

Blast Resistant Design of a Data Centre, Malaysia

MMI advised on threat and site layout and performed design of blast resistant structure. MMI advised the typical threats to which a facility might be exposed and what could be suitable design threats. Advice was provided on the positioning of the building within the site footprint to maximize standoff. The RC frame and external RC walls were designed to survive the prescribed blast. Limited glazing was provided and this too was designed to break but to protect occupants.



Blast Resistant Design of Signalling & Control Centre, UK

MMI performed design of blast resistant structure and blast deflection wall. This control centre was to be built on a narrow strip of land and the scheme design required a blast deflection wall to compensate for limited standoff. MMI carried out blast hazard modeling to demonstrate the effectiveness of the blast wall and then designed the blast wall for blast and fragment protection as well as the mission critical parts of the steel-framed building to withstand the residual blast pressures.



Blast Resistant Façade at Blackfriars Station, London

MMI utilised test data to support the blast-resistant design of a large glazed façade. MMI were appointed by Jacobs UK to assist in demonstration that the façade would limit the consequences of a bomb blast at this high profile inner city site. MMI advised on the integration of hostile vehicle mitigation measures and then reviewed component blast test information before utilising structural and finite element analysis to demonstrate acceptable performance of the glass planar panels and the supporting façade steelwork when subjected to both external and internal threats.



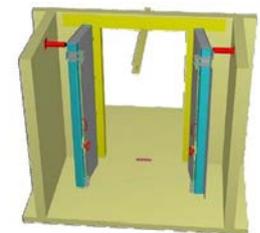
Blast Resistant Canopy at Paddington Station, London

MMI performed an initial rapid appraisal of the blast resistance to support redefinition of the design brief. MMI were appointed by Ramboll UK to carry out a review of the blast resilience of a RIBA Stage D design proposal for a canopy structure at this high profile site. The design utilized glass fins as beams and had minimal supporting steelwork. An initial rapid appraisal was carried out by MMI and this was used to negotiate a redefinition of the design brief. This work is ongoing.



New Blast Doors for Weapon Manufacturing Facility, UK

MMI designed new blast-resistant doors to protect workers within a manufacturing facility. The operator of this facility was concerned that an accidental blast from a weapon under assembly would present too high a risk to workers. As a first measure towards risk reduction MMI were appointed to design blast resistant doors which would integrate with the existing room layout. It was found that the RC walls were a weak link in the protection and the blast doors were deferred in preference of a new facility.



Personnel Security Risk Assessment for Gas Reception Facility, UK

MMI was asked to review the potential for personnel or intruders to cause either accidental or malicious damage to the facility. MMI approached this by considering a standard range of threats against each part of the plant and then prepared frequency and consequence assessments to derive a relative risk rating for each scenario. The information was summarized using graphical matrices so that high risk scenarios could be identified and mitigated.



Floating Jetty, UK

MMI performed independent technical assessment of blast consequence assessments MMI was providing ITA services to the design of this facility which was being designed and constructed to modern nuclear standards. Due to their specialism in blast engineering MMI were also asked to review consequence assessments for specific blast scenarios arising from such incidents as gas bottle blast and transformer explosion. MMI carried out parallel analyses and calculations to help make judgments regarding localized non-linear behavior.



Forecourt Security Design at Heathrow, Gatwick & Stansted Airports UK

MMI supported Jacobs UK in the design of hostile vehicle mitigation measures for 7 forecourts. MMI supported Jacobs UK on a large programme of forecourt enhancement projects aimed at preventing hostile vehicles from entering terminal buildings. This was part of a staged improvement plan to upgrade the facilities to provide increased standoff. This work involved discussion with suppliers of test products, attendance at tests and impact calculations to design hostile vehicle measures and their foundations.



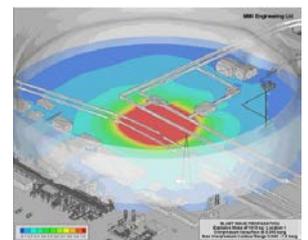
Blast Resistant Hotel Façade, Washington DC

MMI performed a blast assessment of a cable-supported planar glass façade. The client wished for an open entrance lobby at this new hotel and chose to utilize planar glass supported by steel cables. MMI performed finite element analyses to investigate the response of the glass and the tendons, including connections. Thanks to the hazard being quite low, it was found that the glass was unlikely to break, giving margins of safety.



Bomb Blast Risk Assessment for Gas Facility, UK

MMI performed blast modeling and consequence assessments for a series of VBIED and PBIED threats. MMI was asked to advise on the extent and severity of blast pressures across this site when exposed to a variety of vehicle borne and person borne improvised explosive devices. This was achieved by performing CFD analyses to determine the propagation of the blast wave and the interaction with site structures such as control buildings, pipe racks and large equipment items. These hazards were then considered in conjunction with building vulnerability assessments which were in turn based on drawing review and site inspections.



Security Advice for LNG Terminal, Chile

MMI prepared security plans and procedures. MMI developed security flow charts to show how a range of security incidents would be responded to and what layers of protection existed. This enabled stand site security procedures and manpower levels to be tailored to the specific configuration of this site.

