

DAVID PARTRIDGE LTD

CHARTERED ENGINEER

B.ENG., C.ENG., M.I.C.E.

**REPORT ON ‘THE ORANGERY’ at
GRITTLETON HOUSE,
HULLAVINGTON,
WILTSHIRE
SN14 6AP**

JOB NUMBER	25 / 195
CLIENT	Matthew and Vanessa Shipp
DATE	14th October, 2025

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1.0 SCOPE OF BRIEF

Attached to the southern end of Grittleton House, 'The Orangery' has a glazed duo-pitched roof supported on a masonry wall to the north [Grittleton House] and isolated masonry piers to the other three elevations.

It is proposed to replace the existing glazing with tiling to improve the thermal performance of the building. The building is rectangular on plan with its longer axis orientated approximately east to west.

I have been asked to appraise the effect on the structure of introducing profiled steel sheet cladding on the existing roof pitches and to advise what remediation, if any, needs to be introduced to ensure the long term stability of the roof and, by implication, the supporting elements of the building below.

The inspection of the building was made on 10th September, 2025 by the Principal of this Practice, David Partridge B.Eng.[Hons]., C.Eng., M.I.C.E., who is also the author of the document. My experience of this type of appraisal extends to over forty five years in Private Practice.

2.00 STRUCTURAL FORM and CONDITION

The structural form of the building is very typical of this age and previous function comprising a glazed covering supported on slender metal angles spanning between fabricated metal trusses spanning the narrow width of the building; the southern wall of Grittleton House to the north and slender isolated masonry columns in its southern elevation and both gable ends.

Unfortunately, the purlins and trusses could not be seen due to the presence of a temporary fabric ceiling supported from the roof structure, presumably to 'manage' the internal air temperatures. However, my Clients have found a photograph of the building interior; this shows the roof soffit and walls, and is included as Plate 01 in Appendix 'A' as reference.

The external and internal inspection of the masonry showed a very slight outwards lean at the head of the columns in the two gable ends, and slightly more in the long, southern wall. [Plate 02]. In addition, some cracking can be seen in the turned masonry arches in the southern wall. [Plate 03]. This damage clearly indicates outwards movement of the upper part of the southern wall caused by an unrestrained outwards thrust at the feet of the roof trusses.

This type of cause of damage is very typical in large roofs where there is no effective lateral tie to the truss feet where they are built into their supporting walls. The material properties of the trusses are unknown because the date of manufacture pre-dates the time when adequate records were retained. Accordingly, it is impossible to precisely calculate the magnitude of theoretical outwards spread at eaves level – nevertheless, by comparing those likely material properties with current parameters I have assessed that the likely eaves spread will be approximately 25-35mm at the southern elevation; there can be no spread at the northern side due to the buttressing provided by the house.

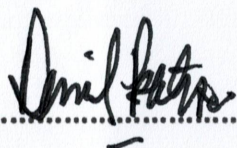
3.00 CONCLUSIONS

The existing spread at eaves level clearly indicates that the existing roof structure and its supporting masonry cannot satisfactorily sustain the weight imposed by the roof structure with the consequence being outwards spread at eaves level and cracking of some masonry units.

The replacement roof covering of steel sheet cladding will very nominally increase the weight to be sustained by the trusses and so greater theoretical outwards spread is a risk and, with it, more damage.

The most simple and structurally efficient remedy is to install a tie across the building width between the feet of each truss. I have prepared calculations to prove what is required and drawings to demonstrate the details, all included as Appendix 'B'. The vertical position of the tie is determined by the height of the arched 'feature' against the southern wall of the house; the ties cannot be below this height and so will be installed immediately above it.

The performance of the existing roof purlins cannot be seen due to the internal 'lining' but the reasonable assumption can be made for their replacement as they too will sustain additional weight.

Signed.....

Dated.....*5th December, 2015*

David Partridge Limited
B.Eng., C.Eng., M.I.C.E.

APPENDIX A

Calculation sheets 01 – 05

Sketch drawings 25/195 : 01 and 02

Project	THE ORANGERY , GRITTLETON HOUSE	Sheet No	01
Subject	<u>ROOF DESIGN CHECK</u>	Contract No	25/195
		Date	
		Engineer	

Refer to CLARK + MASLIN drawings 4977/-
.....from which all dimensions have been taken.

Designed to	
Loadings	BS648 BS6399 CP3
Steel	BS449 BS5950
Masonry	BS5628
Concrete	BS8110
Timber	BS5268

Project Brief

Project

Sheet No

02

THE ORAN FERRY

Contract No

25/195

Subject

LOADING

Date

Engineer

Roof

SLOPE

PLAN

SHEETING

0.28

B + FELT

0.05

'RAGGUS'

0.10

INSULATION

0.05

P/BAD CEILING

0.20

 $0.68 / 0.538 = 0.86 \text{ kW/m}^2$

SNOW

0.55

 1.41 kW/m^2

Project

THE ORANFERY

Sheet No

63

Contract No

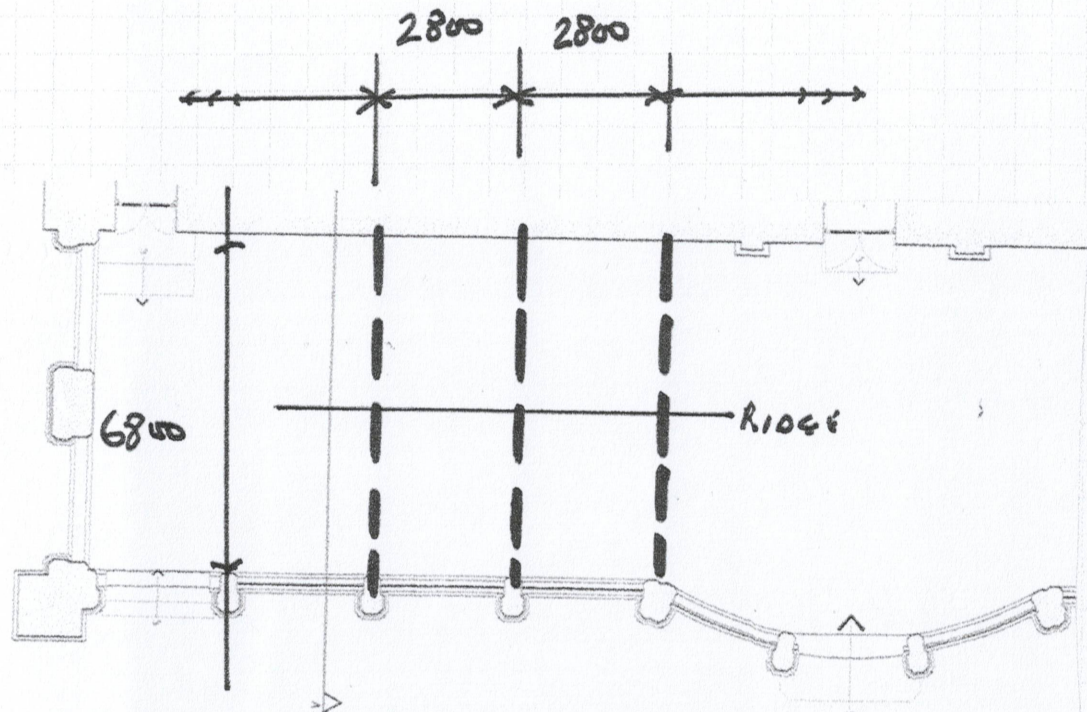
25/195

Subject

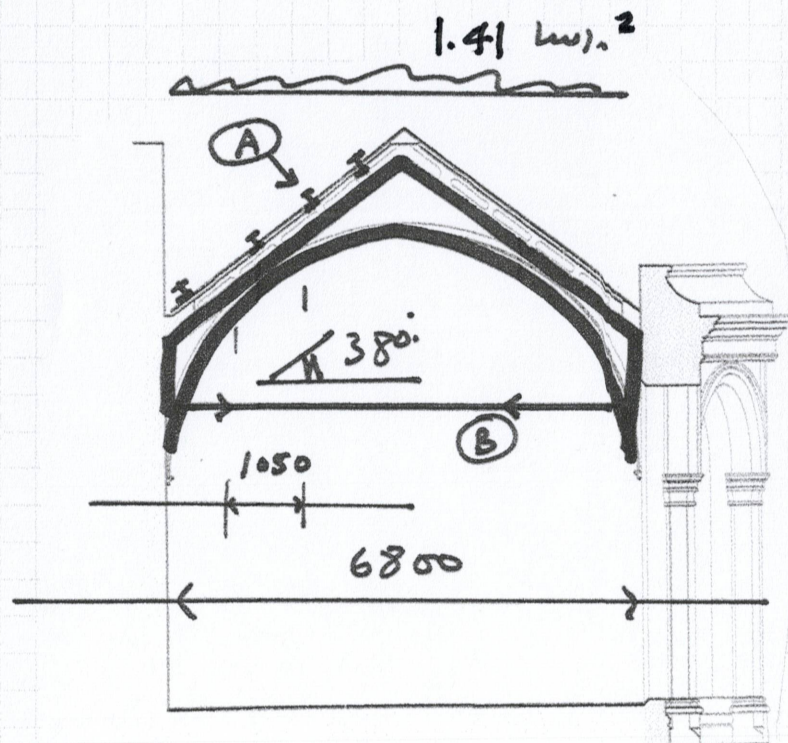
LAYOUT

Date

Engineer



FLOOR PLAN



① PURLIN

$$w_{ps} = 1.41 \times 1.05$$

$$= 1.48 \text{ kN/m}$$

$$M = 1.48 \times 2.8^2 / 8$$

$$= 1.48 \text{ kNm}$$

70x70x8 RJA

$$f_c = 1480 / 95.2$$

$$= 15 \text{ N/mm}^2$$

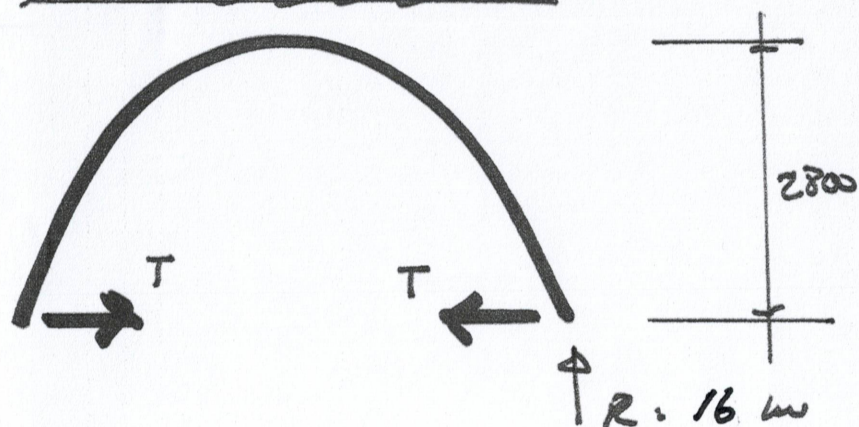
$$\Delta = \frac{5 \times 1.48 \times 2800^4}{384 \times 75.3 \times 21 \times 10^8}$$

$$= 27.40 \text{ mm}$$

$$(\frac{30 \text{ mm}}{378})$$

② TRUSS / TIE BAR

$$(1.41 \times 2.80) + 0.60 = 4.58 \text{ kN/m}$$



Project

Sheet No. 05

THE ORAN FERRY

Contract No. 25/195

Subject

Date

Engineer

→ Rise .

$$(16 \times 3.4) = (4.55 \times 3.2 \frac{1}{2}) + (T \times 2.80)$$

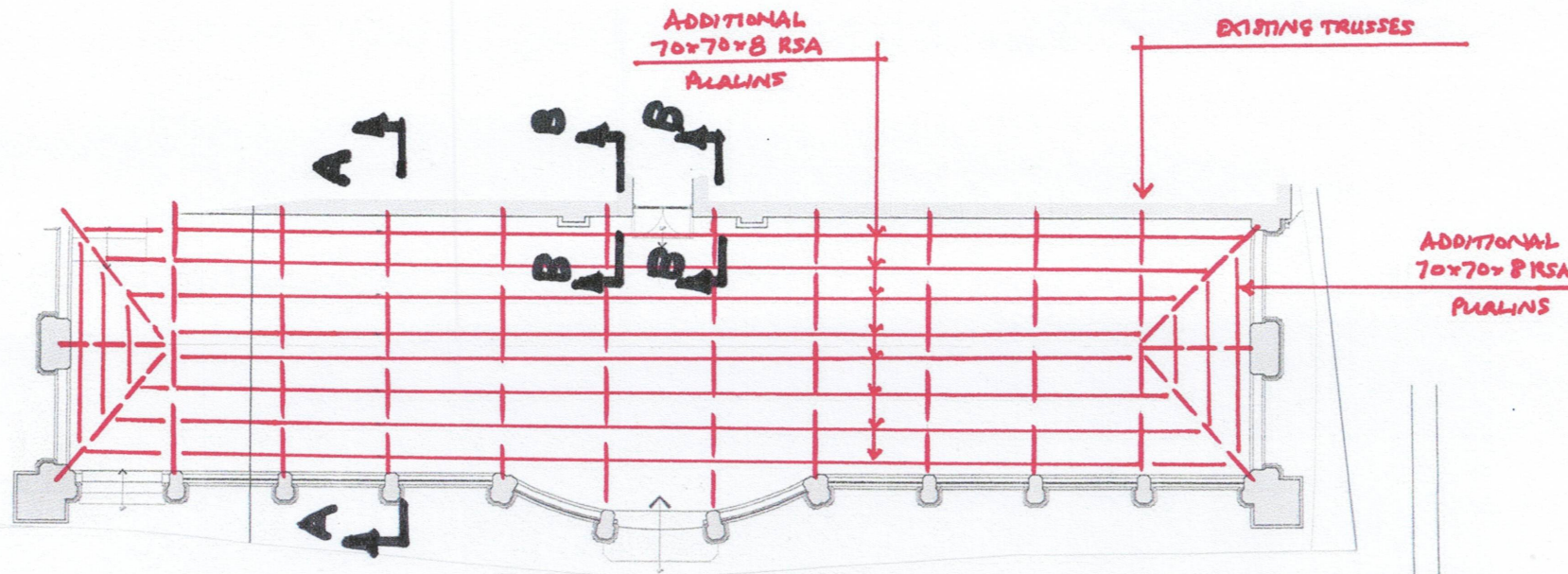
$$\therefore T = 11 \text{ mm}$$

$$\text{AREA TIG} = \frac{11500}{160} = 69.4 \text{ mm}^2$$

18 - BAR

$$A = 179 > 69.4 \checkmark$$

DO NOT SCALE



MR	REVISION	BY	DATE

DRAWING STATUS

DRAWING TITLE

PLAN

PROJECT

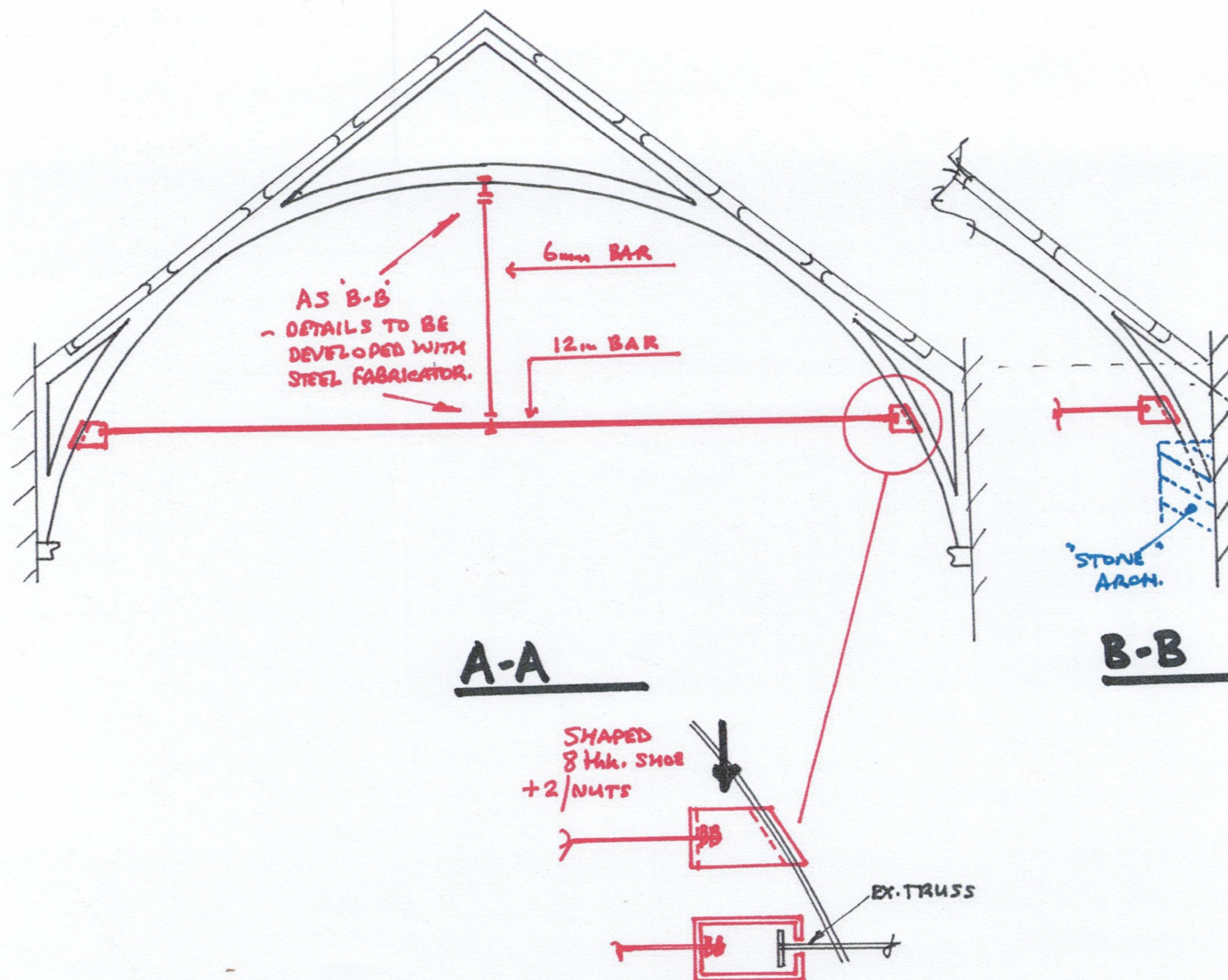
THE ORANGERY,
GRITTLETON HOUSE

David Partridge Ltd
Dorsetley Cottage
Bridlip
Gloucestershire
GL4 8JH
T:01274 212054

Drawn	Chkd	Scale	Date
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Purpose of Issue

Drawing Number	Revision
25/195 : 01	



MR.	REVISION	BY	DATE

DRAWING STATUS

DRAWING TITLE

SECTIONS

PROJECT

THE ORANGERY,
GRITTLETON HOUSE

David Partridge Ltd
Beverley Cottage
Birdlip
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Drawn	Chkd	Scale	Date
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Purpose of Issue

Drawing Number	Revision
25/195 :02	

APPENDIX B

Photographs 01, 02 and 03



PLATE 01 -- INTERNAL VIEW



PLATE 02 -- LEANING SOUTHERN ELEVATION WALL



PLATE 03 -- MASONRY DAMAGE IN SOUTHERN WALL ARCH