

#### PROJECT OVERVIEW

RBA were commissioned by a large multi-national manufacturing company in North Wales to complete inspections, static analyses and fatigue analyses of several large steel-framed structures to mitigate the risk of failure.

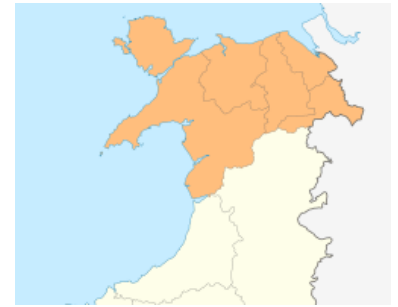
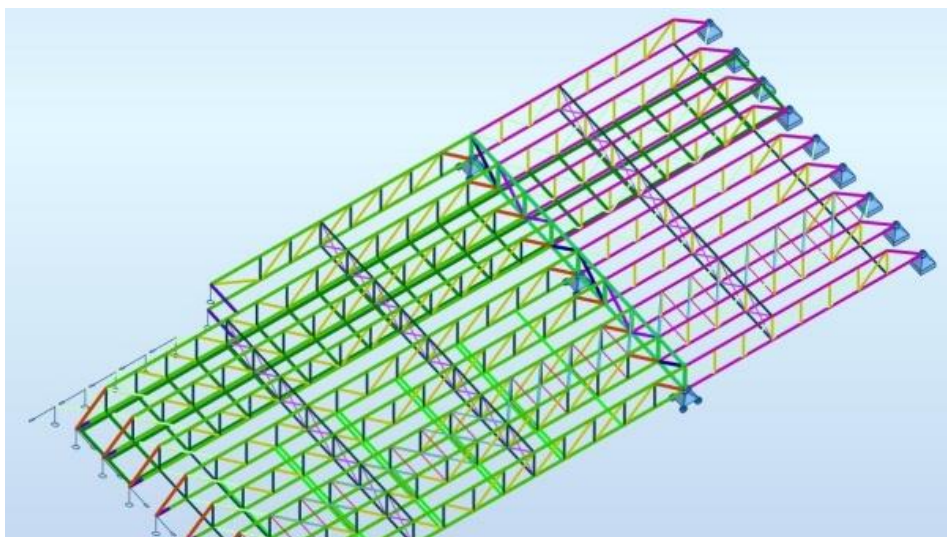
These steel-framed structures have trusses spanning in excess of 100 metres, with overhead travelling cranes suspended from the roof. Due to the cyclic nature of the loading, this has the potential to induce fatigue-related defects.

Working in partnership with steelwork contractors, our experienced structural engineers are undertaking detailed surveys of the structures, often at weekends when production and crane usage is lower, so that access can be gained safely using ground based MEWPs. The surveys are required to obtain dimensional information of members and connections due to as-built information being limited.

RBA are carrying out structural analyses of the existing structures to include new proposed cranes using Autodesk Robot software, with cranes represented as moving loads. Fatigue analysis of the existing structures is being carried out according to BS EN 1993-1-9. RBA's structural engineers work closely with others to determine the crane cycles and typical crane loadings based on duty ratings and production data, which is used to establish stress ranges in each structural component. Detailed technical reports are prepared outlining the findings of the inspections and analyses, with recommendations to:

- Adopt an immediate and planned maintenance regime.
- Strengthen or replace members and connections.
- Replace normal bolted connections which are subject to load reversal with connections that resist slip, such as tension control bolts, or resin injection.
- Reduce the allowable imposed maintenance load on the roof.

RBA's inspections and analyses informs recommendations and follow-up work which is proving to extend the service-life of the structures and reduce the risk of future defects arising. Due to the lower risk, the quantity of planned inspections can also be reduced, thus generating a cost saving.



#### Services Snapshot

- Structural Survey
- Fatigue Analysis
- Static Analysis
- Autodesk Robot software
- Remedials design solutions
- Site supervision