

Taylor Partington Design

Structural Design Consultants

13 Gillibrand Street
Chorley
Lancashire
PR7 2EJ
Tel: (01257) 275725
Fax: (01257) 231915

TPD/598-21/RGT/pmr

8th February 2021

STRUCTURAL ASSESSMENT OF ROOF AND WALL CONSTRUCTION Palm Court Restaurant Imperial Hotel Blackpool

1.0 INTRODUCTION

Following the collapse of part of the ceiling in the restaurant of the above hotel a preliminary inspection for damage was carried out by the writer on Friday, 8th January 2021.

At the time of the inspection it was decided to carry out a general visual inspection of the other parts of the restaurant ceiling and internal wall finishes particularly with reference to past and ongoing water penetration affecting the plastered wall decoration.

Further investigations were carried out with openings formed in the suspended ceilings in order to determine the condition of the roof and wall construction.

2.0 BRIEF DESCRIPTION OF BUILDING

The Palm Court Hotel Restaurant forms part of an extension attached to the north end of the front wall of the main hotel building, built at a later date circa late 1800s to early 1900s and overlooking the Promenade in a very exposed position directly facing the Irish Sea.

The extension built to match the front of the hotel façade consists of a basement at lower level containing a swimming pool and leisure facilities with a restaurant above set at the same level as the ground floor of the main hotel.

Attached to the north side of the original square shaped restaurant is a later extension built we suspect to provide a larger basement area at lower ground floor level and a more predominant entrance into the restaurant.

On the front of the restaurant and along the north elevation the ground level is set approximately 1m below the internal floor level of the restaurant with an open lightwell along these elevations serving various window openings providing natural light into the lower basement area. The ground level rises up along the south side of the extension to allow access into the restaurant entrance.

The walls of the original restaurant consist of a mixture of two leaves of solid 225mm thick leaves of brickwork separated with a small cavity strengthened with a mixture of substantial natural stone and resin concrete feature piers and columns.

At the north and south corner of the front wall are two large circular bay windows of similar construction with feature stone mullions, curved glass windows enclosed with rendered stone surrounds. The bay windows are capped on top with filler joist type concrete slabs which in turn support decorative stonework and a semi-circle of a regency style stone/concrete balustrade. The remaining walls of the extension are also capped with similar feature stone/concrete balustrades.

The south elevation of the later extension containing the restaurant entrance consists mainly of large stone/concrete piers, feature circular columns and stone built window surrounds.

The roof of the original extension consists of a system of steel beams designed to support 3 no. curved roof lights now lined internally with plasterboard and externally covered with shallow pitched roofs clad with mineral felt. Along the north, south and east side of the roof lights is a flat filler joist type concrete roof covered with asphalt which are supported off the external walls and the internal steel beams.

The later extension on the south side has a flat roof of filler joist concrete construction similar to the main roof with the edge of the roof cantilevering out above the external walls approximately 400mm.

Internally the walls of the restaurant have been lined below the existing picture rail with 6mm thick plywood fixed direct to the brickwork with a wire reinforced waterproof plasterboard lining the walls above the picture rail.

There is a suspended ceiling located below the concrete slab sections of the roof construction.

There are stepped levels to the dining room floor mainly located adjacent to the front wall of the restaurant and extending into the circular bay windows.

3.0 APPRAISAL OF DEFECTS

3.1 Restaurant Roof

The original curved glass lantern lights have been covered over in the past with the introduction of 3 no. shallow double pitched roofs clad with mineral felt. Whilst details of the two roof constructions are unknown the roof slopes have satisfactory horizontal alignment and appear to be in sound condition at the present time. We suspect that the roof lights were covered when the restaurant was refurbished circa 2000-2001 indicating that the roofing felt is at least 20 years old although at the present time the roof felt is in good condition.

The areas of flat roof surrounding the roof lights have an asphalt finish the age of which is unknown. There are cracks evident however in the asphalt particularly noticeable over the flat roof of the later extension. Overall however the flat concrete areas of the roof have satisfactory horizontal alignment.

We note new flashings have been installed to the brick parapet walls which surround the projection along the front elevation which we understand was

carried out during the general external refurbishment of the walls in 2015-2016.

We also note there is a recessed gutter formed in the asphalt along the north side balustrade wall with the drain outlet discharging through the north side wall into a hopper head located on the pier between the feature arched windows in the north wall.

Internally the flat concrete areas of the roof (accept for the roof over the circular north side bay window where the ceiling has partly collapsed) are covered with suspended ceilings preventing an inspection of the original concrete roof construction.

In the north side circular bay window area where the section of the plaster has fallen off exposing the soffit of the concrete roof slab, considerable corrosion of the steel filler joists can be seen causing spalling of the surrounding concrete.

3.2 Restaurant Walls

Externally the walls of the restaurant were refurbished in 2015-2016 including some repointing, installation of a damp proof course at roof level in the brick wall over the large front window, repainting the exposed stone features with stone paint and infilling cracks particularly evident at the south west corner of the restaurant building.

At the present time the repaired cracks have opened up slightly and deterioration of the recently painted stone surfaces can be observed. Otherwise however, with the exception of minor areas of damaged brickwork below the north side circular bay window and particularly evident where the stone arch has dropped over the arched window in the north elevation. The external brick walls, feature piers and columns all appear to be in sound structural condition requiring cosmetic treatment only. We note the concrete coping along the parapet wall around the central front projection which were cast during the renovation works in 2016 are still in sound condition.

The feature balustrading along the front and side elevations and around the circular bay windows have suffered from erosion and in the most exposed location are in poor condition.

Internally considerable damp penetration was evident damaging the wall finishes particularly noticeable at high level and in the stone mullions within the two circular bay windows.

Inspection holes formed in the bulkhead along the north wall show a section in the wall where considerable erosion of the internal leaf of brickwork has occurred. Towards the centre of the north wall a large section of the plastered ceiling had fallen off including part of the concrete surface exposing one of the steel filler joists. Most of the plaster finish to the inside face of the north wall within the bulkhead had also fallen off in the past possibly prior to forming the bulkhead.

Along the south wall the area within the bulkhead at high level showed similar erosion of the brickwork towards the west side of the wall including lifting of the brickwork due to corrosion of what appeared to be steel tie bars built into the brick courses. Whilst the ceiling and plaster coving appeared to be mainly

intact, the plaster finish to the inside face of the wall within the bulkhead area has also fallen off similar to that observed along the north wall.

An inspection of the roof above the suspended ceiling along the front wall at each side of the central large window opening confirmed loss of plaster to the ceiling exposing the concrete surface and a number of corroded filler joist steel beams. In particular a large section of the original feature plaster coving had fallen off onto the suspended ceiling adjacent to the inspection hole at the south end section of the ceiling.

Inspection holes formed in the ceiling adjacent to the front wall of the main hotel building showed the plasterwork to the underside of the concrete roof to be in relatively sound condition with no evidence to indicate deterioration of the concrete soffit or corrosion of the steel filler joists.

Where the plywood boarding was removed in the front wall below the picture rail, the plaster, brickwork and mortar joints were found to be in a dry condition.

Where the brickwork had been taken out at the top of the wall over the window cavity it was found to be clean and dry suggesting that the cavity tray installed in 2016 had proved successful.

Where the small panel of plywood had been removed in the central pier between the two arched windows in the north wall the plaster, brickwork and mortar joints were found to be in a saturated condition.

Considerable damp staining could also be observed along the soffit to both windows where the top of the arched window frames had been infilled in the past with dampness continuing into the adjacent pier.

An inspection of two holes formed in the reinforced plasterboard above the picture rail at each side of the large window in the front wall showed high moisture readings in the exposed brickwork with similar high readings in the exposed brickwork and remaining plaster coving above the suspended ceilings.

In addition to the areas exposed we note extensive damp penetration affecting the walls and mullions around the two large bay windows.

4.0 CONCLUSIONS

It is clear from our initial inspection and subsequent investigation that the source of most of the defects relate to ingress of water predominantly through the roof in particular with respect to its age, exposed and aggressive location together with poor construction detailing exacerbated by the choice of a concrete filler joist concrete roof which are well documented for corrosion of the steel joists where ingress of water occurs.

Notwithstanding the defects highlighted in the report the walls are of substantial construction and overall, whilst some remedial works are required, are still considered to be in satisfactory structural condition and adequate for their present use.

The cracks observed towards the south west corner of the later extension are due to corrosion of the steel filler beams in the concrete roof. These can be treated by grout injection to prevent further corrosion in the future.

The steel beams which were provided in order to stabilise the roof over the circular bay window at the south west corner of the restaurant appears to have been successful and as such we would suggest that this steelwork is fully exposed and retained subject to any possible upgrading required.

The roof over the circular bay window at the north west corner of the restaurant where the ceiling has partly collapsed is obviously in poor condition evident in the corroded filler beams and spalled concrete. In this case we are of the opinion that the roof should be strengthened with a framework of steelwork similar to that previously carried out to the bay window at the south west corner. Grout injection can be carried out to prevent further corrosion of the steel filler joists similar to that described. It is proposed to apply a specialist roof covering to prevent further ingress of water in the future.

Whilst damage has previously occurred internally from water penetration through the remaining flat concrete roof, at the present time the most severely affected roof areas are still not considered to be in a dangerous structural condition although some areas will require strengthening with a system of small steel beams similar to that proposed for the bay windows.

In order to prevent further water ingress through the roof we recommend that the whole of the flat roofed areas are covered with a new waterproof membrane similar to the bay window roofs.

Internally it is proposed to cover the walls above the dropped ceilings with a SIKA render. Elsewhere walls internally are to be covered with various types of waterproof boarding replacing the existing wall finishes.

We anticipate the walls externally will require upgrading as part of the proposed remedial works including minor brick and stone crack repairs, repointing and painting of the stone/rendered concrete features.

Internally it is proposed to reinstate the dropped ceiling areas removed during the installation of the waterproof membrane including painting and redecoration of the internal wall finishes.

5.0 RESUME OF SUGGESTED REMEDIAL WORKS

- Provide steelwork to support the filler joist concrete roof slab over the flat roof area and the north side bay window.
- Expose and appraise existing supporting steelwork to the south bay window.
- The flat concrete roof slab to be injected with grout to strengthen the concrete and protect the steel filler joists from further corrosion.
- Re-cover the whole of the flat roofed areas with a new waterproof membrane.
- Allow for further investigation and remedial work to make good damp penetration to the central pier between the arched windows in the north wall of the restaurant.

- Allow for general upgrading of external wall surfaces including repairs to crack lines, brickwork repairs and repainting of external rendered finishes.
- Internally the areas of dropped ceilings are to be removed to allow the walls at high level to be waterproofed with reinstatement of the ceilings and walls on completion.
- The existing internal wall finishes are to be removed and replaced with new waterproof board reusing existing dado rails, picture rails and skirting boards where possible.
- The external walls are to be repainted to match the existing with similar redecoration internally.

R G TAYLOR C.Eng MI.Struct.E
Chartered Structural Engineer
For and on behalf of
TAYLOR PARTINGTON DESIGN

6.0 APPENDICES

Appendix A –Floor Plan Sketch Sheet SK1

Appendix B – Photographs taken at the time of the inspection

Appendix A –Floor Plan Sketch Sheet SK1

Appendix B – Photographs taken at the time of the inspection