

# Structural Calculations

for

22 Maesteg Road,  
Cymmer,  
Port Talbot,  
SA13 3HS



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Date – 25<sup>th</sup> September 2020

Structural Calculations

for

22 Maesteg Road,  
Cymmer,  
Port Talbot,  
SA13 3HS

(rear 2 storey extension)

for

Client  
Mr and Mrs A Chamberlain  
68, Southend,  
Cold Ash,  
West Berkshire  
RG18 3BW

Job No 3133\_2

| Rev | Date | Notes |
|-----|------|-------|
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## 1. CALCULATION PLAN

This report contains the structural engineering calculations for the proposed development for 22 Maesteg Road, Cymmer.

The development consists of a two storey rear extension.

### 1.1. SUMMARY OF STRUCTURE

The property is a stone-built end of terrace house with cut roof on purlins. The existing single storey rear extension has been demolished.

|                         |                    |
|-------------------------|--------------------|
| Maximum plan dimensions | 11.7m by 5.5m      |
| Footprint area          | 52.8m <sup>2</sup> |
| Storeys                 | Ground and First   |
| Maximum height          | 8m (approx.)       |

### 1.2. IMPOSED LOADS

The following imposed loads have been used

|                                                                 |                        |
|-----------------------------------------------------------------|------------------------|
| Typical imposed loads on pitched roofs                          | 0.75 kN/m <sup>2</sup> |
| Typical imposed loads on floors                                 | 1.50 kN/m <sup>2</sup> |
| Partitions loads on floors (as imposed loads)                   | 1.00 kN/m <sup>2</sup> |
| Typical imposed loads on flat roofs<br>allowing for maintenance | 1.50 kN/m <sup>2</sup> |

### 1.3. REAR EXTENSION

The rear extension is built on a concrete raft foundation, which has been founded on the rock outcrop. This foundation has already been cast and is adequate for the loads to be imposed upon it.

The floor joists and roof joists have been specified as 47x150 C24 timbers at 400 centres.

A thermally broken Catnic lintel is specified over the rear patio doors.

## **2. RESOURCES**

### **2.1 CODES & REFERENCES**

BS6399 Pt1 Loadings for buildings. Code of practice for dead and imposed loads.

BS6399 Pt2 Loadings for buildings. Code of practice for wind loads.

BS6399 Pt3 Loadings for buildings. Code of practice for imposed roof loads.

BS5269 Pt2 Structural use of Timber. Code of practice for permissible stress design, materials and workmanship.

BS5628 Pt1 Use of masonry. Structural use of unreinforced masonry.

BS5950 Pt1 Structural use of steelwork in building. Code of practice for design in simple and continuous construction hot rolled sections.

BS8110 Pt1 Structural use of concrete

Manual for the design of plain masonry in building structures – The Institution of Structural Engineers. July 1997.

### **2.2 SOFTWARE**

Tekla Structural Designer suite of design and analysis tools.

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| <b>Peter Christian Structural Engineering</b><br>Chilton House, Charnham Lane, Hungerford, RG17 0EY<br>t: 07894 583048, e: peter.christian@mybroadbandmail.com                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                               | Project No.:<br><br>3133_2 |  | Sheet No.:<br><br>3. 1 |  | Rev.:<br><br>- |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
| Project title:<br>22, Maesteg Road, Cymmer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                               |                            |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
| Calculations:<br>Area Loads                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                               | Designed:<br>PC            |  | Date:<br>22/09/2020    |  | Ckd:<br>-      |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
| <div>First floor</div> <table><tr><td>Dead</td><td>Finishes</td><td>0.15 kN/m<sup>2</sup></td></tr><tr><td></td><td>Boarding</td><td>0.14 kN/m<sup>2</sup></td></tr><tr><td></td><td>Joists</td><td>0.15 kN/m<sup>2</sup></td></tr><tr><td></td><td>Services</td><td>0.05 kN/m<sup>2</sup></td></tr><tr><td></td><td>Plasterboard and skim coat</td><td>0.18 kN/m<sup>2</sup></td></tr><tr><td></td><td></td><td>0.67 kN/m<sup>2</sup></td></tr><tr><td></td><td>Without joists for use in the joist calculation is</td><td>0.52 kN/m<sup>2</sup></td></tr><tr><td>Imposed</td><td></td><td>1.50 kN/m<sup>2</sup></td></tr><tr><td></td><td>Partitions</td><td>1.00 kN/m<sup>2</sup></td></tr><tr><td></td><td></td><td>2.50 kN/m<sup>2</sup></td></tr></table> <div>Proposed flat roof</div> <table><tr><td>Dead</td><td>EPDM rubber membrane</td><td>0.08 kN/m<sup>2</sup></td></tr><tr><td></td><td>Boarding</td><td>0.14 kN/m<sup>2</sup></td></tr><tr><td></td><td>Insulation</td><td>0.05 kN/m<sup>2</sup></td></tr><tr><td></td><td>Joists</td><td>0.15 kN/m<sup>2</sup></td></tr><tr><td></td><td>Services</td><td>0.05 kN/m<sup>2</sup></td></tr><tr><td></td><td>Plasterboard and skim coat</td><td>0.18 kN/m<sup>2</sup></td></tr><tr><td></td><td></td><td>0.65 kN/m<sup>2</sup></td></tr><tr><td></td><td>Without joists for use in the joist calculation is</td><td>0.50 kN/m<sup>2</sup></td></tr><tr><td>Imposed</td><td></td><td>0.75 kN/m<sup>2</sup></td></tr></table> <div>Proposed Cavity Wall</div> <table><tr><td>Dead</td><td>Proprietary slate facing 50mm (assuming 27kN/m<sup>3</sup>)</td><td>1.35 kN/m<sup>2</sup></td></tr><tr><td></td><td>100mm blockwork</td><td>2.24 kN/m<sup>2</sup></td></tr><tr><td></td><td>Insulation</td><td>0.05 kN/m<sup>2</sup></td></tr><tr><td></td><td>100 Blockwork (assuming 18 kN/m<sup>3</sup>)</td><td>1.80 kN/m<sup>2</sup></td></tr><tr><td></td><td>Plasterboard and skim coat</td><td>0.18 kN/m<sup>2</sup></td></tr><tr><td></td><td></td><td>5.62 kN/m<sup>2</sup></td></tr></table> |                                                               |                            |  |                        |  |                |  | Dead | Finishes | 0.15 kN/m <sup>2</sup> |  | Boarding | 0.14 kN/m <sup>2</sup> |  | Joists | 0.15 kN/m <sup>2</sup> |  | Services | 0.05 kN/m <sup>2</sup> |  | Plasterboard and skim coat | 0.18 kN/m <sup>2</sup> |  |  | 0.67 kN/m <sup>2</sup> |  | Without joists for use in the joist calculation is | 0.52 kN/m <sup>2</sup> | Imposed |  | 1.50 kN/m <sup>2</sup> |  | Partitions | 1.00 kN/m <sup>2</sup> |  |  | 2.50 kN/m <sup>2</sup> | Dead | EPDM rubber membrane | 0.08 kN/m <sup>2</sup> |  | Boarding | 0.14 kN/m <sup>2</sup> |  | Insulation | 0.05 kN/m <sup>2</sup> |  | Joists | 0.15 kN/m <sup>2</sup> |  | Services | 0.05 kN/m <sup>2</sup> |  | Plasterboard and skim coat | 0.18 kN/m <sup>2</sup> |  |  | 0.65 kN/m <sup>2</sup> |  | Without joists for use in the joist calculation is | 0.50 kN/m <sup>2</sup> | Imposed |  | 0.75 kN/m <sup>2</sup> | Dead | Proprietary slate facing 50mm (assuming 27kN/m <sup>3</sup> ) | 1.35 kN/m <sup>2</sup> |  | 100mm blockwork | 2.24 kN/m <sup>2</sup> |  | Insulation | 0.05 kN/m <sup>2</sup> |  | 100 Blockwork (assuming 18 kN/m <sup>3</sup> ) | 1.80 kN/m <sup>2</sup> |  | Plasterboard and skim coat | 0.18 kN/m <sup>2</sup> |  |  | 5.62 kN/m <sup>2</sup> |
| Dead                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Finishes                                                      | 0.15 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
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| Imposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                               | 1.50 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
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| Dead                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | EPDM rubber membrane                                          | 0.08 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Plasterboard and skim coat                                    | 0.18 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                               | 0.65 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Without joists for use in the joist calculation is            | 0.50 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
| Imposed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                               | 0.75 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
| Dead                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Proprietary slate facing 50mm (assuming 27kN/m <sup>3</sup> ) | 1.35 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 100mm blockwork                                               | 2.24 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Insulation                                                    | 0.05 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 100 Blockwork (assuming 18 kN/m <sup>3</sup> )                | 1.80 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Plasterboard and skim coat                                    | 0.18 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                               | 5.62 kN/m <sup>2</sup>     |  |                        |  |                |  |      |          |                        |  |          |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |  |            |                        |  |  |                        |      |                      |                        |  |          |                        |  |            |                        |  |        |                        |  |          |                        |  |                            |                        |  |  |                        |  |                                                    |                        |         |  |                        |      |                                                               |                        |  |                 |                        |  |            |                        |  |                                                |                        |  |                            |                        |  |  |                        |

| Beam & Load description                                                        | Span<br>m | Area loads              |                         | Width<br>m | Location   |          | UDL        |            | Point loads |          |
|--------------------------------------------------------------------------------|-----------|-------------------------|-------------------------|------------|------------|----------|------------|------------|-------------|----------|
|                                                                                |           | DL<br>kN/m <sup>2</sup> | LL<br>kN/m <sup>2</sup> |            | from<br>mm | to<br>mm | DL<br>kN/m | LL<br>kN/m | DL<br>kN    | LL<br>kN |
| use the loads from Section 3.1                                                 |           | 0.50                    | 0.75                    |            |            |          |            |            |             |          |
| use these loads in Section 06, which shows that 47x150 C24 joists are required |           |                         |                         |            |            |          |            |            |             |          |

This lintel can take the applied load

|                                                                                                                                                                                                                                                                                       |                              |            |            |              |                         |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------|------------|--------------|-------------------------|---------------|
| <br><b>Peter Christian</b><br><b>Structural Engineering</b><br>Chilton House, Charnham Lane,<br>HUNGERFORD, RG17 0EY<br><a href="https://www.pcsestdesign.co.uk/">https://www.pcsestdesign.co.uk/</a> | Project                      |            |            |              | Job no.                 |               |
|                                                                                                                                                                                                                                                                                       | 22, Maesteg Road, Cymmer     |            |            |              | 3133_2                  |               |
|                                                                                                                                                                                                                                                                                       | Calcs for                    |            |            |              | Start page no./Revision |               |
|                                                                                                                                                                                                                                                                                       | Extension first floor joists |            |            |              | 05. 1                   |               |
|                                                                                                                                                                                                                                                                                       | Calcs by                     | Calcs date | Checked by | Checked date | Approved by             | Approved date |
|                                                                                                                                                                                                                                                                                       | PC                           | 25/09/2020 |            |              |                         |               |

## **TIMBER JOIST DESIGN (BS5268-2:2002)**

Tedds calculation version 1.1.04

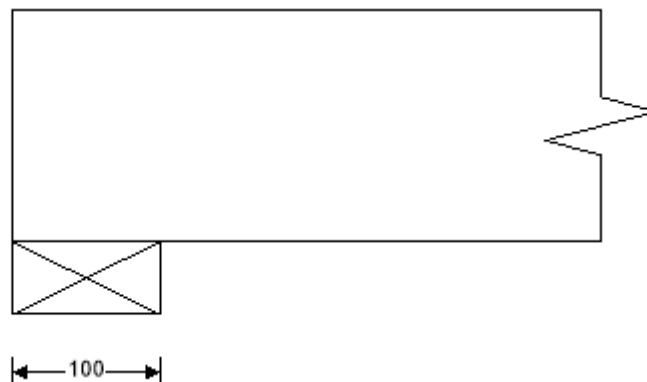
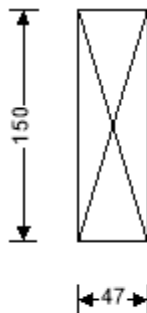
### **Joist details**

|                         |                   |
|-------------------------|-------------------|
| Joist breadth           | <b>b = 47 mm</b>  |
| Joist depth             | <b>h = 150 mm</b> |
| Joist spacing           | <b>s = 400 mm</b> |
| Timber strength class   | <b>C24</b>        |
| Service class of timber | <b>1</b>          |



### **Span details**

|                          |                                 |
|--------------------------|---------------------------------|
| Number of spans          | <b>N<sub>span</sub> = 1</b>     |
| Length of bearing        | <b>L<sub>b</sub> = 100 mm</b>   |
| Effective length of span | <b>L<sub>s1</sub> = 2620 mm</b> |



### **Section properties**

|                       |                                                                   |
|-----------------------|-------------------------------------------------------------------|
| Second moment of area | <b><math>I = b \times h^3 / 12 = 13218750 \text{ mm}^4</math></b> |
| Section modulus       | <b><math>Z = b \times h^2 / 6 = 176250 \text{ mm}^3</math></b>    |

### **Loading details**

|                                  |                                                                                                |
|----------------------------------|------------------------------------------------------------------------------------------------|
| Joist self weight                | <b><math>F_{swt} = b \times h \times \rho_{char} \times g_{acc} = 0.02 \text{ kN/m}</math></b> |
| Dead load                        | <b><math>F_{d\_udl} = 0.52 \text{ kN/m}^2</math></b>                                           |
| Imposed UDL(Long term)           | <b><math>F_{i\_udl} = 2.50 \text{ kN/m}^2</math></b>                                           |
| Imposed point load (Medium term) | <b><math>F_{i\_pt} = 1.40 \text{ kN}</math></b>                                                |

### **Modification factors**

|                                             |                              |
|---------------------------------------------|------------------------------|
| Service class for bending parallel to grain | <b>K<sub>2m</sub> = 1.00</b> |
| Service class for compression               | <b>K<sub>2c</sub> = 1.00</b> |
| Service class for shear parallel to grain   | <b>K<sub>2s</sub> = 1.00</b> |
| Service class for modulus of elasticity     | <b>K<sub>2e</sub> = 1.00</b> |

|                                                                                                                                                                                                                                                                                   |                                           |                          |            |              |                                  |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|--------------------------|------------|--------------|----------------------------------|---------------|
| <br><b>Peter Christian</b><br><b>Structural Engineering</b><br>Chilton House, Charnham Lane,<br>HUNGERFORD, RG17 0EY<br><a href="https://www.pcsedesign.co.uk/">https://www.pcsedesign.co.uk/</a> | Project<br>22, Maesteg Road, Cymmer       |                          |            |              | Job no.<br>3133_2                |               |
|                                                                                                                                                                                                                                                                                   | Calcs for<br>Extension first floor joists |                          |            |              | Start page no./Revision<br>05. 2 |               |
|                                                                                                                                                                                                                                                                                   | Calcs by<br>PC                            | Calcs date<br>25/09/2020 | Checked by | Checked date | Approved by                      | Approved date |

Section depth factor  $K_7 = 1.08$

Load sharing factor  $K_8 = 1.10$

#### **Consider long term loads**

Load duration factor  $K_3 = 1.00$

Maximum bending moment  $M = 1.057$  kNm

Maximum shear force  $V = 1.614$  kN

Maximum support reaction  $R = 1.614$  kN

Maximum deflection  $\delta = 5.562$  mm

#### **Check bending stress**

Bending stress  $\sigma_m = 7.500$  N/mm<sup>2</sup>

Permissible bending stress  $\sigma_{m\_adm} = \sigma_m \times K_{2m} \times K_3 \times K_7 \times K_8 = 8.904$  N/mm<sup>2</sup>

Applied bending stress  $\sigma_{m\_max} = M / Z = 5.999$  N/mm<sup>2</sup>

*PASS - Applied bending stress within permissible limits*

#### **Check shear stress**

Shear stress  $\tau = 0.710$  N/mm<sup>2</sup>

Permissible shear stress  $\tau_{adm} = \tau \times K_{2s} \times K_3 \times K_8 = 0.781$  N/mm<sup>2</sup>

Applied shear stress  $\tau_{max} = 3 \times V / (2 \times b \times h) = 0.343$  N/mm<sup>2</sup>

*PASS - Applied shear stress within permissible limits*

#### **Check bearing stress**

Compression perpendicular to grain (no wane)  $\sigma_{cp1} = 2.400$  N/mm<sup>2</sup>

Permissible bearing stress  $\sigma_{c\_adm} = \sigma_{cp1} \times K_{2c} \times K_3 \times K_8 = 2.640$  N/mm<sup>2</sup>

Applied bearing stress  $\sigma_{c\_max} = R / (b \times L_b) = 0.343$  N/mm<sup>2</sup>

*PASS - Applied bearing stress within permissible limits*

#### **Check deflection**

Permissible deflection  $\delta_{adm} = \min(L_{s1} \times 0.003, 14 \text{ mm}) = 7.860$  mm

Bending deflection (based on  $E_{mean}$ )  $\delta_{bending} = 5.296$  mm

Shear deflection  $\delta_{shear} = 0.267$  mm

Total deflection  $\delta = \delta_{bending} + \delta_{shear} = 5.562$  mm

*PASS - Actual deflection within permissible limits*

#### **Consider medium term loads**

Load duration factor  $K_3 = 1.25$

Maximum bending moment  $M = 1.116$  kNm

Maximum shear force  $V = 1.704$  kN

Maximum support reaction  $R = 1.704$  kN

Maximum deflection  $\delta = 4.954$  mm

#### **Check bending stress**

Bending stress  $\sigma_m = 7.500$  N/mm<sup>2</sup>

Permissible bending stress  $\sigma_{m\_adm} = \sigma_m \times K_{2m} \times K_3 \times K_7 \times K_8 = 11.130$  N/mm<sup>2</sup>

Applied bending stress  $\sigma_{m\_max} = M / Z = 6.333$  N/mm<sup>2</sup>

*PASS - Applied bending stress within permissible limits*

#### **Check shear stress**

Shear stress  $\tau = 0.710$  N/mm<sup>2</sup>

Permissible shear stress  $\tau_{adm} = \tau \times K_{2s} \times K_3 \times K_8 = 0.976$  N/mm<sup>2</sup>

Applied shear stress  $\tau_{max} = 3 \times V / (2 \times b \times h) = 0.363$  N/mm<sup>2</sup>

|                                                                                                                                                                                                                                                                                   |                              |            |            |              |                         |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------|------------|--------------|-------------------------|---------------|
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|                                                                                                                                                                                                                                                                                   | 22, Maesteg Road, Cymmer     |            |            |              | 3133_2                  |               |
|                                                                                                                                                                                                                                                                                   | Calcs for                    |            |            |              | Start page no./Revision |               |
|                                                                                                                                                                                                                                                                                   | Extension first floor joists |            |            |              | 05. 3                   |               |
|                                                                                                                                                                                                                                                                                   | Calcs by                     | Calcs date | Checked by | Checked date | Approved by             | Approved date |
|                                                                                                                                                                                                                                                                                   | PC                           | 25/09/2020 |            |              |                         |               |

*PASS - Applied shear stress within permissible limits*

#### Check bearing stress

Compression perpendicular to grain (no wane)

$$\sigma_{cp1} = \mathbf{2.400 \text{ N/mm}^2}$$

Permissible bearing stress

$$\sigma_{c\_adm} = \sigma_{cp1} \times K_{2c} \times K_3 \times K_8 = \mathbf{3.300 \text{ N/mm}^2}$$

Applied bearing stress

$$\sigma_{c\_max} = R / (b \times L_b) = \mathbf{0.363 \text{ N/mm}^2}$$

*PASS - Applied bearing stress within permissible limits*

#### Check deflection

Permissible deflection

$$\delta_{adm} = \min(L_{s1} \times 0.003, 14 \text{ mm}) = \mathbf{7.860 \text{ mm}}$$

Bending deflection (based on  $E_{mean}$ )

$$\delta_{bending} = \mathbf{4.672 \text{ mm}}$$

Shear deflection

$$\delta_{shear} = \mathbf{0.281 \text{ mm}}$$

Total deflection

$$\delta = \delta_{bending} + \delta_{shear} = \mathbf{4.954 \text{ mm}}$$

*PASS - Actual deflection within permissible limits*

|                                                                                                                                                                                                                                                                                       |                                     |                          |            |              |                                  |               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|------------|--------------|----------------------------------|---------------|
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|                                                                                                                                                                                                                                                                                       | Calcs for<br>Extension roof joists  |                          |            |              | Start page no./Revision<br>06. 1 |               |
|                                                                                                                                                                                                                                                                                       | Calcs by<br>PC                      | Calcs date<br>25/09/2020 | Checked by | Checked date | Approved by                      | Approved date |

## **TIMBER JOIST DESIGN (BS5268-2:2002)**

Tedds calculation version 1.1.04

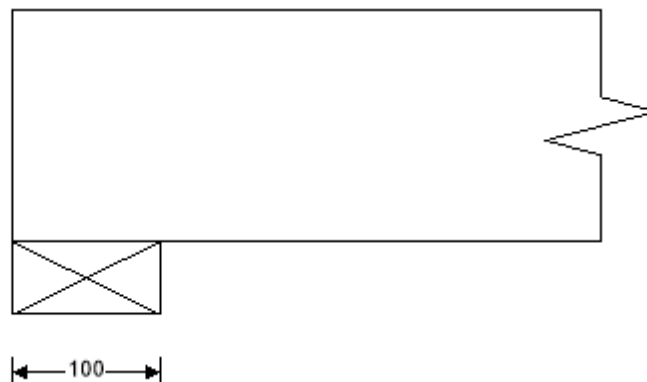
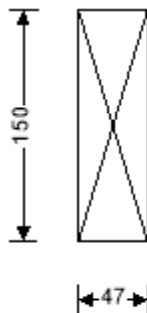
### **Joist details**

|                         |                   |
|-------------------------|-------------------|
| Joist breadth           | <b>b = 47 mm</b>  |
| Joist depth             | <b>h = 150 mm</b> |
| Joist spacing           | <b>s = 400 mm</b> |
| Timber strength class   | <b>C24</b>        |
| Service class of timber | <b>1</b>          |



### **Span details**

|                          |                                 |
|--------------------------|---------------------------------|
| Number of spans          | <b>N<sub>span</sub> = 1</b>     |
| Length of bearing        | <b>L<sub>b</sub> = 100 mm</b>   |
| Effective length of span | <b>L<sub>s1</sub> = 2620 mm</b> |



### **Section properties**

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| Second moment of area | <b>I = b × h<sup>3</sup> / 12 = 13218750 mm<sup>4</sup></b> |
| Section modulus       | <b>Z = b × h<sup>2</sup> / 6 = 176250 mm<sup>3</sup></b>    |

### **Loading details**

|                                 |                                                                                 |
|---------------------------------|---------------------------------------------------------------------------------|
| Joist self weight               | <b>F<sub>swt</sub> = b × h × ρ<sub>char</sub> × g<sub>acc</sub> = 0.02 kN/m</b> |
| Dead load                       | <b>F<sub>d_udi</sub> = 0.50 kN/m<sup>2</sup></b>                                |
| Imposed UDL(Medium term)        | <b>F<sub>i_udi</sub> = 0.75 kN/m<sup>2</sup></b>                                |
| Imposed point load (Short term) | <b>F<sub>i_pt</sub> = 0.90 kN</b>                                               |

### **Modification factors**

|                                             |                              |
|---------------------------------------------|------------------------------|
| Service class for bending parallel to grain | <b>K<sub>2m</sub> = 1.00</b> |
| Service class for compression               | <b>K<sub>2c</sub> = 1.00</b> |
| Service class for shear parallel to grain   | <b>K<sub>2s</sub> = 1.00</b> |
| Service class for modulus of elasticity     | <b>K<sub>2e</sub> = 1.00</b> |

|                                                                                                                                                                                                                                                                                   |                                     |                          |            |              |                                  |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|--------------------------|------------|--------------|----------------------------------|---------------|
| <br><b>Peter Christian</b><br><b>Structural Engineering</b><br>Chilton House, Charnham Lane,<br>HUNGERFORD, RG17 0EY<br><a href="https://www.pcsedesign.co.uk/">https://www.pcsedesign.co.uk/</a> | Project<br>22, Maesteg Road, Cymmer |                          |            |              | Job no.<br>3133_2                |               |
|                                                                                                                                                                                                                                                                                   | Calcs for<br>Extension roof joists  |                          |            |              | Start page no./Revision<br>06. 2 |               |
|                                                                                                                                                                                                                                                                                   | Calcs by<br>PC                      | Calcs date<br>25/09/2020 | Checked by | Checked date | Approved by                      | Approved date |

Section depth factor  $K_7 = 1.08$

Load sharing factor  $K_8 = 1.10$

#### **Consider medium term loads**

Load duration factor  $K_3 = 1.25$

Maximum bending moment  $M = 0.450$  kNm

Maximum shear force  $V = 0.687$  kN

Maximum support reaction  $R = 0.687$  kN

Maximum deflection  $\delta = 2.366$  mm

#### **Check bending stress**

Bending stress  $\sigma_m = 7.500$  N/mm<sup>2</sup>

Permissible bending stress  $\sigma_{m\_adm} = \sigma_m \times K_{2m} \times K_3 \times K_7 \times K_8 = 11.130$  N/mm<sup>2</sup>

Applied bending stress  $\sigma_{m\_max} = M / Z = 2.552$  N/mm<sup>2</sup>

*PASS - Applied bending stress within permissible limits*

#### **Check shear stress**

Shear stress  $\tau = 0.710$  N/mm<sup>2</sup>

Permissible shear stress  $\tau_{adm} = \tau \times K_{2s} \times K_3 \times K_8 = 0.976$  N/mm<sup>2</sup>

Applied shear stress  $\tau_{max} = 3 \times V / (2 \times b \times h) = 0.146$  N/mm<sup>2</sup>

*PASS - Applied shear stress within permissible limits*

#### **Check bearing stress**

Compression perpendicular to grain (no wane)  $\sigma_{cp1} = 2.400$  N/mm<sup>2</sup>

Permissible bearing stress  $\sigma_{c\_adm} = \sigma_{cp1} \times K_{2c} \times K_3 \times K_8 = 3.300$  N/mm<sup>2</sup>

Applied bearing stress  $\sigma_{c\_max} = R / (b \times L_b) = 0.146$  N/mm<sup>2</sup>

*PASS - Applied bearing stress within permissible limits*

#### **Check deflection**

Permissible deflection  $\delta_{adm} = \min(L_{s1} \times 0.003, 14 \text{ mm}) = 7.860$  mm

Bending deflection (based on  $E_{mean}$ )  $\delta_{bending} = 2.253$  mm

Shear deflection  $\delta_{shear} = 0.113$  mm

Total deflection  $\delta = \delta_{bending} + \delta_{shear} = 2.366$  mm

*PASS - Actual deflection within permissible limits*

#### **Consider short term loads**

Load duration factor  $K_3 = 1.50$

Maximum bending moment  $M = 0.782$  kNm

Maximum shear force  $V = 1.194$  kN

Maximum support reaction  $R = 1.194$  kN

Maximum deflection  $\delta = 3.523$  mm

#### **Check bending stress**

Bending stress  $\sigma_m = 7.500$  N/mm<sup>2</sup>

Permissible bending stress  $\sigma_{m\_adm} = \sigma_m \times K_{2m} \times K_3 \times K_7 \times K_8 = 13.355$  N/mm<sup>2</sup>

Applied bending stress  $\sigma_{m\_max} = M / Z = 4.436$  N/mm<sup>2</sup>

*PASS - Applied bending stress within permissible limits*

#### **Check shear stress**

Shear stress  $\tau = 0.710$  N/mm<sup>2</sup>

Permissible shear stress  $\tau_{adm} = \tau \times K_{2s} \times K_3 \times K_8 = 1.172$  N/mm<sup>2</sup>

Applied shear stress  $\tau_{max} = 3 \times V / (2 \times b \times h) = 0.254$  N/mm<sup>2</sup>

|                                                                                                                                                                                                                                                                                   |                          |            |            |              |                         |               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|------------|------------|--------------|-------------------------|---------------|
| <br><b>Peter Christian</b><br><b>Structural Engineering</b><br>Chilton House, Charnham Lane,<br>HUNGERFORD, RG17 0EY<br><a href="https://www.pcsedesign.co.uk/">https://www.pcsedesign.co.uk/</a> | Project                  |            |            |              | Job no.                 |               |
|                                                                                                                                                                                                                                                                                   | 22, Maesteg Road, Cymmer |            |            |              | 3133_2                  |               |
|                                                                                                                                                                                                                                                                                   | Calcs for                |            |            |              | Start page no./Revision |               |
|                                                                                                                                                                                                                                                                                   | Extension roof joists    |            |            |              | 06. 3                   |               |
|                                                                                                                                                                                                                                                                                   | Calcs by                 | Calcs date | Checked by | Checked date | Approved by             | Approved date |
|                                                                                                                                                                                                                                                                                   | PC                       | 25/09/2020 |            |              |                         |               |

*PASS - Applied shear stress within permissible limits*

#### Check bearing stress

Compression perpendicular to grain (no wane)

$$\sigma_{cp1} = \mathbf{2.400 \text{ N/mm}^2}$$

Permissible bearing stress

$$\sigma_{c\_adm} = \sigma_{cp1} \times K_{2c} \times K_3 \times K_8 = \mathbf{3.960 \text{ N/mm}^2}$$

Applied bearing stress

$$\sigma_{c\_max} = R / (b \times L_b) = \mathbf{0.254 \text{ N/mm}^2}$$

*PASS - Applied bearing stress within permissible limits*

#### Check deflection

Permissible deflection

$$\delta_{adm} = \min(L_{s1} \times 0.003, 14 \text{ mm}) = \mathbf{7.860 \text{ mm}}$$

Bending deflection (based on  $E_{mean}$ )

$$\delta_{bending} = \mathbf{3.326 \text{ mm}}$$

Shear deflection

$$\delta_{shear} = \mathbf{0.197 \text{ mm}}$$

Total deflection

$$\delta = \delta_{bending} + \delta_{shear} = \mathbf{3.523 \text{ mm}}$$

*PASS - Actual deflection within permissible limits*

GENERAL NOTES

- 1. All drawings to be read in conjunction with all relevant specifications, Architect's drawings and Services Engineer's drawings.
- 2. For setting out refer to Architect's drawings.
- 3. All dimensions are in millimetres unless noted otherwise.
- 4. Do not scale from the drawings or the computer digital data; only figured dimensions to be used. Any discrepancies to be reported immediately to the Architect.
- 5. Structural levels are in metres and related to the site datum.
- 6. Structural slab level (SSL) is the top surface level of the concrete slab immediately adjacent to a column position.
- 7. For all waterproofing details see Architect's drawings.
- 8. Holes of maximum dimension less than 150mm are not shown on the structural drawings. For details of such holes refer to relevant Architect's drawings and services builders-work drawings.
- 9. The works contractor is to provide any temporary bracing necessary to maintain structural stability during construction.
- 10.The works have been designed and shall be constructed in accordance with the following codes. This list is not exhaustive and is only intended to list the principal codes used:
  - a) BS 6399 : part 1 : 1996 : code of practice for dead and imposed loads.
  - b) BS 6399 : part 2 : 1995 : code of practice for wind loads.
  - c) BS 6399 : part 3 : 1988 : code of practice for imposed roof loads.
  - d) BS 8004 : 1986 : Code of practice for foundations.
  - e) BS 8102 : 1990 : Code of practice for protection of structures against water from the ground.
  - f) BS 8110 : parts 1, 2 and 3 : 1997 : structural use of concrete.
  - g) BS 5950 : part 1 : 2000 : structural use of steelwork in buildings.
  - h) BS 5628 : part 1 : 1992 : structural use of un-reinforced masonry.
  - i) BS 5268 : part 2 : 1996 : structural use of timber.
- 11.The works have been designed for the finished state. The superimposed loads used are detailed in the calculation package.
- 12.All works shall comply with building regulations and other relevant Statutory notices e.g. health and safety bylaws, COSHH etc.

NOTES ON STRUCTURAL STEELWORK

- 1. These notes are to be read in conjunction with relevant Architect's and Services Engineer's drawings and specifications.
- 2. The design, fabrication and erection of the structural steelwork is to be in accordance with the current version of BS 5950 and the latest edition of the national structural steelwork specification for building construction and all clauses, including appendices are deemed to be part of this specification.
- 3. Fabrication drawings shall be submitted for approval 14 days prior to commencement of fabrication, unless agreed otherwise. If fabrication drawings are not to be submitted the fabricator shall be responsible for coordination of the Architect's and Engineer's drawings. Any discrepancy shall be notified immediately to the contract administrator, and prior to commencement of fabrication.
- 4. All steelwork shall comply with BS 5950, BS 4-1, BS EN 10210-2.
- 5. Unless otherwise stipulated structural steelwork shall confirm to BS EN: Weldable structural steels.
- 6. All rolled steel shall be grade S355 unless noted otherwise, steel grade shall conform with table 4 of BS 5950 or BS EN 10210.
- 7. All hollow section steelwork to be Celsius 355 to BS EN 10210-1.
- 8. Unless noted otherwise all butt welds shall be full penetration.
- 9. Unless noted otherwise all fillet welds shall be full profile with a minimum leg length of 6mm.
- 10.Unless noted otherwise all ordinary bolt assemblies shall be M16 grade 8.8.
- 11.Unless noted otherwise all holding down bolt shall be M16 grade 8.8 anchored a minimum of 200mm depth into the supporting concrete with a 100x100x8mm thick washer plate at the embedded head of the bolt.
- 12.The clearance of base plates from supporting concrete shall be a minimum of 20mm and on completion of erection this shall be grouted solid under the full area of the base plate with an approved non-shrink grout.
- 13.Corrosion protection for internal steelwork:
  - a) surface protection - blast clean to SA 2.5 quality BS EN ISO 8501-1.
  - b) prefabricator primer - epoxy zinc phosphate HB: 50 microns (DFT).
  - c) finishing coat - see Architect's specification for details, colour and texture.

- 14.Corrosion protection for external steelwork to be hot dip galvanized.
- 15.Fire protection to be specified by the Architect, but may be achieved as follows:
  - a) ½ hour one layer of plasterboard and skim coat or intumescent paint to manufacturer's specification.
  - b) 1 hour two layers of plasterboard with joints staggered and skim coat or intumescent paint to manufacturer's specification.
- 16.Serviceability criteria shown below have been adopted in the design in accordance with BS5950. The Contractor is to ensure all supported finishes allow for these deflections. Pre-deflection may be required for significant permanent loads.
  - a) Beams - Span/360
  - b) Cantilevers - Length/180
  - c) Columns - Height/300

- 17.The fabricated steelwork for the project must be CE marked in accordance with the construction products regulation. The project is execution Class 2 and the steelwork fabricator must therefore be certified for execution Class 2 or 3 work. They must provide the following three documents to prove compliance
  - a) Factory production control certificate.
  - b) Welding certificate
  - c) Declaration of performance
- 18.All fabrication and painting to be carried out at shop. Site welding is not permitted under any circumstances

NOTES ON TIMBER

- 1. These notes are to be read in conjunction with relevant Architect's and Services Engineer's drawings and specification.
- 2. All timber-work shall comply with BS 5268: Part 2 : 1996.
- 3. All timber shall be grade C24 unless noted otherwise. Evidence of grading shall be provided before work commences.
- 4. The sizes shown on the drawings are finished sizes.
- 5. Plywood shall be as follows, unless noted otherwise:
  - (i) type - Swedish Spruce Pine Grade P30
  - (ii) grade - select un-sanded
  - (iii) nominal thickness - 18.0mm
  - (iv) number of plies - 5
- 6. In joint zones, waness, shakes and knots are not permitted.
- 7. Timber to be carefully cut and planed to ensure tight fit and continuous bearing against metalwork.
- 8. All gaps between timber and metalwork to be resin-grouted, to the approval of the Engineer.
- 9. All connectors, bolts, nails etc. shall be galvanised to BS 729.
- 10.Timber adhesive to be a thixotropic polyurethane paste adhesive to EN204:D4 (Illbruck PU230, Sika product Everbuild Lumberjack 30 Min PU Wood Adhesive, or similar).
- 11.All timber to be treated in accordance with the British wood preservative and damp-proofing association commodity specification C8 for 40 years desired service life.
- 12.All timber flat roofs to be tied down with Expamet STSS stainless steel vertical restraint straps (or similar approved) @ 1200mm c/c. All walls to be laterally restrained with Expamet HS horizontal restraint straps (or similar approved) @ 1200mm c/c.
- 13.Serviceability criteria shown below have been adopted in design in accordance with BS 5268. Contractor to ensure all supported finishes allow for these deflections. Also note that timber exhibits long term creep and will therefore continue to deflect after load has been applied.
  - a) Beams - span/333
  - b) Cantilevers - length/167
  - c) Columns - height/300

NOTES ON CONCRETE

- 1. These notes are to be read in conjunction with relevant Architect's and Services Engineer's drawings and Specifications.
- 2. All concrete shall comply with BS 5328 "Concrete" and BS 8110 "Structural use of Concrete".
- 3. The structural concrete is to be Grade C30, unless otherwise stated. Mass concrete shall be grade C20. If an alternative source or grade is proposed, the mix shall be subject to approval as described in BS 5328 and BS 8110.
- 4. Cover to reinforcement is to be as shown on the drawings.

- 5. The concrete finishes are to be; 3U for the surfaces of all slabs; A for all formed surfaces
- 6. 50mm thick blinding concrete is to be placed under all reinforced concrete in contact with the ground. Concrete to be grade C30.
- 7. Reinforcement shall comply with BS 4449 or BS 4483 as relevant.
- 8. Openings shown on the Engineer's drawings are to be checked by the Contractor with the relevant services builders work drawings prior to construction. Any discrepancies must be drawn to the attention of the Architect.
- 9. No holes in reinforced concrete are to be formed or cut without the Engineer's prior agreement.
- 10.The positions and details of all construction joints are to be agreed with the Engineer before work commences. Maximum length of wall shall be 10m. Maximum area of slab shall be 200 m².
- 11.Water bars shall be used at all construction joints and penetrations. Puddle flanges shall be used on pipework passing through RC walls or slabs.
- 12.Serviceability criteria shown below have been adopted in design in accordance with BS 8110. Contractor to ensure all supported finishes allow for these deflections. Predeflection may be required for significant permanent loads.
  - a) Beams - span/250
  - b) Cantilevers - length/125
  - c) Columns - height/300

NOTES ON MASONRY

- 1. These notes are to be read in conjunction with relevant Architect's and Services Engineer's drawings and specifications.
- 2. All brickwork shall comply with BS 5628.
- 3. All bricks shall have a minimum crushing strength of 20N/mm², unless otherwise stated.
- 4. Blockwork shall have a minimum crushing strength of 7.3 N/mm², unless otherwise stated.
- 5. Mortar shall be class (iii) / M4 cement:lime: sand mix (1:1:6), unless otherwise stated.
- 6. All vertical joints shall be completely filled. Bricks shall be laid frog up. The voids in perforated bricks shall be filled.
- 7. Fissured bricks or bricks with unplanned voids shall not be used.
- 8. Horizontal chases are prohibited. Vertical chases and builders work holes shall be agreed with the Architect.
- 9. Wall ties to be Ancon ST1 type 1 ties at 450mm vertically and 900mm horizontally unless otherwise stated.

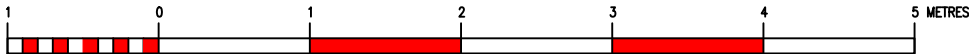
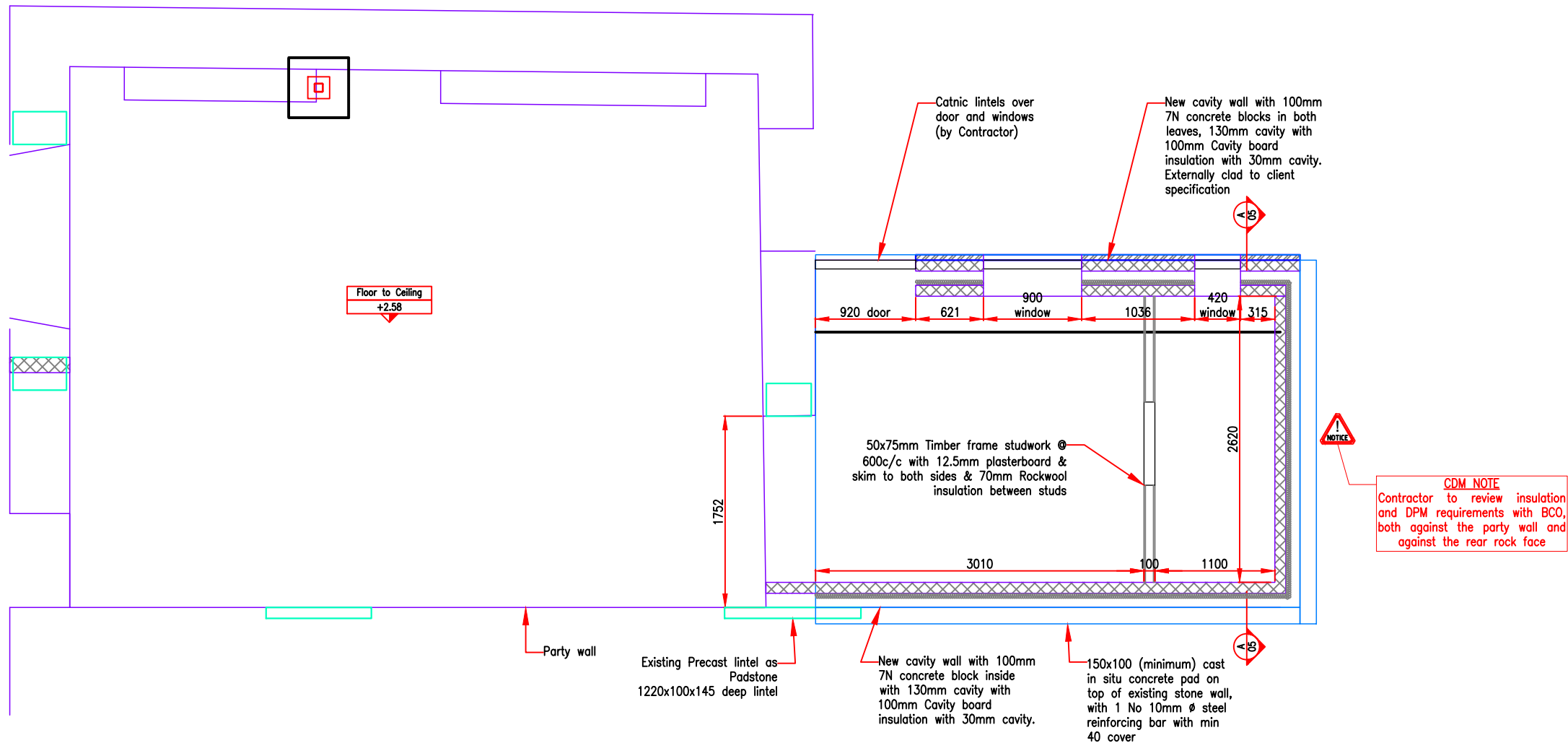
NOTES ON EARTHWORKS

- 1. These notes are to be read in conjunction with relevant Architect's and Services Engineer's drawings and specifications.
- 2. All earthworks shall be carried out in accordance with health and safety regulations. The contractor shall provide all necessary temporary works.
- 3. Excavated spoil shall be disposed of off-site to relevant tips.
- 4. The contractor shall keep the site, all formations and all excavations free of water. Water shall be disposed of via settling tanks and silt traps to agreed points.
- 5. The minimum ground bearing pressure required is 100kN/m². The founding level shall be approved by the Building Control Officer. Over-excavation to a suitable bearing shall be backfilled with C30 concrete.
- 6. Formations and bearings shall be clean and free from debris, roots, and any organic material prior to concreting or filling. Any over-excavation to remove roots and organic material to be backfilled with C30 concrete.
- 7. Hardcore shall consist of type 1 or type 2 material or broken brick free from plaster, dust, loam, wood, rubbish or organic materials. All pieces shall be less than 225mm in any direction. Compaction shall be carried out using appropriate equipment.
- 8. All roots to be cut back to 150mm from edge of foundations.
- 9. Fill behind external retaining walls to be free draining material as described in note 7 above.
- 10.The contractor shall undertake a c.a.t scan survey to ensure that existing services and drainage are not affected by the proposed works.

|                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                             |                                                                           |                                                                                   |                                |                    |               |                  |         |
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| CDM2015 Statement<br>Any information given on this drawing must be used in conjunction with the Construction Phase Plan prepared by the Principal Contractor.<br>Any changes in design, or conditions arising, or information becoming known at a later date, which may impact upon the design, construction or use of the building, must be notified to the Principal Contractor and Principal Designer immediately. | Peter Christian Structural Engineering<br>Structural Design & Project Management<br>Chilton House, Charnham Lane,<br>Hungerford, RG17 0EY<br>Telephone: 07894 583048 (Mobile)<br>Email: peter.christian@mybroadbandmail.com | CLIENT<br>Mr and Mrs A Chamberlain<br>68, Southend,<br>Cold Ash, RG18 3BW | PROJECT<br>22 Maesteg Road, Cymmer,<br>Port Talbot, Neath Port Talbot<br>SA13 3HS | DRAWING TITLE<br>General Notes | DATE<br>23-09-2020 | SCALE<br>NTS  | DRAWN<br>CHECKED | PC<br>- |
|                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                             |                                                                           |                                                                                   |                                | JOB No.<br>3133_2  | DRG No.<br>01 | REVISION<br>-    |         |
|                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                             |                                                                           |                                                                                   | DRAWING STATUS<br>Construction |                    |               |                  |         |

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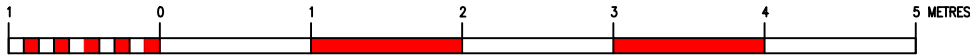
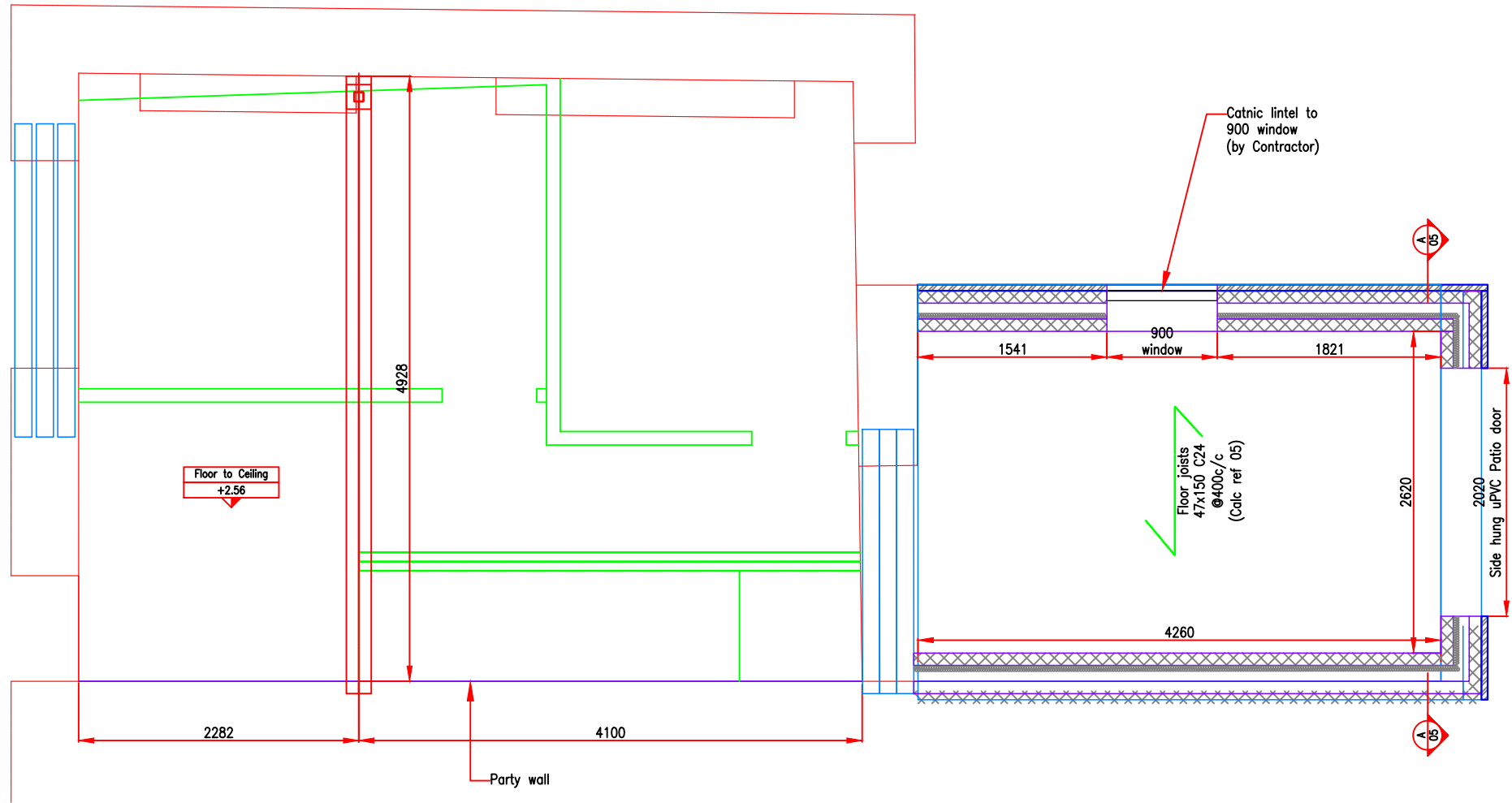
1. Do not scale from this drawing in either paper or digital form. Use written dimensions only. To check that the drawing has been printed to the intended scale use the scale bar in the absence of written dimensions.
2. All levels and dimensions to be checked on site by Contractor, prior to commencement of work.



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|                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                    |                                                                                  |                                                                                          | <b>DRAWING STATUS</b> Construction        | <b>JOB No.</b><br>3133_2  | <b>DRG No.</b><br>02                   | <b>CHECKED</b> - |
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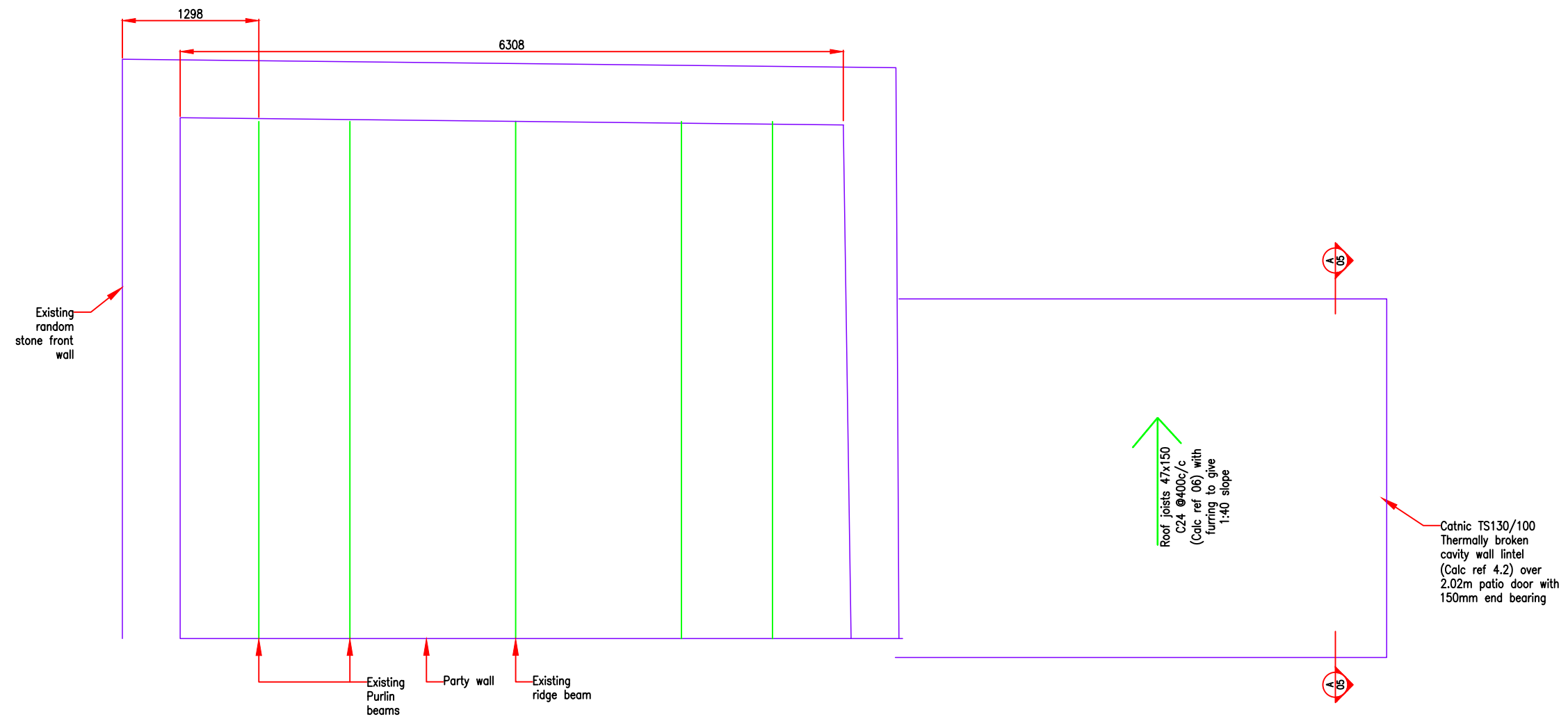
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|                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                    |                                                                                  |                                                                                          | <b>DRAWING STATUS</b><br>Construction    | <b>JOB No.</b><br>3133_2  | <b>DRG No.</b><br>03                   | <b>CHECKED</b> - |
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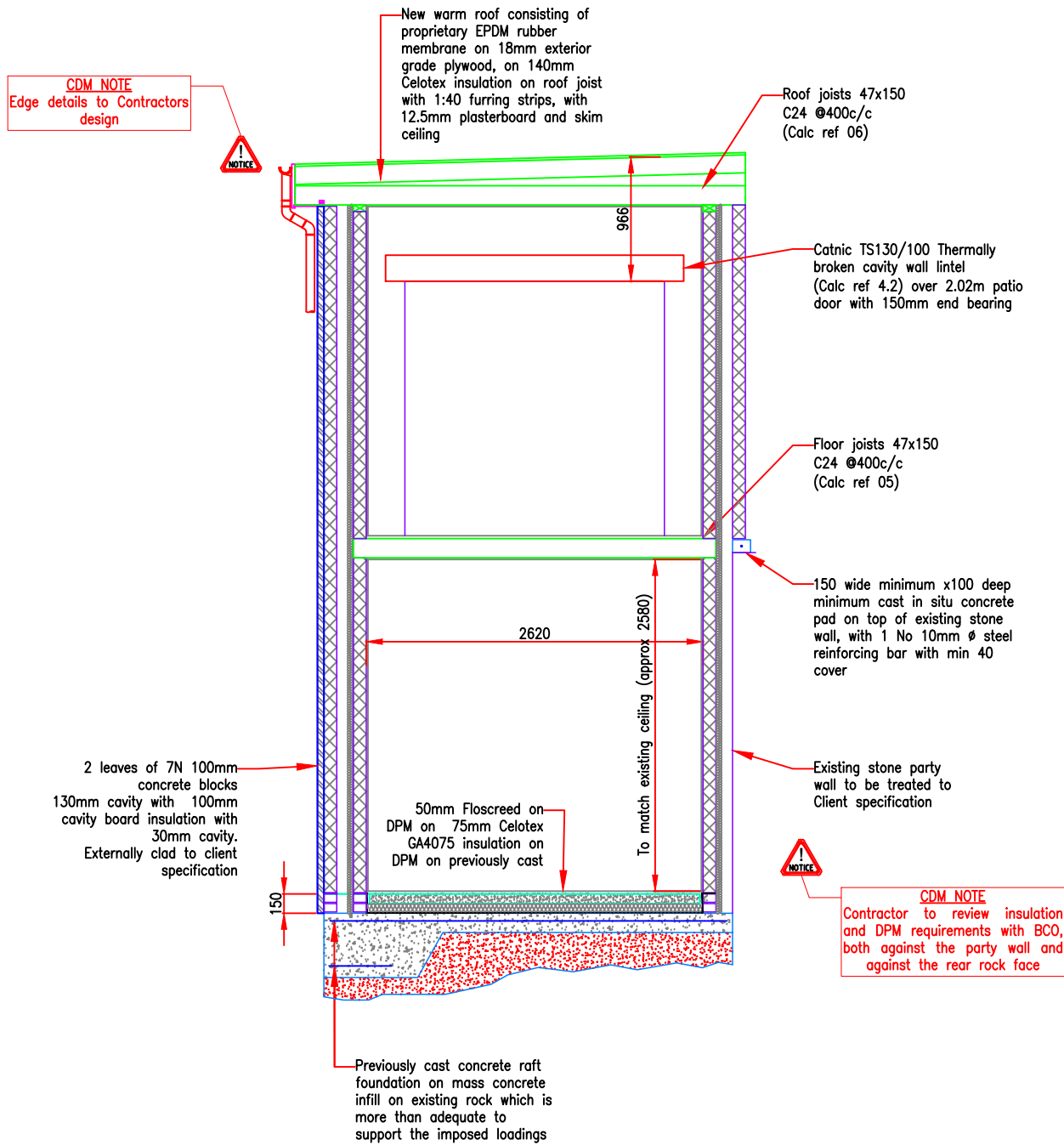
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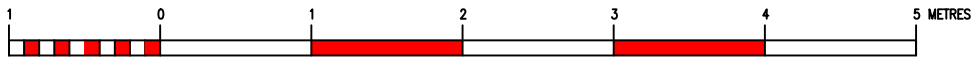
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|                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                    |                                                                                  |                                                                                          | <b>DRAWING STATUS</b> Construction | <b>JOB No.</b><br>3133_2  | <b>DRG No.</b><br>04                   | <b>CHECKED</b> - |
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- Notes
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SECTION A-A  
02/03/04



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| <b>CDM2015 Statement</b><br>Any information given on this drawing must be used in conjunction with the Construction Phase Plan prepared by the Principal Contractor.<br>Any changes in design, or conditions arising, or information becoming known at a later date, which may impact upon the design, construction or use of the building, must be notified to the Principal Contractor and Principal Designer immediately. | <b>Peter Christian Structural Engineering</b><br>Structural Design & Project Management<br>Chilton House, Charnham Lane,<br>Hungerford, RG17 0EY<br>Telephone: 07894 583048 (Mobile)<br>Email: peter.christian@mybroadbandmail.com | <b>CLIENT</b><br>Mr and Mrs A Chamberlain<br>68, Southend,<br>Cold Ash, RG18 3BW | <b>PROJECT</b><br>22 Maesteg Road, Cymmer,<br>Port Talbot, Neath Port Talbot<br>SA13 3HS | <b>DRAWING TITLE</b><br>Section A-A | <b>DATE</b><br>23-09-2020 | <b>SCALE</b><br>A1 - 1:25<br>A3 - 1:50 | <b>DRAWN</b> PC  |
|                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                    |                                                                                  |                                                                                          | <b>DRAWING STATUS</b> Construction  | <b>JOB No.</b><br>3133_2  | <b>DRG No.</b><br>05                   | <b>CHECKED</b> - |
|                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                    |                                                                                  |                                                                                          | <b>REVISION</b><br>-                |                           |                                        |                  |