21 THE GREEN

LONDON N14 7AB

PROPOSED BASEMENT EXTENSION

CONSTRUCTION METHOD STATEMENT

Prepared by:
STEPHEN COYNE
Chartered Engineer
BEng MSc DIC MBA CEng MIEI

COYNE CONSULTING LTD
South Park Studios
88 Peterborough Road
London W6 9JG

Mob: 07726310375

Date:
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21 The Green, LONDON N14 7AB

Proposed Basement Extension

1.0 Introduction

It is proposed to construct a basement extension at 21 The Green, London N14 7AB. The basement extension will occupy the front right-hand section of the property and below the existing double fronted garage, see **Appendix A, Figure 1.**

The new basement extension will involve underpinning existing perimeter walls. The garage floor above the basement will consist of a concrete slab supported by profiled metal decking which in turn will be supported by steel beans spanning the basement.

21 The Green is a detached family dwelling. It is traditionally built, consisting of pitched roof and timber joisted upper floors spanning between solid masonry walls.

2.0 Construction Method Statement

The construction stages for the basement extension are as follows: -

A - Check Sub Soil Conditions

B - Site Set Up, Temporary Hoarding and Conveyor Belt

C - Reinforced concrete underpinning to Basement Extension

D - Install Steel Beams for Suspended Ground Floor Slab

E - Install Drainage and Construct Basement Slab

F - Fix Internal Waterproofing Membrane and Lay Floor Screed

2.1 Check Sub-Soil Conditions

2.1 Surface Features and Geology

There are no significant man-made slope changes within 20m of the property.

The British Geological Survey (BGS) drift sheets show the highest underlying natural superficial deposit to be the Dollis Hill Gravel Member.

Below the Gravel deposit is the London Clay Formation.

The new underpinning will be constructed within the London Clay.

The new basement will be designed to limit ground bearing pressure to 150kNm2 to ensure overall settlement is reduced to an absolute minimum. It is expected that groundwater will not be encountered during the excavation.

Although it is expected that ground water will not be encountered during the works, the basement will be designed in accordance with the recommendations of BS8102:1990 Protection of structures against water from the ground.

2.2 Site Access, Conveyor Belt and Temporary Hoarding

A conveyor belt will be installed at the front of the property. The conveyor belt will then be extended to ground level and to the position of the skip. A temporary plywood hoarding will be installed to secure the conveyor belt.

The plywood hoarding will be fully secure with a lockable door for site access only.

Excavation will be done with hand tools powered by compressed air and by a mini – digger.

Spoil will be transported from the face of the excavation by wheelbarrow to the base of the conveyor belt.

Spoil will be removed via the conveyor belt and deposited into a skip placed directly in front of the property. The skip will be exchanged when it is full, or alternatively a grab lorry will be used to remove the spoil from the skip.

As the basement excavation progresses in depth, the conveyor belt will be extended correspondingly.

2.3 Reinforced Concrete Underpinning to Basement Extension

The basement will be constructed by underpinning perimeter walls.

Appendix A, Figures 1 and 3 show details of the underpins and an underpinning sequence.

Appendix B provides a basic structural design of the basement including underpins and suspended ground floor above the basement.

The underpins are designed to support the vertical loads from the walls and horizontal loads from the earth. They are designed as free-standing cantilevers in the temporary and permanent conditions.

All concrete used to construct the underpins will be mixed with a waterproof additive, for example Sika Watertight Concrete System.

Underpinning bases will be excavated in short sections not exceeding 1000mm in width.

The sequence of the underpinning will be such that no more than 20% of any section of the wall will be undermined at any one time. Underpins will be sequenced such that any given underpin will be completed, dry packed, and a minimum period of 24 hours lapsed before starting an adjacent excavation to form another underpin.

Lateral propping will be provided to the excavated soil face. The front and side face of the excavation will be propped using plywood, timber boards and Acro props as appropriate. The stages for installing the propping to the excavated soil face is shown on **Figure 4.**

The toe section of the underpin will be concreted first, see **Figure 4, Stage 3.**

Following construction of the toe, the design steel reinforcement will then be fixed for the stem (or wall) of the underpins, see **Figure 4, Stage 4**. Adjacent underpins will be mechanically connected to each other using H16 dowel bars at 400mm horizontal centres, each 800mm long with 400mm embedment. A plywood shutter is then erected, and concrete poured to form the underpinning up to a maximum of 75mm below the underside of the existing foundation, see **Figure 4**, **Stage 4.**

After 24 hours, the void between the top of the underpin stem and underside of the existing foundation will then be dry packed with Conbextra GP non-shrink grout by Fosroc, see **Figure 4**, **Stage 5.**

After all, underpins are cast, the central soil berm will be reduced, see **Figure 4, Stage 6** and **Figure 5, Stage 7**. Perimeter props will be provided to brace the underpins on the perimeter of the excavations. The perimeter props will be placed at 1000mm above the surface of the proposed concrete basement slab level.

After the perimeter props are installed, the basement slab will be concreted, see **Figure 5, Stages 8 and 9.**

Existing foundations that protrude into the site will be carefully trimmed back using hand tools to avoid causing any damage to the foundation, see **Figure 3**. The existing foundations will be trimmed back to be flush in line with the face of the underpins and wall above.

Finally, when the suspended ground floor is installed, all temporary propping including horizontal props will be removed.

2.4 Steel Beam Installation

New steel beams are to be installed at ground floor level to provide support to the suspended ground floor, see **Figure 2**.

The new beams will bear onto concrete pad stones so that the loading from the beams is distributed to acceptable stresses onto the supporting masonry.

Where steel beams are positioned directly under load bearing walls, temporary works will be required to enable this work. If temporary support to load bearing walls is required, this will consist of steel needle beams at high level, supported on vertical props, to enable safe removal of brickwork below, and installation of the new beams.

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.

Once full permanent structural bearing is provided, 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 dry packed with a 1:3 (cement: sharp sand) dry pack layer, between the top of the steel and underside of brickwork above.

Any voids in the brickwork left after removal of needle beams at ground floor level can at this point be repaired by bricking up and/or dry packing, to ensure continuity of the structural fabric.

2.5 Basement Slab Construction and Drainage

Once excavation to basement formation slab level has been completed, the pump sump units and associated underground drainage will be installed in conjunction with the mechanical and electrical details.

2.6 Waterproofing Membrane and Floor Screed

When the basement slab and walls are complete, the DELTA internal waterproofing cavity membrane will be installed in accordance with the manufacturer’s technical specification.

The floor finishes which will include insulation and may include under floor heating, can then be laid.

Finally, a cement and sand screed will be applied to the basement floor.

3.0 Impact Assessment

The following key stages have been identified to safeguard, the general public, construction work force and the project as a whole. We describe how these stages are managed throughout the construction of the basement. The key stages are: -

3.1 Environmental Considerations

3.1.1 Noise

3.1.2 Dust

3.1.3 Vibration

3.1.4 Light Pollution

3.2 Ground and Watercourse Contamination-

3.3 Site Safety Procedures

3.4 Potential Impact on Existing Utilities and Services

3.5 Potential Impact on Drainage, Sewerage and Surface Water Levels

3.1 Environmental Considerations.

To ensure that the basement works progress with the minimum disruption to the surrounding area and its neighbours, especially those located immediately adjacent to the site; particular consideration will be given to address environmental factors such as noise, dust, vibration, and light pollution as follows: -

3.1.1 Noise

Noise levels will be fully recorded by the contractor and logged prior to commencing the works and will be diligently monitored throughout the duration of the site works. Equipment selection, materials and systems will contribute to noise control.

Noisy activities such as breaking existing concrete will be carried out by prior agreement with the local residents. Noise reduction measures include: -

- Effective silencing of plant and processes, including the use of well-maintained equipment
- Use of mains electricity in place of generators where practicable
- Personal radios banned from site.
- Sirens / Bells for emergency use only

3.1.2 Dust

The contractor will consider the spread and effect of airborne dust during the works.

Dust prevention measures will include: -

- Consideration at material procurement stage to reduce the need for the cutting of materials and then only allowing site cutting in designated areas.
- Dampening down of dust generating activities
- Covered wagons to be used for the transportation of dust generating materials.

- Existing roads will be kept clean and maintained.

3.1.3 <u>Vibration</u>

Vibration reduction measures at the site will include: -

- Omit/limit vibrating activities where possible.
- Control working hours of vibrating activities.

3.1.4 <u>Light Pollution</u>

- Site lighting will only be used when necessary, and of sufficient intensity to progress the works and maintain security.
- Flood lights will be located to provide the necessary site illumination with lamp heads directed so as not to shine onto adjacent properties and therefore not to be a nuisance, in particular to the adjacent buildings.

3.2 Ground and Watercourse Contamination

The contractor will employ the following to guard against ground and watercourse contamination: -

- Method statements for the works will be devised to take account of contamination risk and the effective management of that risk.
- All materials and processes will be handled in accordance with the manufacturer's recommendations.
- All bulk solid, granular, liquid materials will only be stored on site in (limited) quantities necessary to meet the requirements of the construction process.
- All liquid materials to be stored in suitable containers, adequately bunded to comply with Health, Safety and Environmental legislation and recommendations.
- Sensitive areas will be subjected to specific regimes.
- Spillage reaction plans will be in place and will be undertaken by a trained squad of personnel.
- Specialist cleaning equipment will be placed in key locations around site to minimise any spillage should it occur.
- All waste materials will be controlled and sorted into the appropriate waste containers on site prior to removal by a licensed waste carrier.

3.3 Site Safety Procedures

Throughout the project the contractor will encourage and enforce a “Good Housekeeping” regime.

All site operatives engaged in the works will be familiar with the work in progress, skilled at their task and aware of their duties and responsibilities to others. Special attention will be given to confined spaces and deep excavations as well as working at height.

All excavations and work areas will be adequately fenced, and sign posted. All personnel on site will always wear full Personal Protection Equipment.

3.4 Potential Impact on Existing Utilities and Services

Any services including gas and electrical on the property’s land will be maintained during construction of the basement and re–routed. The exact location of these services will not be known until the works commence.

However, the impact of the construction works will be negligible as these services will be maintained. If it is necessary to relocate or divert any utilities, the contractor will notify the utility owner prior to any diversions. This will allow the utility owner to assess the impact of the works and grant or refuse their approval. There are no known tunnels in the vicinity of the basement.

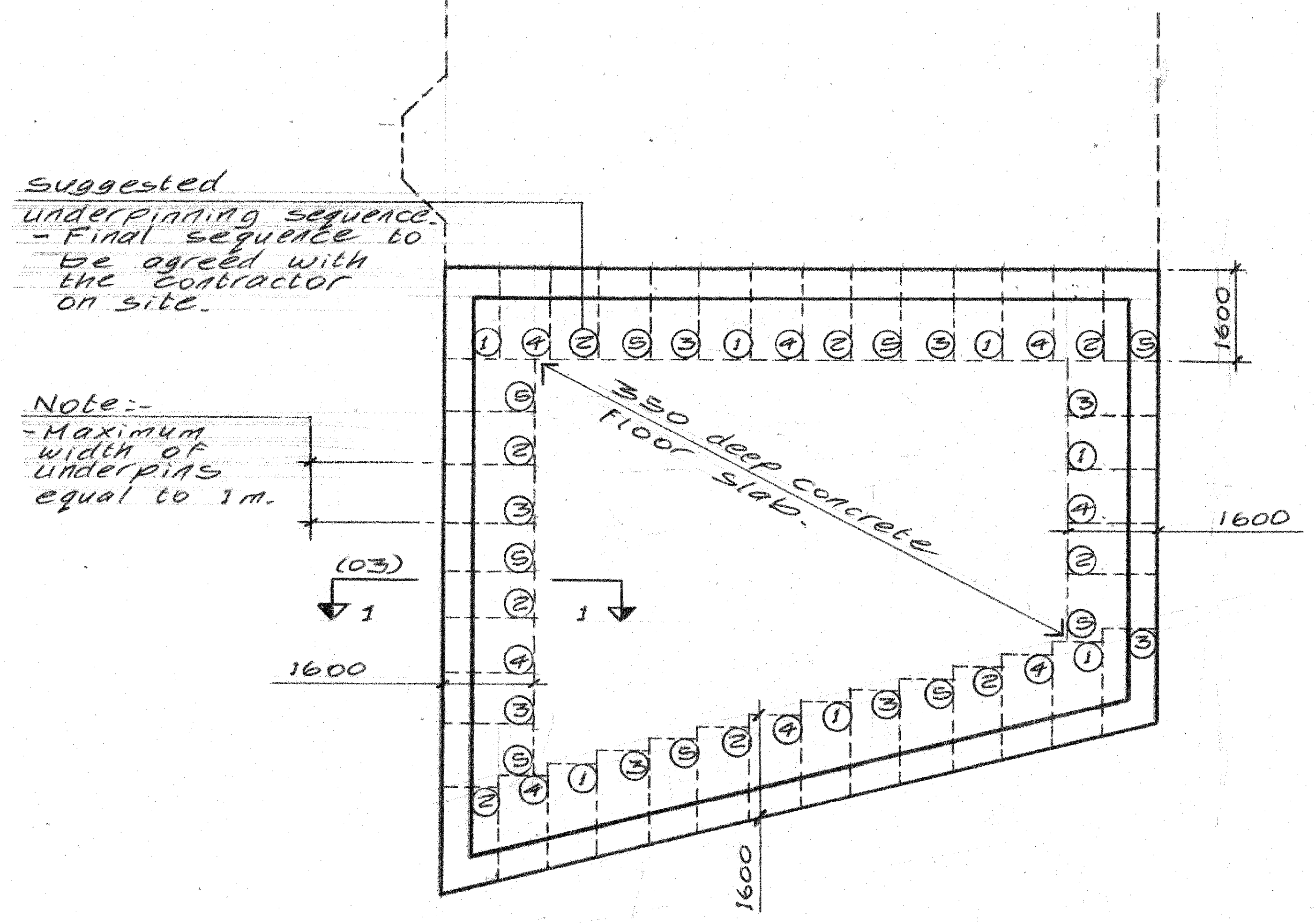
3.5 Potential Impact on Drainage, Sewerage and Surface Water Levels

All existing drainage and sewage connections will be maintained throughout the construction of the basement and therefore, there will be minimal impact on these existing services.

The proposed basement will remain as part of a single-family dwelling and therefore, there will be no significant increase in discharge rates into the existing drainage and sewage systems. Surface water will not be altered as the proposed works are underground.

APPENDIX A

- Structural Drawings and
  Temporary Works Drawings



Proposed Basement Floor Plan

NOTE

1. Concrete shall be grade C35.
2. Concrete to include Sika waterproof additive.
3. Contractor to allow for Delta waterproofing membrane and pump sumps in accordance with manufacturers design.

FIGURE 1

NOTE: -

1. **TEMPORARY WORKS:** All temporary works to be designed, detailed, installed and guaranteed by the main contractor.
2. **BUILDING CONTROL:** The contractor is to ensure that all works are agreed and approved by the building control inspector, particularly areas of structure carrying additional load.
3. **DIMENSIONAL CHECKS:** All setting out dimensions must be checked by the contractor and cross referenced to the architects' drawings before commencing any structural works.
4. **ARCHITECTS DRAWINGS:** The contractor must cross reference structural drawings against the architects' drawings. Final setting out on site must comply with the architects' drawings. Any discrepancies must be brought to the notice of the structural engineer before commencing the works.

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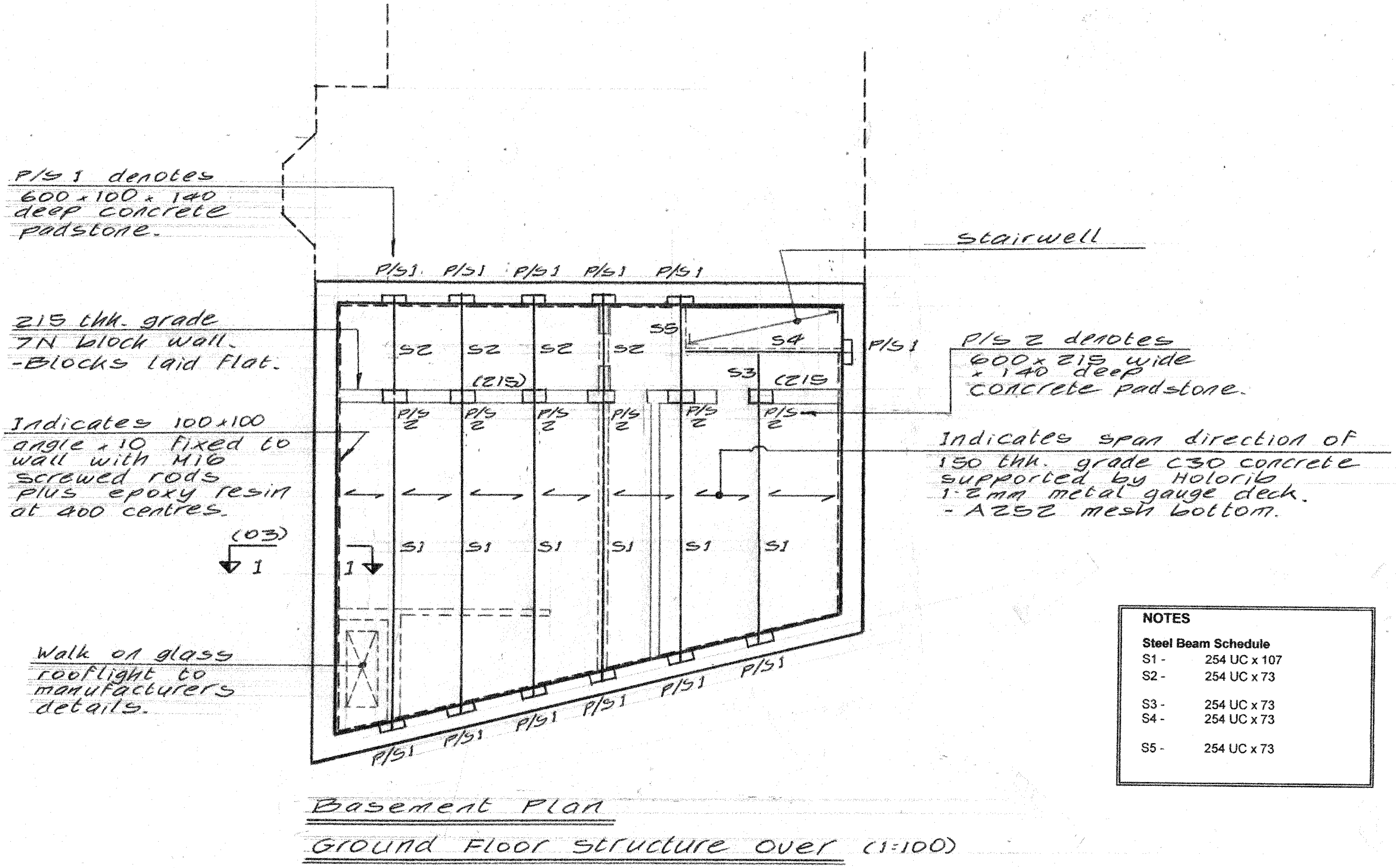
Coyne Consulting Structural Design Engineers
South Park Studios, 88 Peterborough Road,
LONDON SW6 3HH
07726 310375
stephen@coyneconsulting.co.uk

Project	21 THE GREEN, LONDON N14 7AB				
Title	PROPOSED BASEMENT FLOOR PLAN				
Date	Nov 2023	Scale	1:100 @ A3	Drg No.	23107/S/01



NOTES

Steel Beam Schedule

S1 -	254 UC x 107
S2 -	254 UC x 73
S3 -	254 UC x 73
S4 -	254 UC x 73
S5 -	254 UC x 73

FIGURE 2

NOTE: -

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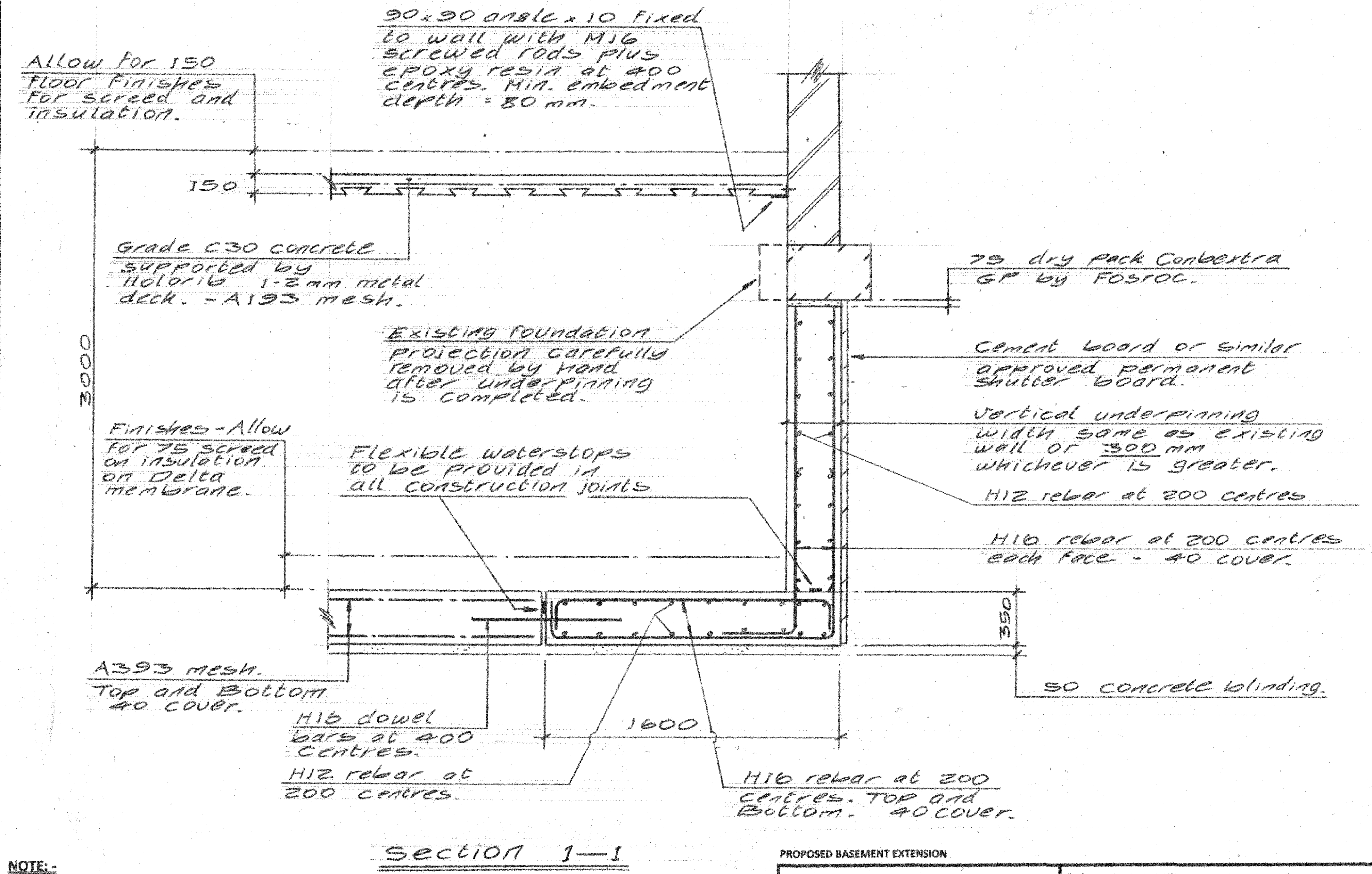
Coyne Consulting Structural Design Engineers
South Park Studios, 88 Peterborough Road,
LONDON SW6 3HH
07726 310375
stephen@coyneconsulting.co.uk

Project	21 THE GREEN, LONDON N14 7AB				
Title	BASEMENT FLOOR PLAN – GROUND FLOOR STRUCTURE OVER				
Date	Nov 2023	Scale	1:100 @ A3	Drg No.	23107/S/02

FIGURE 3



Section 1—1

NOTE: -

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2. Concrete to include Sika waterproof additive.
3. Contractor to allow for Delta waterproofing membrane and pumps in accordance with manufacturers design.

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South Park Studios, 88 Peterborough Road,
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07726 310375
stephen@coyneconsulting.co.uk

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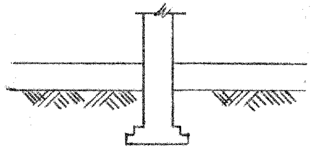
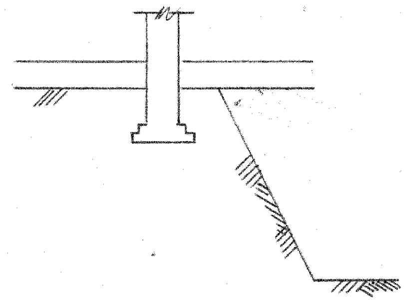
Title	SECTION 1 – 1 THRO BASEMENT				
Date	Nov 2023	Scale	1:20 @ A3	Drg No.	23107/S/03

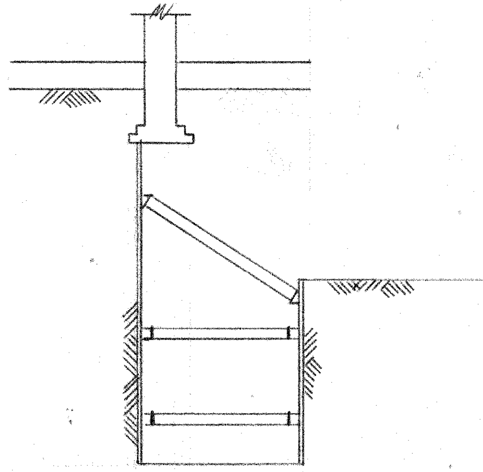
FIGURE 4



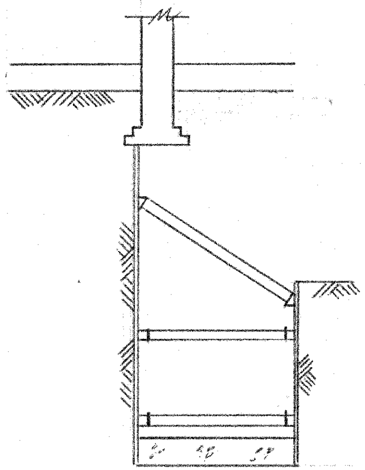
Stage 0
Existing



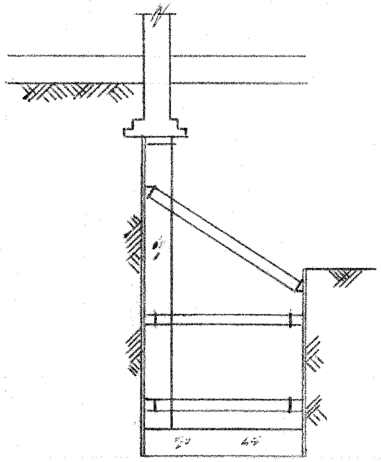
Stage 1
Level reduction



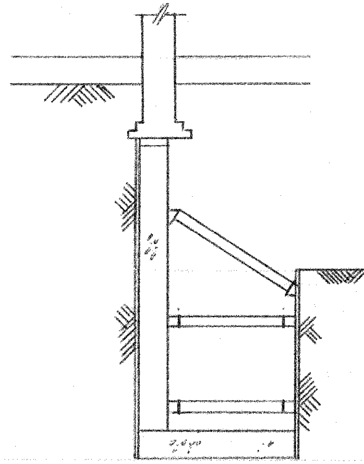
Stage 2
Excavate for underpin.



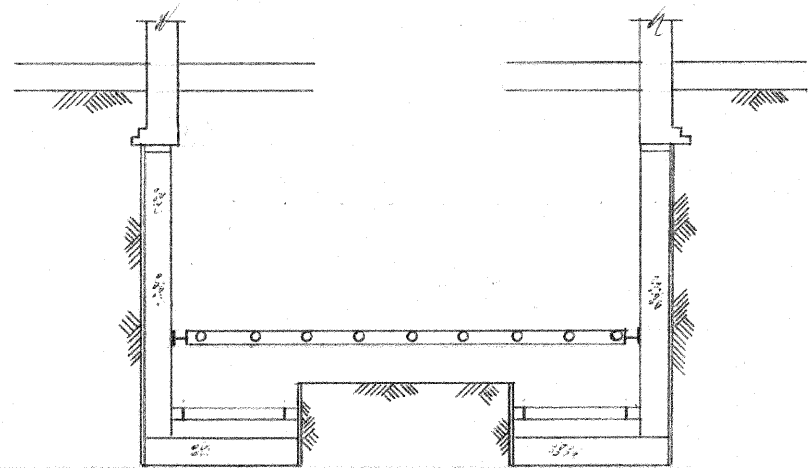
Stage 3
Concrete base to underpin.



Stage 4
Erect shutter concrete stem of underpin



Stage 5
Strike shutter when concrete has strength, drypack, trim off projecting foundation.
Re-prop until basement slab is cast.



Stage 6
Commence excavation of berm when excavation is 600mm above formation level.
Install super slim soldier prop across basement at low level.

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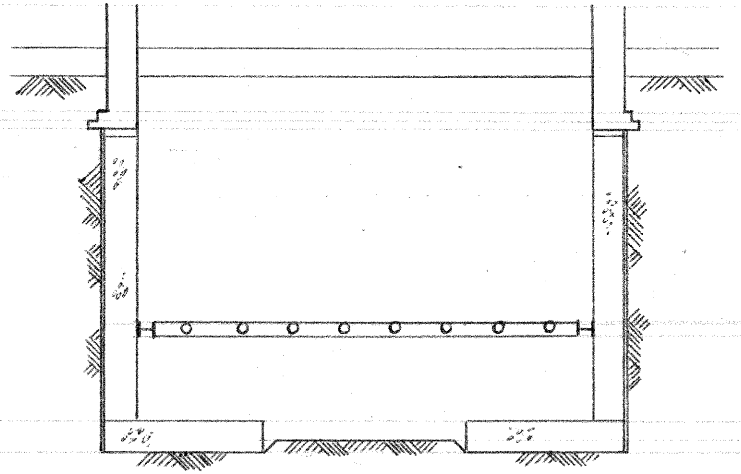
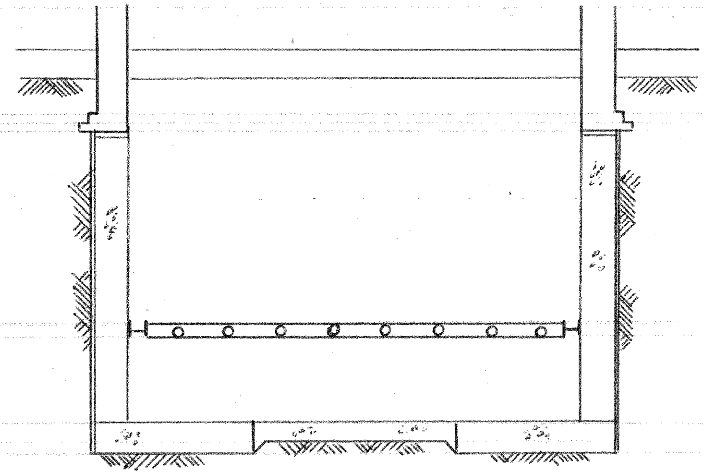
Coyne Consulting Structural Design Engineers South Park Studios, 88 Peterborough Road, LONDON SW6 3HH 07726 310375 stephen@coyneconsulting.co.uk	Project	**21 THE GREEN, LONDON N14 7AB**				
	Title	**TEMPORARY WORKS DETAILS – SHEET 1 OF 2**				
	Date	Nov 2023	Scale	As shown @ A3	Drg No.	**23107/T/01**

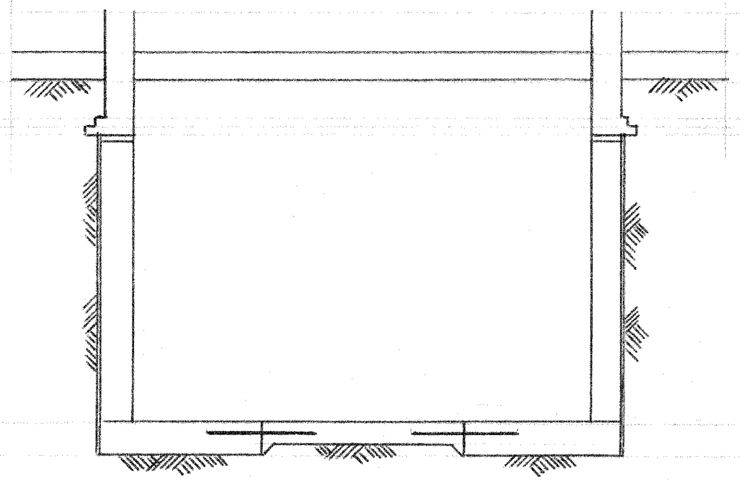
FIGURE 5



Stage 7
Complete excavation to formation level



Stage 8
Cast basement slab.



Stage 9
Remove all props
Install waterproofing and complete basement.

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Coyne Consulting Structural Design Engineers
South Park Studios, 88 Peterborough Road,
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Title	**TEMPORARY WORKS DETAILS – SHEET 2 OF 2**				
Date	Nov 2023	Scale	As shown @ A3	Drg No.	**23107/T/02**

APPENDIX B

- Preliminary Structural Design of Basement

- **Design of Basement Underpinning**

		Project	Project No	Page No
		21 The Green	**23107**	1
Checked	Calculated by SC	Subject **Underpinning to Basement**	Date **Nov-23**	Rev

Ref	Calculations	Output
	Underpinning to Basement	

Specification

The basement will be founded within the London Clay Formation.

Soil Parameters

Although the basement will be founded within the London Clay, for the purposes of basement design assume Non-Cohesive paramers as follows:

Density of retained material = 19 kN/m3

Angle of internal friction = 30 degrees

Active coefficient ka = 0.33

Limit allowable bearing pressure to 150 kN/m2

SURCHARGE Add a surcharge load load of 10 kN/m2 to allow for construction traffic.

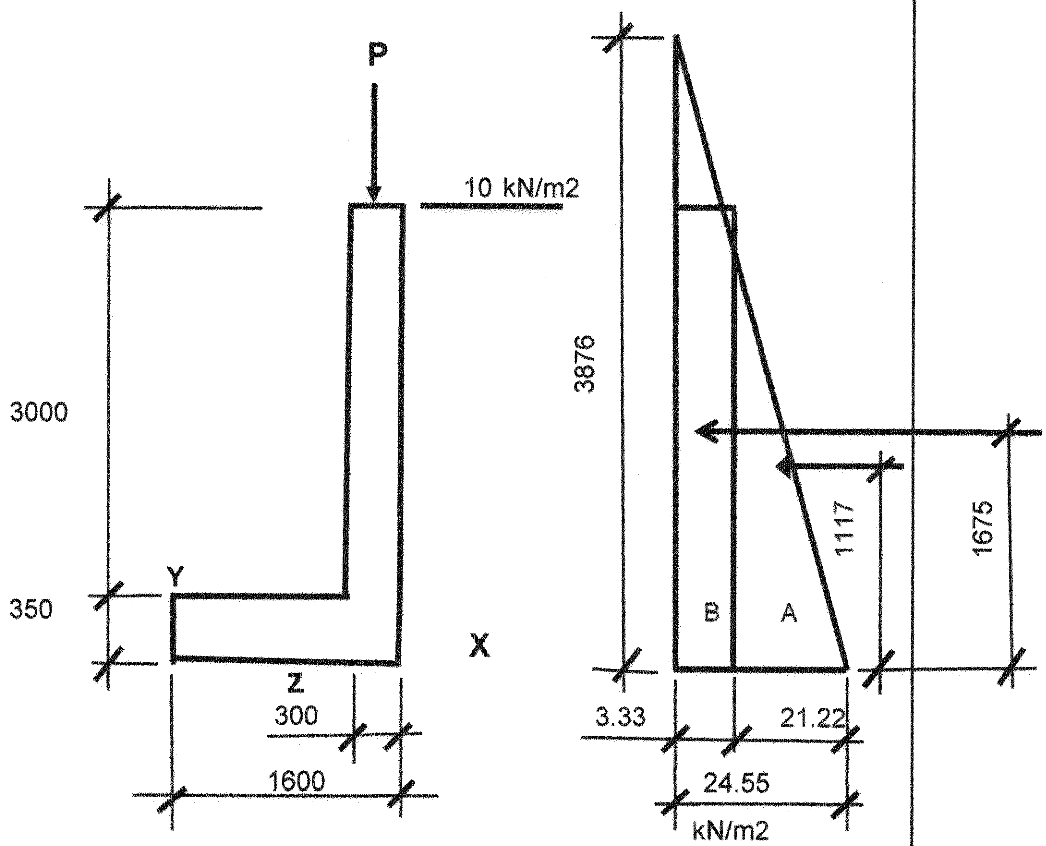
Ref	Calculations	Output
	Underpinning to Basement	

Surcharge is equal to an additional height of soil 10 / 19
= 0.53 m

From page 1 Wall Dimensions are;

Wall height = 3 m
Wall thickness = 0.3 m
Heel width = 0 m
Base thickness = 0.35 m
Base width = 1.6 m

Density of reinforced concrete = 24 kN/m3



		Project	Project No	Page No
		21 The Green	**23107**	3
Checked	Calculated by	Subject	Date	Rev
	SC	**Underpinning to Basement**	**Nov-23**	

Ref	Calculations	Output

Underpinning to Basement

Take equivalent height of soil retained

3000 + 350 + 526

equal to 3876 mm

Applied loading P to top of wall

Applied loading P to top of wall

The most onerous loading from applied to the top of the wall is equal to 50 kN/m

Horizontal pressure at base = 3.88 x 19 x 0.33

= 24.55 kN/m2

Force A =	21.22 x	3.4 /2 =	35.5 kN
Force B =	3.33 x	3.4 =	11.2 kN

Moment about Base "X" see page 2

A =	35.5 x	1.12 =	39.7 kNm
B =	11.2 x	1.68 =	18.7 kNm
			58.4 kNm

Weight of Wall

0.3 x 3 x 24 = 21.6

Weight of Base

0.35 x 1.6 x 24 = 13.4

Axial Load "P" = 50.0

85.0

kN

		Project	Project No	Page No
		21 The Green	**23107**	4
Checked	Calculated by	Subject	Date	Rev
	SC	**Underpinning to Basement**	**Nov-23**	

Ref	Calculations	Output

Underpinning to Basement

Bending Moment about top of Base "Y"

Wall	21.6	x	1.45 =	31.3
Base	13.4	x	0.80 =	10.8
Axial Load "P"	50.0	x	1.45 =	72.5
				114.6
				kNm

Factor of safely against overturning =

114.6 / 58.4 = 2.0

OK

Check Bearing Pressure

Bending Moment about centre of Base "Z"

Wall	21.6	x	0.65 =	14.0
Base	13.4	x	0.00 =	0.0
Axial Load "P"	50.0	x	0.65 =	32.5
				46.5
				kNm

Soil Pressure

Base Modulus =	1.6 ^2 / 6	=	0.43 m3
Base Area =	1.6 x 1	=	1.60 m2

Pressure

$$\frac{85.0}{1.60} \text{ ` + / - } \frac{58.4 - 46.5}{0.43}$$

53.2 ` + / - 27.8

Max pressure 80.9 kN/m^2

Min pressure 25.4 kN/m^2

Less than 150 kN/m^2

Hence, bearing pressure OK

		Project **21 The Green**	Project No **23107**	Page No 5
Checked	Calculated by SC	Subject **Underpinning to Basement**	Date **Nov-23**	Rev

Ref	Calculations	Output
	Underpinning to Basement	

Reinforcement – Walls

- Service Moment = 58.4 kNm
  – see page 3.

Take ultimate Moment
= 1.5 x 58.4 = 88 kNm.

wall thickness = 300 mm.
Take cover = 40 mm.

$d = 300 - (40 + 16\,\phi/2)$
$= 252$ mm.

$k = 88 \times 10^6 / 1000 \times 252^2 \times 35$
$= 0.04$

Take lever arm Z
= 0.95 d
= 239 mm.

As reqd
$= 88 \times 10^6 / 0.95 \times 460 \times 239$
$= 842$ mm²/m.

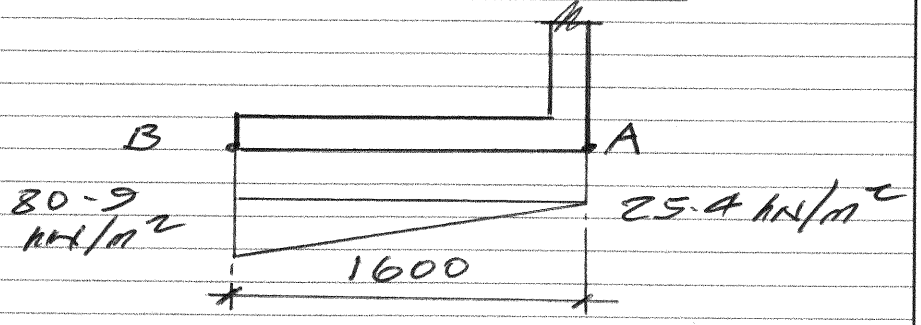
- Provide H16 rebar
  at 200 centres
  = 1005 mm²/m

- For summary,
see page 7.

		Project **21 The Green**	Project No **23107**	Page No 6
Checked	Calculated by SC	Subject **Underpinning to Basement**	Date **Nov-23**	Rev

Ref	Calculations	Output
	Underpinning to Basement	

Reinforcement – Base



Ultimate Pressure.

1. 80.9 x 1.5 = 121.4 kN/m²
2. 25.4 x 1.5 = 38.1 kN/m²

Force

1. 83.3 x 1.6/2 = 66 kN.
2. 38.1 x 1.6 = 61 kN.

– **Bending about A**

1. 66 x 1.07 = 70.6 kNm.
2. 61 x 1.6/2 = 52.8 "

= 123.4 kNm.

– Base Thickness = 350mm.

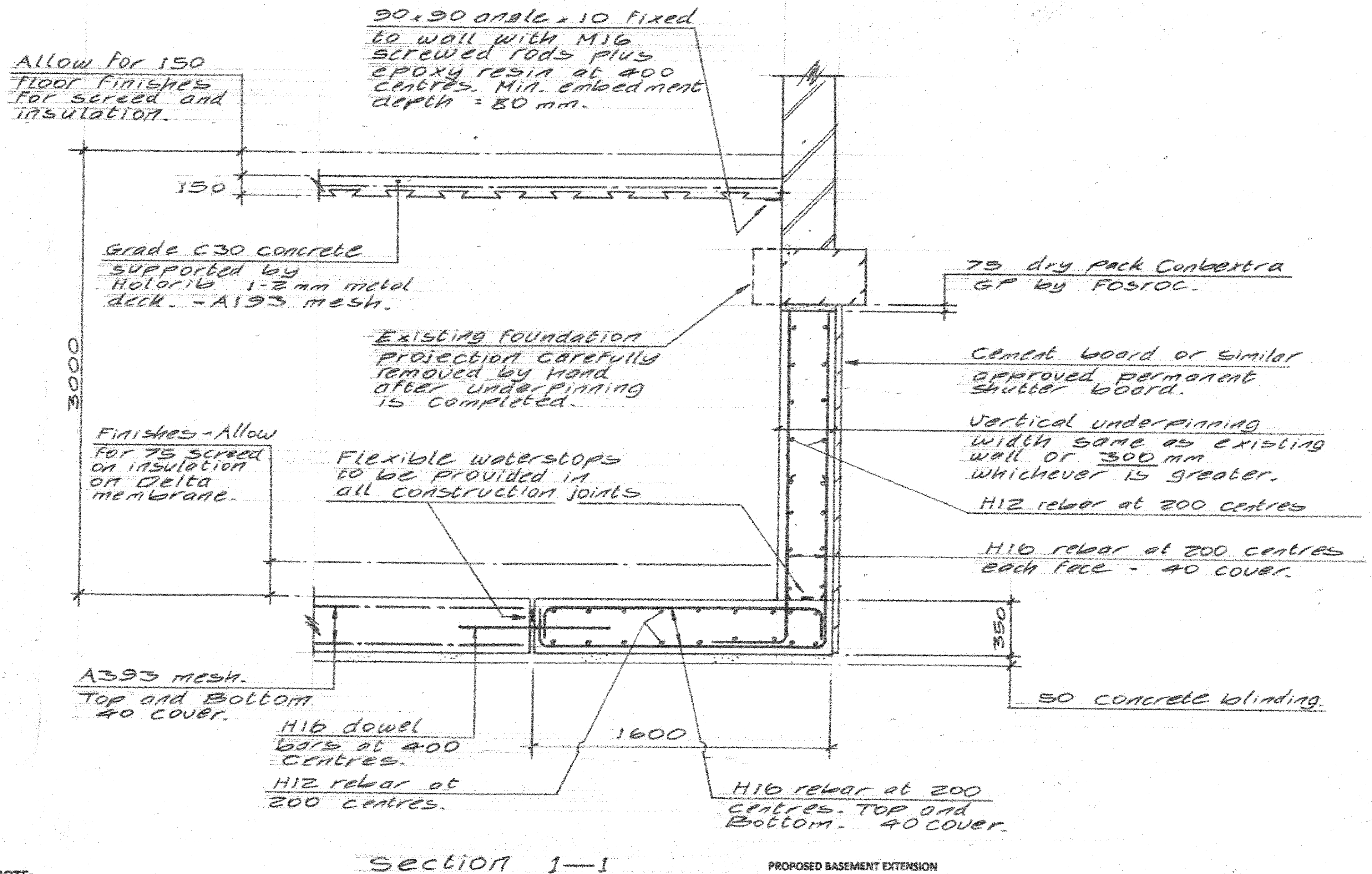
d = 350 – (40 cover + 16 ø/c)
= 302 mm.

Take lever arm Z =
0.95d = 287mm.

As reqd
= $123.4 \times 10^6 / 0.95 \times 460 \times 287$
= 984 mm²/m width.

– Provide H16's @ 200 c/c.
= 1005 mm²/m width.

– For summary, see page 7



Section 1—1

NOTE: -

1. Concrete shall be grade C35 concrete
2. Concrete to include Sika waterproof additive.
3. Contractor to allow for Delta waterproofing membrane and pumps in accordance with manufacturers design.

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Title	SECTION 1 – 1 THRO BASEMENT				
Date	Nov 2023	Scale	1:20 @ A3	Drg No.	23107/S/03

- **Design of New Suspended Ground Floor**

  Note: -
  New suspended ground floor above proposed basement consists of 150mm thick concrete slab supported by 1.2mm gauge Holorib profied metal decking.
  The Holorib spans between steel beams and the steel beams are supported off loadbearing masonry.

21 The Green
Applied Loading Sheet

Nov-23

General Note

Dead Loads. Density of materials used to assess Dead Loads were taken from
BS 648: Schedule of Weights of Building Materials.

Live Load (Floors). Floor Live Loads were taken from BS 6399-1: Code of Practice for Dead and Imposed Loads.

Live Load (Roof). Roof Live Loads were taken from BS 6399-3: Code of Practice for Imposed Roof Loads.

	Suspended Concrete Ground Floor Slab	**Weight (kN/m3)**	**Depth (m)**	**Dead Load (kN/m2)**	**Live Load (kN/m2)**
	18mm plywod on			0.13	
	timber battens on			0.05	
	150mm thk Richard Lees Holorib slab with			3.5	
	12.5mm suspended plasterboard ceiling			0.1	
	Services			0.2	
	Lightweight partitions			0.50	
BS6399					
Part 1	Imposed Load (Domestic)				1.5
Total				4.5	1.5

		Project **21 The Green**	Project No **23107**	Page No 2
Checked	Calculated by SC	Subject **Design of Steel Beams**	Date **Nov-23**	Rev

Ref	Calculations	Output
BS5950 Pt 1:2000	**Beam S1**	

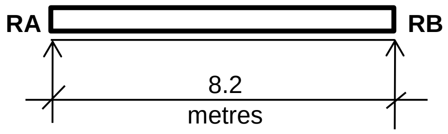
Note: For location of steel beams, see page **4**

Supports:
UDL 1. Suspended Concrete Ground Floor

UDL
1. Suspended Concrete Ground Floor

Loaded width (m) =	*2.00*				**Dead Load**	**Live Load**
Dead Load =	2.00	x	4.5	`=	9.00	
Live Load =	2.00	x	1.5	`=		3.00
				Sum	9.00 kN/m	3.00 kN/m

Beam Span (m) = 8.2



Total Dead Load =	8.2	x	9.00	=	73.8	kN
Total Live Load =	8.2	x	3.00	=	24.6	kN
Beam reactions RA = RB					98.4	
Dead Load =	36.9 kN					
Live Load =	12.3 kN					

Beam S1
From page **3**
Select **254 UC x 107**

Coyne Consulting Limited	Project	21 The Green	Steel Beam Design		
	Client		Made by	Date	Job No
	Description	Beam S1	SMC	1-11-23	23107
			Checked	Revision	Page No
Originated from Steel Beam © 2000-2008 Chris Buczkowski	Spreadsheet licensed to Coyne Consulting Limited		-	-	03

Design in accordance with BS 5950 : Part 1 : 1990

Simply supported beam

Analysis

Span (m)	8.200

Choose steel section: 254x254x107

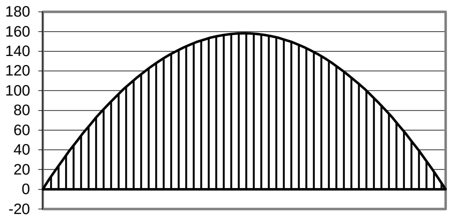
○ UB
◉ UC
○ RSJ
○ PFC

Load Factors	
Dead	1.4
Imposed	1.6

E (N/mm²)	205000
Ix (cm⁴)	17510

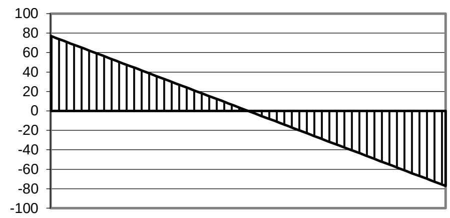
Design Status		capacity ratio
Vertical shear	**PASS**	0.14
Moment	**PASS**	0.40
Buckling	**PASS**	0.58
Deflection	**PASS**	0.94

LOADING	Dead	Imposed	Position	Length
	kN	kN	m	m
UDL	73.5	24.6	-	-
Point load				-
Point load				-
Point load				-
Point load				-
Partial UDL				
Partial UDL				



Bending Moment Diagram

RESULTS			
M max	F_V max	Max. deflection (mm)	
		Imposed only	Total load
kNm	kN		
158.18	-77.16	-4.92	-21.34



Shear Force Diagram

Design

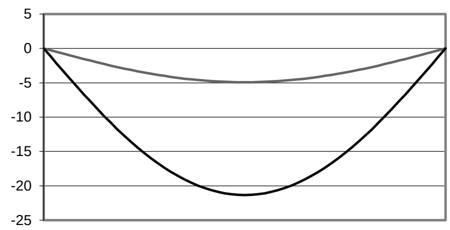
Design Strength	
p_y N/mm²	265

◉ grade S275
○ grade S355

section classification
Plastic

Shear Capacity	
Area A_v	capacity P_v
mm²	kN
3413.8	542.79

cl. 4.2.3



Deflection Diagram

Moment Capacity	Position	Moment	Fv	M_{cx}	Unity Factor
	m	kNm	kN	kNm	
Maximum Moment	4.100	158.18	0.00	393.26	0.40
Critical section	4.100	158.18	0.00	393.26	0.40

* low shear

Lateral torsional buckling

Equivalent Uniform Moment		kNm
Maximum moment	M_A	158.18
Uniform factor	m	1.00
Buckling moment	M_{bar}	158.18

cl. 4.3.7.2

Z_x (cm³)	1313
S_x (cm³)	1484

Slenderness Ratio				
Effective length			radius of gyration	slenderness
L	factor	L_E		
m		m	r_y (cm)	λ
8.200	1.0L+2D	8.733	6.59	132.53

cl. 4.3.7.5

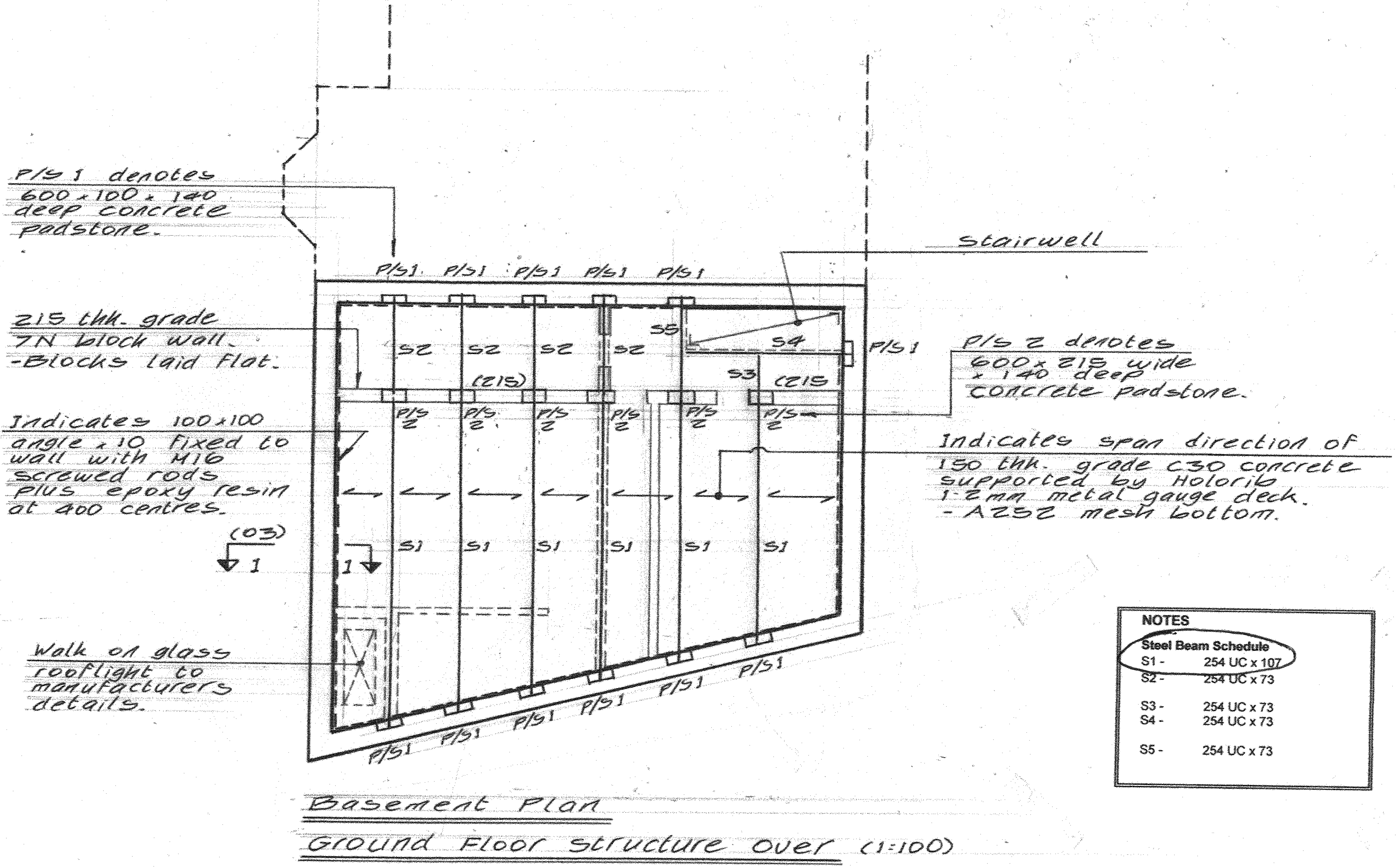
cl. B.2.4	limiting slenderness	λ_{Lo}	34.95
cl. 4.3.7.6	correction factor	n	**1.00**
	buckling parameter	u	0.848
	torsional index	x	12.4
cl. B.2.5 (d)	slenderness factor	v	0.621
cl. B.2.5	equivalent slenderness	λ_{LT}	69.82
cl. B.2.3	Perry coefficient	η_{LT}	0.244
	Plastic moment capacity	M_p	393.26
cl. B.2.2	Elastic critical moment	M_E	615.88
	Buckling index	ϕ_B	579.74
cl. B.2.1	**Buckling capacity**	M_b	273.32

Deflection

Deflection Limits		Allowable
span/deflection ratios		mm
Imposed Loads	360	22.8
Total Loads	360	22.8

table 5

Section used:	UC	254x254x107



Basement Plan

Ground Floor Structure Over (1:100)

NOTES

Steel Beam Schedule

S1 -	254 UC x 107
S2 -	254 UC x 73
S3 -	254 UC x 73
S4 -	254 UC x 73
S5 -	254 UC x 73

NOTE: -

1. **TEMPORARY WORKS:** All temporary works to be designed, detailed, installed and guaranteed by the main contractor.
2. **BUILDING CONTROL:** The contractor is to ensure that all works are agreed and approved by the building control inspector, particularly areas of structure carrying additional load.
3. **DIMENSIONAL CHECKS:** All setting out dimensions must be checked by the contractor and cross referenced to the architects' drawings before commencing any structural works.
4. **ARCHITECTS DRAWINGS:** The contractor must cross reference structural drawings against the architects' drawings. Final setting out on site must comply with the architects' drawings. Any discrepancies must be brought to the notice of the structural engineer before commencing the works.

PROPOSED BASEMENT EXTENSION

Coyne Consulting Structural Design Engineers
South Park Studios, 88 Peterborough Road,
LONDON SW6 3HH
07726 310375
stephen@coyneconsulting.co.uk

Project	21 THE GREEN, LONDON N14 7AB				
Title	BASEMENT FLOOR PLAN – GROUND FLOOR STRUCTURE OVER				
Date	Nov 2023	Scale	1:100 @ A3	Drg No.	23107/S/02