ACRP Problem Statement No. 13-09-05 **Recommended Allocation: --**

Choosing Building Materials to Maximize Return on Investment and Minimize Operations and Maintenance

ACRP Staff Comments: The proposed research seems geared more for design firms than airport operators, but it could be useful. Funding could be reduced to between $350,000 and $400,000.

TRB Aviation Group Committees Comments: AIRPORT TERMINALS AND GROUND ACCESS: The committee does not support this proposal; much of the information has already been generated and is being generated as airports design and construct LEED certified facilities and also pay closer attention to life cycle costs. Moreover, this is an architectural issue not a transport one and is in no way unique to airports. Other major high traffic public buildings face the same challenge. Often the issue is not understanding the value but rather being willing to make the upfront investment. This research would not materially contribute to improving aviation industry practices.
AIRCRAFT/AIRPORT COMPATIBILITY: An ambitious topic that could also lend itself to determining ROI of LEED-recommended products. The study team and advisory panel should be careful not to bias the study in favor of certain products.

Review Panel: <u>Not recommended</u> — Isn't this research done by manufacturers? It will be difficult to refrain from endorsing products.

AOC Disposition: No funds allocated. No discussion.

ACRP *Problem Number:* **13-09-05**

I. PROBLEM TITLE

Choosing Building Materials to Maximize Return on Investment and Minimize Operations and Maintenance

II. RESEARCH PROBLEM STATEMENT

Each day, millions of passengers pass through airport terminals around the world. This results in airport terminals being some of the heaviest used facilities of any building type. The choices of materials that airports and architects make when designing and renovating terminal buildings play a significant role in the initial expense of the project and in the ongoing operations and maintenance of the facility.

Often times materials are utilized in inappropriate applications, chosen solely for their aesthetic quality or their low initial cost without regard to their durability or ongoing maintenance costs. This can result in early failure of the materials resulting in unappealing aesthetics, safety issues and added unnecessary costs to replace or repair the issue.

III. OBJECTIVE

This research aims to provide architects and airport owners a straightforward guide to identify the wide range of available materials and their appropriate application in terminal facilities with relative information on their initial costs, return on investment, and ongoing operations and maintenance costs.

IV. RESEARCH PROPOSED

1. Literature search
    a. Identify existing research on materials, durability and operations and maintenance
    b. Identify existing applications where material choice has resulted in negative impacts on the airport terminal
2. Identify zones of the facility where material choices (interior/exterior walls, floors, restrooms, lighting, roofs, etc.) are most impacted by the high volumes of passengers
3. Identify materials most often used in airport facilities and their various applications
4. Identify common material failures in airport facilities
5. Identify initial costs for various materials
6. Identify ongoing operations and maintenance impacts resulting from material choices
7. Identify sustainability impacts of various material choices
8. Provide a range of appropriate material choices and their appropriate applications for each of the identified zones of the terminal facility
    a. Comparisons of initial costs
    b. Comparisons of ongoing operations and maintenance costs
9. Provide typical pitfalls to consider relating to material specifications to ensure the best quality of the various material recommendations

V. ESTIMATE OF THE PROBLEM FUNDING AND RESEARCH PERIOD

Recommended Funding: $ 500,000
Research Period: 12 months

VI. URGENCY AND PAYOFF POTENTIAL

Airport facilities around the world are continually going through renovation and expansion projects. This research can immediately educate airports and architects with information that can help them make the best decisions with regard to their material choices that will optimize the initial cost and the ongoing operations and maintenance costs.

VII. RELATED RESEARCH

There is no known published research on this information.

VIII. PERSON(S) DEVELOPING THE PROBLEM

JIM WILSON AIA, LEED® AP BD+C
Senior Associate | Aviation + Transportation
HOK
jim.wilson@hok.com
t +1 312 254 5394 *f* +1 312 782 6727 *m* +1 312 404 9917
60 East Van Buren Street, 14th Floor | Chicago, IL 60605 USA

ISILAY CIVAN BArch, MSc, PhD^2, LEED® AP O+M, IFMA BOD
Associate | Senior Consultant, Consulting
HOK
isilay.civan@hok.com
t +1 312 254 5374 *f* +1 312 782 6727
60 East Van Buren Street, 14th Floor | Chicago, IL 60605 USA

COLIN K ROHLFING Assoc. AIA, LEED® AP BD+C
Senior Associate | Sustainable Design Leader
HOK
colin.rohlfing@hok.com
t +1 312 254 5376 *f* +1 312 782 5797 *m* +1 312 730 2375
60 East Van Buren Street, 14th floor | Chicago, IL 60605 USA

IX. PROCESS USED TO DEVELOP PROBLEM STATEMENT

This problem statement is the result of a group of individuals that have been performing design and sustainability work for the Aviation industry.

X. DATE AND SUBMITTED BY

ISILAY CIVAN BArch, MSc, PhD^2, LEED® AP O+M, IFMA BOD
Associate | Senior Consultant, Consulting
HOK
isilay.civan@hok.com
t +1 312 254 5374 *f* +1 312 782 6727
60 East Van Buren Street, 14th Floor | Chicago, IL 60605 USA

March 1, 2012