BDI
Blast Deflectors

REDUCING AIRPORT NOISE AND IMPROVING SAFETY

GROUND RUN-UP ENCLOSURES FOR COMMERCIAL, GENERAL AVIATION & MILITARY AIRCRAFT

Blast Deflectors

THE ORIGINAL EXPERTS

Founded in 1957, Blast Deflectors, Inc. is a global leader in ground run-up enclosures (GRE) and aircraft acoustic enclosure technology.

BDI's innovative solutions set the standard for ground run-up enclosures through a variety of tested and proven features manipulating controlled airflow and providing noise attenuation.

The entire BDI facility, from planning and design to manufacturing, delivery and installation, is engineered with quality in mind.

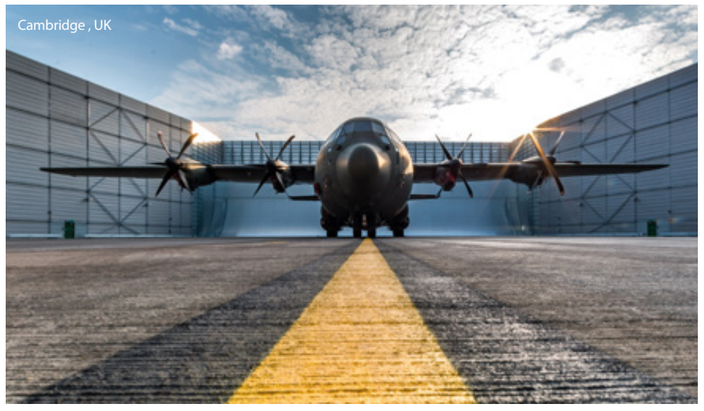
Our ground run-up enclosures consist of a corrosion-resistant structural steel frame and sheeting system with other optional features.

Our trademarked Noise Blotter™, Vortex Killers™, and Stabile Flow™ innovative designs provide features unique only from BDI.


Milwaukee, USA


Indianapolis, USA


Saudi Arabia


Cambridge , UK

A RUN-UP NOISE SOLUTION


Cambridge, UK


St Louis, USA


Hamburg, Germany


Subang, Malaysia

BDI offers ground run-up enclosure facilities that use patented components, proven designs and a spotless track record of successful installations. Our philosophy is to balance project requirements with practical solutions.

The combination of the aerodynamically advanced Stabile Flow™ design with the effectiveness of Noise Blotter™ acoustic panels provide an efficient GRE with very high usability and outstanding noise reduction.

"BDI's extensive knowledge of acoustics and aerodynamics, along with an extraordinary commitment during the design and construction phases, were critical factors in the overall success of the project."

AIRBUS GROUP
Martin Tzschichhold
Project Manager

www.bdi.aero

Blast Deflectors

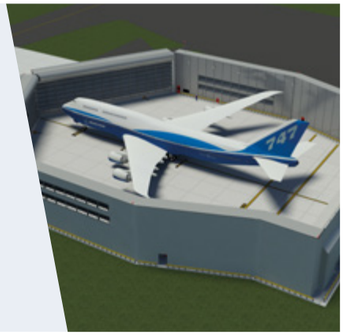
OUTSTANDING PERFORMANCE

BDI pioneered a cost-effective, technologically-advanced solution for ground run-up noise attenuation. We design and build GREs for any aircraft mix including commercial, general aviation and military.

Our excellent international reputation of performance is based on providing the highest quality products and services and includes technically-sound designs, timely deliveries, professional installation and outstanding customer service.

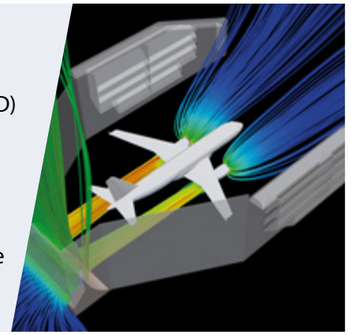
Utilizing the latest aerodynamic, acoustical and structural software packages, combined with scale modeling and field measurements, BDI ensures project requirements are met.

Planning & Design Specification Support



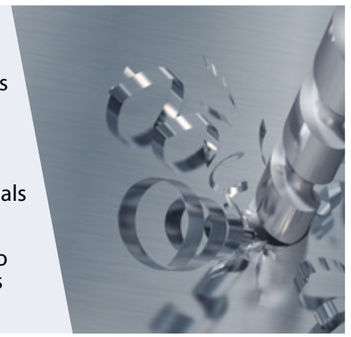
- Ground run-up noise assessments
- Photo-realistic renderings for communicating concepts to stakeholders
- Support for FAA Part 150 studies, airspace studies, obstacle free conflicts, aerodynamic usability, etc.

Engineering



- Continuous innovation using computational fluid dynamics (CFD) and finite element (FE)
- Computer aided design (CAD) and 3D structural models for BIM integration
- Local code compliance of concrete foundations, anchoring systems and structural design

Fabrication & Supply



- ISO 9001:2015 certification ensures that the highest quality standards are followed
- Global manufacturing capability offering the highest quality materials and production techniques
- Custom-manufactured solutions to meet unique project requirements

Delivery

- GRE material delivered to any location in the world via truck, rail, ship or air freight
- All material is professionally packed in easily-handled bundles
- Project management team oversees design, delivery and construction to meet schedules and deadlines

Installation

- BDI's staff of field technicians provide site assistance to ensure a smooth and efficient installation
- Our diverse capabilities enable BDI to offer turnkey installation service
- All BDI projects are backed by a performance guarantee and material warranty

Performance Verification

- Upon completion of an installation, BDI can assist with field validation of the GRE performance
- Field data of jet blast exhaust, air flow and acoustic performance are compiled into a report
- BDI's R&D department uses field data to develop new products and solutions

Support

- Spare parts and replacement components are stocked at various BDI facilities around the world
- Refurbishment program to evaluate and repair older facilities to extend service life
- Archives of documentation and details from more than 1,500 past projects available

www.bdi.aero

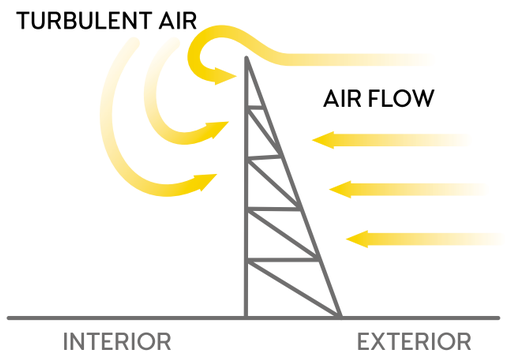
THE AERODYNAMIC CHALLENGES OF GROUND RUN-UPS

THE CHALLENGES

Running aircraft engines at high power settings while stationary can be challenging for various reasons:

- Aircraft engines require smooth and turbulence-free air
- Modern aircraft are more efficient and powerful, using larger turbofan engines with high bypass ratios and larger fan diameters closer to the ground than previous generation aircraft. This creates significant aerodynamic challenges
- Ground-running aircraft in a GRE is more complicated than open-field conditions. The fixed facility orientation, tall acoustic walls, and controlled airflow are configured to increase usability in a variety of wind conditions
- Engine proximity to the ground creates air vortices which can cause engine ingestion of various debris

A traditional acoustic barrier

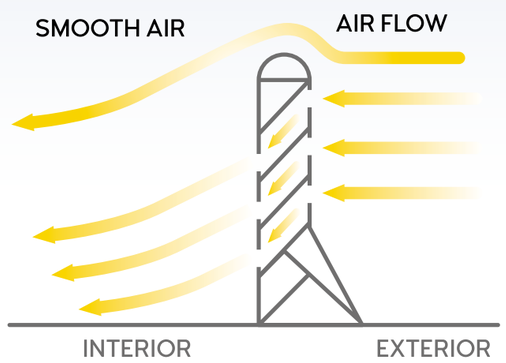


BDI'S SOLUTION

Through the use of scale model testing, computational fluid dynamics (CFD) and field evaluation of more than 30 completed facilities, our GREs have innovative aerodynamic features that maximize facility usability.

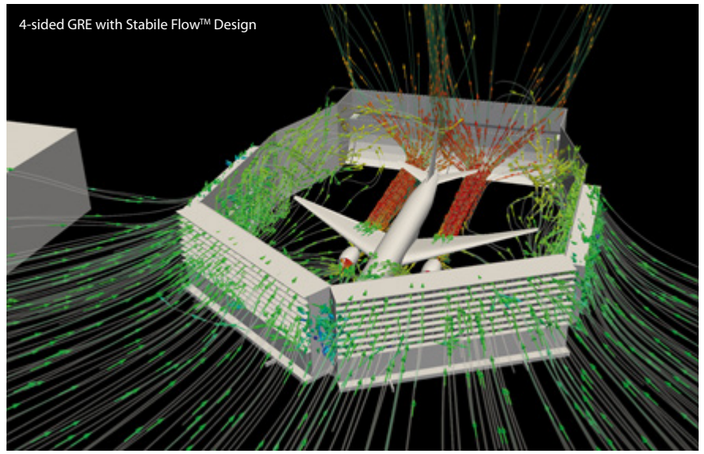
GRE aerodynamic design is a critical factor in usability. An aerodynamically efficient, curved jet blast deflector at the rear of the GRE redirects the jet blast vertically and maintains the jet efflux momentum to drive the flow inside the facility.

BDI's Stabile Flow™ Design



BDI's patented, vented rear wall, the Vertivent™, directs entrainment air to the discharge lip of the jet blast deflector. The Vertivent™ improves the jet blast discharge angle, reduces high intensity turbulence due to the jet blast discharge, and dramatically improves usability in tail wind conditions.

BDI GREs are designed to use the momentum of aircraft engines to smoothly drive air with minimal turbulence generation, not only through the jet engines but through the entirety of the facility.



Engine performance testing may also be improved through the use of a flow conditioner apparatus which conditions the air flow in front of an engine and eliminates all ground vortices.

The BDI 3-sided GRE design improves airflow into the facility and eliminates vortex formation, due to separation, at the front and top of the side walls.

Our 4-sided GRE design uses large, vented front gates with sufficient open area to supply the necessary air into the facility. The side walls of our GRE facilities use large, acoustically-treated vents to provide engine entrainment air and to improve usability in crosswind and tailwind conditions while mitigating any air recirculation.

NOISE ATTENUATING TECHNOLOGY

Engine run-ups typically occur at night, precisely when communities near airports are most sensitive to noise. BDI understands that the primary reason to build a GRE is the acoustic benefits such a facility brings to airports and communities.

BDI works with all stakeholders to develop a solution that, first and foremost, meets the project's acoustic requirements. We use the latest computer modeling programs for noise contouring.

Our team truly understands the complex issues, community concerns, and associated federal regulations involved in analyzing aircraft noise.


Norfolk, USA


Toronto, Canada


Subang, Malaysia

"Users of the Billy Bishop Toronto City Airport are able to successfully test aircraft inside the BDI GRE in almost all wind conditions ensuring excellent facility usability."

PORTS TORONTO
Bojan Drakul
Vice President- Infrastructure, Planning and Environment

Example of noise contour without GRE

Example of noise contour with GRE

50-60 dBA | 60-70 dBA | 70-80 dBA | 80-90 dBA | 90+ dBA


Finkenwerder, Germany

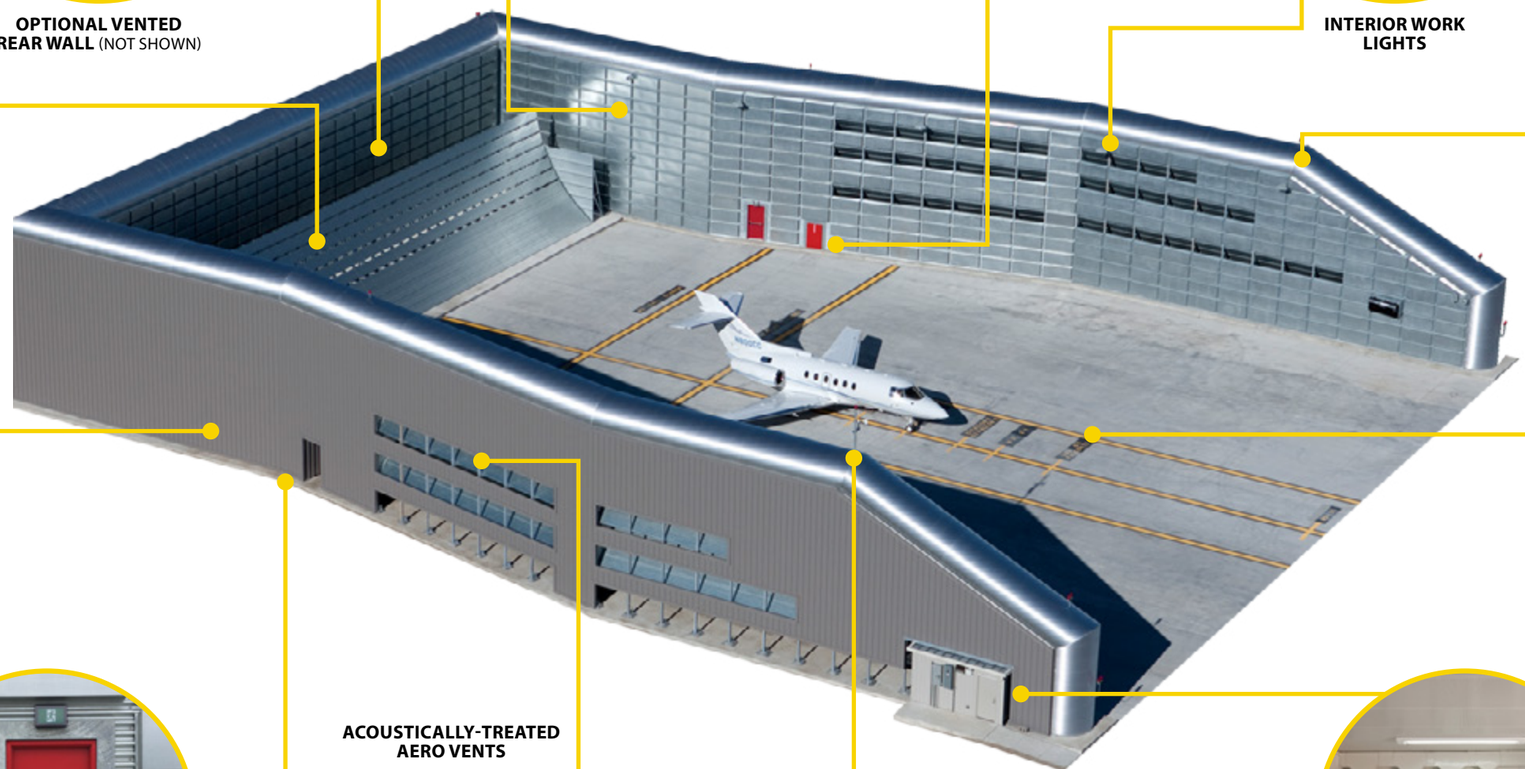
BDI's ground run-up enclosures incorporate the latest high-performance materials and designs in our patented Noise Blotter™ acoustic panel, which were designed specifically for control of the low frequency noise generally associated with aircraft engine run-ups. The use of hydrophobic and acoustically-transparent wrap materials ensures that the panels will provide a long, maintenance-free service life.

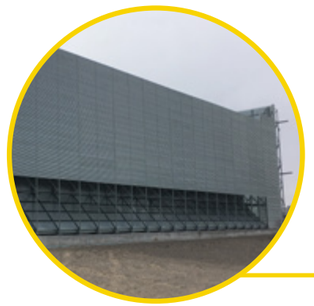
FEATURES

- Panels feature a high transmission loss (STC) of 36
- Effective absorption of low frequency noise
- Noise Reduction Coefficient (NRC) of 1.25
- Absorption coefficient of 1.0 at100Hz.

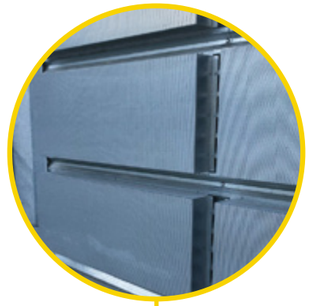
FEATURES OF A BDI 3-SIDED GRE

BDI's line of 3-sided GREs provides the optimal balance of acoustic performance, aerodynamic usability and budget considerations.





OPTIONAL VENTED REAR WALL (NOT SHOWN)



NOISE BLOTTER™ ACOUSTIC PANELS

SAFETY FEATURES

INTERIOR WORK LIGHTS

CURVED/SLOTTED JET BLAST DEFLECTOR

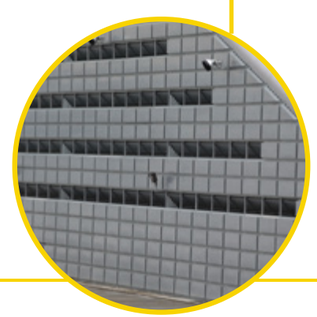
WIND CONDITION DISPLAY

OPTIONAL AESTHETIC CLADDING

INGRESS/EGRESS GUIDES

ACCESS DOORS

ACOUSTICALLY-TREATED AERO VENTS



WEATHER MONITORING STATION

OBSERVATION CABIN

BDI can design the ideal solution to accommodate any commercial or military aircraft.

Aerial Photo: Spirit of St. Louis, USA

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FEATURES OF A BDI 4-SIDED GRE

BDI's line of 4-sided GREs provides 360 degrees of acoustic protection, which is ideal for projects in highly congested areas or when stringent acoustic performance is required.

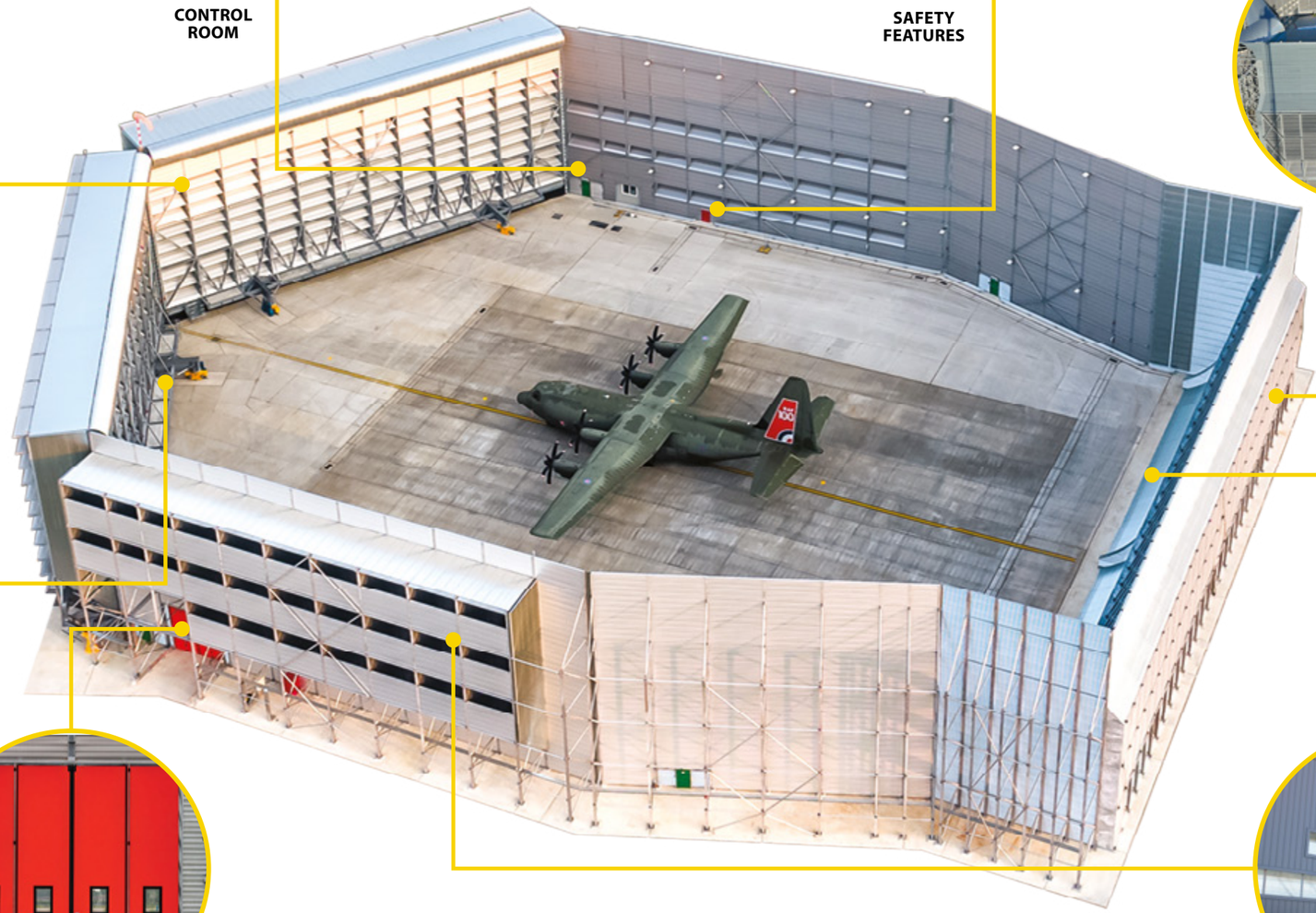
CONTROL ROOM

SAFETY FEATURES

The Stabile Flow™ design in combination with the patented Vertivent™ delivers smooth, turbulence-free air that results in a facility with very high aerodynamic usability.

VENTED REAR WALL

ACOUSTICALLY TREATED FRONT GATES



MOTORIZED GATES

EMERGENCY VEHICLE ACCESS

CURVED JET BLAST DEFLECTOR

OPTIONAL AESTHETIC CLADDING (NOT SHOWN)

Aerial Photo: Marshall of Cambridge, UK

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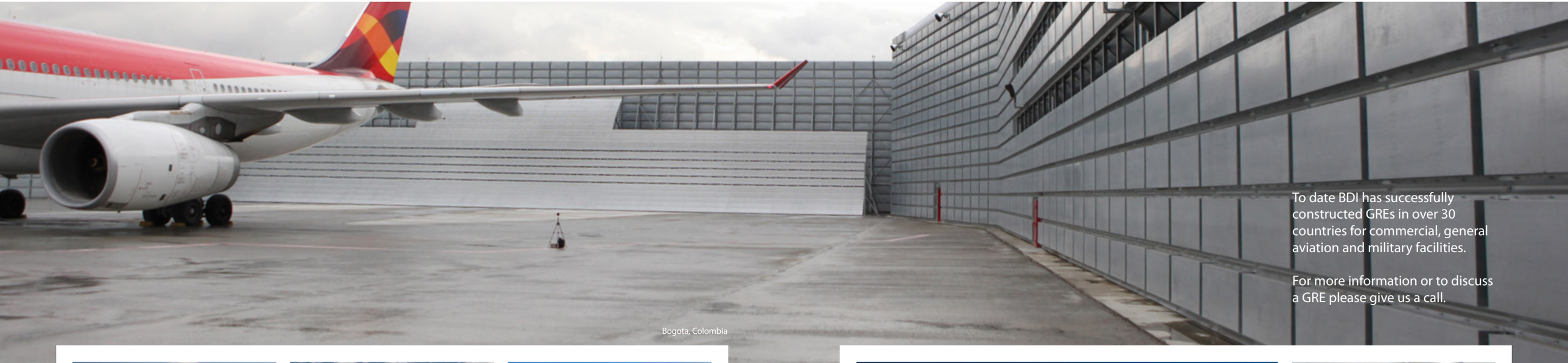
BDI'S GLOBAL PRESENCE



Bogota, Colombia

To date BDI has successfully constructed GREs in over 30 countries for commercial, general aviation and military facilities.

For more information or to discuss a GRE please give us a call.

São Paulo, Brazil

Bangkok, Thailand

Melbourne (Florida), USA

Kuala Lumpur, Malaysia

St. Louis, USA

Bangkok, Thailand

Finkenwerder, Germany

With over six decades of experience to benefit your project

Contact us today!

AMERICAS
us.sales@bdi.aero

EUROPE, MIDDLE EAST & AFRICA
emea.sales@bdi.aero

ASIA-PACIFIC
ap.sales@bdi.aero

JET BLAST DEFLECTORS

GROUND RUN-UP ENCLOSURES

VISUAL SCREENS

ACOUSTIC BARRIERS

BDI
Blast Deflectors

Blast Deflectors, Inc.
Head office: Reno, NV (USA)
+1 775.856.1928

www.bdi.aero