

## **Examination of Timberwork at the Carnegie Free Library, Swords.**

### **Summary.**

A visit was paid to the Carnegie Free Library, Swords, Co. Dublin on 4<sup>th</sup>. February 2021. Timberwork to the building was examined. Decay and insect attack was found to be widespread on the ground floor, with ingress of moisture. The first floor is generally in good condition with slight moisture ingress and local decay. The roof structure appears sound and dry. General recommendations are made for remedial treatment.

### **Examination.**

Prior to my examination areas at floor and roof levels were opened up. These locations and room designations are shown on the attached plan, originally prepared by CORA consulting engineers.

The moisture content of components was measured with a calibrated moisture meter (Protim Timbermaster). Walls were scanned with a non-contact meter (Tramex)

Areas of floor joists were strength graded according to the provisions of BS 4978/ I.S.127 – strength grading of softwood timber.

#### 1. Ground floor.

Room G 01.

Joists generally 150x50mm at 300mm on wallplates on tassel walls, no wallplate.

Severe decay to joists and wallplate at front RH corner, moisture content (MC) over 30% at wall, reducing to 24% 600mm out. Considerable insect attack here.

At the rear RH corner the wallplate has disintegrated, with decay to the bearing ends of the joists – see figure 1. MC at top of joists 24%, over 30% at bottom. Active insect attack.

Decay to the back of horizontal battens to wainscoting on external side wall to rear of

chimney breast. MC over 30%, active insect attack in wainscoting.

Floorboards 100x27mm T&G, probably original.

Room G 02.

Solid terrazzo floor. Decay and active insect attack to skirting boards and base of wainscoting, particularly to rear of room. MC over 30% at floor level. Active insect attack in cubbyhole under stairs. Bottom riser of stairs over 30% MC. Wainscoting to bottom flight of stairs over 30% MC under damp wall, with some local decay.

Room G 03.

Floor sagging along rear wall, decay present. MC over 30% at floor level, reducing to 15-17% at top of wainscoting, this with severe insect attack. Insect attack also to skirting boards, plywood to floor, and shelving unit.

Room G 04.

Joists as in room G 01. At ope to front adjacent G 02 there is no DPC under the wallplate. MC below plywood flooring all over 30%, slight decay, severe insect attack. Wainscoting over 30% MC in corner, reducing to 15% under window.

Severe decay and insect attack to joists at ope to rear adjacent toilet.

Decay and insect attack along floor at rear wall, with subsidence – see figure 2. MC of plywood on floor over 30% for most of the rear half of the room.

## 2. First floor.

Room F 01.

Ope at door. Joists run parallel to front wall, 225x50mm at 200-300mm centres, of SS (special structural) grade where visible. Joists spliced at ope – these appear to run out under lobby F 03. MC 14-17%, no decay or insect attack seen. Wainscoting 15% MC.

Plaster to wall above here with signs of former water ingress, now dry.

Ope in centre of room (chipboard flooring) with 275x50mm joists of SS grade,

herringbone bridging, MC 13-14%. No decay or insect attack.

Room F 02.

Ope in centre of room. Joists 275x50mm at 300mm centres, SS grade. Three rows herringbone bridging. Joists lapped over rising wall between G 02 & G 04. MC 13-14%, no decay or insect attack. Battens to wainscoting to rear of fireplace up to 20% MC, very slight decay to backs against wall.

Room F 04.

Header joist 225x75mm, next 225x50mm, SS grade. MC at ope 17%, MC of skirting at external wall 15%. No decay or insect attack seen.

Rooms F 03, F 05 & F 06 not opened.

### 3. Roof level.

Access was gained internally to eaves level by ladder. An ope had been made to the TG&V boarding to the bottom of the slope of the ceiling below the valley to the rear of the north chimney stack (room F 02). Water staining and discolouration was seen on the valley boards and the internal timber cornice – see Figure 3. Present MC of cornice 15-16%, valley board 19%, no decay or insect attack seen. Rafters here 140x40mm at 300mm centres, probably of SS grade.

The exposed ends of the hip rafters and trusses were visually examined. No decay or insect attack was seen. MC 13-14% throughout.

Sawdust was present on the truss ends over rooms F 05 & F 06. This initially had the appearance of bore dust from insects, but closer examination showed that this was not so. The ceiling to room F 01 has cover slips over the joints in the TG&V sheeting, apparently to catch falling dust – see discussion below.

**Discussion and Recommendations.**

Sub-floor vents are visible at the front below floor level, but occur just below window level at the rear. It is not clear how these rear vents function, but it is apparent that the venting arrangements have been inadequate to maintain the moisture content of the ground floor timberwork at a sufficiently low level to prevent decay (timber at moisture contents in excess of 20% is at risk of decay, the risk increasing with increasing moisture content). The high moisture content at this level, allied to the presence of susceptible plywood species (probably birch) has allowed insect attack (woodworm) to flourish. Virtually all timber at this level, including the wainscoting, has been affected and total replacement is inevitable. Given the ventilation difficulties the installation of a solid floor at this level is probably advisable. The base of the stairs should be opened up for closer examination. Some repair may be necessary. The condition of the timberwork at first floor and roof level, as far as could be seen given the restriction on access due to stored materials, is good, with no or negligible decay seen, and no insect attack.

Joist ends at first floor level presumably bear into the external side walls and it would be advisable to examine these when access is available.

The ceiling sheeting over room F 01, with the cover slips, restricts ventilation between the slating and the sheeting. If occupancy increases some form of ventilation may be advisable due to the risk of condensation on the underside of the slating.

While insect attack was not seen at first floor or roof level there is a risk of such attack developing and some may already be present (such attack only becomes apparent 3-4 years after eggs are laid when the adult beetles emerge and holes and bore dust appear). Insecticidal treatment of all timber to the upper levels is advisable. This treatment should be carried out, if possible, before the summer when the next

generation of adults will emerge. Wooden components of museum artefacts should also be treated.

Considerable growth of vegetation was present on the chimney stacks at high level. While this does not appear to be causing problems at roof level at present it indicates that ingress of moisture is occurring at the tops of the stacks. Further growth of roots can disrupt mortar bonds and lead to increased ingress of moisture. Growth was also seen at the front gutter. This should be cleared and the adjacent flat roof checked.

**Notes.**

1. All insect attack is of the common woodworm, *Anobium punctatum*.
2. All decay is of Wet rot. The true dry rot, *Serpula lacrymans*, was not seen.
3. Timber at moisture contents in excess of 20% is susceptible to fungal attack (decay), and is more susceptible to insect attack. In a normal intact building, even if unheated, the moisture content of timber will not reach this level.
4. As access was limited, further decay may be present in unexamined areas.
5. Conventional insecticidal treatment may not be suitable for museum artefacts. The National Museum of Country Life in Castlebar has expertise in this area and could advise.
6. The first floor joists are probably of White deal. These joists, of SS grade where seen, could provisionally be assigned to Strength Class C24.

**Att.**

Floor plans



Figure 1. Severe decay to wallplate and joists, ground floor.



Figure 2. Severe insect attack, with piles of boredust from emerging adults.



Figure 3. Water staining to cornice (bottom), and to valley board at top left.