath.

The material removed will be fill and sandy silty clay and its excavation will relieve very little pressure on the underlying London Clay and we estimate that this relief will not be significant, will not lead to noticeable swelling of the clay and so will not impact significantly on the surrounding buildings and foundations.

The new building will still be arranged over four levels, albeit with the basement level deeper. The new basement walls, and basement slab will be constructed in concrete, some plain and others reinforced. The height of the basement and relative level of the water table determines that Types A (barrier), B (structurally integrated) or C(drained) protection against ingress of water will be satisfactory, as defined by BS 8102:2009. The basement will be constructed and detailed to achieve a Grade 3 Level of Performance, as defined by BS 8102:2009.

Table 2 **Grades of waterproofing protection**

Grade	Example of use of structure[A)]	Performance level
1	Car parking; plant rooms (excluding electrical equipment); workshops	Some seepage and damp areas tolerable, dependent on the intended use[B)] Local drainage might be necessary to deal with seepage
2	Plant rooms and workshops requiring a drier environment (than Grade 1); storage areas	No water penetration acceptable Damp areas tolerable; ventilation might be required
3	Ventilated residential and commercial areas, including offices, restaurants etc.; leisure centres	No water penetration acceptable Ventilation, dehumidification or air conditioning necessary, appropriate to the intended use

A) The previous edition of this standard referred to Grade 4 environments. However, this grade has not been retained as its only difference from Grade 3 is the performance level related to ventilation, dehumidification or air conditioning (see BS 5454 for recommendations for the storage and exhibition of archival documents). The structural form for Grade 4 could be the same or similar to Grade 3.

B) Seepage and damp areas for some forms of construction can be quantified by reference to industry standards, such as the ICE's *Specification for piling and embedded retaining walls* [1].

There is no active groundwater within the proposed construction zone but to achieve Grade 3 Performance we suggest either that a bentonite-impregnated membrane is installed between the back of the concrete wall elements and the retained soil, and have specified the VOLCAY supplied by CETCO, or a suitable grade tanking is applied to the internal elevation of the completed basement

The basement slab will be a reinforced concrete raft cast on a suitable sub-base and will be formed off the underlying dense gravels. While neither pad nor strip foundations are intended the slab will be thicker beneath the lines of the separating walls that will be built in loadbearing masonry and support the floors above.

BELOW GROUND DRAINAGE

The building discharges foul and storm water to the main sewer in the centre of Kylemore Road. It is proposed to use the existing connections where possible; however, the level of the proposed lower basement slab will be 5.60m below ground level so it may be necessary to create a new pumped route for this.

5.0 RISKS TO & IMPACT ON SURROUNDING BUILDINGS

The proposed development is a relatively low-level, low-density construction and it will occupy the same overall footprint and will incorporate the existing boundaries in its envelope.

The surrounding buildings fall in to Group 1a defined by BS ISO 4866:2010, i.e. Ancient, Historical or **Old**; the foundations to the new building fall in to Classes B & C and the soil as Type e: from Table B1 of BS ISO 4866 the surrounding buildings fall within Category 6 and can be considered to have a medium resistance to vibration. From Table B.2 of BS ISO 4866 the surrounding buildings fall in to Class 8, which are deemed to have a medium level of resistance to vibration and, conversely, to require no or little protection against vibration for the types of works intended.

- Although the construction will be further below ground level than the existing building it will not be significantly deeper than the lowest level of the surrounding buildings.
- The basement construction will not be lower than the prevailing groundwater level in this area so will not interfere with the natural flow of the groundwater.
- The building will be formed off of dense gravels, which have a significant bearing capacity, and the foundations will be designed to reflect the recommended permissible pressures and ensure they will not be compressed by more than 15mm
- Removal of the existing construction will generate little or no relief and consequent heave in the London Clay that underlies the substantial band of gravels.
- The boundary walls on three sides can be retained safely and easily following industry-standard practices and, by following a pre-determined sequence will allow the basement wall to be constructed without detriment to the existing, surrounding construction.
- Excavations for the pins that will form the new basement walls can be undertaken using a small excavators, which will be low-impact technique and unlikely to generate excessive vibration.

6.0 CONCLUSIONS

The proposed development of 23 Kylemore Road can be achieved using standard construction techniques and materials. The new construction will not be beneath the prevailing groundwater level. The basement can be constructed using relatively light techniques, in controlled and pre-determined sequences and without the need for a large open excavation before construction can start and consequent extensive temporary works. Where mechanical means are necessary to construct permanent works these can be of a type that generates low vibrations to which the surrounding buildings have a form and construction that is robust and resistant to.

We can therefore conclude with confidence that the construction of the proposed development generally, and the subterranean basement in particular, will not affect the integrity of the surrounding building stock, will not disturb underlying hydrogeology or overload the near-surface geology. There are no critical utilities or infrastructure beneath the site that cannot be relocated easily to accommodate the construction and, as there is no change in use proposed there will be no significant increase in foul discharge to the public sewer.

The techniques proposed for the subterranean element of the building and the nature of the underlying geology minimises the risk of instability, ground slip and movement.

Report Prepared By	Qualifications	Position	Signature	Date
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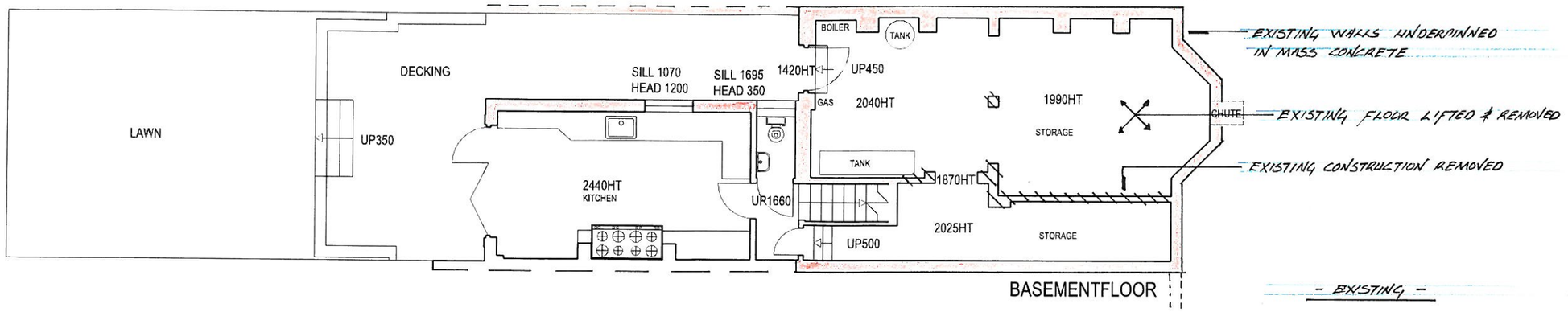

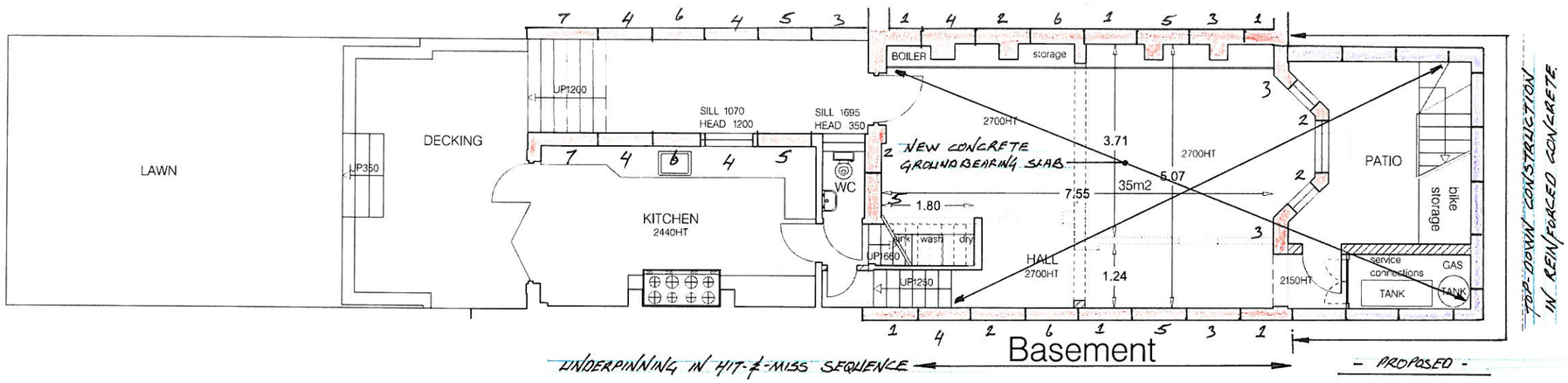

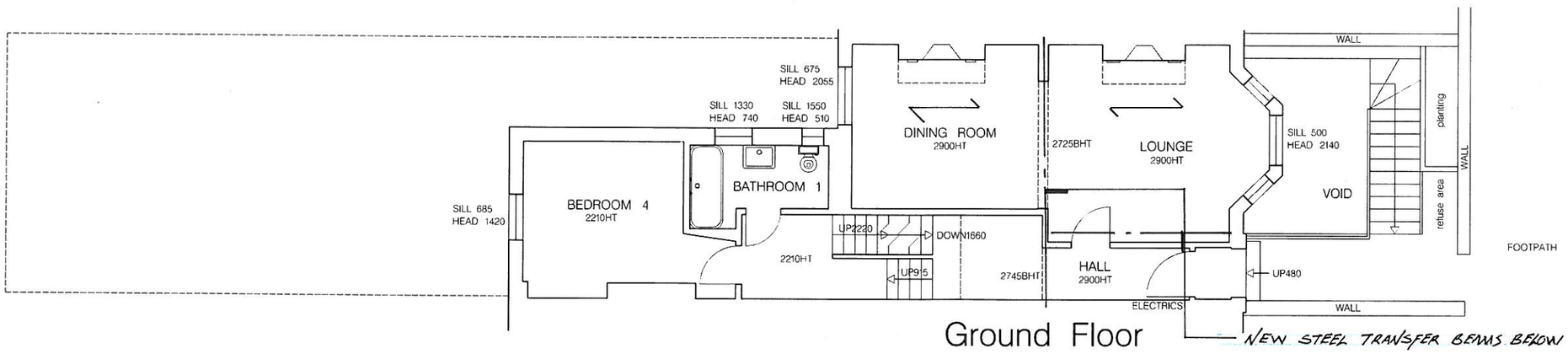

Rev	Date	Description	By
P1	19/12/11	PRELIMINARY ISSUE	mb

Job
23 Kylemore Road
Basement Extension

Title
EXISTING & PROPOSED PLANS

Scale	Date	By	Checked
	Dec 11	mb	

Status
PRELIMINARY

Drawing Number	Revision
5045 /300	P1

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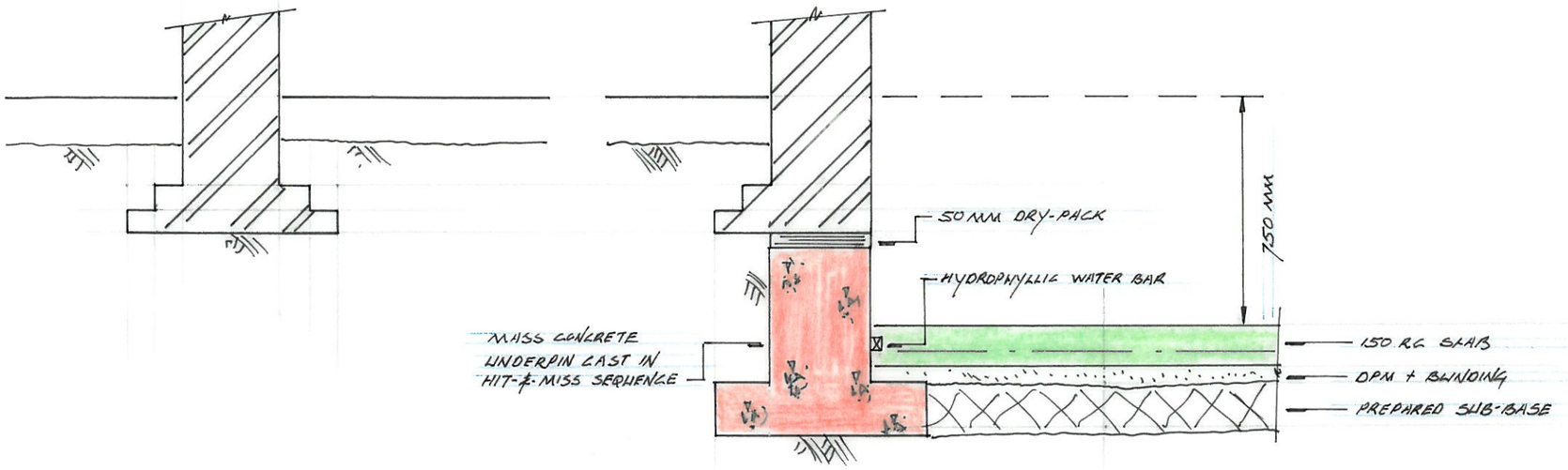

– EXISTING PARTY WALL SECTION –

– PROPOSED PARTY WALL SECTION –

Rev	Date	Description	By
P1	19/12/11	PRELIMINARY ISSUE	mb

Job: 23 Kylemore Road
Basement Extension

Title: UNDERPINNING TO PARTY WALLS

Scale	Date	By	Checked
	Dec 11	mb	

Status: PRELIMINARY

Drawing Number: 5045 / 301

Revision: P1

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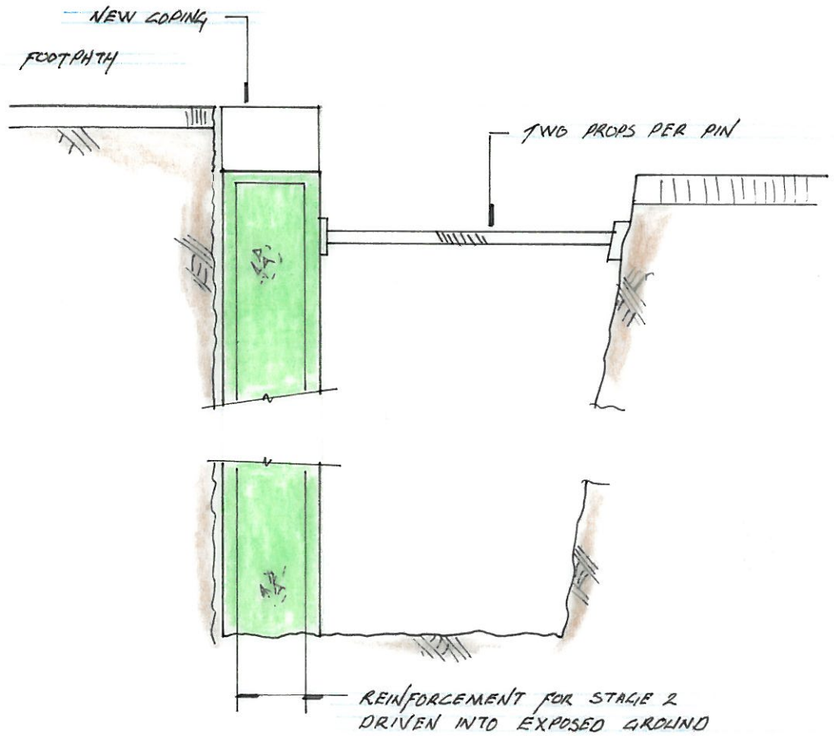
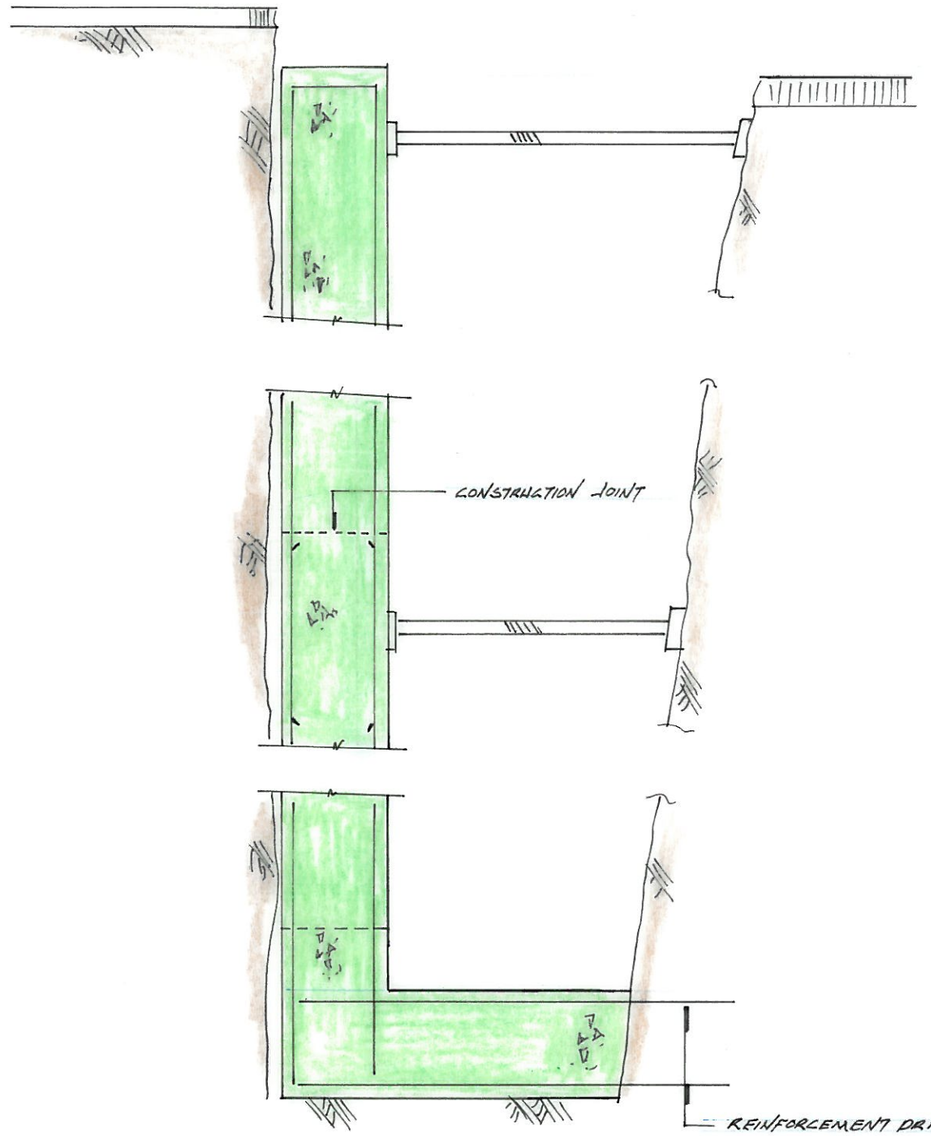


STAGE 1 : · CONSTRUCT TOP-HALF OF RC WALL AROUND PERIMETER OF LIGHTWELL IN HIT-&-MISS SEQUENCE
· PROP PINS OF EXCAVATION FACE



STAGE 2 : · COMPLETE EXCAVATION IN HIT-&-MISS SEQUENCE
· CAST BASE & STAGE 2 OF WALL

Rev	Date	Description	By
P1	19/12/11	PRELIMINARY ISSUE	mb

Job: 23 Kylemore Road
Basement Extension

Title: FRONT LIGHTWELL CONSTRUCTION

Scale	Date	By	Checked
	Dec 11	mb	

Drawing Number: 5045 / 302
Revision: P1

Status: PRELIMINARY

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