HOCKLEY & DAWSON
CONSULTING ENGINEERS

Title: 70 Marine Parade Escape Staircase Structural Inspection

Job No: 22231

Date: January 2025

Client: Patrick O'Donoghue

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Reference 22231		Revision	Issue Date 15.1.25

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1.0 Introduction and Brief

This report was commissioned by Patrick O'Donoghue and is for his sole use only.

Hockley and Dawson were instructed to carry out a visual structural survey of the escape stair to the rear of 70 Marine Parade, Worthing BN11 3QB. The inspection was carried out on 19 December 2024, focused on identifying structural issues and safety concerns, for the existing external escape stairs.

The inspection covered the following aspects of the steel fire escape:

- Structural integrity of the steel framework and supporting elements
- Condition of all stair treads, landings, and handrails
- Corrosion, wear, and any signs of physical damage
- General wear and tear from exposure to the elements, given the building's coastal location

The weather on the day of the survey was bright and sunny with a light breeze.

2.0 Description

The existing building is a four-storey building with a basement situated on the coast road Marine Parade. The building is mixed-use with the basement occupied by an arts club, the ground floor by a recruitment agency and the remaining floors residential. It is understood that the stair is no longer necessary as a fire escape as an alternative compliant method of fire protection has been approved and provided and made the stair obsolete. It is unclear when the stair was installed but probably 30 -40 years old and possibly installed when the house was divided into apartments which may make the stair even older.

The stairs serve all the floors and the basement. The stair is constructed in steel and consists of a landing at each floor level supported with steel stringers bearing onto the masonry walls of the building at the other end, the steel stringers are supported on steel columns that span vertically from the basement level to the half landing between second and third floor. The stairs enabled access to all the floors with two flights and a half landing between each of the floors.

The landing and treads are formed in steel plates with surface indentations to provide some form of anti-slip for users. This plate is commonly known as Durbar plate and is widely used in steel structures where there is a need for a lightweight floor/access surface to be provided.

It should be noted that due to the poor condition of the stairs, access for closer inspection of the various elements of the stairs was not possible. Instead, observations were made from the floor windows, from the street and via binoculars or by camera.

3.0 Observations

The building is situated close to the sea and the stair steelwork will be prone to even faster corrosion if it has not been adequately protected.

The steel stair structure is in a state of significant deterioration and is no longer fit for its intended purpose. Extensive corrosion has affected large portions of the structural elements and their connections. Key components have either corroded, delaminated, or completely deteriorated. This degradation poses a safety concern, as it undermines the structural integrity of the stair system.

Further details of the corrosion extent, including photographs and descriptions, are provided in Appendix B for a clearer understanding of the damage.

Key Observations of Steel Stair Structure Deterioration

1. **Second-Floor Apartment Access Landing**
   The access landing on the second floor has either disintegrated or completely detached from the steel stringer beam supports. The stringer beam at this landing has sustained severe corrosion, with the web largely eroded and the flanges significantly weakened. Specifically, the right-hand stringer flange has corroded away, leaving only the bottom flange still holding the stringer in place. As a result, the stringers have dropped and rotated, severely compromising the structural integrity of the stairway.

2. **Second-floor half Landing**
   The second-floor half landing has lost a section of the supporting stringer/beam, and it is questionable as to whether the durbar plate is attached to anything.

3. **Ground to Basement Stair Flight**
   The stair flight between the ground floor and basement was inspected, with careful testing of each tread. One tread failed under body weight, indicating that the welded connections had corroded to the point of being unable to withstand applied stresses.

4. **Corrosion of Stair Elements**
   The stair treads, risers, and landings exhibit extensive corrosion. These elements, which appear to be welded to the supporting stringer beams, are severely compromised. Several of these welded connections have deteriorated, contributing to the overall instability of the stair structure.

5. **Condition of Columns**
   While the columns are in relatively better condition compared to other components, they are still subject to corrosion and, in some areas, delamination. This affects their long-term durability and load-bearing capacity.

6. **Column Splice Connection**
   The columns feature a splice connection, with external plates bolted to either side of a break in the column construction. These splice connections are heavily corroded and delaminating, which further weakens the overall structure.

7. **Handrails and Balustrades**
   In some areas, the handrails have corroded to the point of detaching from the balustrade. Additionally, the balustrades have disconnected from the stringer or landing beams in multiple places due to the corrosion at these connection points.

4.0 Conclusions and Recommendations

In conclusion, the steel stair structure is in a critically deteriorated condition, with extensive corrosion and structural degradation compromising its safety and functionality. The second-floor landing and supporting stringer beams have sustained severe damage, including complete disintegration in some areas, leading to structural instability. The stair treads, risers, and landings exhibit significant corrosion, with welded connections failing under minimal load. The columns, while in somewhat better condition, still show signs of corrosion and delamination, and the splice connections have weakened significantly.

The corrosion has also affected key safety features, including the handrails and balustrades, which are no longer securely connected to the structure. Given the extensive nature of the corrosion and the loss of structural integrity, it is evident that immediate intervention is required. The current state of the structure is not fit for purpose and poses a serious risk to those who might attempt to use the stairs and potential injury and /or damage to adjacent buildings or those on the public road should there be a collapse. We recommend that the structure be safely dismantled as soon as possible and in the interim, access is prohibited with clear signage and/or barricades erected.

5.0 Standard Conditions

This report is the property of and is confidential to the client designated in the report. Whilst it may be shown to the client's professional advisors, the contents are not to be

disclosed to, or made use of, by any third party, without our express written consent. Without such consent, we can accept no responsibility to any third party.

Whilst every effort will be made to fully inspect those parts of the building requested of us to inspect, no permanent or secured fixtures and fittings will have been removed. We will not have inspected woodwork or other parts of the structure which were covered, unexposed or inaccessible and we are unable to report that any such part of the property is free from defect.

Hockley and Dawson certify that they have carried out the works contained herein with due care and diligence to their best belief and knowledge based on the time and information available.

This report is made on behalf of Hockley and Dawson. By receiving it and acting on it, the client – or any third party relying on it – accepts that no individual is personally liable in contract, tort or breach of statutory duty (including negligence).

6.0 Appendices

6.1 Appendix A – Photos

Appendix A - Photos

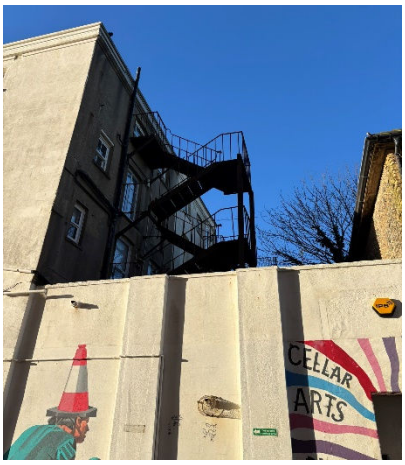
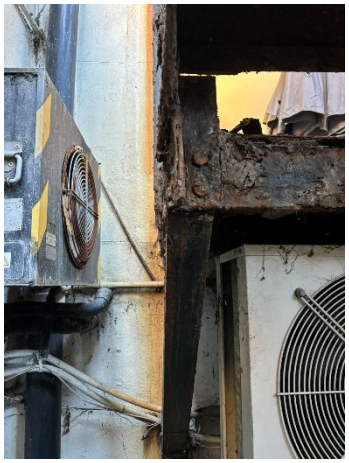
Photo Reference	Comment
 Photo 1	General photo of the fire escape to the rear of 70 Marine Parade taken from Prospect Place.
 Photo 2	Basement area. Steelwork is highly corroded and delaminating.
 Photo 3	Basement area. Steelwork is highly corroded and delaminating.

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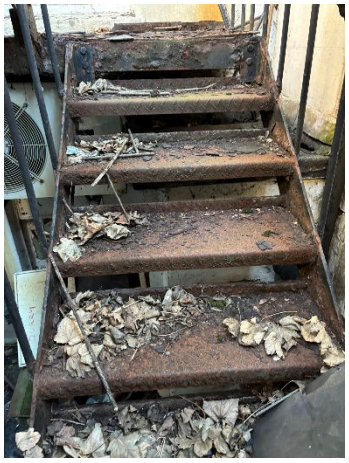
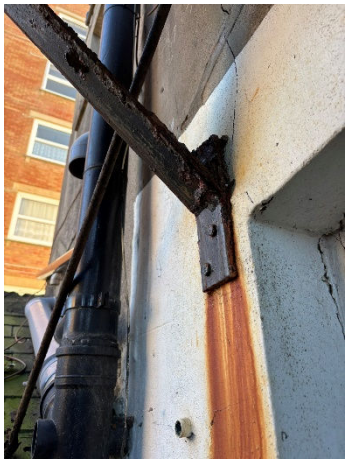
Photo Reference	Comment
 Photo 4	Basement area. Steelwork is highly corroded and delaminating. Stair treads to all floors are corroded. The treads are welded to steel stringers. The integrity of the welded connection has been compromised on many of the treads.
 Photo 5	Basement area. Steelwork is highly corroded and delaminating. Stair treads to all floors are corroded. The treads are welded to steel stringers. The integrity of the welded connection has been compromised on many of the treads.
 Photo 6	The typical connection to the landing support gallows bracket to the building is by bolted connections. There is rust staining evident and cracks emanating from the bolted connections

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Photo Reference	Comment
 Photo 7	The gallows bracket struts have severe corrosion and the landing support structures have been severely compromised by corrosion,
 Photo 8	Columns to the scape stairs are severely corroded. Detached handrails.
 Photo 9	Columns to the scape stairs are severely corroded.

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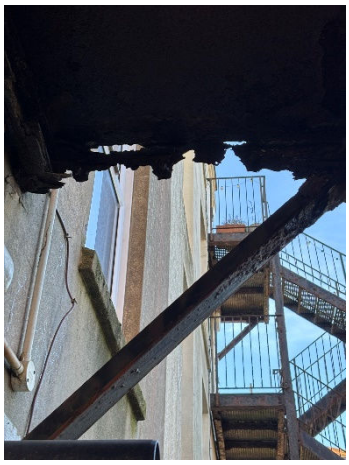
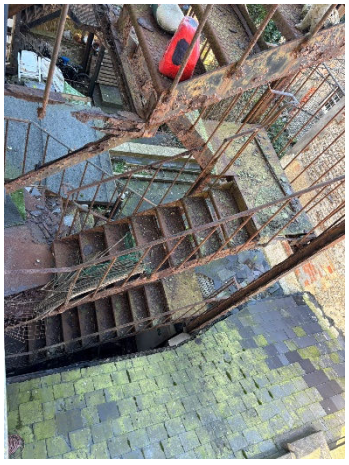
Photo Reference	Comment
 Photo 10	The gallows bracket struts have severe corrosion and the landing support structures have been severely compromised by corrosion
 Photo 11	Stringers, balustrades and handrails are all severely corroded and delaminated.
 Photo 12	Stringers, balustrades and handrails are all severely corroded and delaminated. Note the first-floor landing durbar pale has been lost and the landing supports corroded away.

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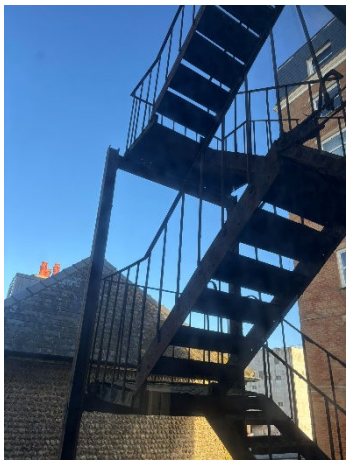
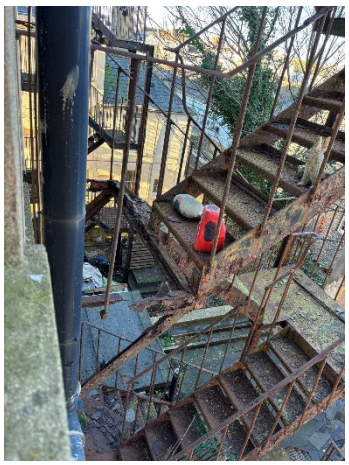
Photo Reference	Comment
 Photo 13	Stringers, balustrades and handrails are all severely corroded and delaminated. Note the first-floor landing durbar pale has been lost and the landing supports corroded away.
 Photo 14	Stringers, balustrades and handrails are all severely corroded and delaminated. Note the first-floor landing durbar pale has been lost and the landing supports corroded away.
 Photo 15	Stringers, balustrades and handrails are all severely corroded and delaminated. Note the first-floor landing durbar pale has been lost and the landing supports corroded away.

Appendix A - Photos

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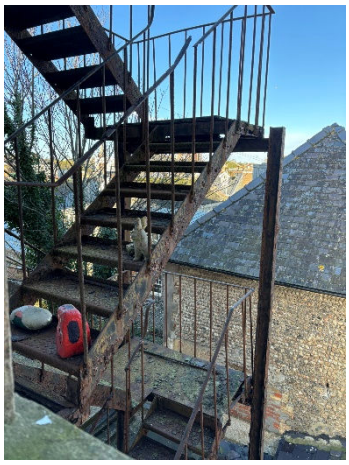
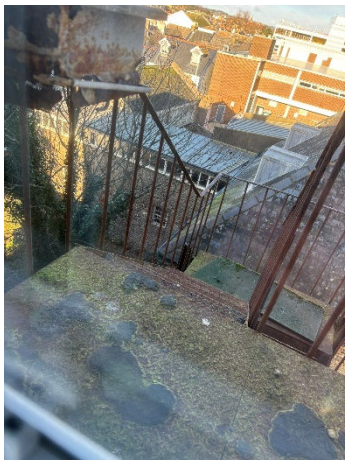
 Photo 16	Stringers, balustrades and handrails are all severely corroded and delaminated. Note the first-floor landing durbar pale has been lost and the landing supports corroded away.
 Photo 17	The landing supports appear to be a steel channel. On the first floor, this has corroded to the extent that the web is largely now missing and only the badly corroded flanges remain. The neighbouring stairs can be seen in the background. This is a similar steel construction, but uses an open grid floor for both the landings and stair treads which allows rainwater to pass through,.
 Photo 18	The top (third) floor landing appears to be in reasonable condition by comparison although, extensively corroded below.

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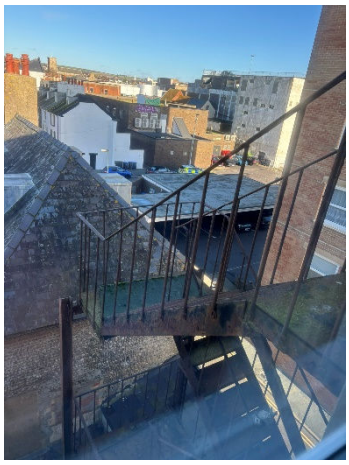 Photo 19	Stringer from the third floor to half landing.
 Photo 20	Underside of the third-floor landing.
 Photo 21	Underside of the third-floor landing.

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Photo Reference	Comment
 Photo 22	Third- floor half landing to first-floor landing stringer.
 Photo 23	Second-floor landing floor plate missing and the gallows bracket ties are severely corroded and provide minimal support to the stair flights. The ties have minimal material remaining.
 Photo 24	Close-up photo of the second floor supporting beam and stair flights.

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Photo Reference	Comment
 Photo 25	Third-floor half-landing – Note the severe corrosion and delamination.
 Photo 26	Second-floor landing gallows bracket support beam and diagonal strut. Highly corroded and failed section. Lost landing.
 Photo 27	Second -floor landing gallows-bracket beam. Highly corroded and delaminated.

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Photo Reference	Comment
 Photo 28	Stair support columns and column splice connection highly corroded and delaminating.
 Photo 29	Close-up of splice connection. Note the severe corrosion and delamination of the steel as well as the nuts and bolts themselves.
 Photo 30	Half-landings between the first and second floor were severely corroded. The loss of steel from the landing support beam and the effective loss of the balcony gallows bracket has caused the stair flight to rotate and drop. It was noted that a number of the balustrade bolted connections had corroded away leaving no connection to the stringers or stair landing. Note also the corrosion and delamination to the column. Supporting landing beam has corroded away.

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Photo Reference	Comment
 Photo 31	Second-floor half landing. The supporting edge beam is missing. Balustrades detached.