

Structural Appraisal
of
Heywood Library
for
Rochdale Borough Council

Ref: Y28

April 2022

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1. Introduction

Heywood Library is a Grade II Listed Building dated from 1906. In spite of a major refurbishment in 2012 there are areas of structural cracking which are the subject of this report.

2. Inspection

The building was inspected on various days in April 2022. All parts were available for inspection.

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We have not inspected woodwork or other parts of the structure, which are covered unexposed or inaccessible, and we are therefore unable to report that any such part of the property is free from defect.

Measured plans were made available, as well as a Geo-environmental Appraisal from 2007 relating to the community buildings behind the library, by Eric Wright Construction Ltd.

3. Ground Conditions

The Geo-environmental Appraisal shows that there were terraced houses roughly where the basement now sits.

The boreholes revealed a combined depth of made ground and peat up to a depth of 4.9m, which is not suitable as a foundation material. The recommendation for the new construction was for a piled foundation extending to a depth of 15-20m.

We have no information about the foundations of the existing building, but the settlement pattern suggests spread footings, which have settled differentially. The settlement is consistent with poor ground conditions.

4. Construction

The building is built of load-bearing brickwork, with stone dressings, and brick internal columns supporting a grid of steel beams carrying the first floor and the slate roofs. The roof of the front part of the building is carried on timber trusses, while the rear part is carried on lightweight steel trusses.

It was noted that modern steel beams and posts have been inserted in the right-hand first floor roof space to give additional support to the roof structure. This is not related to the current issues.

5. Structural Defects

The whole building is suffering from differential foundation movement. The rear part where the basement is located appears to be most stable, but the front of the building has settled by over 300mm relative to the rear. The settlement has allowed the building to rotate downwards at the front by 1.3%. This has caused the front wall to rotate outwards and has led to cracking in the walls around the middle of the building, and cracking at some of the column heads where the steel beams are supported. These have not been detailed fully in this report and we have not carried out a detailed measured survey, which could pick up the settlement and distortions more accurately than has been possible for this study. It was noted that the west side roof ridge appears from the ground to be level, whereas the west wall has settled significantly, suggesting that some adjustments might already have been made in the roof to accommodate the movement.

The resulting slope on the roof valleys has doubtless contributed to the leaks that are occurring. The two valley gutters flow to the rear, with a number of steps, but the backfall means that water 'ponds' below each step. Another result of movement has been the pulling out of the lead flashings at the verges, where the east and west gable walls are leaning outwards.

6. Recommendations

There are proposals to re-roof the building, but the plans have been put on hold pending the resolution of the structural movement. It is considered that in order to stop the movement extensive site investigation and piled underpinning would be required, at great expense, so it is proposed that the gable walls are stabilised in such a way that foundation movement can be allowed to continue, but the re-roofing, which is urgent due to leaks, can proceed.

In the re-roofing it is important to

- Ensure that the gutter falls are corrected.
- Ensure that the flashings and soakers are fitted snugly at the verges.

For strengthening we recommend:

- (a) A tie bar spanning between the two side gables of the front elevation at ridge level, passing over the curved central ceiling.
- (b) Ties from front to back at ceiling level in the central first floor room, hidden behind the cornice.
- (c) Cintec anchors across the open joints at the upper left and right corners of the front elevation.

The tie bar details and specification can be firmed up when more detailed survey information is available for the elevations.

The open joints in the external brick and stonework should be pointed up in lime mortar. As these joints may continue to move, no bed reinforcement should be installed because this would only lead to cracking elsewhere if the movement continues. The cracks and open joints should be monitored photographically.

Charles Blackett-Ord C.Eng, FICE, CARE

Engineer Accredited in Conservation

April 2022

PHOTOGRAPHS



West Elevation Showing Settlement



Front Elevation Right Side, Open Joints



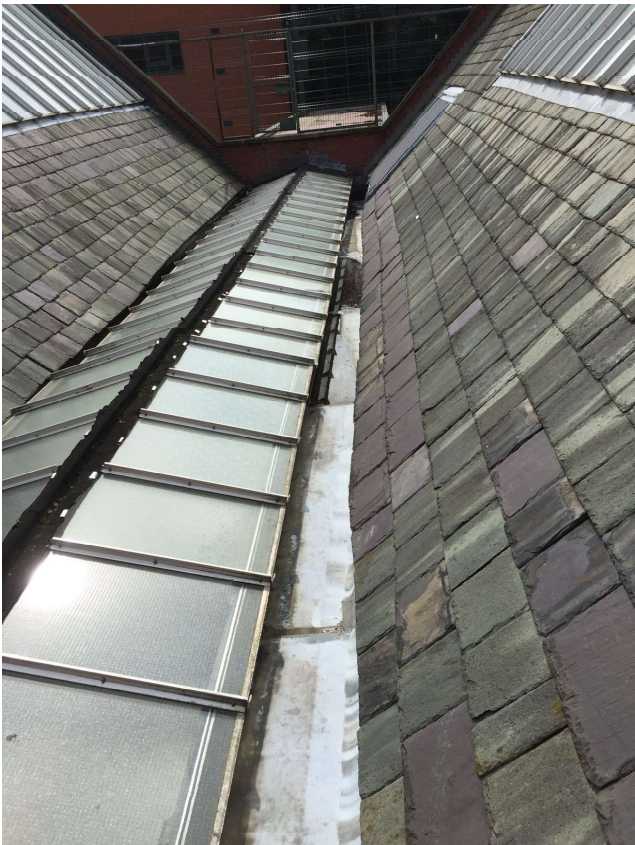
Basement Looking South



Interior, Showing Settlement of Columns



East Gable Verge Slating



Central Valley



Roof Over Rear Part of Library



Front Right Roof Space

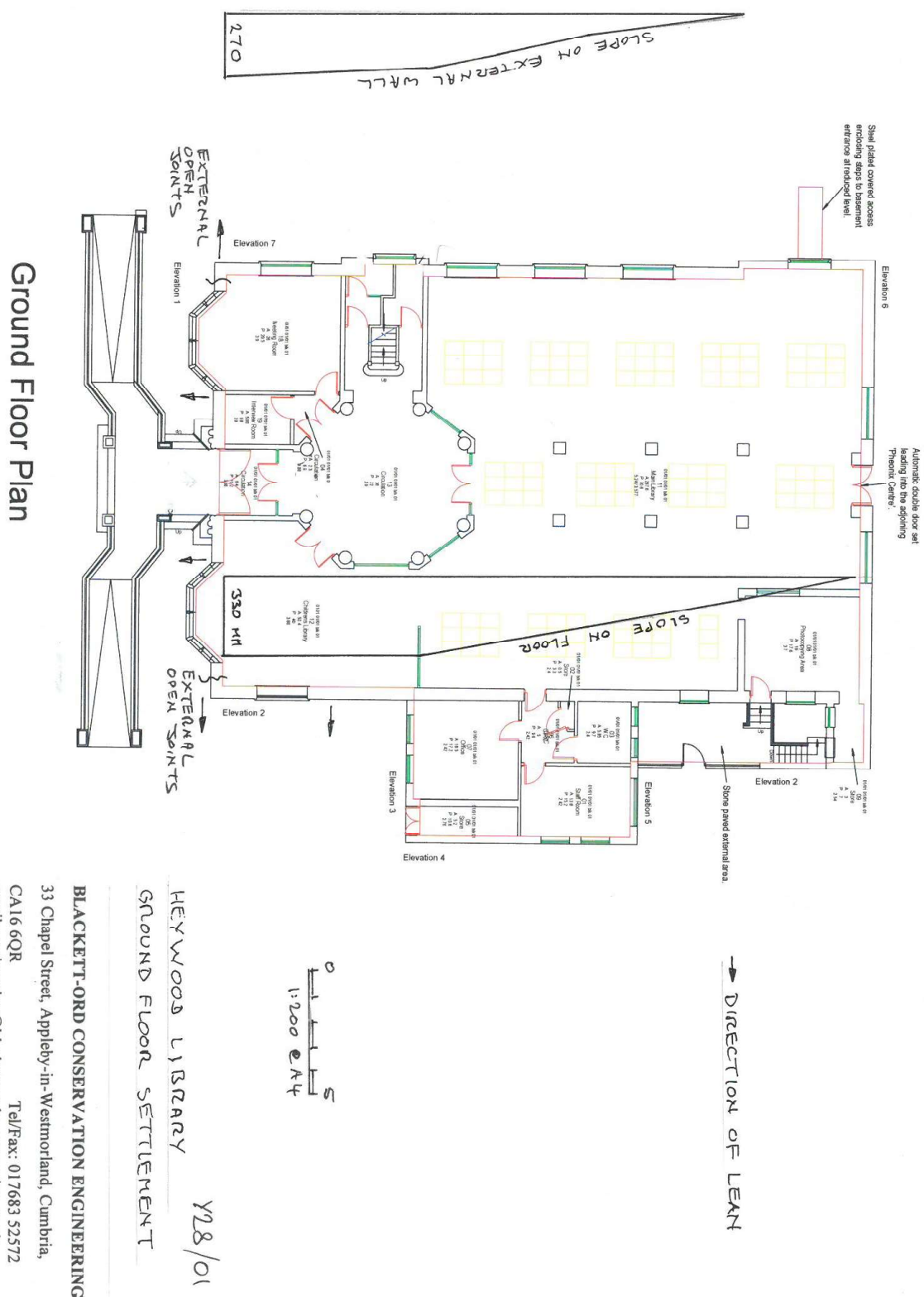


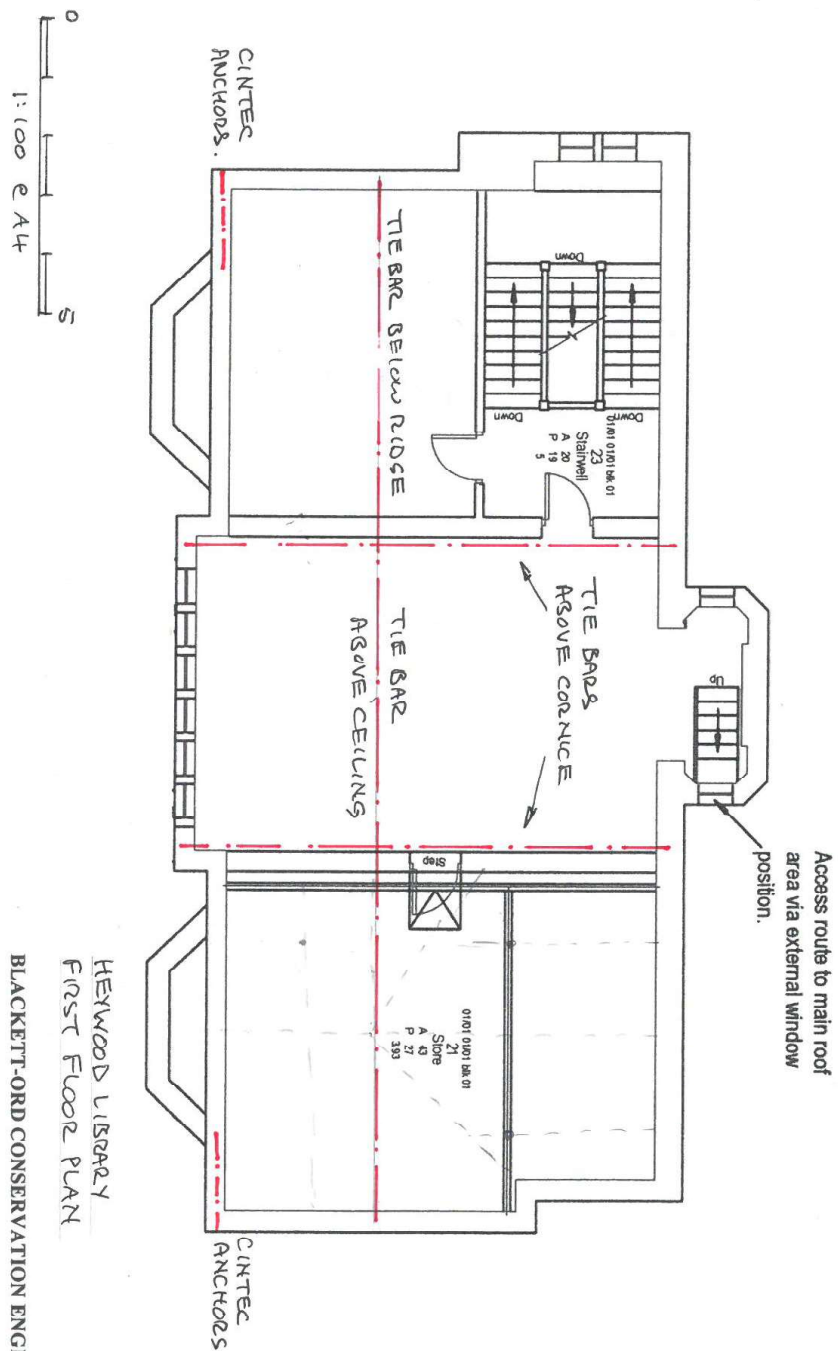
Structural Steel Insertions to Improve Roof Support

DRAWINGS

Y28/01 – Ground Floor Settlement

Y28/02 – First Floor Plan

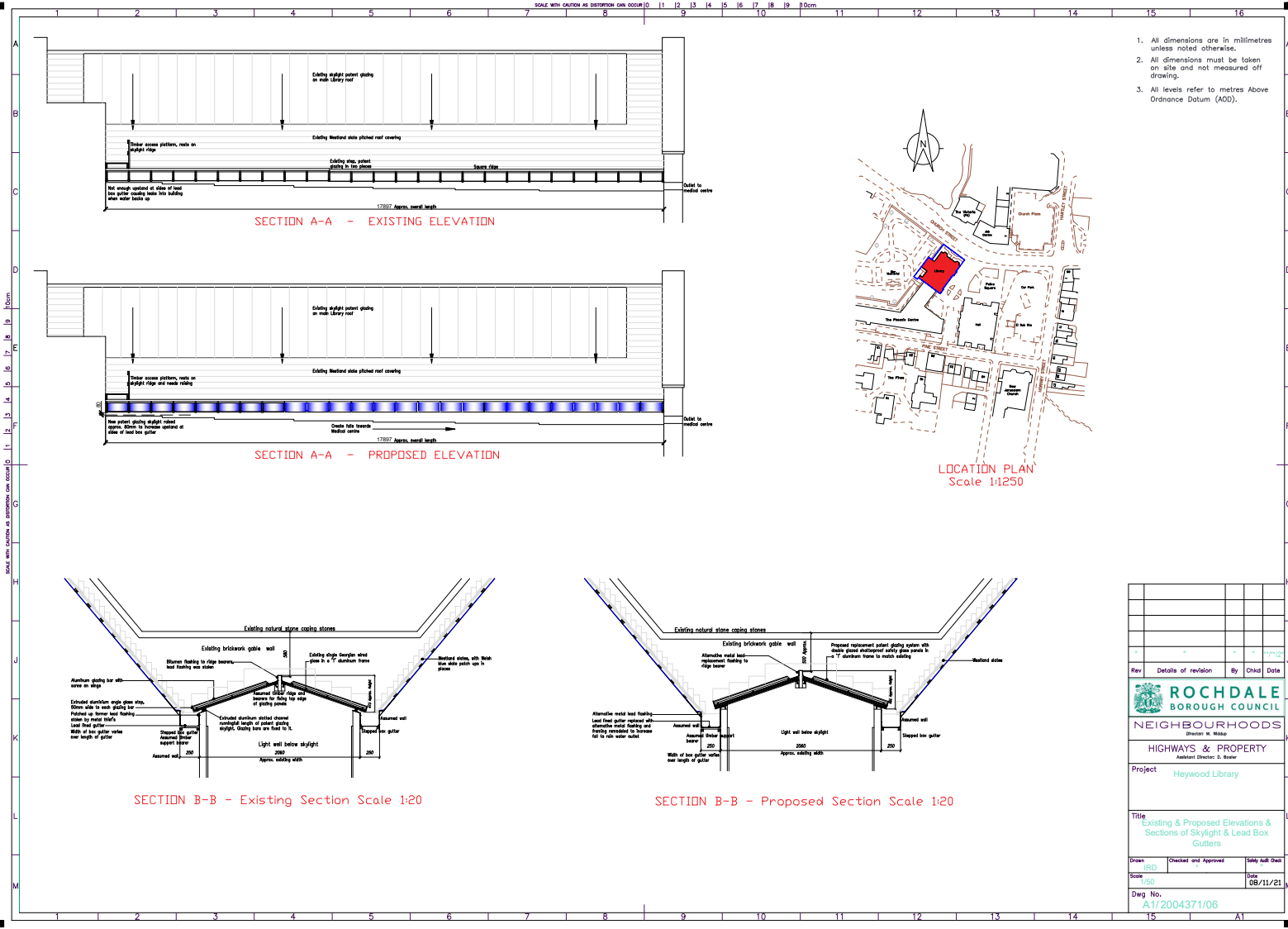




HEYWOOD LIBRARY
FIRST FLOOR PLAN

Y28/02

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1. All dimensions are in millimetres unless noted otherwise.
2. All dimensions must be taken on site and not measured off drawing.
3. All levels refer to metres Above Ordnance Datum (AOD).

Rev	Details of revision	By	Chkd	Date
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ROCHDALE BOROUGH COUNCIL
NEIGHBOURHOODS
HIGHWAYS & PROPERTY
Assistant Director: S. Beale
Project: Heywood Library
Title: Existing & Proposed Elevations & Sections of Skylight & Lead Box Gutters
Drawn: (RD)
Scale: 1:50
Dwg No.: A1/2004371/06
Checked and Approved: [Signature]
Date: 08/11/21
Sdly Auth: [Signature]