Quayside
40-58 Hotwell Road
Bristol
BS8 4UQ

t: 0117 302 7560
e: bristol@curtins.com
w: www.curtins.com

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25th August 2022

Aster Property Limited
Sarsen Court
Horton Avenue
Cannings Hill
Devizes
SN10 2AZ

FAO Ms. Christina O'Brien-Noyes,

Re: Inspection Report – 32A-36 New Park Street, Devizes, SN10 1DZ – External Steel Stair

1.0 INTRODUCTION

Curtins were instructed by Aster Property Limited to undertake a structural inspection of the external steel stair at the above property in June 2022, in order to review its overall condition and provide an opinion on whether repairs or replacement is most appropriate.

We attended the property on Wednesday 20th July to undertake a visual inspection and of the steel stair structure only. No further inspection of the rest of the properties or surrounding structure was undertaken. In some areas small sections of rust and deteriorated paintwork were removed in order to view the remaining streel thicknesses and gain an indication of the extent of corrosion damage.

This report and any accompanying photographs/sketches/drawings etc. has been prepared for the sole benefit, use, and information for the client. The liability of Curtins Consulting Limited with respect to the information contained in the report will not extend to any third party. Digital copies of all photos etc. are available on request.

2.0 STAIR ARRANGEMENT

The streel stair structure is located to righthand side of the rear elevation of the building and provides access to the first-floor flats. The stair is comprised of 3 flights with 2 intermediate landings in a dogleg configuration abutting the adjacent brick wall, with a third curved top landing turning into the first-floor terrace/access path.

Another masonry/concrete stair, excluded from the scope of this survey, is present to the left of the rear elevation. While the left-hand stair matches the rest of the structure and looks to be original, the right-hand steel stair appears to be a later addition, presumably to provide a secondary means of escape or simply to improve the first floor's accessibility.

The stair is formed checker plate steel steps and landings supported off steel beam and stringer sections, in turn supported by steel columns or bolted directly to the adjacent masonry. Steps have open risers with the checker plate tread spanning between right-angled flats welded to the top of stringer beams, referred to as tread supports.

The primary steel frame is formed of steel channel sections (RSCs or PFCs) and square hollow section (SHS) columns. A steel handrail and balusters is welded directly to the face of the edge beams. See appended photo record for the general arrangement.

Curtins Consulting Ltd registered in England No. 2054159
Registered Office: 51-55 Tithebarn Street, Liverpool, L2 2SB
Branch registered in Ireland No. 908625

3.0 CONDITION

The staircase is generally in a state of disrepair with all elements generally suffering from surface corrosion and have worn or peeling paintwork (where present) requiring general rust removal, treatment and repainting to prevent further deterioration, and with areas of more severe historic and reoccurring rust requiring more thorough remedial action and/or local repairs.

The treads of two steps, No1 & No10 (from the bottom), were found to deflect excessively underfoot and are recommended for replacement or reinforcement. However, there were no structural concerns for the stability or safety of the stair overall, at the time of inspection.

The condition and recommended action for the various elements are discussed in more detail below. Please note this is based on a visual inspection only and as such are views given are opinions only.

3.1 Primary Framing

The primary steel framing appears to be in fair condition but with general surface corrosion, and areas of more progressed expansion and section loss noted, often painted over several times. The worst areas are those horizontal surfaces subject to standing water (top surfaces of bottom flanges to landing beams etc.) as would be expected, but the side faces of both landing and stringer beams were also noted to have patches of greater corrosion where previous rust has been painted over or where water drains off a landing etc.

No corrosion of significant structural consequence was noted in these elements, but repairs to properly clean off rust and loose paintwork before treating and repainting, as well as a regular maintence regime is required to prevent deterioration. Some local steel repairs (remedial welding & patch plates etc.) may be required should the deterioration be worse than anticipated once cleaned up and brought back to good steel. We would expect an experienced contractor to confirm this kind of remedial requirement and detail during the works, however, should any concern for the structural performance be suspected Curtins should be asked to attend and review the cleaned up steel in situ.

3.2 Tread Supports

Tread supports are more sheltered than other elements and appear to be in slightly better condition, but could be susceptible to trapped water and, as with the rail post connections, special attention should be given to these joints during remedial and maintence works.

3.3 Stair Treads & Landings

Generally, the horizontal tread and landing steelwork is in poor condition with significant surface corrosion and wear to the top surfaces, but a significant amount of expanding rust and delamination was also noted in the hidden bottom surfaces.

Several layers of rust 3-6mm thick were easily removed from various locations and allowing that this would not be the total thickness of rust removed over its lifespan, it is estimated that up to approx. 10-12mm of rust may have been removed in places over the years. This would equate to approximately 1.0-1.2mm of steel section loss. If this level of corrosion were to occur to both sides in the same location this would equate to double the section loss (c.2.0mm). But this is unlikely as water would tend to collect on one or the other, and an overall loss of c.1.0mm loosely correlates to the variation of 1.0mm in tread plate thicknesses measured, approx. 4.5-5.5mm.

We were not able to confirm the original thickness of the steel plate, but it is assumed to be around 5mm. An estimated section loss of 1.0-1.2mm is therefore, around 20% of the section thickness. Ordinarily, for most structural members a 20% section loss would be unacceptable and would result in failure, but the short spanning stair treads and landings would have had far more structural capacity than required, having been sized for practicality and detailing purposes, not structural requirements.

So, in general the locally reduced section thicknesses, estimated to be c.4.5mm, is not an immediate concern in and of themselves.

However, the robustness and longevity of these elements has been significantly reduced and any additional capacity has been eroded so that should further deterioration occur we would expect to see a reduction in performance and eventually failure. Remedial and regular maintence is recommended It is recommended as a minimum that all stair treads & landings be fully cleaned, rust removed, treated, and repainted to provide protection in order to minimise and slow future deterioration.

Please note there may be areas not seen with greater that typical corrosion/section loss, or key locations where a smaller amount is affecting structural performance etc., which only become apparent once the rust material is removed and the good steel exposed during the remedial works. If so, local steelwork repairs may be required to the contractor's details.

Greater than typical section loss is suspected to the underside of the landings, particularly around the drain holes, and particular attention should be given to these areas. It is unknown if these holes were original or drilled later to alleviate a standing water issue on the top surfaces, but the arrangement without a "drip detail" means that water tracks down and around the edge of the hole and is held by surface tension to the underside of the plate. Either remaining there or then running across the soffit to collect on the otherwise protected perimeter beam flanges causing significant corrosion in these areas. See Photos 16-19.

The treads of two steps, No1 & No10, were noted to deflect excessively underfoot. This could be due to the corrosion and section loss as deflection would be one of the first indications of reduced structural performance but were unable to access the underside of these steps to inspect them directly, and there are several other possibilities. It is recommended that these treads be replaced or reinforced, in addition to the generally required rust removal, treatment and repainting etc.

An allowance for more significant remedials to a further 3-4 treads, such as tread replacement or reinforcement TBC during the works, is suggested. Although the Aster/the Contractor may find removal and replacement of all treads and landings preferable purely on grounds of practicality and accessibility. Removing treads etc. generally would give make cleaning and treating works to the rest of the structure much easier and more successful – TBC by contractor.

3.2 Handrail and Balusters

The handrail and balusters were in reasonable overall condition, and generally had the least deteriorated paintwork. Some small areas of surface corrosion were noted and a general cleaning, scaling back or treatment of rusted areas before repainting is recommended.

Due to the multiple layers of paintwork over what appears to be historic corrosion at the connection between posts and stringers/landing beams, it is hard to assess the condition of the connections. However, they appeared to be in a reasonable condition and the handrail felt secure when manually tested under load. These areas are generally more susceptible to corrosion as water collects in the small joints and crevices, so special attention should be given to the post connections during remedial works.

4.0 CONCLUSION

The external steel stair is in a state of disrepair due to poor detailing and lack of maintence.

While remedial intervention is required to address a few local issues as well as the general steel corrosion to prevent further deterioration and failure in the future, it is structurally sound with no concerns in the short-term and does not warrant replacement, structurally.

The treads and landing checker plate steel are the worst effected elements, and although originally oversized (structurally) the robustness and structural capacity of these elements has been reduced by the amount of corrosion and steel section loss suffered to date. Thorough cleaning and new protective paintwork should prevent further significant deterioration if properly maintained, but these elements are now considered to be nearing the end of their working lifespan.

There are several practical remedial options available, and the appropriate level of intervention is dependent on Aster's long-term plans or preference for the property.

1. **Complete** - Remove and replace all treads and landing steel with new checker plate to facilitate good access to all surfaces of steel framing elements for full & thorough descaling & treatment of rust and paintwork (removing all rust back to good steel) before providing new protective paintwork. Allow for minor local steelwork repair as required by Contractor on inspection following descaling.

2. **Moderate** – Thorough descaling & treatment of rust and paintwork (removing all rust back to good steel) before providing new protective paintwork to all accessible areas. Allow for minor local steelwork repair as required by Contractor on inspection following descaling, with particular attention to underside of landings and stair treads. Replace or reinforce deflecting treads, No1 & No10, and allow for 3-4 more TBC during works.
   Consider preemptive reinforcement of all treads.

3. **Minimal** – *Reasonable descaling & cleaning of rust and paintwork (removing all loose rust & paint) before providing new protective paintwork to all accessible areas. Monitor deflecting treads, No1 & No10, and remainder generally.*

All of the above options require a regular maintenance regime with checks for any minor repairs or repainting requirement from scuffs/scratches or general wear no less than every 5years, although depending on the use the trafficked landing and tread surfaces may need some repainting more regularly. General repainting of all surfaces should be planned for every 10-15years or sooner in line with the manufacturers recommendations.

Option 1 is the best technical solution and may be more practical than Option 2 (TBC by Contractor). By replacing all treads /landings and enabling quality repairs and protection of the primary frame etc. the structure is restored to almost like new condition and no further significant works would be anticipated in the foreseeable future.
It also provides the opportunity to improve the drainage detail to create a more robust detail (discussed below) and inheritably improves better grip replacing the current worn checker plate with new

Option 2 is a reasonable compromise dealing with all known issues as far as practicable but access is likely to be restricted and protective works less effective. Meaning the reduced lifespan of treads etc. remain and future allowances should be budgeted for eventual remedials – unless preemptively reinforced. Risk of hidden issues presenting in the near future remains.

And Option 3 is a stop gap option and requires monitoring review every 1-2years. While this should slow the rate of deterioration, it will still continue, and more in depth remedials will be eventually be required. Additionally, the risk of hidden issues presenting in the near future, any minor defects not become more serious in the future, and the reduced lifespan of treads etc., remain, so future allowances should be budgeted for remedials.

From a purely structural perspective Option 1 would be our recommendation as this would resolve the issues as far as possible, and for all intents and purposes restore the stair to something close to a like new condition. Meaning that only normal maintence be considered going forward. Neither option 2 & 3 fully resolve the issues and remedials or replacement works will be required in the future albeit delayed somewhat by the action now. Both these options also carry the risk of inaccessible and unseen defects becoming an issue potentially in the near future, where Option 1 should pick up any further unknown during the works.

However, the practicalities of the work and access constraints are significant and would define a large proportion of the costs. It is therefore recommended that Aster engage with a contractor to determine potential costs for the proposed options 1, 2 & 3, or an alternative compromise between them, before making their final decision on the way forward.

4.1 Additional Improvement Options

Should landing plates be replaced we would recommend that improved drainage detailing be incorporated into the replacement decking. Either by the addition of a drip detail to any drainage holes i.e., with an extended downward lip to stop water tracking along the soffit (like a punched instead of a drilled hole), or by ensuring a slight fall to a suitable position with a defined low edge overhang other steel elements or its own drip detail.

The top curved landing was noted to be level and have a noticeable fall from its midpoint towards the first step down (Photos 4 & 25). This appears to have formed this way but in use this can be slightly disorientating at the top of a flight of stairs, and it is recommended that Aster consider addressing/correcting this during any remedial /maintence being undertaken.

5.0 RECOMMENDATION SUMMARY

- It is recommended that Aster engage with a contractor to determine potential costs for the Remedial Option 1, 2 & 3, discussed above to assist in determining the appropriate level of intervention to suit Aster's long-term plans / preference for the property.

- It is recommended that one of the Remedial Options 1, 2 & 3 set out above be actioned in line with Asters long term requirements.

- In addition to the short-term remedial actions, a regular maintenance regime is required to check for and undertake any minor repairs or repainting requirement from scuffs/scratches or general wear etc., at least every 5 years as a minimum.

- General repainting of all surfaces should be planned for every 10-15years or sooner in line with the manufacturer's recommendations. Note that *trafficked landing and tread surfaces are likely to need some repainting more regularly due to wear from use.*
- Should steel checker plates to landings be replaced (Option 1), drainage detailing to the new landing decks should be improved with the introduction of drip details to prevent water tracking along the soffit leading to corrosion in this otherwise protected area.

We do not anticipate further input to be required from us in this matter, however, should Aster desire Curtins to review their or any contractor proposals we would of course be happy to assist further.

We trust this report is sufficient in explaining the observations made during our recent site visits, but should you have any queries, please do not hesitate to contact the undersigned.

Yours faithfully

[redacted]

Tom Aylott
Senior Engineer
For and on behalf of
Curtins Consulting Ltd

Enc.
General photo record

General Photo Record

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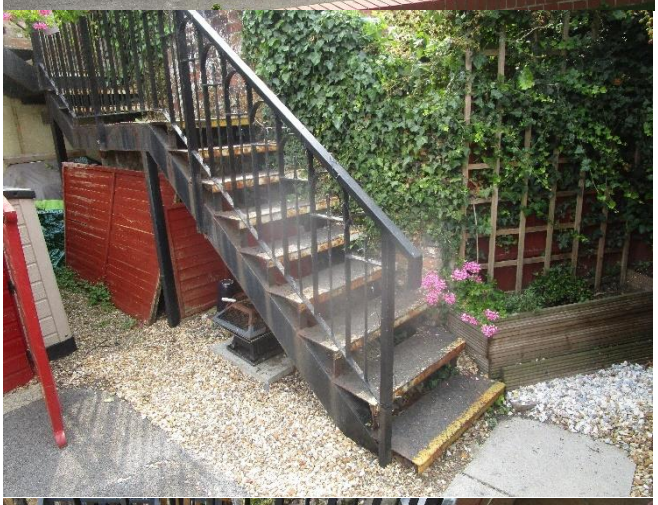

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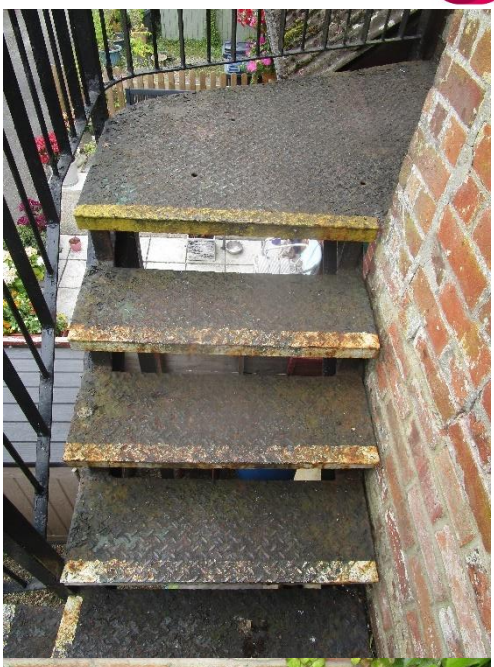

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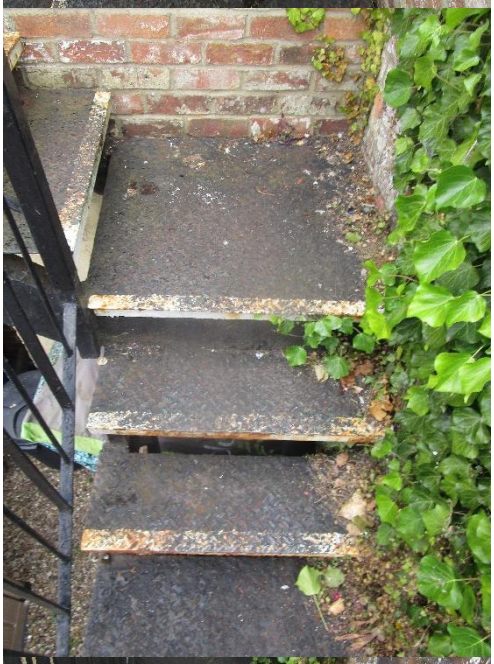

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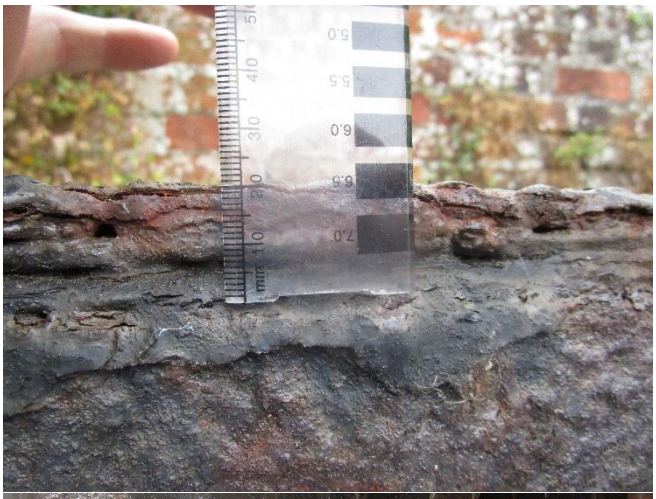

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