

We have prepared this statement to support the design for a steel staircase to replace the existing cast iron stair to the Whitworth Street courtyard elevation of London Road Fire Station.

Following a programme of repairs which have been unsuccessful in bringing the existing staircase back into use, Curtins Structural Engineers have advised the existing stair is beyond repair and for health and safety reasons should be replaced. Please refer to Curtins condition report CUT-00-XX-RP-S-00040-V02.

Purcell, in consultation with Curtins, have prepared a proposal, for a steel stair to replace the existing [refer to Purcell drawing 240242-PUR-00-XX-DR-A-9014], which closely matches the details of the existing with a few principal departures, as follows:

Setting out

The existing staircase is set out such that its eastern 3 columns bear onto the masonry of the 2nd floor Fairfield Street courtyard terrace. In order to maintain consistent step widths, these 3 columns slightly cantilever out from the masonry. This has contributed to the various structural failures of the stair. To overcome this issue, we have proposed that the stairwell above 2nd floor is wider than the below levels. This allows the principal columns to sit comfortably on the masonry of the 2nd floor terrace without the need for reduced step widths which would be required due to modern steel structural sections and would conflict with the building regulations requirements for the widths of the flight.

Utilising the same stairwell dimension as the existing stair is crucially important as the historically important walkway at first floor level, which has already been repaired and reinstated where necessary, wraps around the stair and constrains it on 3 sides.

Structural Sections

The original stair utilised slender cast iron I-section strings with approx. 38mm flanges. These historic sections are not available in the mild steel we are proposing to manufacture the replacement stair from and as such we have selected, wider 75mm parallel flange channels as a replacement. This will have the effect of adding some additional relief and shadow to the string sections.

In order to provide a stair, fit for purpose, that will have an adequate service life, we have introduced 4 new horizontal steel beams to tie the structural columns together, along with steel rod cross bracing between the columns to the courtyard side of the stair.

Decorative Elements

We propose to retain as many of the decorative elements from existing stair as possible, including the cast iron ball finials to the columns, decorative gallows brackets which supported the walkways wrapping around the stair at first floor level, these are no longer undertaking a structural role, nevertheless are contributing to the aesthetic value of the existing staircase, and decorate cross sections of guard railing to the landings.

Other elements are proposed for replacement. This includes step tread and riser sections for which we propose are replaced with matching profile and patterns, however are required to be slightly wider to suit the new structural steel sections.

Smaller, non-decorative gallows brackets which are supporting the landings are no longer required from a structural perspective, and will not be easy to remove and reinstate on the new stair, however, we propose to provide replica brackets to match the profile and location of the existing in steel.

Conclusion

To conclude, we have designed a replacement stair to somewhat reflect of the nature and aesthetic of the existing, this is inherent in its general setting out which is constrained by the heritage of the existing building and walkway fabric, its utilitarian style, the transferring of cast iron features from the existing to the new and replicating those which cannot be transferred. Where required, we have complimented the original stair with new structural elements to provide a stair which is fit for purpose and will have a long service life.