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May 24, 2016

Building Department - Toronto & East York District
Peter Raynes, Planning Consultant (Acting)
Toronto City Hall
100 Queen Street West
Toronto, Ontario
M5H 2N2

Attention: Peter Raynes, Planning Consultant (Acting)

Package Delivered to City Hall
Hard Copies and DVD Copy

RE: Billy Bishop Toronto City Airport Ground Run-Up Enclosure

Dear Mr. Peter Raynes:

In response to a letter from Mr. John Livey - Deputy City Manager, Cluster B, to Mr. Geoffrey Wilson – President and CEO of PortsToronto dated March 10, 2016, the enclosed package is being submitted to the City of Toronto for the development review and approvals process for the planned Ground Run-Up Enclosure (GRE) at Billy Bishop Toronto City Airport (BBTCA).

PortsToronto and its GRE design-build contractor, Blast Deflector's Inc. (BDI) have met with the City of Toronto staff, and have been in contact to ensure the City of Toronto receives a complete package with all the required materials for staff to undertake the development review and approvals process. We have provided 10 copies of this package and 1 digital copy which include a cover letter and the following submission requirements:

- Site plan for the planned GRE (Appendix A);
- GRE Concept Drawing (Appendix B);
- A letter of structure certification by a qualified professional (Appendix C);
- Ground-level renderings of the GRE facility from six vantage points within the surrounding community which have been confirmed with City staff (Appendix D);
- An operations brief on the Aircraft Maintenance Run Procedures (Appendix E);
- A noise abatement brief which identifies typical noise contours for pre and post GRE construction scenarios, including noise reduction specifications (Appendix F);
- Combined Ground Run-Up Enclosure Usage Data (Appendix G); and
- Final Stage 2 Archaeological Assessment Report, including submission to the Ministry of Tourism, Culture and Sport (Appendix H).

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In conjunction with City of Toronto divisional review, we would like to provide some background, rationale and technical details that will assist in the approvals process.

Background

PortsToronto has been planning for a rehabilitation of the airfield at BBTCA, which was contained in the 2012 Airport Master Plan. The Airfield Rehabilitation Program is a significant three-year construction project that will impact the majority of Airfield surfaces at the airport. The program is necessary to replace the existing aging civil and electrical infrastructure (pavements and lighting) for the airport's runways, taxiways and apron. The project scope also includes construction of a ground run-up enclosure (GRE) facility which contributes to reduction in noise during aircraft engine ground maintenance run-ups. A site plan for the planned GRE is included in Appendix A.

Rationale

The purpose of a ground run-up enclosure is to reduce noise from engine run-ups on surrounding communities. The aerodynamic and acoustic design features of the enclosure dampen noise by absorbing and in turn, significantly reducing sound levels in adjacent residential areas.

Aircraft engines are complex mechanical systems that require regular maintenance to meet the rigours of operational service. To maintain a high level of safety, Transport Canada defines stringent maintenance standards and requires operators to test engines and their components before the aircraft is put back into service. These tests are referred to as maintenance run-ups. The duration and engine power setting during a run-up are dependent on the systems being checked. Maintenance staff will attempt to minimize the duration of the run-up as conducting a run-up translates to fuel burn and wear on engine components. However, despite efforts to mitigate noise exposure from maintenance run-ups to the community, noise from these operations are currently audible in the community given the close proximity of residential developments to the airport and the complex sound characteristics from the noise source.

As a good community neighbour, PortsToronto has continuously been working to minimize operational impacts of the airport. As such, the planned GRE will minimize noise impacts for the people who live, work and play on Toronto's waterfront. The construction of a ground run-up enclosure to dampen aircraft engine run-up noise is part of PortsToronto's key infrastructure and capital improvements at BBTCA.

Technical Details

A GRE is a three-sided, open top facility, able to accommodate an aircraft while maintenance mechanics conduct high power engine run-up inspections. Acoustically and aerodynamically designed, a GRE can dramatically dampen the acoustic impact from engine run-ups.

As illustrated in Appendix A, the facility is proposed to be constructed on the southwest side of the airfield (south of Runway 06-24), in the vicinity of where current engine run-ups are being performed. The airport handles on average one (1) engine run-up test daily. With the construction of the new GRE facility, the majority of these run-ups will now be able to be undertaken inside the GRE facility.

The three sides of the GRE facility consist of a 14 m high north wall, an 11 m high south wall and an east wall which transitions from 14 m to 11 m. The steel framed structure is fully lined with acoustic panels

designed specifically for the purpose of absorbing engine noise and reducing impacts on the surrounding community. While the intent is to undertake all engine run-up tests inside the GRE facility, certain wind conditions will not allow its use due to the possibility of aircraft engine damage. The facility is, however, designed and oriented in such a way to maximize its usability. In circumstances when the facility cannot be used, the engine run-ups will occur at the same location outside the facility as they do today. By comparison, in Appendix G, a summary of GRE usage of more than 15,000 run-ups aggregated from three different airport GRE facilities shows that the Q400 turboprop aircraft has a very high GRE usability, at 85%.

PortsToronto is committed to designing and constructing a new GRE facility at BBTCA that will contribute towards noise reductions from the airport operations. This is only the second such facility to be constructed at a Canadian airport (the other facility is located at Vancouver International Airport and has received very positive feedback from the airport community).

PortsToronto has engaged BDI, the same GRE facility design-builder that constructed the Vancouver facility, to design and construct the facility at BBTCA. BDI is one of a limited number of suppliers that specializes in such facilities, and has built over 30 GRE's worldwide.

The design and construction of the facility will be a part of the overall Airfield Rehabilitation Program for which the construction contract has been awarded to the local general contractor, Pave-Al Ltd. PortsToronto has also engaged WSP Canada Inc., one of the leading Canadian and global aviation consulting firms to provide technical oversight and inspection services for the overall project.

Archaeological Assessment

A Stage 2 archaeological assessment with the Archaeologists from AECOM and the Field Liaison Representatives from Mississaugas of the New Credit First Nation community was conducted on April 21, 2016. Work included a two-hour field investigation, after which the Archaeologists confirmed that no artifacts and no signs of artifacts were located in the footprint of the GRE based on the survey regime.

AECOM, the consulting team undertaking the archaeological assessment, completed the Stage 2 report and submitted the report on May 18, 2016 to the provincial Ministry of Tourism, Culture and Sport. PortsToronto has requested an expedited review by the Ministry of Tourism, Culture and Sport, which based on their service standard, will be completed within 20 business days. A copy of the submission, including AECOM's final report is attached in Appendix H.

Consultation and Engagement

In addition to consultation and engagement with the City of Toronto staff and councillors, PortsToronto is consulting with airport stakeholders, and members of the community through meetings with the Community Liaison Committee on February 24, 2016 and the upcoming meeting on June 1, 2016, as well as Doors Open, coming up on May 28, 2016.

We understand the City of Toronto is to host a public consultation meeting with participation from PortsToronto and their consulting teams, which shall include an opportunity for interested parties to participate in a site tour in the general vicinity of the GRE site.

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We also understand this process will conclude with the execution of a binding Memorandum of Understanding between the City of Toronto and PortsToronto which will commit PortsToronto to construction of the GRE in general accordance with final approved plans, drawings and related technical materials and the approval, as well as the terms of the Tripartite Agreement.

Subject to the timely completion of the City of Toronto's development review and approvals process, PortsToronto and its contractor team are planning for the GRE to be operational in March 2017.

If City of Toronto staff have any questions or concerns, please do not hesitate to contact Angela Homewood, Project Manager with PortsToronto at AHomewood@PortsToronto.com or by telephone at (416) 863-2046.

Sincerely,

Toronto Port Authority

per:

K.A Lundy, P.Eng
Vice President Infrastructure, Planning and Environment

cc. Gene Cabral, Executive Vice President, PortsToronto
David Stonehouse, Director, Waterfront Secretariat, City of Toronto
Lynda MacDonald, Manager, Community Planning, City of Toronto
Susan McAlpine, Senior Planner, Community Planning, City of Toronto
Angela Homewood, Project Manager, PortsToronto

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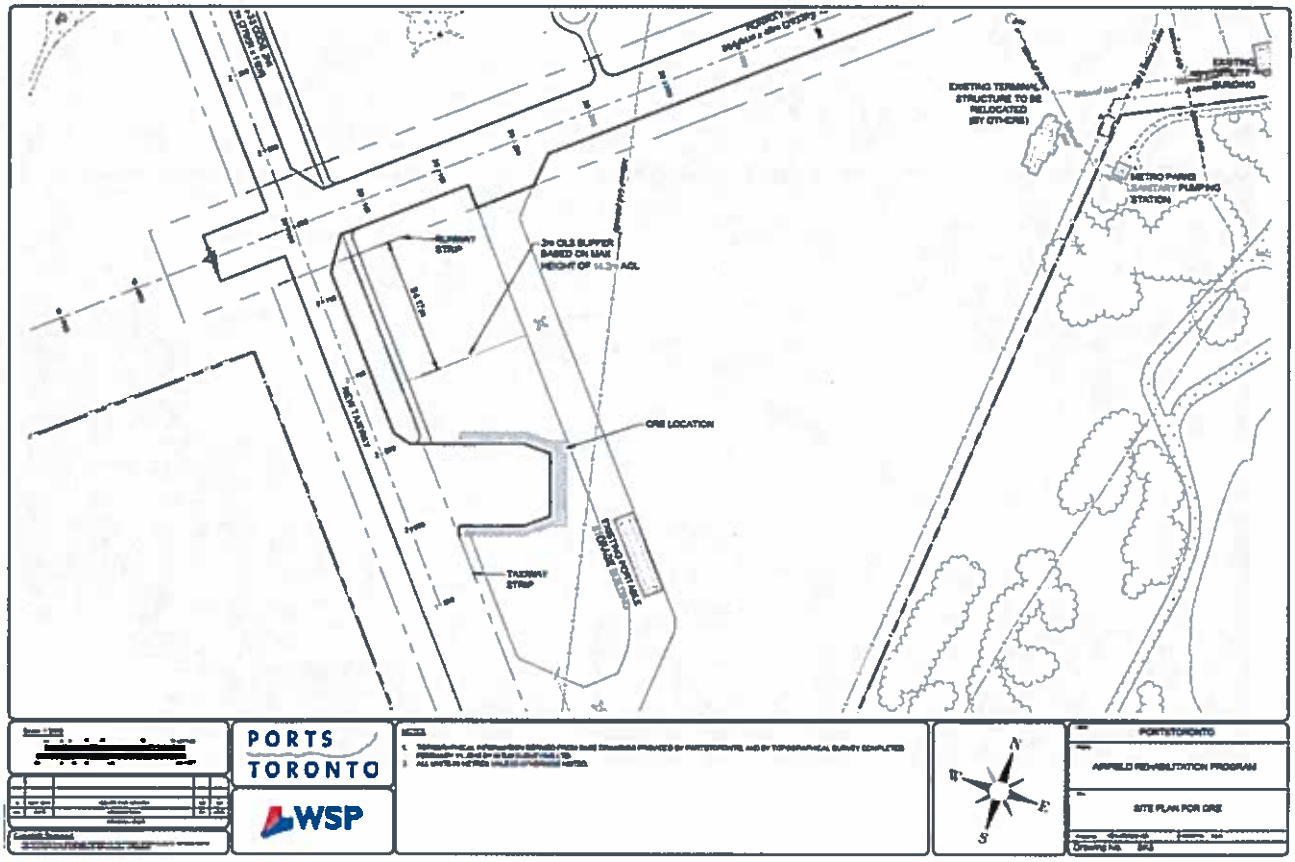
Appendix A: Site Plan for Ground Run-Up Enclosure



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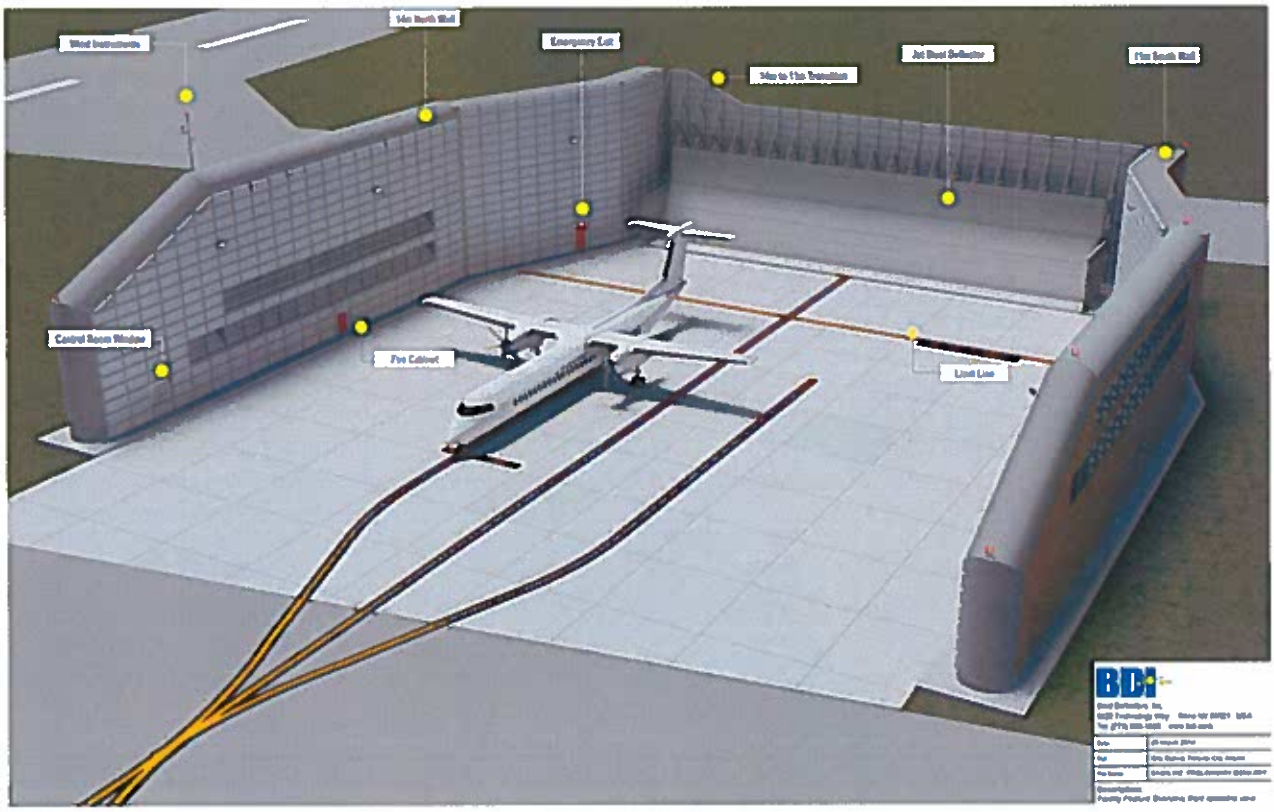
Appendix B: GRE Concept Drawing



Appendix C: Letter of Structural Certification

Hanuschak Consultants Incorporated

Consulting Structural Engineers

May 16, 2016

Toronto Building - Toronto and East York District
Toronto City Hall
100 Queen Street West
Toronto ON M5H 2N2

RE: Billy Bishop Toronto City Airport Ground Run-up Enclosure

To whom it may concern:

It has come to my attention that the City of Toronto has requested clarification regarding the codes and standards used in the design of the proposed ground run-up enclosure (GRE) at the Billy Bishop Toronto City Airport. Hanuschak Consultants Inc. will be contracted by the designer/supplier of this facility, Blast Deflectors, Inc. (BDI), upon their award of contract to perform compliance/peer review of the GRE design.

BDI has indicated that the detailed design documents for this facility have not been started since a contract is yet not in place with the general contractor. However, please consider this letter as confirmation that Hanuschak Consultants Inc. will work closely with BDI in a code compliance/peer review and local certification capacity to ensure that all applicable national, provincial, and city building codes will be properly followed. Upon completion of the design and review process, a follow up letter will be issued confirming the results of my peer review.

If you have any questions or concerns, please do not hesitate to let us know.

Yours very truly,
HANUSCHAK CONSULTANTS INC.

Wm. Hanuschak, P. Eng., FCSCE
Principal
whanuschak@hanuschak.com

LICENSED PROFESSIONAL ENGINEER
W. HANUSCHAK
100175350
May 16/16
PROVINCE OF ONTARIO

CC: Ross Titlow - Blast Deflectors, Inc. rtitlow@bdi.aero

WH/ph

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Appendix D: Ground Level Renderings (Attached)

Appendix E: Operations Brief on the Aircraft Maintenance Run Procedures (Attached)

The amended final version of the Aircraft Maintenance Run Procedures which now include the GRE, is attached to this appendix. For reference, the "draft" watermark on the attached document has been placed as the procedures would only come into effect once the GRE facility is built and operational, which is planned for March 2017.

As well, in the design-build GRE contract with Blast Deflectors Inc., PortsToronto has identified the following testing and reporting requirements:

A. Performance and Proof Tests: following completion of the facility, acoustical performance and proof testing shall be completed and certified by a licensed engineer. The tests shall demonstrate compliance with the specified acoustic performance. Proof tests witnessed by PortsToronto, shall be conducted for all structural components subjected to direct jet blast.

B. Test Report: a complete bound report, covering all required testing and demonstrating compliance with testing as required in Section 3.8.

PortsToronto understands the City of Toronto's interest in the testing reports, and will share these reports with the City of Toronto.

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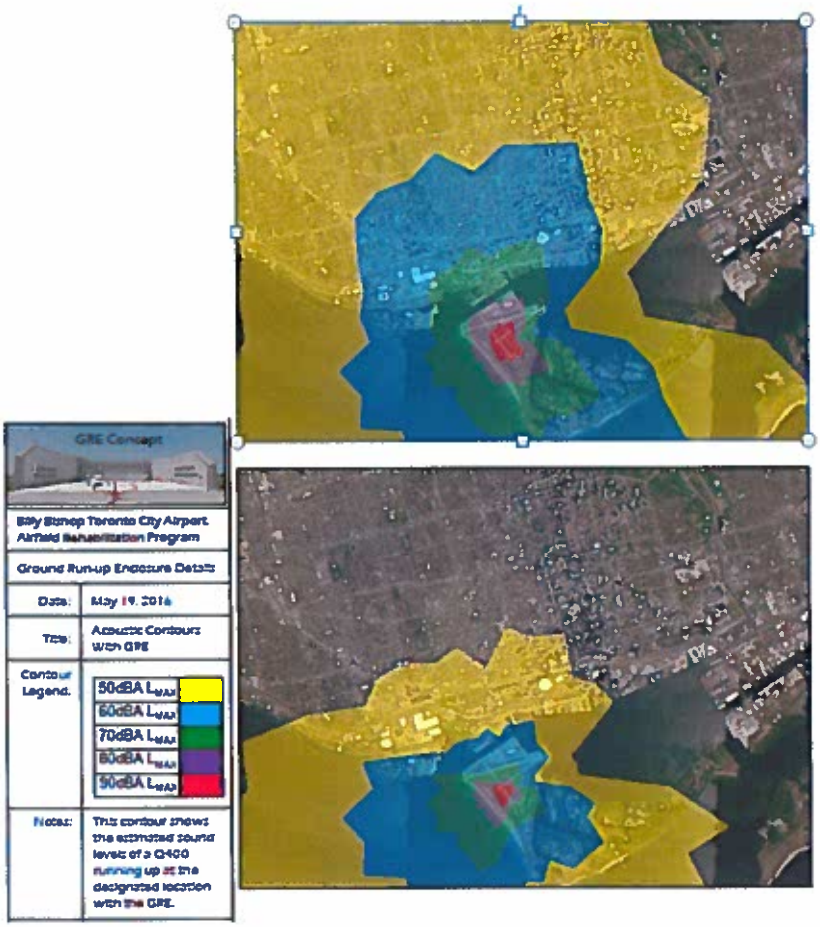
Appendix F: Noise Abatement Brief

Acoustic Contour Explanation

BDI has produced contours showing the predicted noise levels at 50, 60, 70, 80, and 90 dBA L_{MAX}, with and without the GRE, for the Q400 aircraft. The primary design feature of the BDI GRE which maximizes the noise reduction is the performance of the patented Noise Blotter™ panels. They were designed specifically for GRE applications with the highest low frequency absorption in the industry. BDI has extensive experience with the types of aircraft used at BBTCA.



- The top contour shows the predicted L_{MAX} dBA levels from a Q400 running up at the designated run-up position without a GRE.
- The bottom contour shows the predicted L_{MAX} dBA levels from a Q400 running up at the designated run-up position inside a GRE.
- Each color represents a different dBA level, ranging from 50dBA up to 90dBA.
- The purpose of these contours is to provide an approximate indication of how the community surrounding BBTCA may benefit from the GRE.

Acoustics

The GRE walls act as acoustic barriers that reduce the levels of engine noise transmitted to the community. The highly absorptive panels absorb incident sound without reflecting it back toward the opposite side. There is no magnification/amplification of noise created by the walls of the GRE.

Noise reduction is achieved by lining the wall interiors with highly absorptive acoustic panels. The panels are perforated steel cages with thousands of small holes that allow sound to be absorbed by the highly absorptive acoustic fill material inside the panels. Panels are effective in reducing a wide range of frequencies, including the lower range. A verification program is proposed to demonstrate sound level reductions measured in both the dBA and dBC weighting systems.

Aerodynamics

The optimal GRE orientation results in the prevailing winds blowing into the front (open side) of the facility. Aerodynamic features such as acoustically treated vents, rounded edges and a highly efficient curved jet blast deflector allow the facility to be utilized in a wide range of wind conditions. While the proposed facility will be usable in the majority of the winds seen at the Billy Bishop Airport, there may be occasions that the winds are not compatible with the facility orientation. Under these infrequent conditions, engine run-ups will be performed in the open area in front of the GRE. This open area is where engine run-ups have been performed at the airport for over 10 years.

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Appendix G: Combined GRE Usage Data

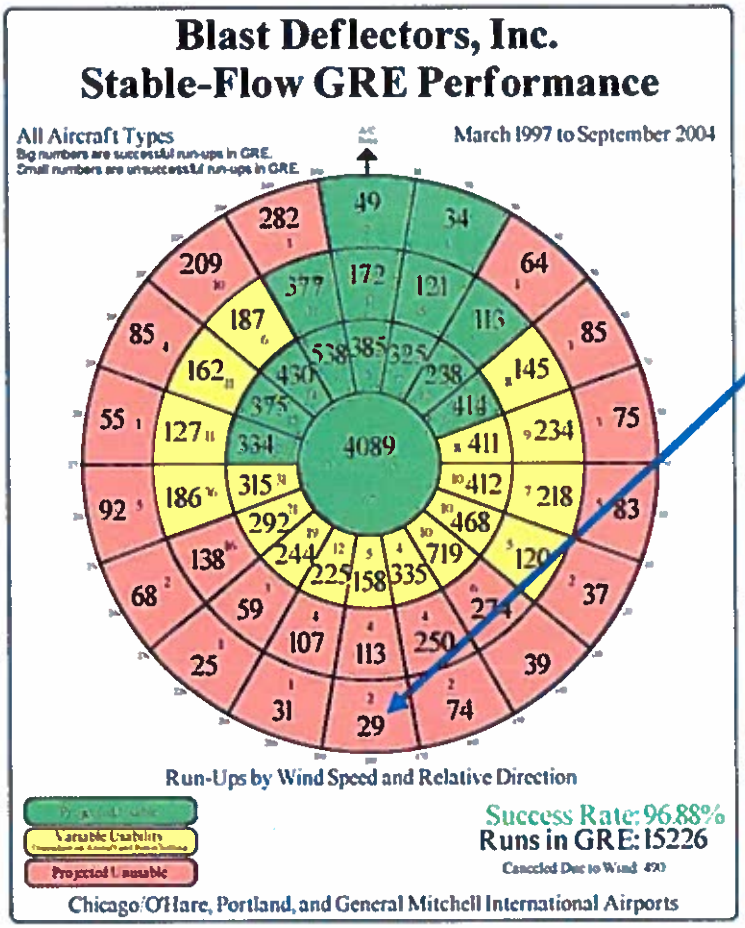
Stable-Flow GRE Performance Chart Explanation

In order to demonstrate the effectiveness of BDI's aerodynamic design, a monitoring program was established at the Chicago O'Hare, Portland and Milwaukee GREs which logs all run-ups successfully completed in the GRE as well as unsuccessful run-ups and run-ups conducted outside the GRE due to wind conditions. To date BDI has logged over 15,000 run-ups.

The runs are logged by aircraft type and time, with wind data from the GRE wind data system used to determine the wind speed and direction at the time of each run-up. The run ups are plotted on a wind rose which shows both the number of successful and unsuccessful run ups in relationship to wind conditions.

The large number of run ups for a variety of aircraft types gives BDI a reliable database, which allows them to accurately predict the performance of individual aircraft types in each wind condition.

All aerodynamic predictions are based upon the actual performance of previous facilities, which BDI has used to establish usable wind speeds and directions by aircraft type. This is predicated on over 15,000 total logged run-ups.



- The large numbers are successful run-ups in the GRE
- The small numbers are unsuccessful run-ups or run-ups that occurred outside the GRE
- Example:
  In a direct tail wind of greater than 15kts, 29 run-ups were successful and 2 were not. In this wind condition, BDI projected that the GRE was likely unusable, but in reality it was usable more than 93% of the time in this condition (based on the logged runs).

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Appendix H: Final Archaeological Assessment Report, Including submission to the Ministry of Tourism, Culture and Sport

(Attached)