



ANALYSIS OF IMPACT ON 1 DEANS GATE LOUVRES

39 Deansgate, Manchester

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Working in partnership with:



Foreword

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1 EXECUTIVE SUMMARY

This report is concerned with assessment of the potential impact of the proposed 39 Deansgate development on the operation of the louvre system on the neighbouring 1 Deansgate building.

The louvres are located around the façade of 1 Deansgate, to allow control of fresh air and climate for the residential winter gardens.

The louvres are a double skin solution provided by Glastec Louvres and installed in 2002. The Louvres are manually operated, but are also controlled for safety according to the building's fire, wind and rain sensors.

The wind sensors allow the automatic closing of the louvres in high wind speeds. Concern has been raised that changes in the local wind environment caused by the 39 Deansgate development will impact the wind speeds recorded at the wind sensors, and cause the louvres to close unnecessarily.

This study examines the potential for raised wind speeds around the façade of the 1 Deansgate building and whether the redeveloped 39 Deansgate is expected to have an adverse impact.

Surface pressure coefficients on 1 Deansgate were measured in CFD, to assess whether more extreme peak positive or negative pressures are expected with the 39 Deansgate development relative to the existing conditions.

More extreme peak positive or negative pressures would result in the wind sensors reading higher wind speeds, and increase the risk of the 1 Deansgate louvres being forced to close.

Pressures were measured from a southerly sector (the dominant wind direction) and from a westerly sector (the second dominant wind direction).

The pressures were assessed on the south, east and west façades of 1 Deansgate (the north façade being sufficiently far from 39 Deansgate to be reasonably expected to not be impacted).

Surface pressures for 170deg, 260deg and 280deg were consistent between the existing conditions and the conditions with the proposed development.

Surface pressures for 190deg and 210deg were less extreme for the proposed development than for the existing conditions. This should allow the 1 Deansgate louvres to be open for a greater percentage of the year.

Overall, no adverse impacts of the 39 Deansgate development on the 1 Deansgate louvres were found, and in fact the proposed development will have a beneficial impact from key wind angles.

2 INTRODUCTION

This report is concerned with assessment of the potential impact of the proposed 39 Deansgate development on the operation of the louvre system on the neighbouring 1 Deansgate building.

The louvres are located around the façade of 1 Deansgate, to allow control of fresh air and climate for the residential winter gardens.

In 2001, PHP Glastec Systeme GmbH were contracted to design, manufacture and install the Glastec louver system including the control unit as an external façade to No 1 Deansgate.

The installation of system was finalised in April 2002. The louvres are a double skin solution and each apartment can manually open their louvres. The individual units have a motor with its own control unit linked to the Wind/Rain sensor and the Fire alarm. Apartments with 2 motors have 2 control units. Each control unit has a meter to count the load reversals.

We also contacted the original manufacturer for any further technical information that might be available however they did not respond.

The wind sensors allow the automatic closing of the louvres in high wind speeds. Concern has been raised that changes in the local wind environment caused by the redeveloped 39 Deansgate will impact the wind speeds recorded at the wind sensors, and cause the louvres to close unnecessarily.

39 Deansgate already exists to the south, and as such will currently influence how the louvres operate.

This study examines the potential for raised wind speeds around the façade of the 1 Deansgate building and whether the redeveloped 39 Deansgate is expected to have an adverse impact.

3 METHOD

To compare the conditions with and without the proposed 39 Deansgate development, CFD runs were performed of both scenarios surrounded by 400m of local context.

From these runs, surface pressures were measured on the façade and roof of 1 Deansgate. High positive pressures will show raised wind speeds striking the building, high negative pressures will show raised wind speeds blowing alongside any building faces.

Analysis was performed to assess how the 39 Deansgate development will impact the surface pressures measured on 1 Deansgate.

Winds in Manchester are predominantly southerly or south/south-westerly, with a secondary peak from westerly or west/north-westerly.

These sectors were covered by analysing winds from the following angles:

- 170deg
- 190deg
- 210deg
- 260deg
- 280deg



Fig. 01: "Existing" scenario



Fig. 02: "Proposed" scenario

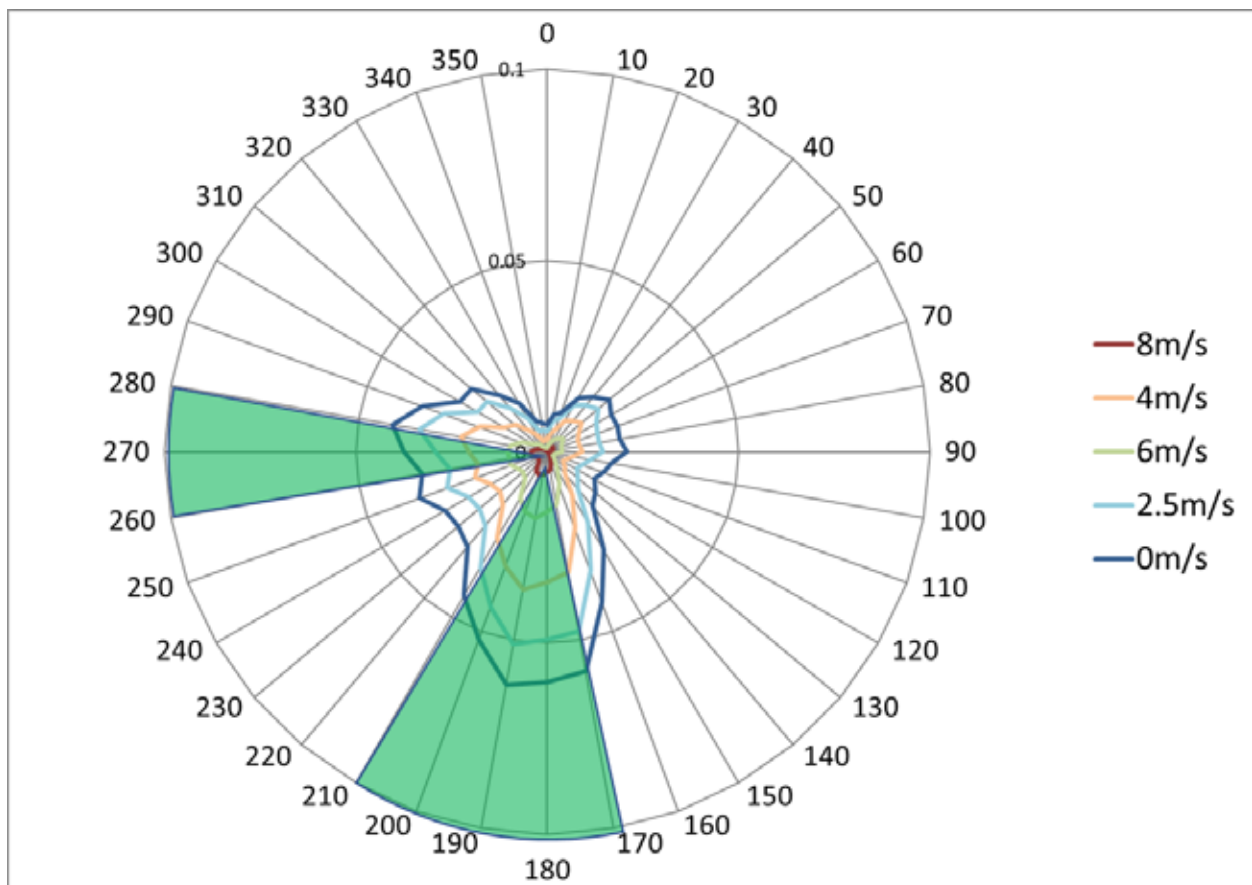


Fig. 03: Wind Rose

4 RESULTS

The following image shows the surface pressure coefficient for 1 Deansgate, for the 2 scenarios, with a view from the south-west.

Conditions are consistent for the 2 scenarios for 170deg, 260deg and 280deg. Conditions are less extreme for the proposed scenario relative to the existing scenario for 190deg and 210deg (highlighted).

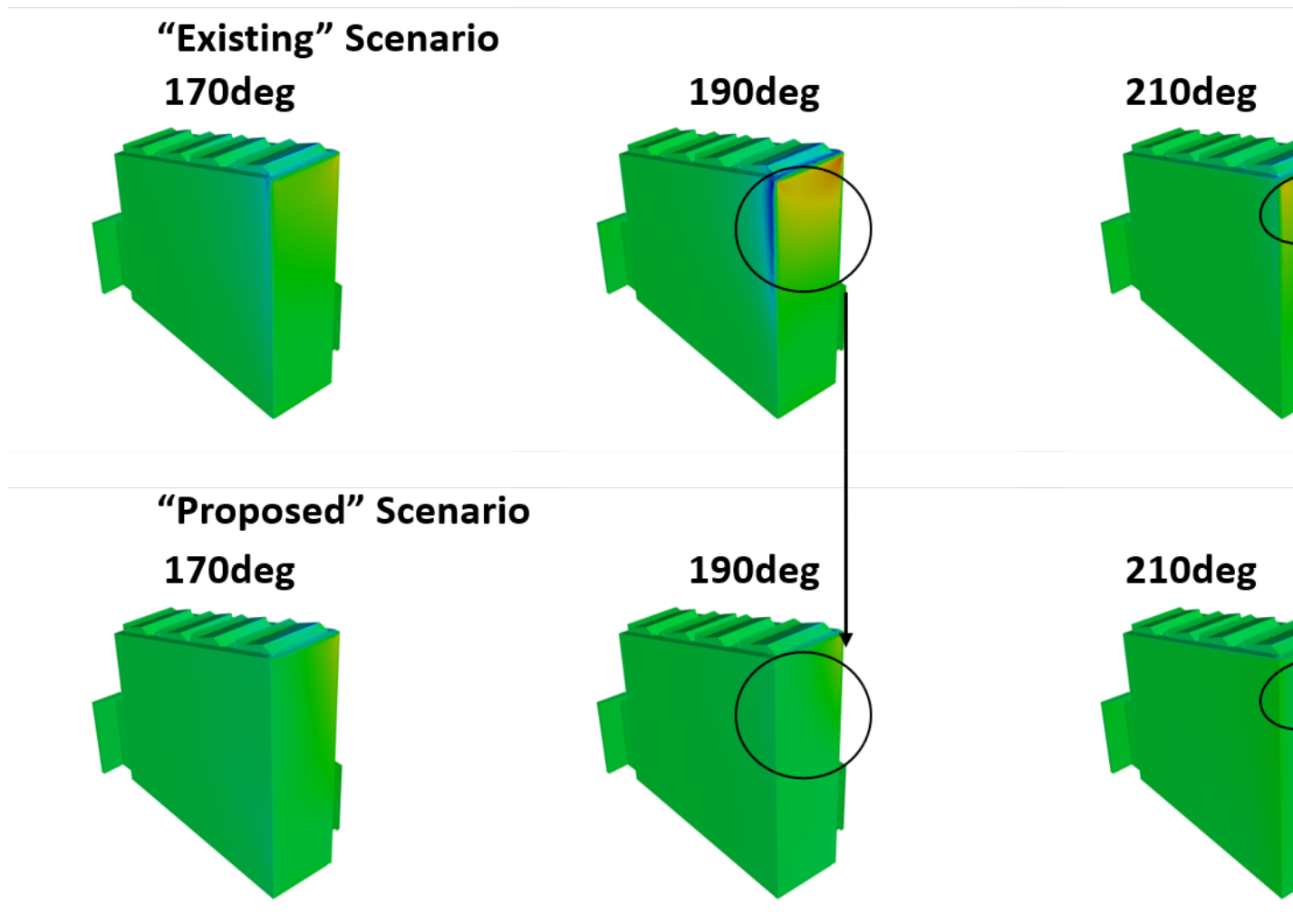
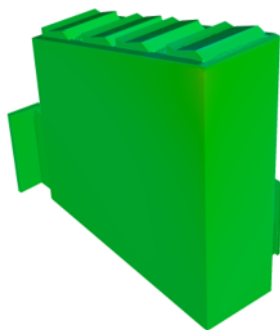


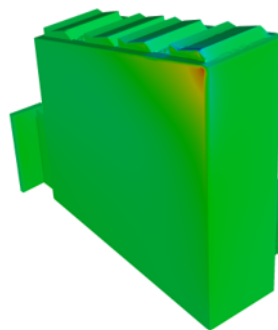
Fig. 04: Surface pressure coefficient for 1 Deansgate, for the 2 scenarios, from the south-west.



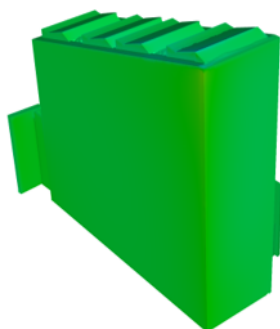
260deg



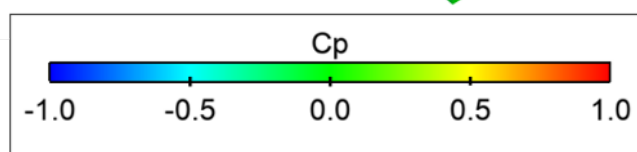
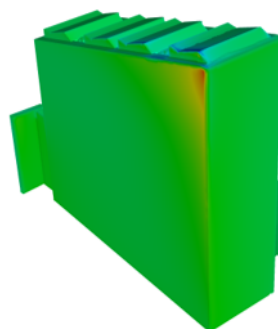
280deg



260deg



280deg



The following image shows the surface pressure coefficient for 1 Deansgate, for the 2 scenarios, with a view from the south-east.

Conditions are consistent for the 2 scenarios for 170deg, 260deg and 280deg. Conditions are less extreme for the proposed scenario relative to the existing scenario for 190deg and 210deg (highlighted).

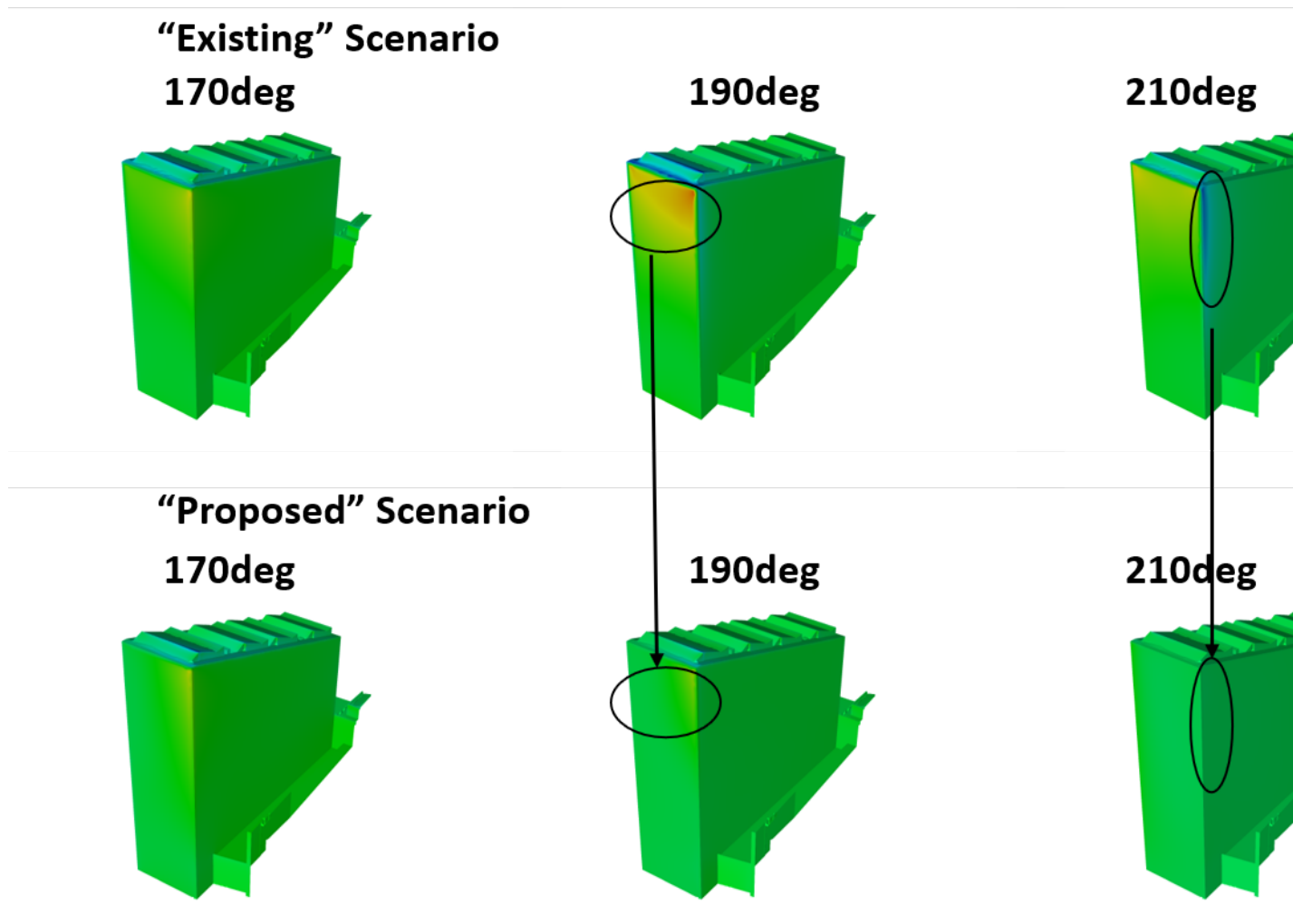
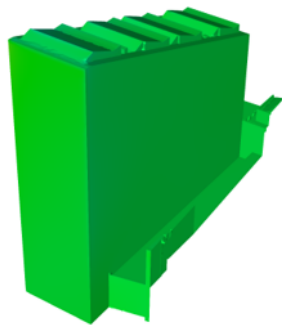
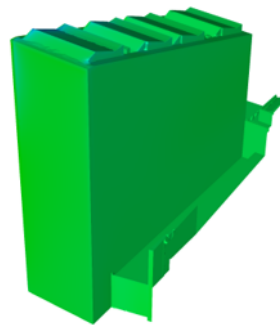


Fig. 05: Surface pressure coefficient for 1 Deansgate, for the 2 scenarios, from the south-east.

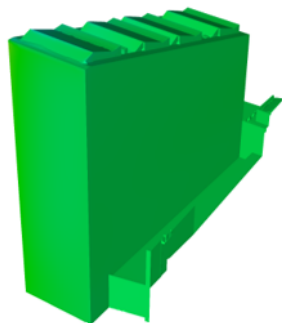
260deg



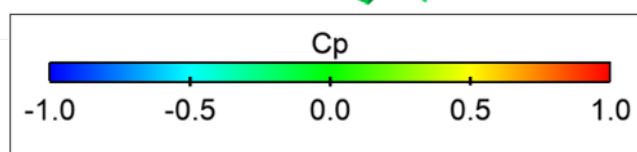
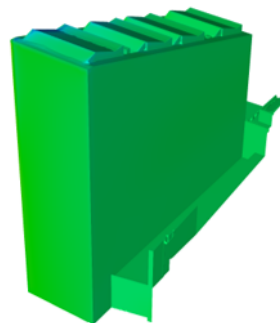
280deg



260deg



280deg



The following image shows the surface pressure coefficient for 1 Deansgate, for the 2 scenarios, with a view of the roof.

Conditions are consistent for the 2 scenarios for 170deg, 260deg and 280deg. Conditions are less extreme for the proposed scenario relative to the existing scenario for 190deg and 210deg (highlighted).

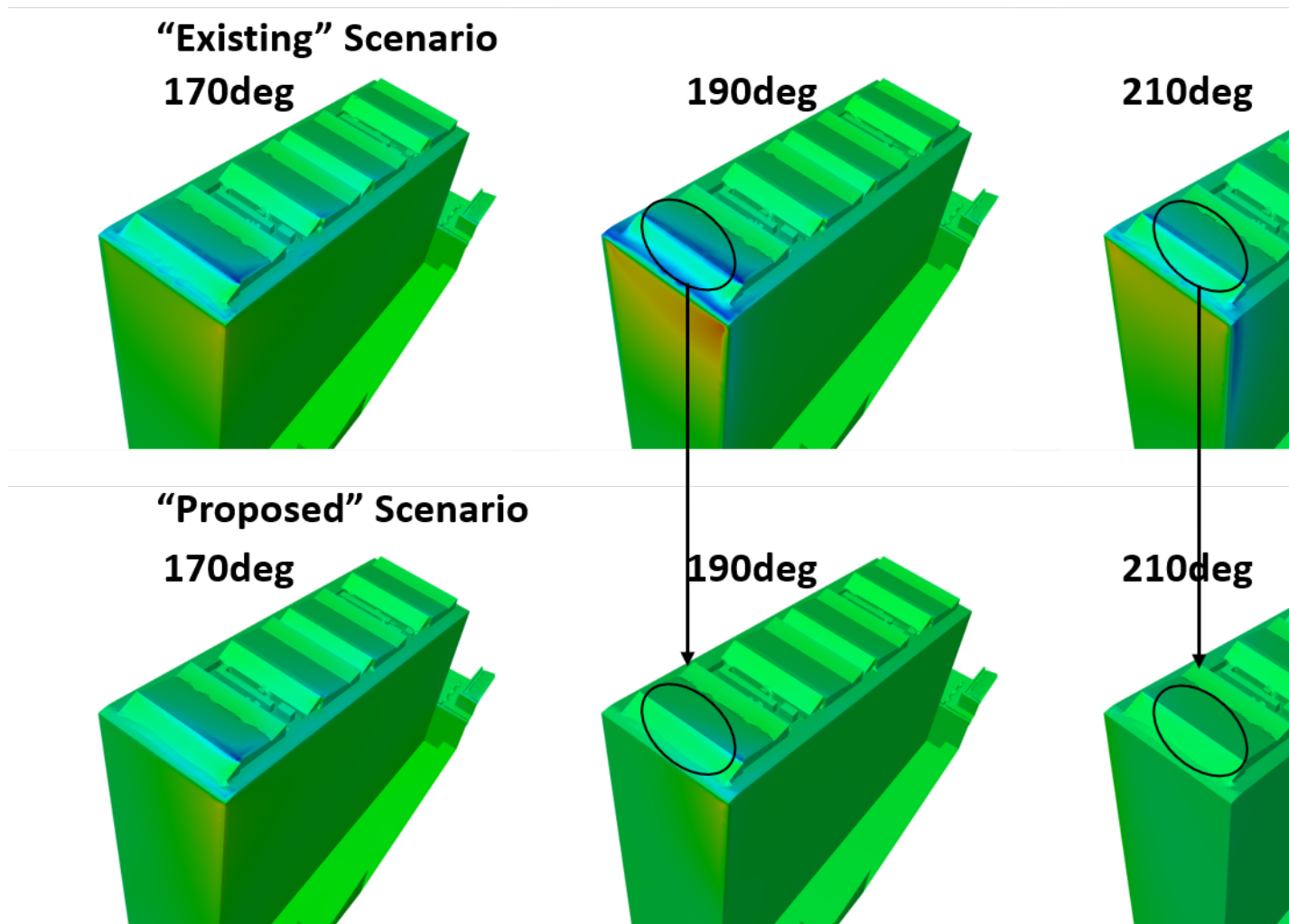
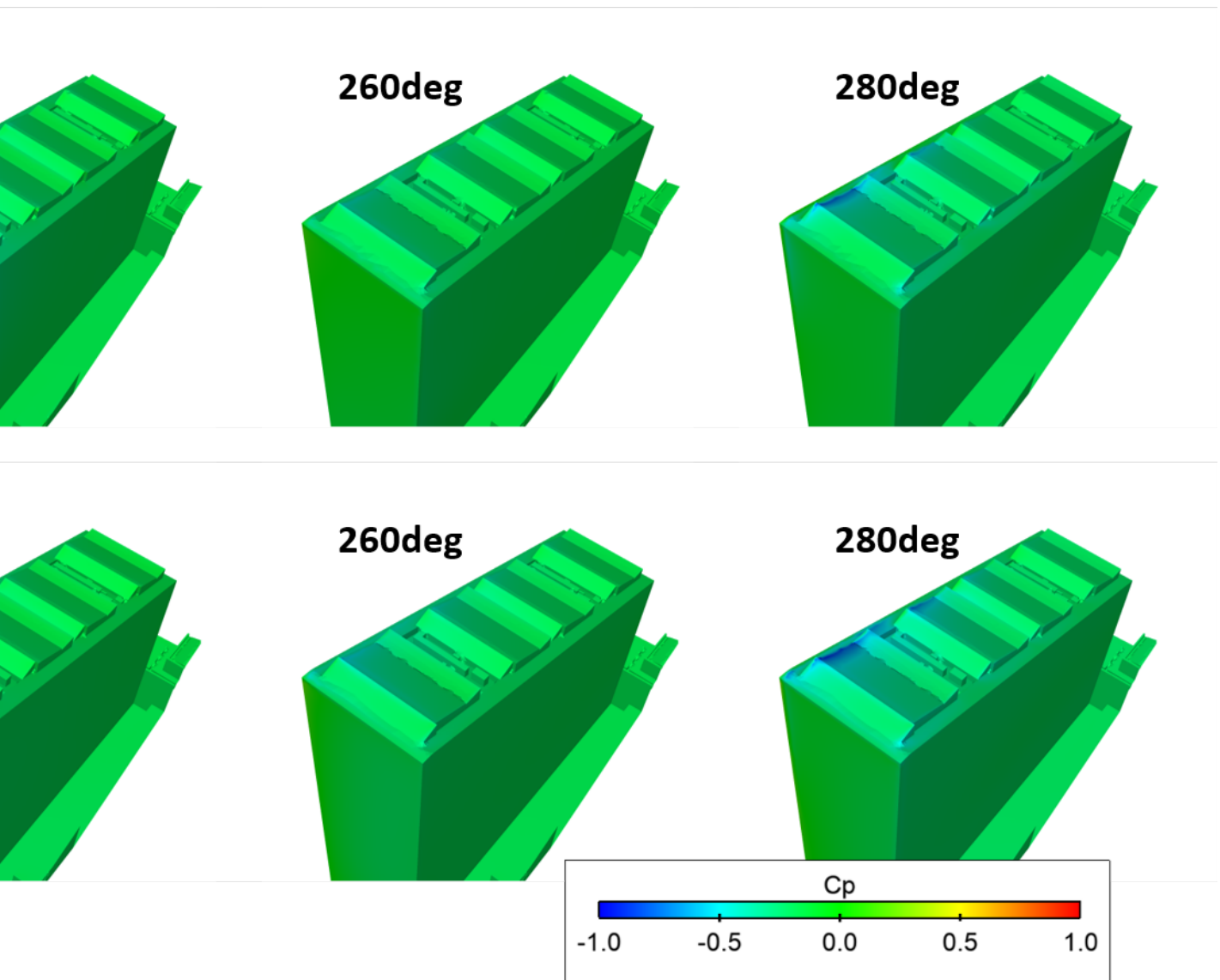


Fig. 06: Surface pressure coefficient for 1 Deansgate, for the 2 scenarios , with a view from the roof.



5 CONCLUSIONS

Surface pressure coefficients on 1 Deansgate were measured in CFD, to assess whether more extreme peak positive or negative pressures are expected with the 39 Deansgate development relative to the existing conditions.

More extreme peak positive or negative pressures would result in the wind sensors reading higher wind speeds, and increase the risk of the 1 Deansgate louvres being forced to close.

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