

Structural Design Package

60 RIDGEWAY

Project:

Existing Foundation Assessment

Client:

Leyton Jones

Project Reference:

CPR-ENG-0290

Revision:

Rev A

Date:

April 2026



CPR Engineering Design Ltd

Structural Engineering | South Wales

CPR ENGINEERING DESIGN LTD

Structural Engineering | South Wales

DOCUMENT CONTROL & ISSUE RECORD

Project Information

Project Title:

Existing Foundation Assessment

Site Address:

60 Ridgeway, Newport, NP20 5AG

Client:

Leyton Jones

Engineer:

CPR Engineering Design Ltd

Project Reference:

CPR-ENG-0290

Date of Issue:

24/04/2026

Document Description

Document Title:

Structural Design Package
Including calculations, sketches and general notes

Contents:

- Design Statement
- Summary
- Load Takedown
- Structural Calculations

Purpose of Issue:

Building Regulations / Construction

Revision Record

Revision	Date	Description of Issue / Amendment	Issued By
Rev A	24/04/2026	Initial issue for Building Control / Construction	CPR

Distribution

This document has been issued to:

- Client
-

Important Notice

This Structural Design Package is to be read in full and in conjunction with all drawings, calculations and general notes contained herein.

Any discrepancies, variations or proposed changes to the structural design are to be reported to CPR Engineering Design Ltd for review and written approval prior to implementation.

CPR Engineering Design Ltd accepts no responsibility for works not carried out in accordance with the issued structural design documentation.



Design Statement

Project: Existing Foundation Assessment

Property Address: 60 Ridgeway, Newport

Client: Leyton Jones

Date: 24/04/2026

Design Basis (Eurocodes & UK National Annexes)

- EN 1991 — Eurocode 1: Actions on structures
- EN 1993-1-1 — Eurocode 3: Design of steel structures
- EN 1995-1-1 — Eurocode 5: Design of timber structures
- EN 1996-1-1 — Eurocode 6: Design of masonry structures
- EN 1997-1 — Eurocode 7: Geotechnical design

UK National Annexes apply.

Regulatory compliance: Building Regulations (Wales) 2010.

Loads: Design loads & combinations per EN 1991 are provided in the calculation pack (separate pages).

Information Sources & Limitations

Design is based on a site inspection and information provided by the client and/or architect. Where elements were concealed, reasonable engineering assumptions have been made. Opening-up must be undertaken as required to verify the existing structure prior to fabrication/installation.

Design Scope

Provide structural design and calculations for existing strip foundations, comprising: foundation design check, all designed to Eurocodes and suitable for Building Control submission.

Key Assumptions (U.N.O.)

- Existing structure (assumed): Loadbearing walls/foundations in the load path are sound, stable, and continuous, with no significant defects and adequate bearing to ground.
- Masonry (assumed): Dense brick/concrete units $\geq 7.3 \text{ N/mm}^2$ with sound mortar joints suitable for loadbearing and fixings.



- Steelwork grade (assumed): S355 sections; bolts grade 8.8 (M16 minimum) unless noted otherwise.
 - Timber grade (assumed): C24 strength class, kiln-dried/graded, for Service Class 1–2 conditions.
 - Ground (assumed): Allowable bearing capacity = 100 kPa at founding level on firm natural strata; no significant shrinkable clay/heave risk or made ground beneath new foundations (to be confirmed on site by Contractor/Building Control; redesign if not met).
 - If any assumption is not met on site, stop and refer to the Engineer before proceeding.
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Structural Bearings

- Provide adequate, central bearing to supports; spread loads evenly using padstones/plates as detailed on the sketches.
 - Minimum steel bearings shall be as shown on the Engineer's drawings (or minimum 150mm where not stated otherwise), seat members centrally on the suitably sized padstone/plate on masonry of adequate strength.
 - New masonry to be bonded to existing; where bonding is not practicable, use stainless steel wall starter systems both faces at 225–300 mm vertical centres.
 - Contractor to confirm suitability of existing supports and locally strengthen/rebuild as required to achieve a sound load path.
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Responsibilities, Verification & Use

- Do not scale. All dimensions/levels/member lengths to be checked on site by the Contractor prior to ordering/fabrication.
- This document is for design/approval; it shall not be used for pricing or fabrication without site-verified dimensions.
- Where existing conditions differ from assumptions/drawings, stop and notify the Engineer immediately for review/redesign.
- Temporary works / propping / needling required to execute the works safely are by the Contractor, who must maintain stability at all times and comply with CDM.
- Steel-to-steel connections to be designed and detailed by the steelwork fabricator to EN 1993-1-8, and submitted for Engineer review/approval prior to fabrication.
- Fire protection to steelwork to meet Building Control requirements (e.g., intumescent coating or encasement to achieve the specified fire resistance).

U.N.O. = Unless Noted Otherwise.

Foundation Assessment Summary

Instruction

CPR Engineering Design Ltd was instructed to assess the existing foundations to a single storey extension to determine their suitability to support a proposed first floor timber frame extension.

Site Inspection

A trial pit was excavated by the client prior to attendance. A site visit was undertaken to inspect and measure the exposed foundation.

The trial pit was limited in size and partially obscured by mud and loose material at the time of inspection.

Observed Foundation Details

- Existing construction: 300mm cavity wall
 - Foundation type: Assumed mass concrete strip footing (see limitations)
 - Measured projection:
 - Approx. 150mm projection externally from face of wall
 - Assuming similar projection internally, estimated total foundation width $\approx$ 600mm
 - Depth to top of foundation: Approx. 1.0m below ground level
 - Depth (thickness) of concrete footing: Not confirmed at time of inspection
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Loading Considered

The foundation has been assessed based on the following assumed loading arrangement:

- Existing ground floor cavity wall construction
 - Proposed first floor timber frame construction
 - First floor imposed and dead loads
 - Roof loads
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Ground Bearing Assumption

An allowable ground bearing pressure of 100kPa has been adopted for the purposes of this assessment.

This is considered reasonable for typical firm natural ground; however, ground conditions were not tested or verified on site.

Assessment

Based on the above assumptions, a 600mm wide strip footing has been assessed.

The foundation has been checked against the applied loading, and using an allowable bearing pressure of 100kPa, the footing is considered to satisfy bearing capacity requirements.

Accordingly, the existing strip foundation is considered adequate to support the proposed first floor timber frame extension, subject to the limitations and recommendations outlined below.

Limitations

- The trial pit was limited in size and did not allow full exposure of the foundation
 - The depth (thickness) of the concrete footing could not be confirmed
 - Due to mud and overlying material, it was not possible to fully verify that the footing is mass concrete, although it appeared consistent with typical concrete strip foundations
 - Ground bearing conditions were not tested or confirmed
 - The internal projection of the footing has been assumed to match the external projection
 - This assessment is based on a visual inspection only, with no intrusive investigation beyond the trial pit provided
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Recommendations

Prior to construction, the following should be confirmed on site:

- The footing is mass concrete
- The depth/thickness of the concrete footing is adequate

The footing should be further exposed and cleaned to allow proper verification.

If any of the above assumptions are found to be incorrect, or if poor ground conditions are encountered, this assessment should be referred back to the engineer for review prior to proceeding.

Conclusion

Subject to confirmation of the foundation construction, dimensions, and ground conditions, the existing strip footing—assessed as approximately 600mm wide and founded at 1.0m depth—is considered adequate to support a proposed first floor timber frame extension based on an assumed allowable bearing pressure of 100kPa.

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Load Assessment / Design Basis

Loadings represent typical UK domestic construction in accordance with EN 1991
and are suitable for structural beam design unless noted otherwise.

60 Ridgeway

Roof

Roof pitch (degrees)	30	
Permanent Load	kN/m²	
Concrete Tiles	0.75	on slope
Felt and Battens	0.05	on slope
Trussed Rafters / Ceiling Joists	0.20	on slope
Sub Total	1.00	on slope
	1.15	on plan
Services	0.02	
insulation	0.05	
plasterboard ceiling	0.15	
Total	1.37	

Variable load **0.75**

Roof Lantern

Permanent load	kN/m²
Lantern	0.35
Total	0.35

Variable load **0.75**

Flat Roof

Permanent load	kN/m²
Asphalt Waterproofing	0.45
Timber Joists & Insulation	0.25
plasterboard ceiling	0.15
Services	0.05
Total	0.90

Variable load **0.75**

Upper Floors

Permanent load	kN/m²
Floor Boarding	0.20
Joists	0.20
Plasterboard ceiling and skim	0.20
Services	0.10
Total	0.70

Variable load

Domestic	1.50	
First Floor Stud Partitions	0.50	Lightweight Partitions
Total	2.00	

WALLS

External Cavity Wall (Superstructure)

Permanent Load	kN/m²
Brickwork	2.10
Brickwork	2.10
Insulation	0.05
Plasterboard/OSB/Plaster Skim	0.15
Total	4.40

Outer Leaf Load	2.10
Inner Leaf Load	2.30

Internal Load Bearing Masonry

Permanent Load	kN/m2
Plasterboard both sides	0.30
Brickwork	2.10
Total	2.40

Timber Dormer Wall

Permanent Load	kN/m2
Timber Stud	0.20
Plasterboard/OSB/Plaster Skim	0.20
Services	0.10
Insulation	0.05
Cladding	0.40
Total	0.95

320mm Thick Chimney Breast

Permanent Load	kN/m2
Brickwork	6.72
Total	6.72

External Cavity Wall (Substructure)

Permanent Load	kN/m2
Blockwork	2.10
Brickwork	2.10
Insulation	0.05
Concrete cavity Fill	1.60
Total	5.85

Element	DL (kN/m2)	IL (kN/m2)
Roof	1.37	0.75
Upper Floors	0.70	2.00
Roof Lantern	0.35	0.75
Flat Roof	0.90	0.75
Timber Dormer Wall	0.95	N/A
Internal Load Bearing Wall	2.40	N/A
320mm Thick Chimney Breast	6.72	N/A
External Cavity (Superstructure)	4.40	N/A
Outer Leaf	2.10	N/A
Inner Leaf	2.30	N/A
External Cavity Wall (Substructure)	5.85	N/A

60 Ridgeway

Unit Loads

Element	DL (kN/m ²)	IL (kN/m ²)
Roof	1.37	0.75
Upper Floors	0.70	2.00
Roof Lantern	0.35	0.75
Flat Roof	0.90	0.75
Internal Load Bearing Masonry	2.40	N/A
Timber Dormer Wall	0.95	N/A
320mm Thick Chimney Breast	6.72	N/A
External Cavity Wall (Superstructure)	4.40	N/A
Outer Leaf Load	2.10	N/A
Inner Leaf Load	2.30	N/A
External Cavity Wall (Substructure)	5.85	N/A

Strip Foundation Design

Element	Side 1 (m)	Side 2 (m)	Cover Width (m)
Roof	5.00	0.00	2.50
First Floor	5.00	0.00	2.50

Characteristic
Line Loads (kN/m)

DL	IL
3.44	1.88
1.75	5.00

Wall Heights

	(m)
Substructure (Cavity)	1.00
Ground to First (Cavity)	3.00
First to Roof (Timber)	3.00

5.85	0.00
13.20	0.00
2.85	0.00
27.09	6.88



Project 60 Ridgeway				Job no. 0290	
Calcs for Existing Strip Foundation Analysis				Start page no./Revision 1 A	
Calcs by CR	Calcs date 24/04/2026	Checked by CR	Checked date 24/04/2026	Approved by CR	Approved date 24/04/2026

FOUNDATION ANALYSIS

In accordance with EN1997-1:2004 + A1:2013 incorporating corrigendum February 2009 and the UK National Annex incorporating corrigendum No.1

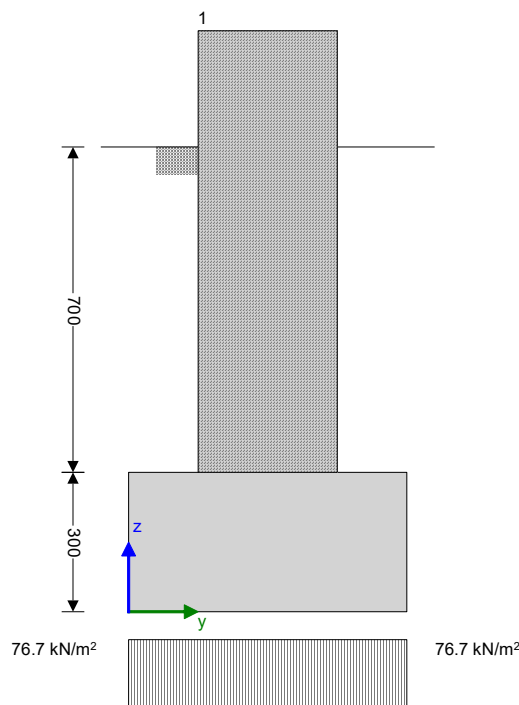
Tedds calculation version 3.3.05

Summary table

Description	Unit	Allowable	Actual	Utilisation	Result
Base pressure	kN/m ²	100	76.7	0.767	Pass

Strip foundation details - considering a one metre strip

Length of foundation	$L_x = 1000$ mm
Width of foundation	$L_y = 600$ mm
Foundation area	$A = L_x \times L_y = 0.600$ m ²
Depth of foundation	$h = 300$ mm
Depth of soil over foundation	$h_{\text{soil}} = 700$ mm
Level of water	$h_{\text{water}} = 0$ mm
Density of water	$\gamma_{\text{water}} = 9.8$ kN/m ³
Density of concrete	$\gamma_{\text{conc}} = 25.0$ kN/m ³



Wall no.1 details

Width of wall	$l_{y1} = 300$ mm
position in y-axis	$y_1 = 300$ mm

Soil properties

Density of soil	$\gamma_{\text{soil}} = 18.0$ kN/m ³
Characteristic cohesion	$c'_k = 0$ kN/m ²
Characteristic effective shear resistance angle	$\phi'_k = 30$ deg
Characteristic friction angle	$\delta_k = 20$ deg



Project				Job no.	
60 Ridgeway				0290	
Calcs for				Start page no./Revision	
Existing Strip Foundation Analysis				2 A	
Calcs by	Calcs date	Checked by	Checked date	Approved by	Approved date
CR	24/04/2026	CR	24/04/2026	CR	24/04/2026

Foundation loads

Self weight

$$F_{\text{swt}} = h \times \gamma_{\text{conc}} = \mathbf{7.5 \text{ kN/m}^2}$$

Soil weight

$$F_{\text{soil}} = h_{\text{soil}} \times \gamma_{\text{soil}} = \mathbf{12.6 \text{ kN/m}^2}$$

Wall no.1 loads per linear metre

Permanent axial load

$$F_{\text{Gz1}} = \mathbf{27.1 \text{ kN}}$$

Variable axial load

$$F_{\text{Qz1}} = \mathbf{6.9 \text{ kN}}$$

Bearing resistance (Section 6.5.2)

Forces on foundation per linear metre

Force in z-direction

$$F_{\text{dz}} = A \times (F_{\text{swt}} + F_{\text{soil}}) + F_{\text{Gz1}} + F_{\text{Qz1}} = \mathbf{46.0 \text{ kN}}$$

Moments on foundation per linear metre

Moment in y-direction

$$M_{\text{dy}} = A \times (F_{\text{swt}} + F_{\text{soil}}) \times L_y / 2 + F_{\text{Gz1}} \times y_1 + F_{\text{Qz1}} \times y_1 = \mathbf{13.8 \text{ kNm}}$$

Eccentricity of base reaction

Eccentricity of base reaction in y-axis

$$e_y = M_{\text{dy}} / F_{\text{dz}} - L_y / 2 = \mathbf{0 \text{ mm}}$$

Pad base pressures

$$q_1 = F_{\text{dz}} \times (1 - 6 \times e_y / L_y) / (L_y \times 1000 \text{ mm}) = \mathbf{76.7 \text{ kN/m}^2}$$

$$q_2 = F_{\text{dz}} \times (1 + 6 \times e_y / L_y) / (L_y \times 1000 \text{ mm}) = \mathbf{76.7 \text{ kN/m}^2}$$

$$q_{\text{min}} = \min(q_1, q_2) = \mathbf{76.7 \text{ kN/m}^2}$$

$$q_{\text{max}} = \max(q_1, q_2) = \mathbf{76.7 \text{ kN/m}^2}$$

Minimum base pressure

Maximum base pressure

Presumed bearing capacity

Presumed bearing capacity

$$P_{\text{bearing}} = \mathbf{100.0 \text{ kN/m}^2}$$

PASS - Presumed bearing capacity exceeds design base pressure