

# AEROSPACE MANUFACTURING



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## THE CLIENT

GKN Aerospace – innovators whose technologies have inspired and industrialised their industry, combining engineering excellence and technology leadership. All major aircraft and engine manufacturers rely on the client’s advanced technologies – their aerostructures, engine systems and special products improve the performance of more than 100,000 flights every day.



Aerospace



21+/-2 C  
50-60% RH



1650m<sup>2</sup>



## THE BRIEF

The client wished to strip out and replace an existing cleanroom at their premises with a brand-new installation in order to increase their Aerospace manufacturing production capacity and improve their compliance. By developing a first-class cleanroom, the client would have more scope for bringing in new projects. The build was scheduled to take place over two phases – with an intelligent temporary dividing wall installed to ensure the client could resume their process as soon as possible.

**“Guardtech have been excellent to deal with...”**

Matt Graves, GKN Aerospace Programme Manager, said: “Guardtech worked with us to produce a 1650sqm cleanroom update within a 100-year-old building. During the design process they were able to incorporate an extended ceiling height over 60% of the previous floor area, both improving and futureproofing the facility.

“My working relationship with Guardtech goes back a number of years on this project. Over that time, I have found them to be an excellent company to deal with; open and honest in their approach, flexible and unphased by changes. Their onsite support and positive interaction with our employees has made this a successful project.”

**Matt Graves**  
GKN Programme Manager



**Cleanroom**  
solutions



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## THE TECH SPECS

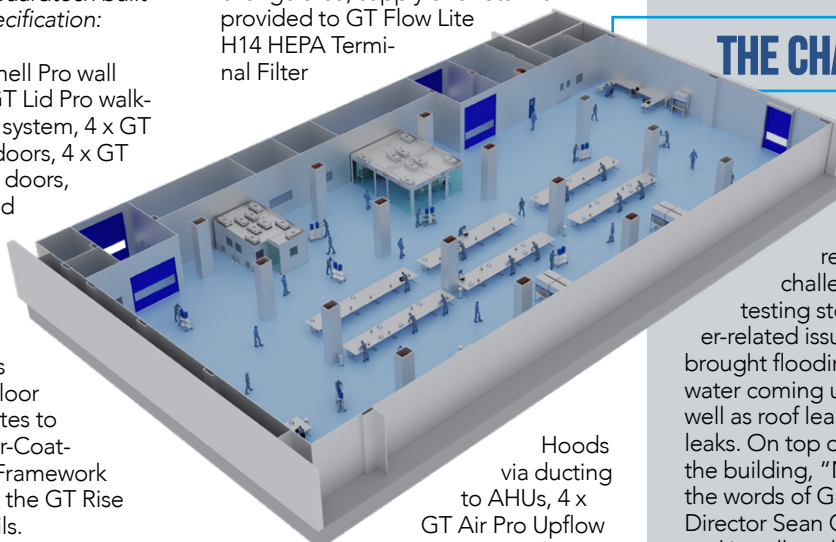
A controlled environment designed, installed, cleaned and commissioned by Guardtech built to the following specification:

◆ **Structural:** GT Shell Pro wall panelling system, GT Lid Pro walk-on panelled ceiling system, 4 x GT Access Plus single doors, 4 x GT Access Plus double doors, 2 x GT Rise Pro rapid roll doors, Span Secondary Steel Beam steelwork between Crane Rail top fixing, Secondary Steel Beams spanned between floor joists with fixing plates to beam body, Powder-Coated Steel Goalpost Framework installed to support the GT Rise doors, GRP laser rails.

◆ **Electrical:** GT Lux Pro surface-mount LED lighting units with intelligent DALI controls providing 1000 lux, electromagnetic door interlocks with status indicators, 251 x 13amp double sockets and 168 x CAT6e in surface-mount three-compartment PVC

trunking, 4 x 125-amp distribution boards, 1 x 63-amp outlet.

◆ **Mechanical:** GT Flow Pro H14 HEPA Fan Filter Units with G4 filters and Roomside Change feature in change area, supply and return air provided to GT Flow Lite H14 HEPA Terminal Filter



Hoods via ducting to AHUs, 4 x GT Air Pro Upflow CRAC Air Handling Units (AHUs) delivering 93kW cooling each with Modbus connectivity, vacuum pipework, additional trim heaters on supply air assisting with temperature and humidity control.

◆ **Monitoring:** GT Scan Pro

Environmental Monitoring System (EMS) measuring temperature, humidity, pressure & leak detection via HDMI 15" Panel with full Modbus PC integration, 4 x particle counters, Fan Filter Unit and lighting controls, in-room alarms.

## THE CHALLENGES

**Age concern:** The cleanroom facility was being constructed in a 150-year-old shipyard and, as a result, presented various challenges. There were several testing storms and other weather-related issues to deal with, which brought flooding and tidal issues with water coming up through the floor, as well as roof leaks and rainwater pipe leaks. On top of all that, with the age of the building, "Nothing was square," in the words of Guardtech Group Projects Director Sean Gaylard, so all our design and install work required extra flexibility and creativity with layouts and services placements. This meant ordering new panels and other components wherever necessary. As well as design amendments, there were various inventory checks and 'panel cuts' to fit different-sized spaces. However, the team endeavoured to waste as little as possi-



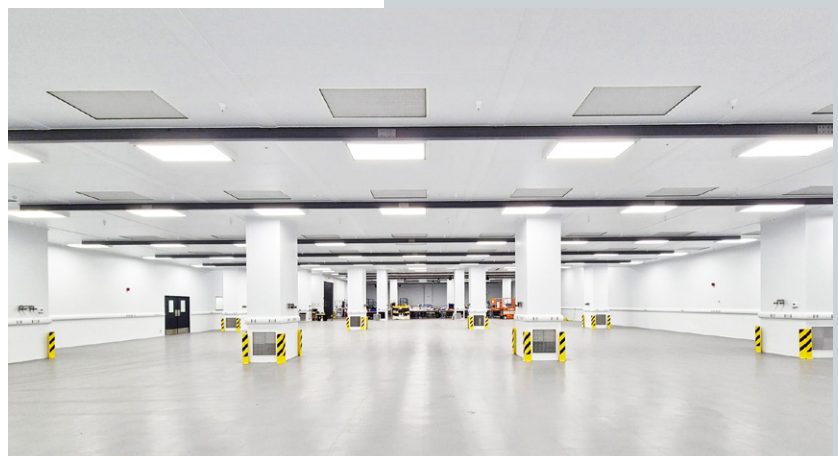
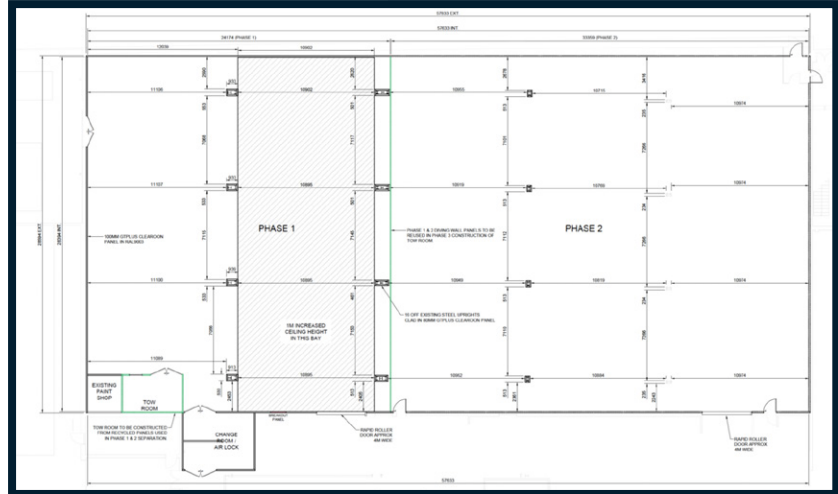
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ble and reworked the design to overcome these ‘on-the-ground’ challenges.

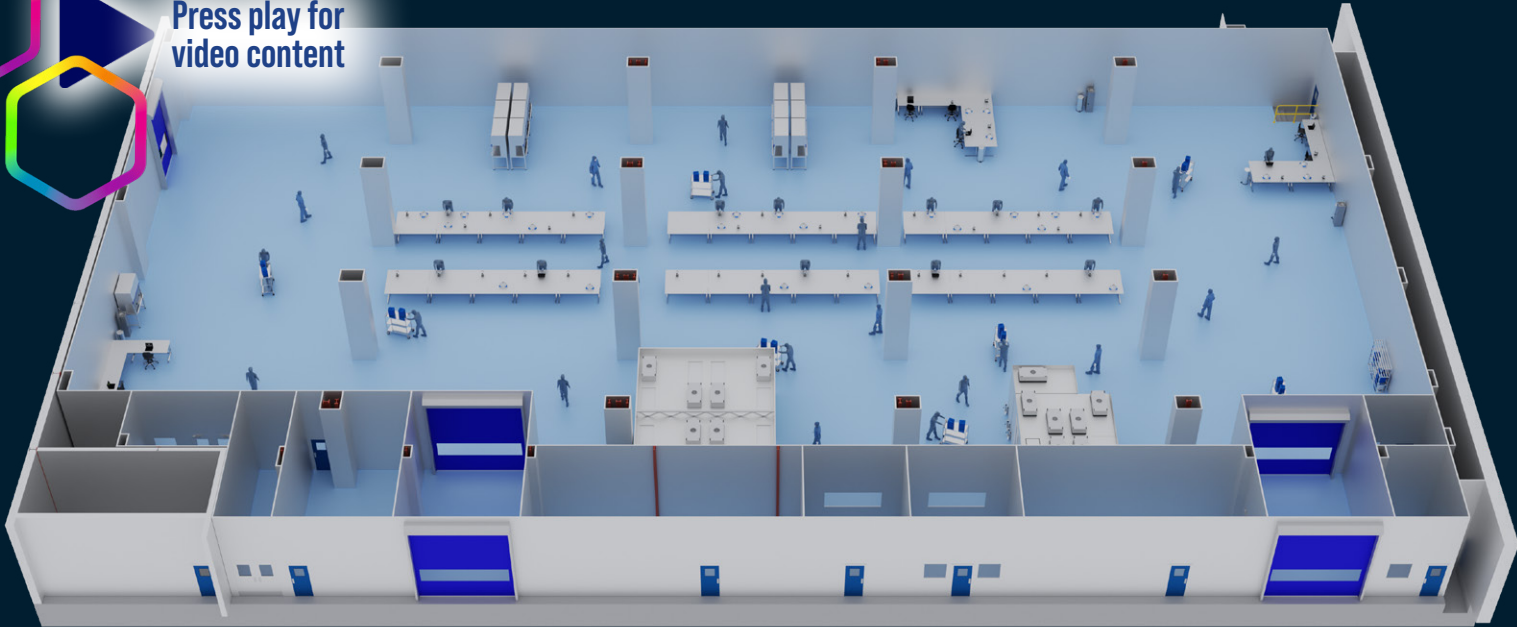
**Temporary wall:** On that same thread, to save the client money whilst also demonstrating our commitment to sustainable working practices, the Cleanroom Solutions team installed a temporary dividing wall in such a manner that 90% of the panels could be repurposed for the plant room and front elevation during the second phase cleanroom installation. The temporary wall would allow the client to resume their process in half of the newly constructed space whilst the second half was installed.

**Steely determination:** The facility features a complex steelwork arrangement which the Guardtech Group oversaw the design and installation of in conjunction with outside specialists. We came up with a unique steel truss design to suit the client’s internal cleanroom requirements and allow a walk-on panelled ceiling. The idea behind the intelligent 12m truss steelwork spans was that additional vertical supports wouldn’t be required within the room – which was critical to the client’s plans to retain as much process space as possible.

**Heights and lows:** Again, because of the aged nature of the host building, the team had to be incredibly flexible when reworking the plans to fit with



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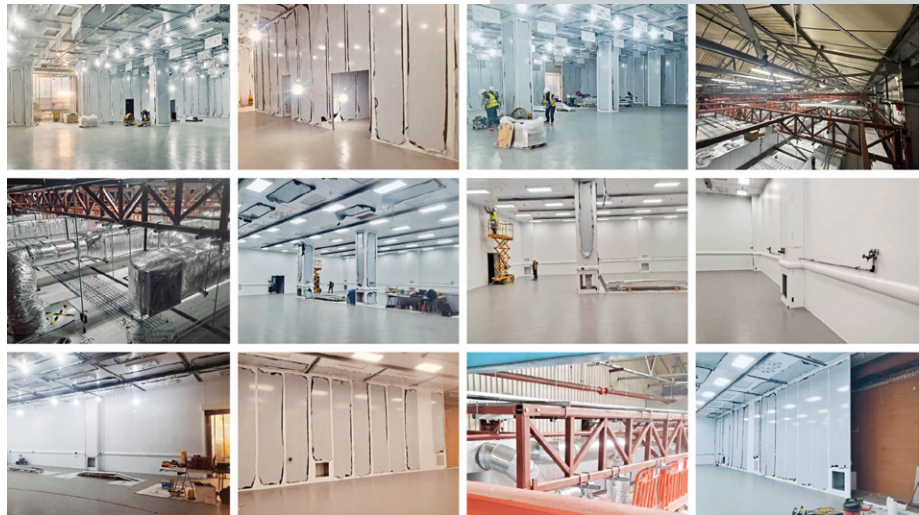
non-level existing steelwork. There were numerous height issues to overcome, with the team constantly having to reconfigure sections to account for differing levels. There was a lot of ‘thinking on our feet’ on site, identifying issues early on, investigating them and reacting swiftly in conjunction with our subcontractor teams to find cost-effective resolutions.

**Daring ductwork:** Because of the sheer scale of the facility, the design included some highly complex ductwork arrangements. The Guardtech Design and Install teams worked brilliantly with the ducting subcontractors to deliver a high-performance solution. “A lot of clash detection went on throughout Phase 1,” added Gaylard. “There were a lot of existing services and infrastructure that we had to work in and around – services that couldn’t be removed. The team needed to be as diligent and careful as ever to ensure we delivered a high-quality build.”

**Sprinkling some magic:** The client asked for a sprinkler system to be installed fairly late in the process.

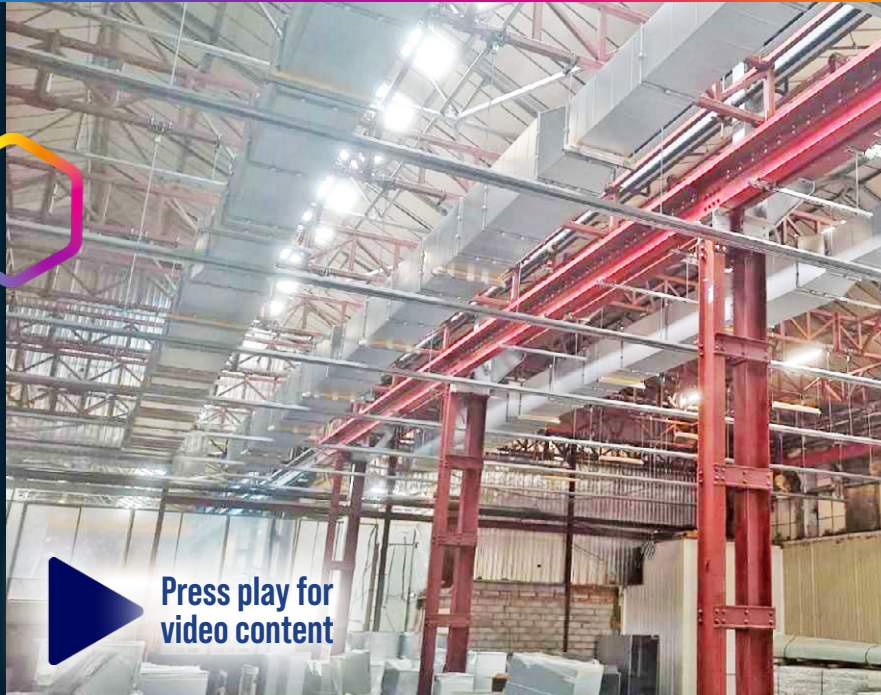
As a result, we had to manage that variation effectively, working with the client’s appointed contractor to ensure the installation fitted in with our designs and didn’t compromise any existing services or infrastructure. This was generally

**Secure and shipshape:** All operatives had to be chaperoned on site, which brought a lot of different challenges, particularly in terms of logistics and moving plant, materials and operatives in and out of the working area. However, the Guardtech Group,



a highlight of our working practice throughout Phase 1 – co-operating supremely well with all of the client’s designated contractors to ensure a well-structured, safe and CDM-complaint, collaborative installation.

Cleanroom Solutions and all of our associated brands have a great deal of experience working in different environments with high levels of security and restrictions/limitations and this was a challenge the team were well equipped to overcome.



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## THE RESULT

Matt Graves, GKN Aerospace Programme Manager, said: "Guardtech Group have worked with us to produce a 1650sqm cleanroom update within a 100-year-old building. This was carried out in two phases, allowing us to maintain full production within the existing footprint.

"During the design process they were able to incorporate an extended ceiling height over 60% of the previous floor area, both improving and futureproofing the facility. The finished development is clean in design, modern and functional.

"My working relationship with Guardtech Group goes back a number of years on this project. Over that time, I have found them to be an excellent company to deal with; open and honest in their approach, flexible and unphased by changes. Communication is excellent. Their onsite support and positive interaction with our employees has made this a successful construction project."

