CROFT
STRUCTURAL
ENGINEERS

14 February 2018

# Addendum

The retaining walls for the permanent structure will have a high level of stiffness.

This can be achieved by propping the wall at the head by the ground floor structure:
- Steel beams at the head of the retaining walls provide the propping required.
- The distance between the adjoining steel beams are considered small enough to allow the retaining walls to span between them and transfer horizontal loads to the ground floor steelwork
- The steel arrangement is shown on revised drawings (SL-10-Rev2 and SL-20-Rev2)

An alternative design solution is to design the walls to be stiff enough to reduce the deflections to an acceptable minimum, without the need for propping at the head.  The following calculations show that the deflection resulting ground movements will be close to negligible.

For both options, the predicted Damage Category will be 0 or 1.

| | Project | | | | | Job Ref. | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | 6 Parsifal road | | | | | 170823 | |
| Croft Structural Engineers | Section | | | | | Sheet no./rev. | |
| Rear of 60 Saxon Rd | Structural calculation for BIA | | | | | 14 | |
| Selhurst | Calc. by | Date | Chk'd by | Date | | App'd by | Date |
| SE25 5EH | EP | 14/02/2018 | | | | | |

## RETAINING WALL DEFLECTION

Simlar loads will be applied as shown in the previously submitted calculations walls, ie
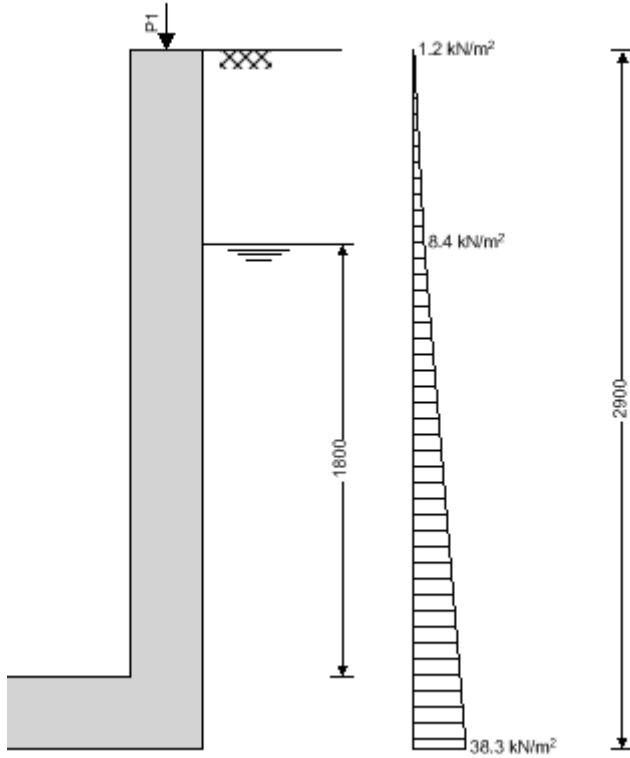


For permanent structure, there is structural continuity between the base of the wall and the basement slab. The wall is now analysed as a cantilevered beam. Calculations below are for SLS to find deflections.

### CONCRETE BEAM ANALYSIS

Concrete beam dimensions:-

Beam width b = **1000** mm

Beam depth h = **300** mm

Cross-section area A = b × h = **300000** mm$^2$

Major axis second moment of area $I_{xx}$ = b × h$^3$ / 12 = **2.25×10$^9$** mm$^4$

$f_{cu}$ = **35** N/mm$^2$

E = 20 kN/mm$^2$ + 200 × $f_{cu}$ = **27.0** kN/mm$^2$

Ref BS8110:1985:Pt 2 - Eq 17

$\rho$ = $\rho_{C.norm}$ = **2400** kg/m$^3$

| | Project | | Job Ref. |
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| **Croft Structural Engineers**<br>Rear of 60 Saxon Rd<br>Selhurst<br>SE25 5EH | 6 Parsifal road | | 170823 |
| | Section<br>Structural calculation for BIA | | Sheet no./rev.<br>15 |
| | Calc. by | Date | Chk'd by | Date | App'd by | Date |
| | EP | 14/02/2018 | | | | |

**Unfactored Loads** — Self weight not included

□Dead  ◺Live

40.000

0.0

mm

A — 2900 — 1 — B
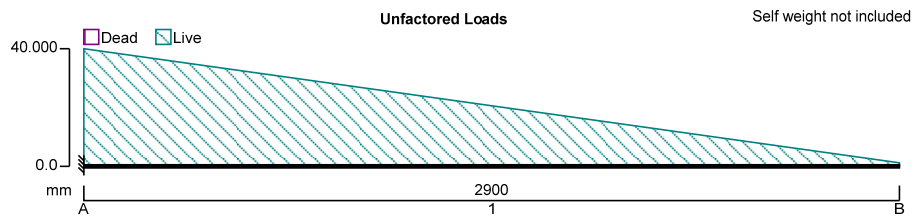
## CONTINUOUS BEAM ANALYSIS - INPUT

### BEAM DETAILS

Number of spans = **1**

### Material Properties:

Modulus of elasticity = **27** kN/mm$^2$  Material density = **2400** kg/m$^3$

### Support Conditions:

**Support A** Vertically **"Restrained"**  Rotationally **"Restrained"**

**Support B** Vertically **"Free"**  Rotationally **"Free"**

### Span Definitions:

**Span 1** Length = **2900** mm  Cross-sectional area = **300000** mm$^2$  Moment of inertia = **2.25×10$^9$** mm$^4$

### LOADING DETAILS

### Beam Loads:

**Load 1** VDL Live load **40.0** kN/m to **1.2** kN/m

### LOAD COMBINATIONS

### Load combination 1

**Span 1** 1×Dead + 1×Live

## CONTINUOUS BEAM ANALYSIS - RESULTS

### Support Reactions - Combination Summary

**Support A** Max react = **-59.7** kN  Min react = **-59.7** kN  Max mom = **-59.4** kNm  Min mom = **-59.4** kNm

**Support B** Max react = **0.0** kN  Min react = **0.0** kN  Max mom = **0.0** kNm  Min mom = **0.0** kNm

### Beam Max/Min results - Combination Summary

Maximum shear = **59.7** kN  Minimum shear$F_{min}$ = **0.0** kN

Maximum moment = **0.0** kNm  Minimum moment = **-59.4** kNm

Maximum deflection = **1.7** mm  Minimum deflection = **0.0** mm

### Span Max/Min results - Combination Summary

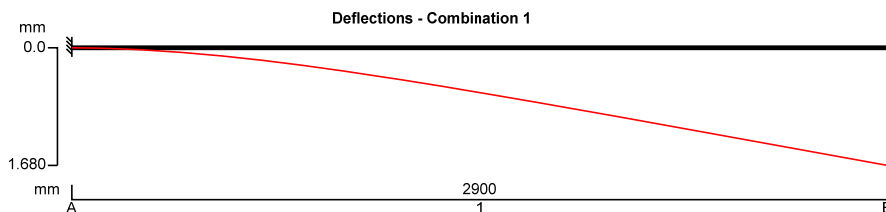**Span 1** Maximum shear = **59.7** kN at **0.000** m  Minimum shear = **0.0** kN at **2.900** m

Maximum moment = **0.0** kNm at **2.900** m  Minimum moment = **-59.4** kNm at **0.000** m

Maximum deflection = **1.7** mm at **2.900** m  Minimum deflection = **0.0** mm at **0.000** m

**Deflections - Combination 1**

mm
0.0

1.680

mm

A — 2900 — 1 — B

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Deflection at top of wall is less than 1.7mm.  This does not account for the vertical load applied to the top of the retaining wall, which would limit the deflection furhter.  By inspection, the deflection of a 300mm thick reinforced concrete wall will not give rise to ground movements and resulting damage categories greater than Category 1.
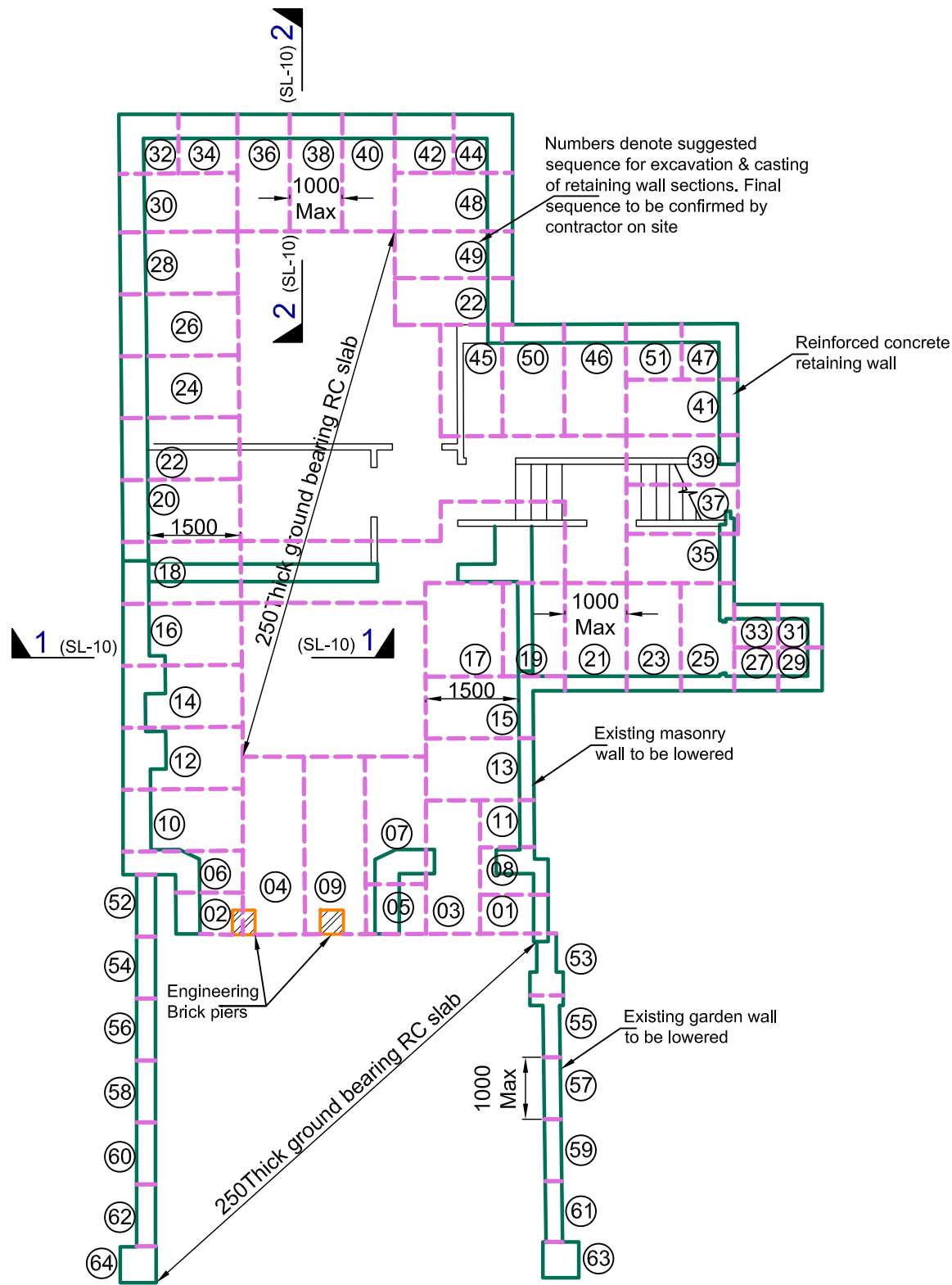
## Basement Plan
Scale 1:100

Numbers denote suggested sequence for excavation & casting of retaining wall sections. Final sequence to be confirmed by contractor on site

2 (SL-10)

1 (SL-10)

2 (SL-10)

1 (SL-10)

32 34 36 38 40 42 44
30 48
28 49
26 22
24 45 50 46 51 47
22 41
20 39
18 37
16 35
14 17 19 21 23 25 33 31
15 13 27 29
12
10 11
07
06 04 09 08
52 02 05 03 01
54 53
56 55
58 57
60 59
62 61
64 63

1000 Max
1500
1500
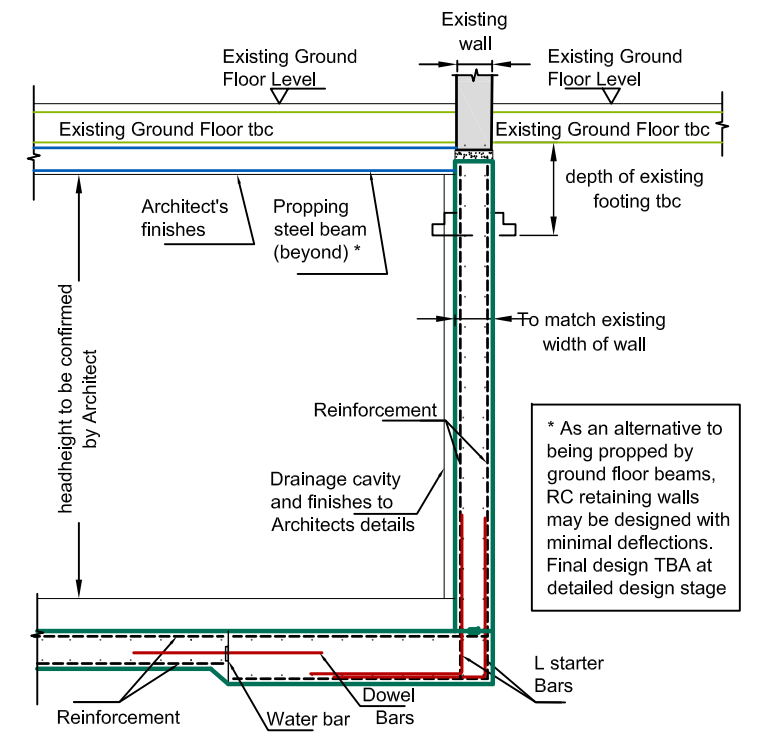1000 Max
1000 Max

250 Thick ground bearing RC slab

250 Thick ground bearing RC slab

Reinforced concrete retaining wall

Existing masonry wall to be lowered

Engineering Brick piers

Existing garden wall to be lowered

## Section 1-1
Scale 1:50

Existing party wall

Neighbors ground floor level

Existing cobbled demolished

Existing ground floor level to be lowered

75mm Dry packing

Links

Reinforcement

Water bar

Dowels

New RC slab

1500

300
250

## Section 2-2
(Scale 1:50)

Existing wall

Existing Ground Floor Level

Existing Ground Floor Level

Existing Ground Floor tbc

Existing Ground Floor tbc

depth of existing footing tbc

Architect's finishes

Propping steel beam (beyond) *

headheight to be confirmed by Architect

Reinforcement

Drainage cavity and finishes to Architects details

To match existing width of wall

* As an alternative to being propped by ground floor beams, RC retaining walls may be designed with minimal deflections. Final design TBA at detailed design stage

Reinforcement

Water bar

Dowel Bars

L starter Bars

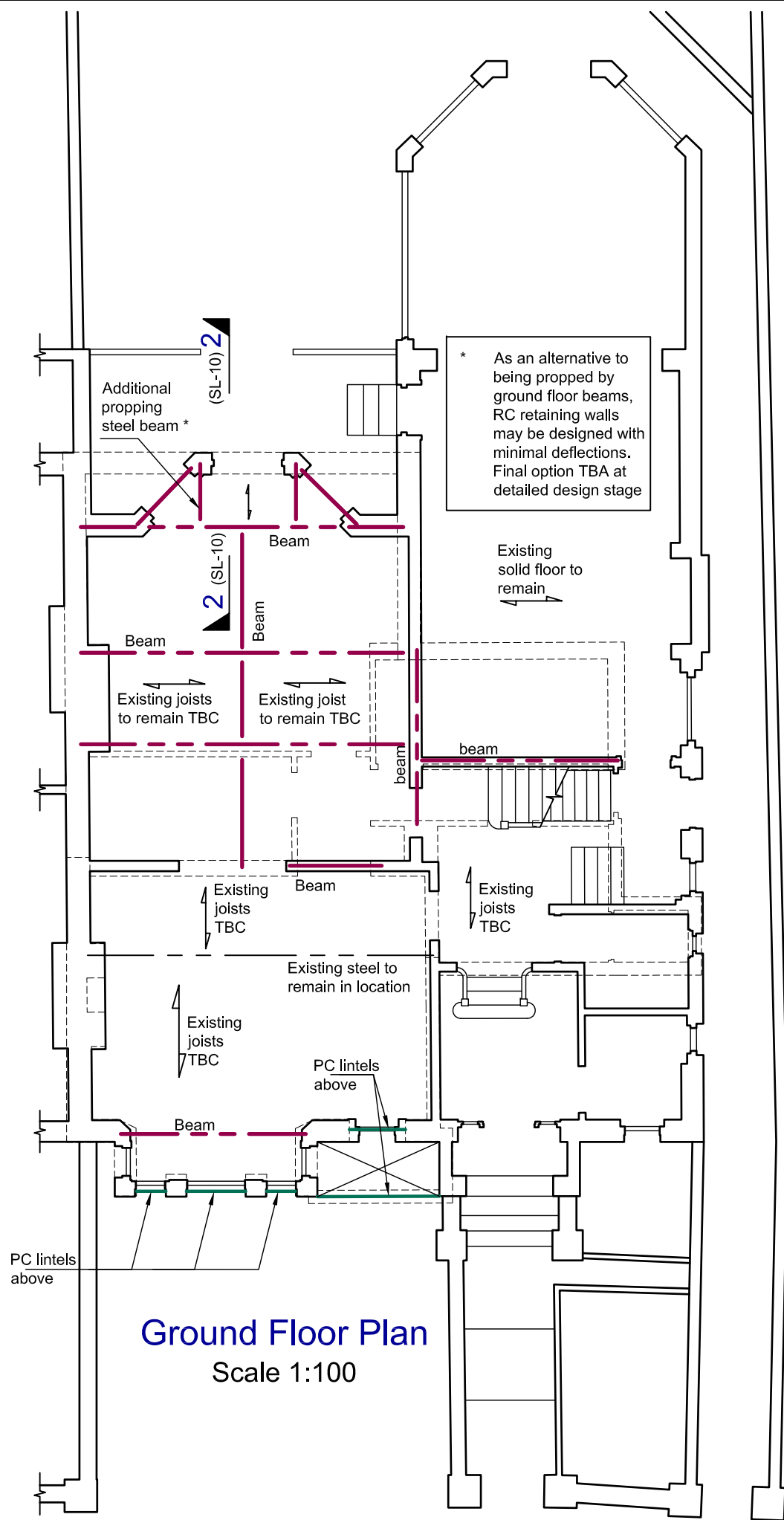| 2 | 14/02/18 | Minor amendment to Section 2-2 to show wall propping option |
| 1 | 16/10/17 | minor amendments to Architects comments |
| - | 06/10/17 | First issue preliminary to Architect |
| Rev | Date | Amendments |

| Job Number | Date |
|---|---|
| 170823 | Oct '17 |

| Dwg Number | Rev |
|---|---|
| SL-10 | 2 |

| Drawn | Ch'kd |
|---|---|
| SB | EP |

Scale: As shown @ A3

Client: Stephan Wilcke

Project: 6 Parsifal Rd

Title: Basement Plan and Section

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Additional propping steel beam *

2 (SL-10)

2 (SL-10)

Beam

Beam

Beam

* As an alternative to being propped by ground floor beams, RC retaining walls may be designed with minimal deflections. Final option TBA at detailed design stage

Existing solid floor to remain

Existing joists to remain TBC

Existing joist to remain TBC

beam    beam

beam

Beam

Existing joists TBC

Existing joists TBC

Existing steel to remain in location

Existing joists TBC

PC lintels above

Beam

PC lintels above

**Ground Floor Plan**
Scale 1:100

| 2 | 14/02/18 | Steel work altered to show wall propping option |
| 1 | 16/10/17 | minor amendments to Architects comments |
| - | 06/10/17 | First issue preliminary to Architect |
| Rev | Date | Amendments |

| Job Number | Date |
|---|---|
| 170823 | Oct '17 |

| Dwg Number | Rev |
|---|---|
| SL-20 | 2 |

| Drawn | Ch'kd |
|---|---|
| SB, GW | EP, GW |

| Scale | |
|---|---|
| As shown @ A3 | |

Client:  Stephan Wilcke

Project:  6 Parsifal Rd

Title :  Ground Floor Plan

**Croft Structural Engineers**

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