



Ground Run-Up Enclosures





Creating a Quieter and Safer World

BDI is a pioneer in aviation noise control.

■ Founded by Stanley Lynn in 1957 in San Francisco, Blast Deflectors, Inc. is a world leader in jet blast deflectors and acoustic enclosures for aircraft run-ups. Our innovative solutions are the result of more than half century of research, development and extensive project experience.

■ BDI offers ground run-up enclosures and jet blast deflectors for all applications and all aircraft types. Our highly trained team of engineers and technicians works with aircraft manufacturers, civil aviation authorities and airport

consultants to analyze the impacts of jet blast and run-up noise. Our experience of more than 50 years in this field allows us to plan, design and implement the most cost-effective and practical solutions.

■ Our projects worldwide are coordinated from our headquarters in Reno, Nevada (USA). BDI's commitment to customer service and continuous improvement is evidenced by our ISO 9001-2008 certification. BDI's project experience and focus on quality will benefit your project.



A Run-Up Noise Solution



BDI's Stabile Flow™ GRE is a 3-sided enclosure designed to reduce the acoustic impact of engine run-ups on communities around airports while allowing for full power engine testing in a wide variety of wind conditions.

■ Aircraft engine run-ups typically create a greater noise nuisance than takeoffs, and are often scheduled at night. This can result in noise complaints from the community and creates a serious public relations challenge for airport officials. BDI's Christopher Lynn and Mark Boe pioneered a cost effective, technologically advanced solution for ground run-up noise attenuation.

■ BDI's philosophy is based on balancing project requirements with practical solutions. We offer turnkey design-build ground run-up enclosure (GRE) facilities that use patented components, proven designs and a spotless track record of successful installations.

■ BDI can design and build ground run-up enclosures for any aircraft mix including commercial, general aviation and military.

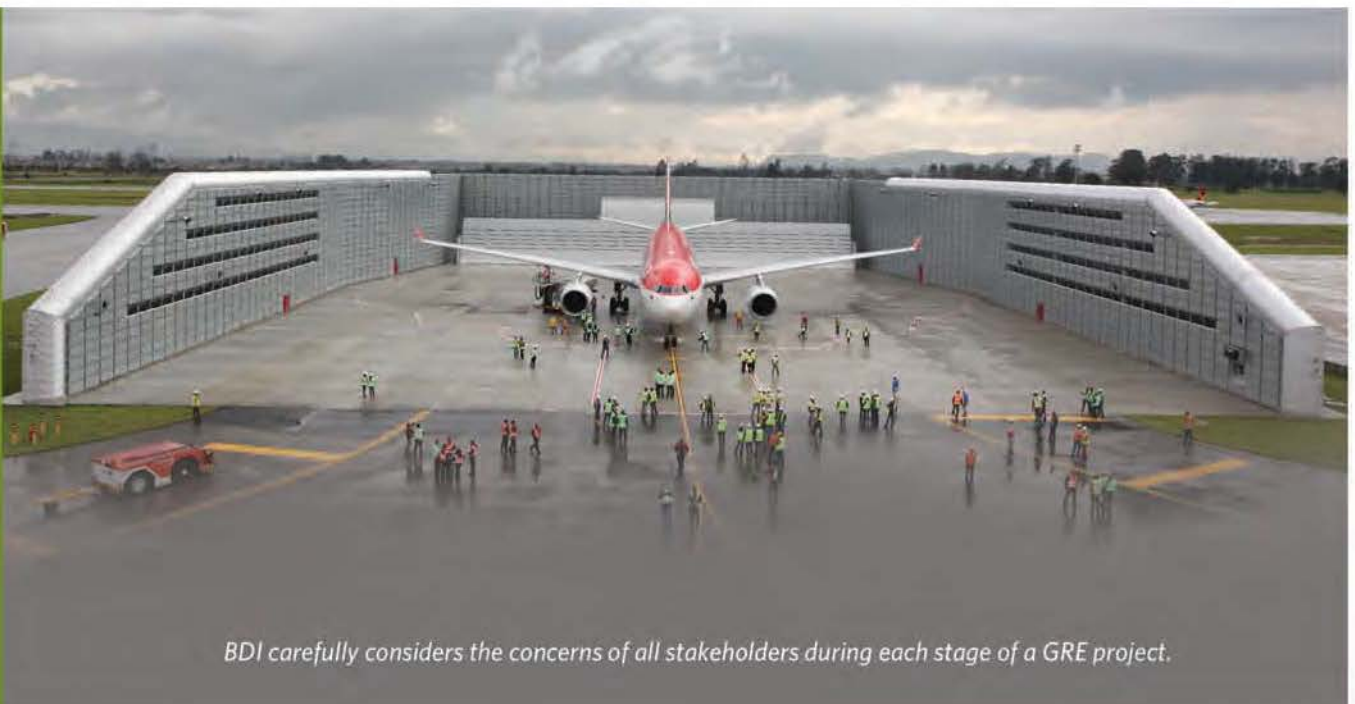
■ For a complimentary analysis of how BDI technology can mitigate a specific ground run-up noise problem, please

contact us. BDI's philosophy is based on providing our customers with the highest quality products and services that match our international reputation of performance and value, earned over the last 55 years. This reputation includes technically sound designs, timely deliveries, professional installation and outstanding post-project customer service.

■ The combination of the aerodynamically advanced Stabile Flow™ design with the effectiveness of Noise Blotter™ acoustic panels provides a stable, effective GRE with very high usability and outstanding noise reduction.

■ BDI utilizes the latest aerodynamic, acoustical and structural software packages combined with scale modeling and numerous field measurements to ensure project requirements are met.

■ Let us assist with your project by providing a complimentary analysis demonstrating how BDI technology can mitigate a specific ground run-up noise challenge.



BDI carefully considers the concerns of all stakeholders during each stage of a GRE project.

Aerodynamically Stable

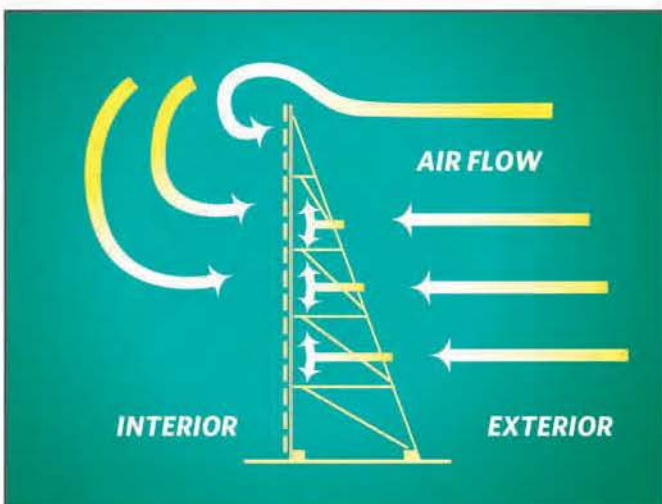
The key to a successful GRE project.



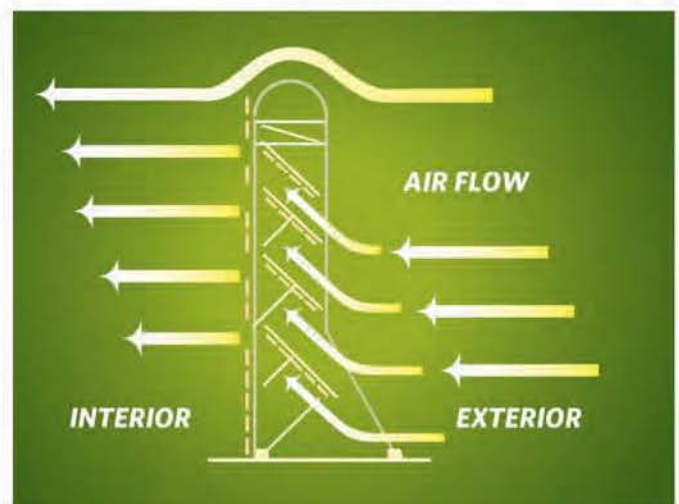
Aircraft engines require smooth, turbulence-free air to run effectively at high power settings while stationary. This is normally not a challenge when running in open-field conditions oriented into the wind. When the aircraft orientation is fixed and tall acoustic walls are placed around the aircraft, air flow can become a challenge for full power ground run-ups.

Historically, GRE designs placed square walls around the aircraft with little regard for aerodynamic performance. This resulted in a GRE usable only in extremely limited wind

conditions due to unsatisfactory airflow conditions at the engine inlet, which can lead to dangerous stalls and surges. Recognizing these issues, BDI began an extensive design program using scale and computer modeling to develop a new approach in GRE technology. The resulting Stable Flow™ design has been demonstrated to drastically improve GRE usability in adverse wind conditions. By reducing vortex formation at the walls, pressure buildup at the rear of the aircraft and inlet pressure drops, the Stable Flow™ system assures appropriate flow conditions are maintained at the engine inlet and that exhaust recirculation is minimized.



Traditional Acoustic Wall



BDI's Patented Stable Flow™ Design



Roll Top
Rounded top edge eliminates turbulence in cross wind conditions.

Independent Curved/Slotted JBD
Protects acoustically treated rear wall and directs exhaust out of the GRE to avoid exhaust gas recirculation.

Acoustically Treated Vented Side Walls
Provides adequate turbulence-free air during side wind conditions.

Sloped Entry
Improves air flow during quartering head wind conditions.





GRE Features & Options

Each BDI facility is customized using a variety of standard options to meet the project requirements.

Obstruction Lights



Limit Lines



Safety Features



Interior Work Lights



Noise Blotter™ Acoustic Panels



Curved/Slotted Jet Blast Deflector



Exterior Cladding



Signage



Wind Condition Display



Ingress/Egress Guides



Aircraft Stop Positions



Access Doors



Acoustically Treated Aero Vents



Instrumentation



Observation Cabin



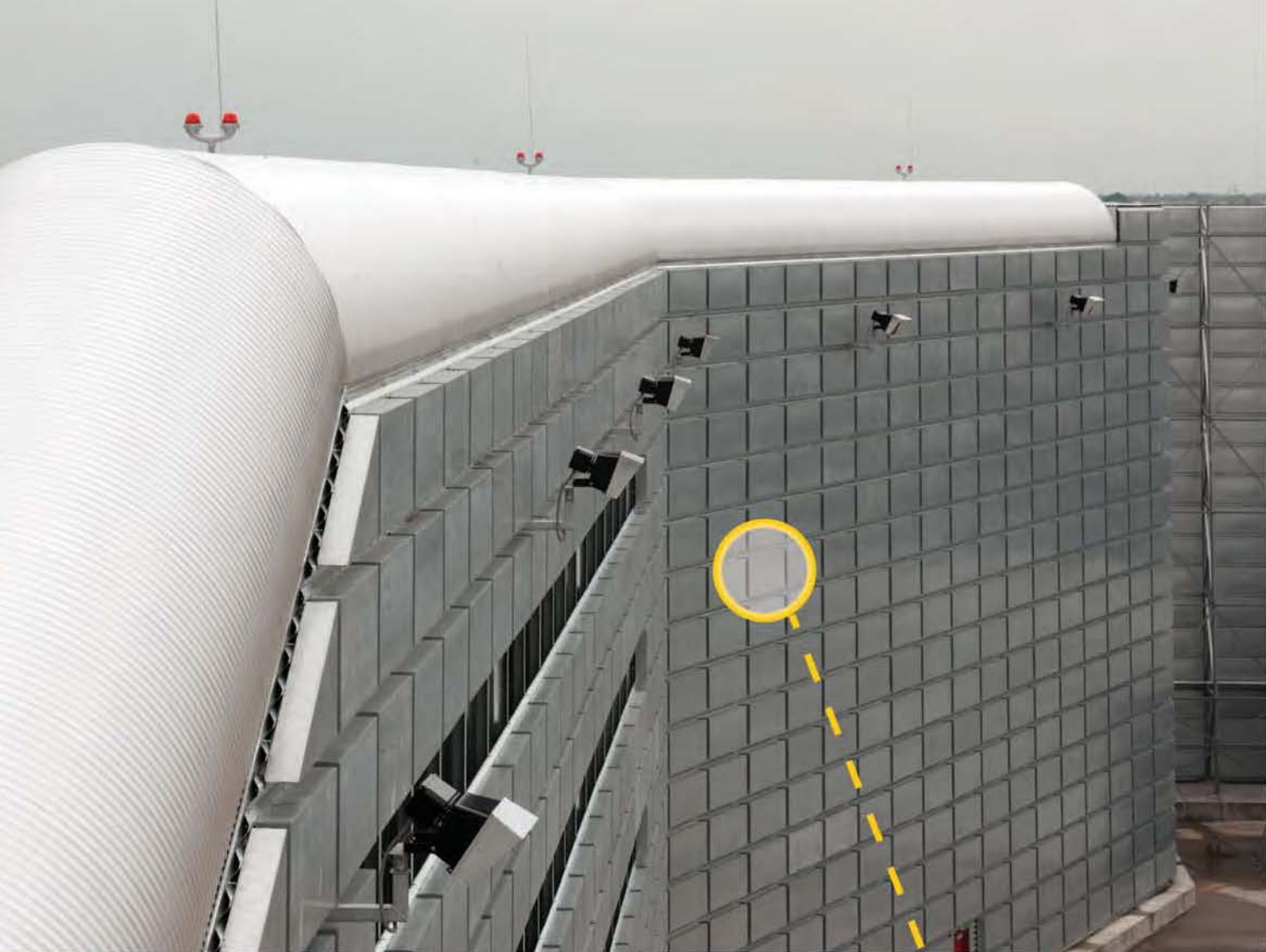
Outstanding Acoustic Performance

The core requirement for a GRE.

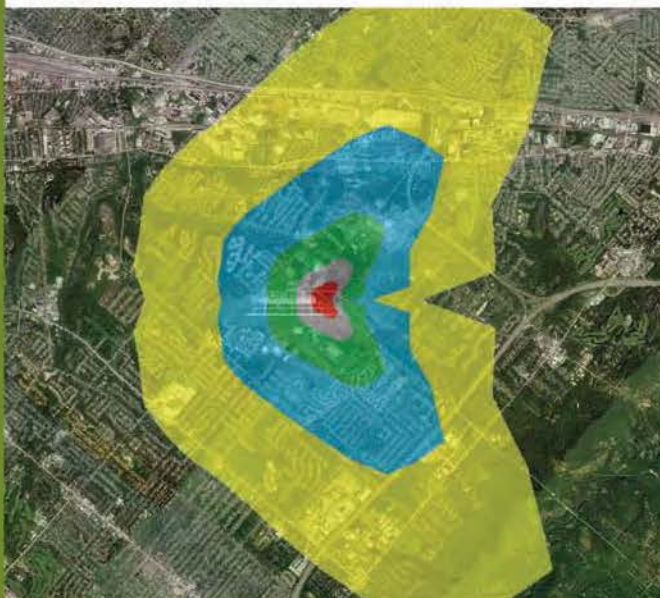
Engine run-ups typically occur at night, precisely when communities near airports are most sensitive to noise. For this reason, BDI's patented Noise Blotter™ acoustic panels were designed specifically for control of the low frequency noise generally associated with aircraft ground run-ups. They feature a high transmission loss (STC) of 36 and effective absorption of low frequency noise. These panels have a demonstrated noise reduction coefficient (NRC) of 1.25 and maintain an absorption coefficient of 1.0 at 100Hz. The use of non-hydroscopic materials and acoustically transparent wrap materials ensure a long and maintenance-free life.



Illuminated signs and logos can be installed on the exterior of the facility. This feature provides a unique branding and messaging opportunity.



A BDI GRE is equipped with thousands of laboratory-tested Noise Blotter™ acoustic panels. The acoustic performance, which is measured in terms of insertion loss, is determined by the height of the facility and the type of aircraft and the power setting used during engine run-ups. A typical BDI facility has a near field insertion loss of 15 dBA, but can be customized to meet a variety of acoustic performance requirements.



Example of noise contour without GRE

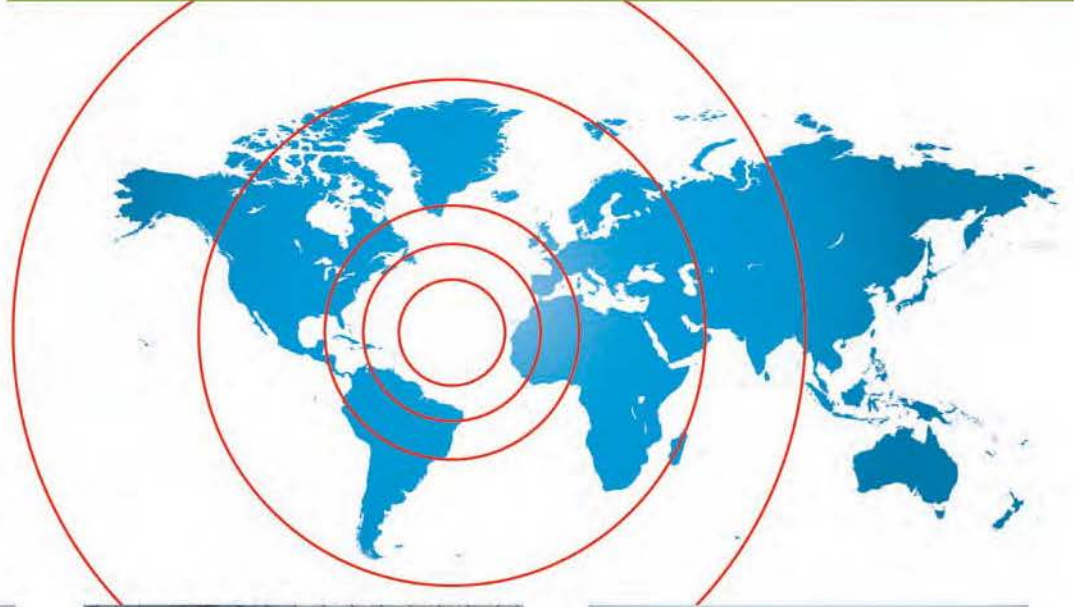


Example of noise contour with GRE



Recognized World Leader

BDI has extensive project experience with proven GRE designs.



Detroit (USA)
Project Highlight: Anti-radar cladding on exterior.



Vancouver (Canada)
Project Highlight: LED signage on cladding.



Winnipeg/GE (Canada)
Project Highlight: Engine ice test facility with Augmentor & exhaust stack.



Zurich (Switzerland)
Project Highlight: Viewing windows incorporated into side walls.



St. Louis (USA)
Project Highlight: Exclusively for general aviation use.



Bangkok (Thailand)
Project Highlight: Accommodates A380 and MD-11.



Bogotá (Colombia)
Project Highlight: First GRE in South America.



Memphis/FedEx (USA)
Project Highlight: Accommodates all commercial aircraft.



Sofia (Bulgaria)
Project Highlight: First modern GRE in Eastern Europe.



Memphis/US Air Force (USA)
Project Highlight: Designed for the C-5A, a very large aircraft.



Dubai (United Arab Emirates)
Project Highlight: First GRE built in the Middle East.



Norfolk (USA)
Project Highlight: Designed primarily for regional jets.



Kuala Lumpur (Malaysia)
Project Highlight: Facility was widened to accommodate A380.



Albany (USA)
Project Highlight: Small GRE for turboprop aircraft.



Pontiac (USA)
Project Highlight: First general aviation GRE facility in the USA.



Tampa (USA)
Project Highlight: Rated for hurricane wind velocities.



Milwaukee (USA)
Project Highlight: Facility was installed directly on existing aircraft pavement.



Oakland (USA)
Project Highlight: Aircraft up to B747 can perform run-ups in GRE.



Portland (USA)
Project Highlight: Used in two opposite prevailing wind directions.



Indianapolis (USA)
Project Highlight: Accommodates high tail engines.



Portsmouth (USA)
Project Highlight: Last non-vented GRE built by BDI.



Chicago O'Hare (USA)
Project Highlight: First installation of BDI's Stable Flow™ system.



St. Augustine/Grumman (USA)
Project Highlight: Designed for both afterburner and non-AB Military Aircraft.



Everett/TRAMCO (USA)
Project Highlight: "L" shaped facility.

BDI uses the latest technology to design GRE facilities with outstanding aerodynamic performance, excellent aesthetics and impressive acoustic benefits.

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