APPENDIX 2 – PRE-APPLICATION ENQUIRIES

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ARCHITECTS

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93 JUDD STREET
PRE-APPLICATION ADVICE AND PREVIOUS APPLICATION SUBMISSIONS TIMELINE
LISTED BUILDING, PLANNING AND ENVIRONMENTAL HEALTH

08.01.09	Initial meeting arranged between Rob Whitlock (Syte Architects) and Caroline Carr (Camden Conservation) to look at properties at 25, 28 and 30 Mornington Crescent and 93 Judd Street.
14.01.09	Initial pre-application submission of drawings for 93 Judd Street made by Syte Architects to Caroline Carr
15.01.09	Initial pre-application submission of report for 93 Judd Street by Michael Barclay Partnership to Caroline Carr
21.01.09	General advice provided by Caroline Carr in connection with pre-application submissions made on 14.01.09 and 15.01.09
23.01.09	Submission of method statement and schedule/drawings of opening up works for 93 Judd Street made by Syte Architects to Caroline Carr
26.01.09	Approval of statement and schedule/drawings of opening up agreed by Caroline Carr
04.08.09	Meeting on site at 93 Judd Street with Caroline Carr, Rob Whitlock and contractor
06.08.09	Pre-application submission of drawings (by Syte and MBP) for 93 Judd Street made by Syte Architects to Caroline Carr
19.08.09	Advice provided by Caroline Carr in connection with pre-application submissions made on 06.08.09
21.10.09	Submission of report for 93 Judd Street by Michael Barclay Partnership to Caroline Carr
10.11.09	Meeting on site at 93 Judd Street with Caroline Carr, Mike Warren (Camden Environmental Health) and Toby Deans (Camden Environmental Health) and Rob Whitlock.
11.11.09	Pre-application submission of drawings (by Syte and MBP) for 93 Judd Street made by Syte Architects to Caroline Carr, Mike Warren, Toby Deans and Elizabeth Beaumont (Camden Planning)
16.11.09	Advice provided by Mike Warren in connection with pre-application submissions made on 11.11.09
21.12.09	Advice provided by Caroline Carr in connection with pre-application submissions made on 11.11.09
23.12.09	Advice provided by Elizabeth Beaumont in connection with pre-application submissions made on 11.11.09
05.03.10	Applications for Planning and Listed Building Consent made
21.05.10	Applications for Planning (2010/1469/P) and Listed Building Consent (2010/1464/L) withdrawn. Johnathan Markwell confirmed withdrawl of the application by email.
22.06.10	Further advice in connection with the unit sizes provided by Johnathan Markwell by email.

APPENDIX 3 – MICHAEL BARCLAY PARTNERSHIP STRUCTURAL INFORMATION

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4037 MB
3 March 2010

Rob Witlock
Syte Architects
83-84 Berwick Street
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Dear Rob

93 JUDD STREET WC1H 9NE - DEFECTS

We discussed when we were last at the property together the visible on the elevation of the rear extension, which is more recent that the property itself. On closer inspection the crack appeared to be in the cement render that covers this part of the building in the location of a joint in the masonry behind it; it was thought that this was a junction between blockwork and brickwork, as the following photograph shows.

We also discussed the possibility of this crack being caused by settlement and/or the influence of tree roots, but there was no obvious sign of settlement, foundation movement or local disruption so my view is that this may instead be due to poor workmanship.

MBP

We agreed that, when the main works begin, the render can be removed from this crack to allow a full inspection to be made and remedial action detailed and instructed: if this proves to be an incomplete joint then I anticipate the repair will be to install remedial ties across it the fix the two panels together, but we can confirm this when the full extent of the problem is identified.

While I trust this is sufficient for you at the moment do let me know if you need anything else.

Yours sincerely

Malcolm Brady
For Michael Barclay Partnership LLP

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20/10/2009

Caroline Carr
Conservation & Urban Design
Camden Town Hall Extension
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Dear Caroline

93 JUDD STREET – PERFORMANCE AND CAPABILITY OF EXISTING FLOOR JOISTS

Michael Barclay Partnership LLP has been appointed as structural engineer to the redevelopment and refurbishment of 93 Judd Street, which will mainly involve a re-arrangement of the living and communal spaces, installation of new services and upgrading of sound and thermal insulation. While there are few structural interventions and alterations proposed an issue with the existing floor construction has been identified and a strategy for dealing with this has been developed.

The building is mid-terrace former townhouse, with a construction typical of its age and development, i.e. loadbearing masonry facades supporting timber floor joists spanning front to back over an internal spine wall, built from timber stud with lathe-and plaster finishes. The ground floor is a retail unit and the spine wall at this level is set back further from the front elevation than it is on the other levels, which has affected the performance of the floor joists.

The enclosed calculations include an assessment of the first floor joists' capability to support the spine wall from first to roof level and a share of the 2nd and 3rd floors themselves; these show that the joists will deflect significantly if arranged as single spans between the facades and spine wall and deflect considerably, albeit within limits, if arranged as continuous spans from front to rear over the spine wall. An assessment of the upper floors for general loading proves that the joists generally have insufficient stiffness for their span and loading, which is evident from their current condition: the floor dips visibly from side to side and toward the spine wall by more than 12mm. Individual joists have been further affected by the weight of separating partitions installed in the front room which have been built directly off the floor in reasonably heavy construction.

Our view on the existing floor construction is that the joists are inadequate in size and stiffness for their historic and future function, which has led to excessive and permanent deformation; the re-arrangement of the spine wall at ground level has compounded this deformation by also allowing the spine walls on the upper floors to settle. By current standards the floor construction fails to satisfy or even to meet serviceability standards.

Our recommendation is for the floors to be improved and levelled to control deflections in the future and to make the floors more comfortable to walk over. This would ideally be done by reinforcing or supplementing the existing joists with intermediate joists of similar section, i.e. setting a second set of joists between the existing or bolting reinforcing joists to the existing joists, to share support of the floor finishes and occupation load. Alternatively the joists can be positively attached to the floor boards or to new decking sheets; this will allow all the joists to perform together to reduce future deflection and vibration of the floor under foot.

Yours sincerely

Malcolm Brady
For Michael Barclay Partnership LLP

encl.- Document '090830 mb existing floor joists and spine wall.pdf'

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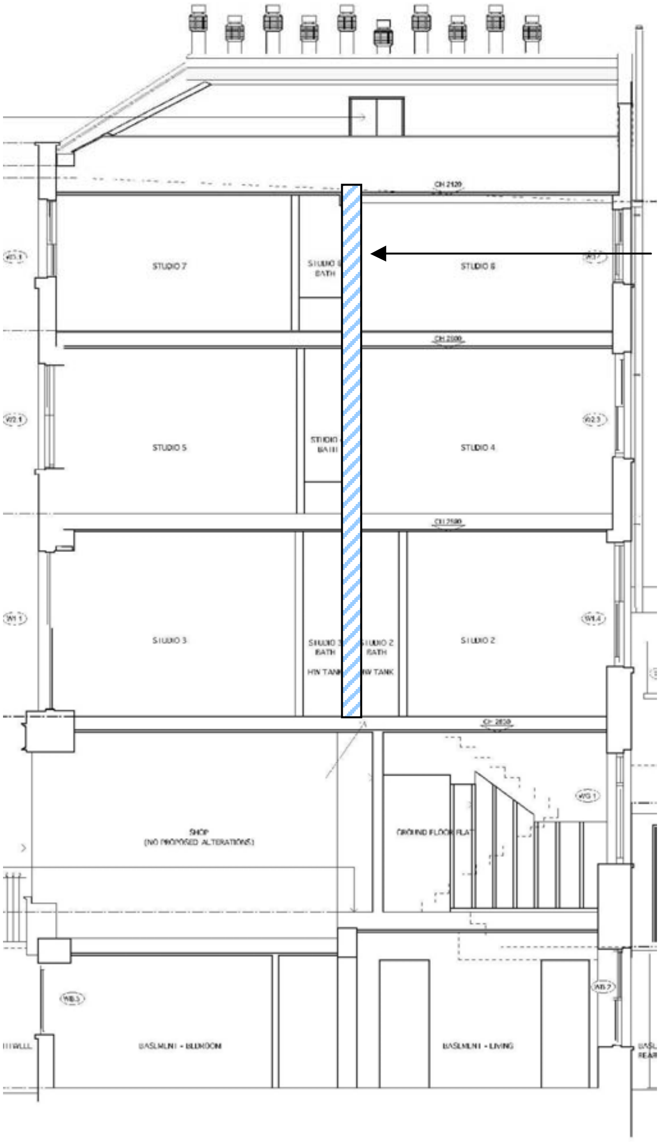
Project				Job Ref.	
93 Judd Street WC1H				4037	
Section				Sheet no./rev.	
Existing Floor Joists & Spine Wall				1	
Calc. by	Date	Chk'd by	Date	App'd by	Date
mb	09/09/2009				



Spine Wall

The building has traditional form and construction; loadbearing masonry wall support timber floor joists, which are in turn supported internally by the spine wall. This spine wall was adapted in a renovation 20 years ago to accommodate the layout of studio flats, one on either side of the spine. The arrangement shown in section above has the spine wall at ground level set-back from the spine wall above, which might explain why the floors are significantly deflected on the upper floors.

The following calculations cover the existing upper floor joists, which are single span elements between the front/rear walls and test two scenarios for the ground floor joists: continuous joists and single span joists.

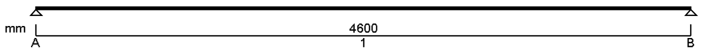
EXISTING FLOOR JOISTS

TIMBER JOIST DESIGN (BS5268-2:2002)

TEDDS calculation version 1.1.01

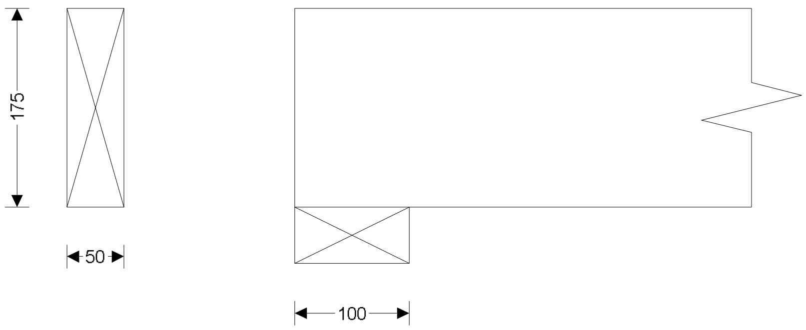
Joist details

Joist breadth;	b = **50** mm;	Joist depth;	h = **175** mm
Joist spacing;	s = **355** mm;	Service class of timber;	**1**
Timber strength class;	**C24**		



Span details

Number of spans;	N_{span} = **1**;	Length of bearing;	L_b = **100** mm
Clear length of span;	L_{s1} = **4600** mm;	;	



Section properties

Second moment of area;	I = **22330729** mm^4;	Section modulus;	Z = **255208** mm^3

Loading details

Joist self weight;	F_{swt} = **0.03** kN/m;	Dead load;	F_{d_udl} = **0.44** kN/m^2
Imposed UDL(Long term);	F_{i_udl} = **1.50** kN/m^2		
Imposed point load (Medium);	F_{i_pt} = **0.90** kN		

Consider long term loads

Design bending moment;	M = **1.901** kNm;	Design shear force;	V = **1.653** kN
Design support reaction;	R = **1.653** kN;	Design deflection;	δ = **16.146** mm

Check bending stress

Permissible bending stress;	σ_{m_adm} = **8.754** N/mm^2;	Applied bending stress;	σ_{m_max} = **7.449** N/mm^2

PASS - Applied bending stress within permissible limits

Check shear stress

Permissible shear stress;	τ_{adm} = **0.781** N/mm^2;	Applied shear stress;	τ_{max} = **0.283** N/mm^2

PASS - Applied shear stress within permissible limits

Check bearing stress

Permissible bearing stress; σ_{c_adm} = **2.640** N/mm^2; Applied bearing stress; σ_{c_max} = **0.331** N/mm^2

PASS - Applied bearing stress within permissible limits

Check deflection

Permissible deflection; δ_{adm} = **13.800** mm; Actual deflection; δ = **16.146** mm

FAIL - Actual deflection exceeds permissible deflection

Consider medium term loads

Design bending moment; M = **1.528** kNm; Design shear force; V = **1.328** kN

Design support reaction; R = **1.328** kN; Design deflection; δ = **11.283** mm

Check bending stress

Permissible bending stress; σ_{m_adm} = **10.942** N/mm^2; Applied bending stress; σ_{m_max} = **5.986** N/mm^2

PASS - Applied bending stress within permissible limits

Check shear stress

Permissible shear stress; τ_{adm} = **0.976** N/mm^2; Applied shear stress; τ_{max} = **0.228** N/mm^2

PASS - Applied shear stress within permissible limits

Check bearing stress

Permissible bearing stress; σ_{c_adm} = **3.300** N/mm^2; Applied bearing stress; σ_{c_max} = **0.266** N/mm^2

PASS - Applied bearing stress within permissible limits

Check deflection

Permissible deflection; δ_{adm} = **13.800** mm; Actual deflection; δ = **11.283** mm

PASS - Actual deflection within permissible limits

FLOOR JOISTS & SPINE WALL

WALL LOADING CHASE DOWN

; ROOF LOADING (PITCHED TILED ROOF)

;Roof slope; θ = **27.0** °

Dead load

; Tiles; $Roof_{D1}$ = **0.45** kN/m^2

; Battens; $Roof_{D2}$ = **0.05** kN/m^2

; Felt; $Roof_{D3}$ = **0.05** kN/m^2

; Rafters; $Roof_{D4}$ = **0.10** kN/m^2

Dead load on slope

$Roof_{DL\_sroof}$ = sum($Roof_{D1}$,$Roof_{D2}$,$Roof_{D3}$,$Roof_{D4}$) = **0.65** kN/m^2

; Ceiling joists; $Roof_{D5}$ = **0.05** kN/m^2

; Insulation; $Roof_{D6}$ = **0.05** kN/m^2

; Plasterboard and skim; $Roof_{D7}$ = **0.14** kN/m^2

; Services; $Roof_{D8}$ = **0.05** kN/m^2

Dead load on plan

$Roof_{DL\_proof}$ = sum($Roof_{D5}$,$Roof_{D6}$,$Roof_{D7}$,$Roof_{D8}$) = **0.29** kN/m^2

Total dead load on plan

$Roof_{DL} = Roof_{DL\_sroof} / \cos(\theta) + Roof_{DL\_proof}$= **1.02** kN/m^2

Imposed load

; Roof imposed load; $Roof_{IL}$ = **0.75** kN/m^2 ; on plan

Total roof loads

Unfactored foundation design loads; $w_{roof\_u} = Roof_{DL} + Roof_{IL}$ = **1.77** kN/m^2

Factored design loads; $w_{roof\_f} = 1.4 \times Roof_{DL} + 1.6 \times Roof_{IL}$ = **2.63** kN/m^2

TIMBER FLOOR LOADING (3RD FLOOR)

Dead load

; Boards; $Floor_{3\_D1}$ = **0.15** kN/m^2

; Joists; $Floor_{3\_D2}$ = **0.15** kN/m^2

; Ceiling; $Floor_{3\_D3}$ = **0.14** kN/m^2

Total dead load;$Floor_{3\_DL}$ = sum($Floor_{3\_D1}$,$Floor_{3\_D2}$,$Floor_{3\_D3}$) = **0.44** kN/m^2

Imposed load

; Imposed load; $Floor_{3\_I1}$ = **1.50** kN/m^2

; Partitions; $Floor_{3\_I2}$ = **0.00** kN/m^2

Total imposed load; $Floor_{3\_IL}$ = sum($Floor_{3\_I1}$,$Floor_{3\_I2}$) = **1.50** kN/m^2

Total 3rd floor loads

Unfactored foundation design loads; $w_{floor3\_u} = Floor_{3\_DL} + Floor_{3\_IL}$ = **1.94** kN/m^2

Factored design loads; $w_{floor3\_f} = 1.4 \times Floor_{3\_DL} + 1.6 \times Floor_{3\_IL}$ = **3.02** kN/m^2

TIMBER FLOOR LOADING (2ND FLOOR)

Dead load

; Boards; $Floor_{2\_D1}$ = **0.15** kN/m^2

; Joists; $Floor_{2\_D2}$ = **0.15** kN/m^2

; Ceiling; $Floor_{2\_D3}$ = **0.14** kN/m^2

Total dead load;$Floor_{2\_DL}$ = sum($Floor_{2\_D1}$,$Floor_{2\_D2}$,$Floor_{2\_D3}$) = **0.44** kN/m^2

Imposed load

; Imposed load; $Floor_{2\_I1}$ = **1.50** kN/m^2

; Partitions; $Floor_{2\_I2}$ = **0.00** kN/m^2

Total imposed load; $Floor_{2\_IL}$ = sum($Floor_{2\_I1}$,$Floor_{2\_I2}$) = **1.50** kN/m^2

Total 2nd floor loads

Unfactored foundation design loads; $w_{floor2\_u} = Floor_{2\_DL} + Floor_{2\_IL}$ = **1.94** kN/m^2

Factored design loads; $w_{floor2\_f} = 1.4 \times Floor_{2\_DL} + 1.6 \times Floor_{2\_IL}$ = **3.02** kN/m^2

TIMBER FLOOR LOADING (1ST FLOOR)

Dead load

; Boards; $Floor_{1\_D1}$ = **0.15** kN/m^2

; Joists; $Floor_{1\_D2}$ = **0.15** kN/m^2

; Ceiling; $Floor_{1\_D3}$ = **0.14** kN/m^2

Total dead load; $Floor_{1\_DL}$ = sum($Floor_{1\_D1}$,$Floor_{1\_D2}$,$Floor_{1\_D3}$) = **0.44** kN/m^2

Imposed load

; Imposed load; $Floor_{1\_I1}$ = **1.50** kN/m^2

; Partitions; $Floor_{1\_I2}$ = **0.00** kN/m^2

Total imposed load; $Floor_{1\_IL}$ = sum($Floor_{1\_I1}$,$Floor_{1\_I2}$) = **1.50** kN/m^2

Total 1st floor loads

Unfactored foundation design loads; w_{floor1_u} = $Floor_{1\_DL}$ + $Floor_{1\_IL}$ = **1.94** kN/m^2

Factored design loads; w_{floor1_f} = 1.4 × $Floor_{1\_DL}$ + 1.6 × $Floor_{1\_IL}$ = **3.02** kN/m^2

TIMBER FLOOR LOADING (GROUND FLOOR)

Dead load

; Boards; $Floor_{grnd\_D1}$ = **0.15** kN/m^2

; Joists; $Floor_{grnd\_D2}$ = **0.15** kN/m^2

Total dead load; $Floor_{grnd\_DL}$ = sum($Floor_{grnd\_D1}$,$Floor_{grnd\_D2}$) = **0.30** kN/m^2

Imposed load

; Imposed load; $Floor_{grnd\_I1}$ = **1.50** kN/m^2

; Partitions; $Floor_{grnd\_I2}$ = **1.00** kN/m^2

Total imposed load; $Floor_{grnd\_IL}$ = sum($Floor_{grnd\_I1}$,$Floor_{grnd\_I2}$) = **2.50** kN/m^2

Total ground floor loads

Unfactored foundation design loads; w_{grnd_u} = $Floor_{grnd\_DL}$ + $Floor_{grnd\_IL}$ = **2.80** kN/m^2

Factored design loads; w_{grnd_f} = 1.4 × $Floor_{grnd\_DL}$ + 1.6 × $Floor_{grnd\_IL}$ = **4.42** kN/m^2

INTERNAL WALL LOADING

Dead load

; Masonry; IW_{D1} = **0.40** kN/m^2

; Plaster (2 sides); IW_{D2} = **0.30** kN/m^2

Total dead load; IW_{DL} = sum(IW_{D1},IW_{D2}) = **0.70** kN/m^2

Total internal wall load

Unfactored foundation design loads; w_{iw_u} = IW_{DL} = **0.70** kN/m^2

Factored design loads; w_{iw_f} = 1.4 × IW_{DL} = **0.98** kN/m^2

INTERNAL WALL - DESIGN LOADS (4 STOREY BUILDING)

Roof

; Span of roof - one side of wall; $Span_{iw\_roof\_1}$ = **4.40** m ;;other side; $Span_{iw\_roof\_2}$ = **4.10** m

Total span on both sides of wall; $Span_{iw\_roof}$ = $Span_{iw\_roof\_1}$ + $Span_{iw\_roof\_2}$ = **8.50** m

Factored load on internal wall from roof

; $W_{iw\_roof\_f}$ = w_{roof_f} × $Span_{iw\_roof}$ / 2 = **11.2** kN/m

Unfactored load on internal wall from roof

; $W_{iw\_roof\_u}$ = w_{roof_u} × $Span_{iw\_roof}$ / 2 = **7.5** kN/m

3rd floor

; Height of the 3rd floor; H_3 = **2.10** m

; Span of 3rd floor - one side of wall; $Span_{iw\_3\_1}$ = **4.40** m ;;other side; $Span_{iw\_3\_2}$ = **4.10** m

Total span on both sides of wall; $Span_{iw\_3}$ = $Span_{iw\_3\_1}$ + $Span_{iw\_3\_2}$ = **8.50** m

Factored load on internal wall

; self weight from roof to 3rd floor; $W_{iw3\_f} = w_{iw\_f} \times H_3$ = **2.1** kN/m

; load from 3rd floor; $W_{iw\_floor3\_f} = w_{floor3\_f} \times Span_{iw\_3} / 2$ = **12.8** kN/m

Unfactored load on internal wall

; self weight from roof to 3rd floor; $W_{iw3\_u} = w_{iw\_u} \times H_3$ = **1.5** kN/m

; load from 3rd floor; $W_{iw\_floor3\_u} = w_{floor3\_u} \times Span_{iw\_3} / 2$ = **8.2** kN/m

2nd floor

; Height of the 2nd floor; H_2 = **2.60** m

; Span of 2nd floor - one side of wall; $Span_{iw\_2\_1}$ = **4.40** m ;;other side; $Span_{iw\_2\_2}$ = **4.10** m

Total span on both sides of wall; $Span_{iw\_2}$ = $Span_{iw\_2\_1}$ + $Span_{iw\_2\_2}$ = **8.50** m

Factored load on internal wall

; self weight from 3rd to 2nd floor; $W_{iw2\_f} = w_{iw\_f} \times H_2$ = **2.5** kN/m

; load from 2nd floor; $W_{iw\_floor2\_f} = w_{floor2\_f} \times Span_{iw\_2} / 2$ = **12.8** kN/m

Unfactored load on internal wall

; self weight from 3rd to 2nd floor; $W_{iw2\_u} = w_{iw\_u} \times H_2$ = **1.8** kN/m

; load from 2nd floor; $W_{iw\_floor2\_u} = w_{floor2\_u} \times Span_{iw\_2} / 2$ = **8.2** kN/m

1st floor

; Height of the 1st floor; H_1 = **2.80** m

; Span of 1st floor - one side of wall; $Span_{iw\_1\_1}$ = **4.40** m ;;other side; $Span_{iw\_1\_2}$ = **4.10** m

Total span on both sides of wall; $Span_{iw\_1}$ = $Span_{iw\_1\_1}$ + $Span_{iw\_1\_2}$ = **8.50** m

Factored load on internal wall

; self weight from 2nd to 1st floor; $W_{iw1\_f} = w_{iw\_f} \times H_1$ = **2.7** kN/m

; load from 1st floor; $W_{iw\_floor1\_f} = w_{floor1\_f} \times Span_{iw\_1} / 2$ = **12.8** kN/m

Unfactored load on internal wall

; self weight from 2nd to 1st floor; $W_{iw1\_u} = w_{iw\_u} \times H_1$ = **2.0** kN/m

; load from 1st floor; $W_{iw\_floor1\_u} = w_{floor1\_u} \times Span_{iw\_1} / 2$ = **8.2** kN/m

Ground floor

; Height of the ground floor; H_{grnd} = **2.80** m

; Span of ground floor - one side of wall; $Span_{iw\_grnd\_1}$ = **4.60** m ;;other side; $Span_{iw\_grnd\_2}$ = **3.90** m

Total span on both sides of wall; $Span_{iw\_grnd}$ = $Span_{iw\_grnd\_1}$ + $Span_{iw\_grnd\_2}$ = **8.50** m

Factored load on internal wall

; self weight from 1st to ground floor; $W_{iwgrnd\_f} = w_{iw\_f} \times H_{grnd}$ = **2.7** kN/m

; load from ground floor; $W_{iw\_grnd\_f} = w_{grnd\_f} \times Span_{iw\_grnd} / 2$ = **18.8** kN/m

Unfactored load on internal wall

; self weight from 1st to ground floor; $W_{iwgrnd\_u} = w_{iw\_u} \times H_{grnd}$ = **2.0** kN/m

; load from ground floor; $W_{iw\_grnd\_u} = w_{grnd\_u} \times Span_{iw\_grnd} / 2$ = **11.9** kN/m

Below ground floor

; Height of the internal wall below ground floor; H_{below} = **2.50** m

Factored load on internal wall

; self weight below ground floor; $W_{iwbelow\_f} = w_{iw\_f} \times H_{below}$ = **2.4** kN/m

Unfactored load on internal wall

; self weight below ground floor; $W_{iwbelow\_u} = w_{iw\_u} \times H_{below}$ = **1.8** kN/m

Factored design load for 3rd floor wall

Conservatively use factored load at base of wall

$W_{iw\_3} = W_{iw3\_f} + W_{iw\_roof\_f}$ = **13.22** kN/m

Factored design load for 2nd floor wall

Conservatively use factored load at base of wall

$W_{iw\_2} = W_{iw3\_f} + W_{iw2\_f} + W_{iw\_roof\_f} + W_{iw\_floor3\_f}$ = **28.59** kN/m

Factored design load for 1st floor wall

Conservatively use factored load at base of wall

$W_{iw\_1} = W_{iw3\_f} + W_{iw2\_f} + W_{iw1\_f} + W_{iw\_roof\_f} + W_{iw\_floor3\_f} + W_{iw\_floor2\_f}$ = **44.15** kN/m

Factored design load for ground floor wall

Conservatively use factored load at base of wall

$W_{iw\_grnd} = W_{iw3\_f}+W_{iw2\_f}+W_{iw1\_f}+W_{iwgrnd\_f}+W_{iw\_roof\_f}+W_{iw\_floor3\_f}+W_{iw\_floor2\_f}+W_{iw\_floor1\_f}$

W_{iw_grnd} = **59.71** kN/m

Total factored load on foundation of the internal wall

$W_{iw\_f} = W_{iw3\_f}+W_{iw2\_f}+W_{iw1\_f}+W_{iwgrnd\_f}+W_{iwbelow\_f}+W_{iw\_roof\_f}+W_{iw\_floor3\_f}+W_{iw\_floor2\_f}+W_{iw\_floor1\_f}+W_{iw\_grnd\_f}$

W_{iw_f} = **80.95** kN/m

Total unfactored load on foundation of the internal wall

$W_{iw\_u} = W_{iw3\_u}+W_{iw2\_u}+W_{iw1\_u}+W_{iwgrnd\_u}+W_{iwbelow\_u}+W_{iw\_roof\_u}+W_{iw\_floor3\_u}+W_{iw\_floor2\_u}+W_{iw\_floor1\_u}+W_{iw\_grnd\_u}$

W_{iw_u} = **53.12** kN/m

;

;

;Dead Load to 1st Floor; N_{G_1st} = **12.10** kN/m;

;Imp Load to 1st Floor; N_{Q_1st} = **22.30** kN/m;

The existing joists are genrally 2"x8" at 14" c/c. Given the age of the building the timber will be of good grade, and it will be satisfactiory to test C24 or even C30 in their analysis.

<u>Single Span Joists</u>

;Joist Spacing; S_{p_joists} = **355.00** mm;

;Dead Load per Joist from Spine Wall; $P_{G\_spinewall} = N_{G\_1st} \times S_{p\_joists}$ = **4.30** kN;

;Imp Load per Joist from Spine Wall; $P_{Q\_spinewall} = N_{Q\_1st} \times S_{p\_joists}$ = **7.92** kN;

;Dead UDL per Joist; $N_{G\_joist} = Floor3_{DL} \times S_{p\_joists}$ = **0.16** kN/m;

;Imp UDL per Joist; $N_{Q\_joist} = Floor3_{IL} \times S_{p\_joists}$ = **0.53** kN/m;

<u>TIMBER BEAM ANALYSIS & DESIGN TO BS5268-2:2002</u>

TEDDS calculation version 1.3.00

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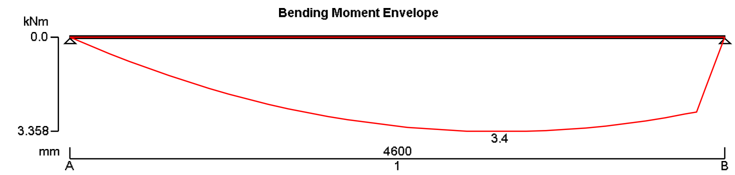
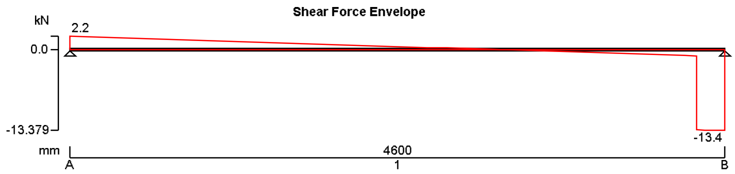
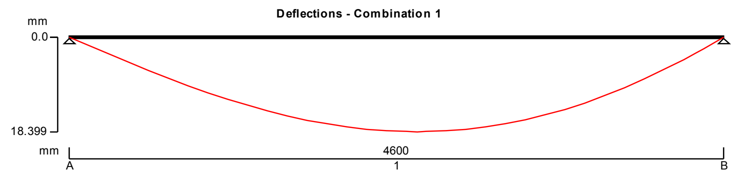
	Section Existing Floor Joists & Spine Wall			Sheet no./rev. 8	
	Calc. by mb	Date 09/09/2009	Chk'd by	Date	App'd by	Date







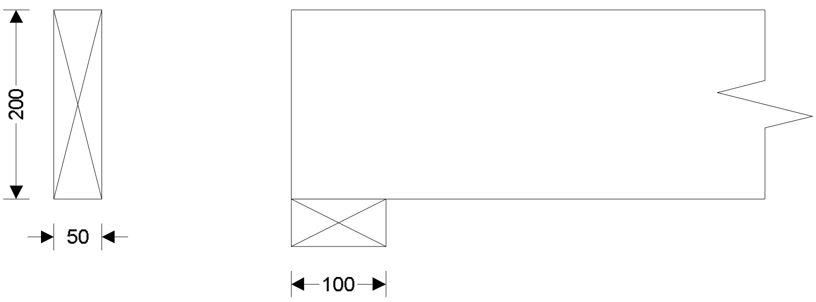
Applied loading

Beam loads — Dead self weight of beam × 1

Span 1 loads — Dead UDL 0.160 kN/m from 0 mm to 4600 mm
Dead point load 4.300 kN at 4400 mm
Imposed UDL 0.530 kN/m from 0 mm to 4600 mm
Imposed point load 7.920 kN at 4400 mm

Analysis results

Design moment;	M = **3.358** kNm;	Design shear;	F = **13.379** kN
Total load on beam;	W_{tot} = **15.602** kN		
Reactions at support A;	R_{A_max} = **2.222** kN;	R_{A_min} = **2.222** kN	
Reactions at support B;	R_{B_max} = **13.379** kN;	R_{B_min} = **13.379** kN	



Timber section details

Breadth of section;	b = **50** mm;	Depth of section;	h = **200** mm
Number of sections;	N = **1**;	Breadth of beam;	b_b = **50** mm
Timber strength class;	**C30**		

Beam details

Length of bearing; L_b = **100** mm; Service class of timber; **1**

Load duration; **Long term**

The beam is part of a load-sharing system consisting of four or more members

Check lateral stability of beam

Permiss.depth-to-breadth ratio; **5.00**; Actual depth-to-breadth ratio; **4.00**

PASS - Lateral support is adequate

Check bearing stress

Permissible bearing stress; σ_{c_adm} = **2.970** N/mm^2; Applied bearing stress; σ_{c_a} = **2.676** N/mm^2

PASS - Compressive stress not exceeded at bearing

Check beam in bending

Permissible bending stress; σ_{m_adm} = **12.652** N/mm^2; Applied bending stress; σ_{m_a} = **10.075** N/mm^2

PASS - Bending stress within permissible limits

Check beam in shear

Permissible shear stress; τ_{adm} = **1.320** N/mm^2; Applied shear stress; τ_a = **2.007** N/mm^2

FAIL - Shear stress exceeds permissible limits

Check deflection

Permissible deflection; δ_{adm} = **13.800** mm; Total deflection; δ_a = **18.923** mm

FAIL - Deflection exceeds permissible limits

As a single span the joists would need to be either deeper than measured elsewhere or/and of better quality. Consider a double span assembly.

TIMBER BEAM ANALYSIS & DESIGN TO BS5268-2:2002

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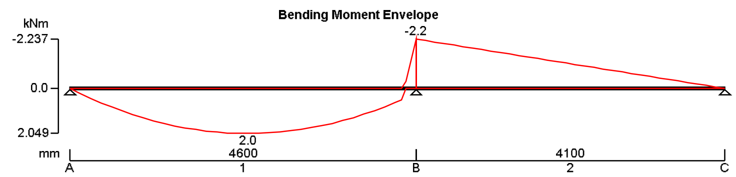
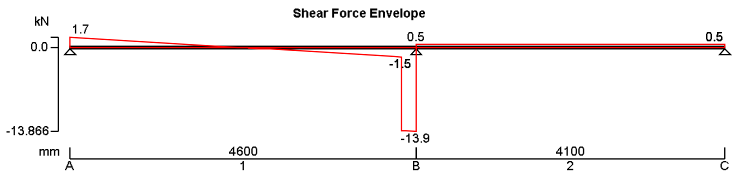
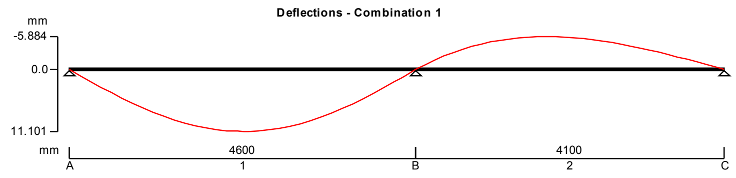






Applied loading

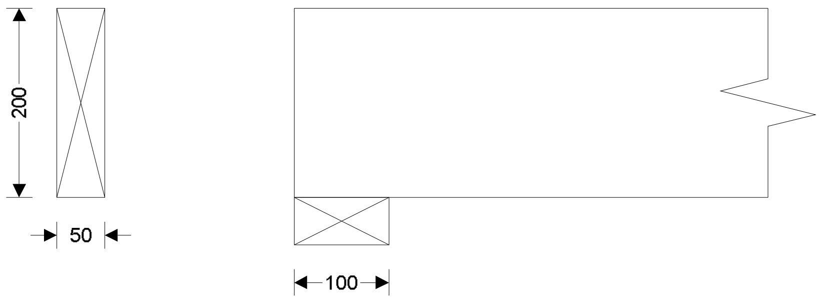
Beam loads — Dead self weight of beam × 1

Span 1 loads — Dead UDL 0.160 kN/m from 0 mm to 4600 mm
Dead point load 4.300 kN at 4400 mm
Imposed UDL 0.530 kN/m from 0 mm to 4600 mm
Imposed point load 7.920 kN at 4400 mm

Span 2 loads — Dead UDL 0.160 kN/m from 0 mm to 4100 mm
Imposed UDL 0.530 kN/m from 0 mm to 4100 mm

Analysis results

Design moment;	M = **2.237** kNm;	Design shear;	F = **13.866** kN
Total load on beam;	W_{tot} = **15.602** kN		
Reactions at support A;	R_{A_max} = **1.736** kN;	R_{A_min} = **1.736** kN	
Reactions at support B;	R_{B_max} = **14.411** kN;	R_{B_min} = **14.411** kN	
Reactions at support C;	R_{C_max} = **-0.546** kN;	R_{C_min} = **-0.546** kN	



Timber section details

Breadth of section;	b = **50** mm;	Depth of section;	h = **200** mm
Number of sections;	N = **1**;	Breadth of beam;	b_b = **50** mm
Timber strength class;	**C30**		

Beam details

Length of bearing;	L_b = **100** mm;	Service class of timber;	**1**
Load duration;	**Long term**		

The beam is part of a load-sharing system consisting of four or more members

Check lateral stability of beam

Permiss.depth-to-breadth ratio; **5.00**; Actual depth-to-breadth ratio; **4.00**

PASS - Lateral support is adequate

Check bearing stress

Permissible bearing stress; σ_{c_adm} = **3.267** N/mm^2; Applied bearing stress; σ_{c_a} = **2.882** N/mm^2

PASS - Compressive stress not exceeded at bearing

Check beam in bending

Permissible bending stress; σ_{m_adm} = **12.652** N/mm^2; Applied bending stress; σ_{m_a} = **6.712** N/mm^2

PASS - Bending stress within permissible limits

Check beam in shear

Permissible shear stress; τ_{adm} = **1.320** N/mm^2; Applied shear stress; τ_a = **2.080** N/mm^2

FAIL - Shear stress exceeds permissible limits

Check deflection

Permissible deflection; δ_{adm} = **13.800** mm; Total deflection; δ_a = **11.421** mm

PASS - Deflection is within permissible limits

So, with continuous spans the joists can be satsifactory although shear stresses are potentially high; in effect the sole plate along the base of the studs will manage this. The deflections are high, however, and possibly accounts for the uneven floors above.

Generally, the joists have inadequate stiffness for their arrangement and span, so deflections will historically have been high. The full design load is unlikley to have ever been generated so the full deflection will not have been realised but the floors have clearly deformed confirms thhat they have been loaded significantly. Compounding this problem is the settlement of the spine wall caused by it being offset at ground level.

Overall, the existing construction has been inadequate in material and structural arrangement and the existing condition, in the form of floor deformation, is a visibly consequence of this.

APPENDIX 4 – AS EXISTING PHOTOGRAPHS

Photograph 1

Photograph 2

Photograph 3

Photograph 4

Photograph 5

Photograph 6

syte ARCHITECTS

General views, 93 Judd Street

Photograph 7

Photograph 8

Photograph 9

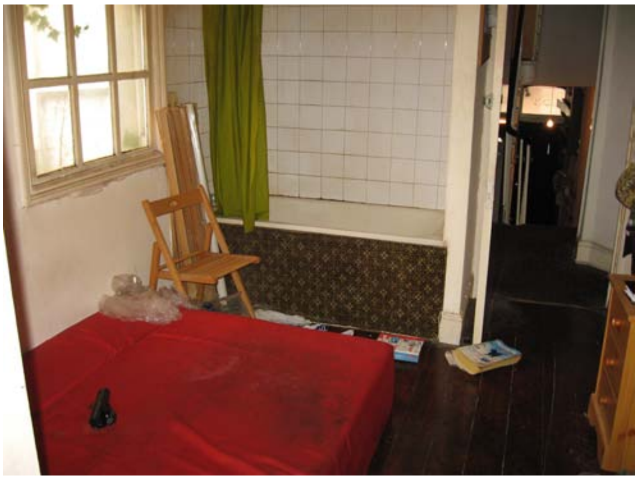
Photograph 10

Photograph 11

Photograph 12

Photograph 13


Photograph 14


Photograph 15


Photograph 16


Photograph 17

Photograph 18

Photograph 19

Photograph 20

Photograph 21

syte ARCHITECTS


Photograph 22


Photograph 23


Photograph 24


Photograph 25

Photograph 26

Photograph 27


Photograph 28


Photograph 29


Photograph 30


Photograph 31


Photograph 32

Photograph 33

Photograph 34

Photograph 35

Photograph 36

Photograph 37

Photograph 38

Photograph 39

Photograph 40

Photograph 41

Photograph 42


Photograph 43


Photograph 44


Photograph 45


Photograph 46


Photograph 47

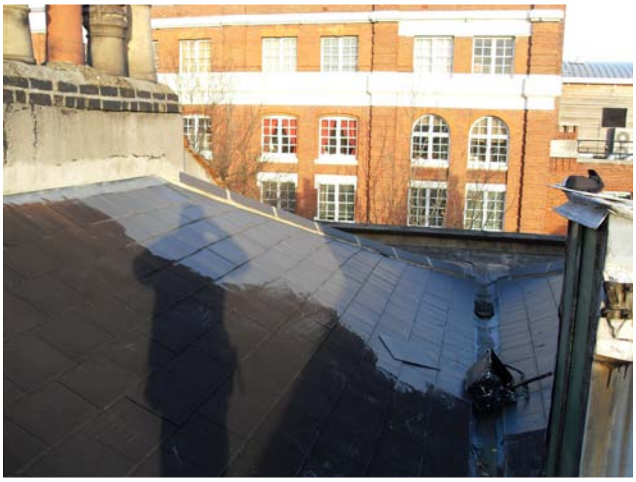

Photograph 48


Photograph 49


Photograph 50


Photograph 51


Photograph 52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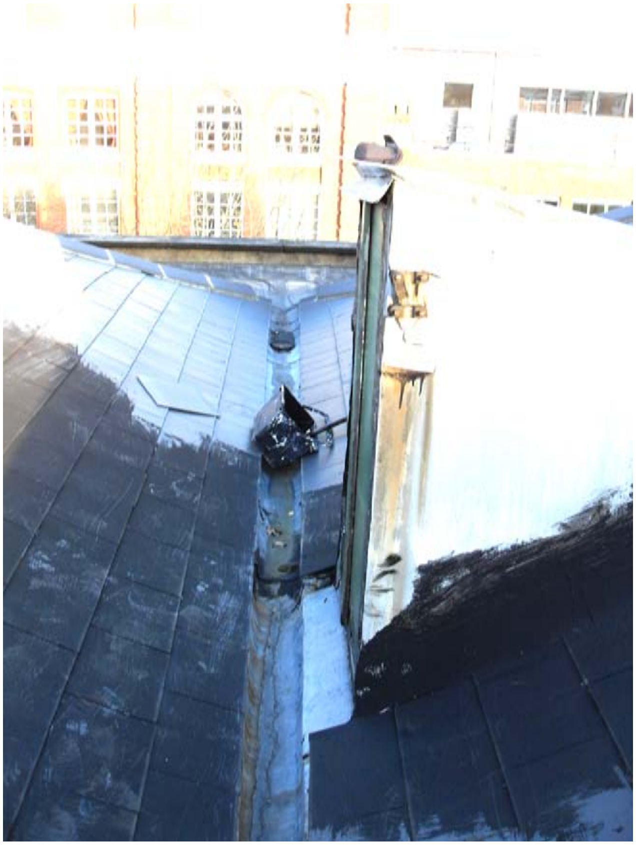
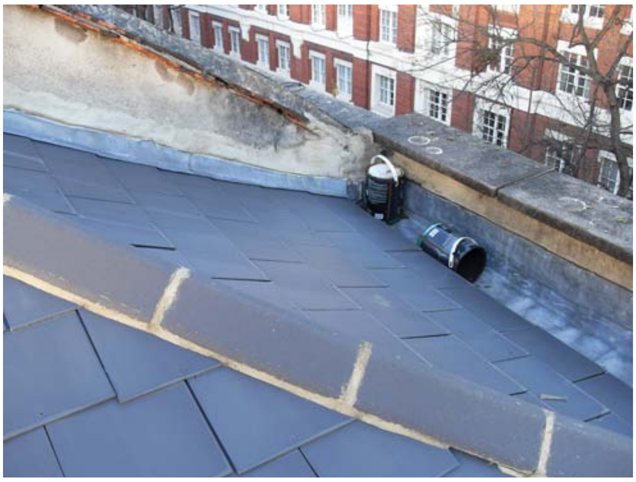
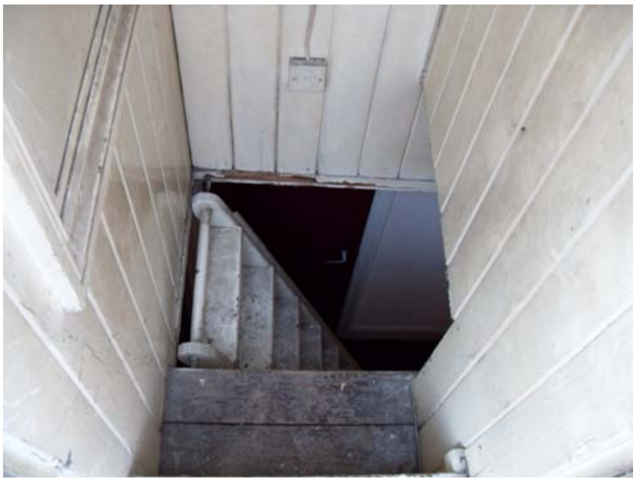

Photograph 54


Photograph 55


Photograph 56


Photograph 57


Photograph 58


Photograph 59


Photograph 60


Photograph 61


Photograph 62

Photograph 63