



# INTERNAL AUDIT REPORT

OPERATIONAL AUDIT  
WEST SIDE FIRE STATION

JANUARY 2017 – JUNE 2018

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## EXECUTIVE SUMMARY

Internal Audit (IA) completed an audit of the proposed West Side Fire Station for the period January 1, 2017 through June 30, 2018. The audit's primary objective was to evaluate the reasonableness of initial cost estimates. We also reviewed lease provisions and the impact it had on the Port's decision to build a temporary facility. Those results were provided to management in a separate letter dated September 28, 2018.

On February 27, 2018, Port Commission approved the construction of an interim Aircraft Rescue Fire Fighting (ARFF) station on the west side of the airport for an estimated cost of \$5.5 million. The project's anticipated completion date is October 2019 and will be utilized for a minimum estimated life of four years until a permanent facility is built.

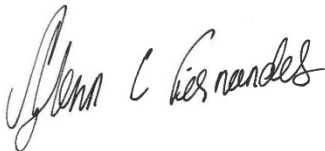
The Port of Seattle Fire Department is required by Federal Aviation Administration (FAA) regulations to respond to an emergency, within three minutes from the time of the alarm, to the midpoint of the farthest runway. This response time is not achievable from the main station.

We identified the following issue:

1) The cost of construction at SeaTac Airport is inherently higher than equivalent construction outside the airport. Additionally, conceptual cost estimates are difficult to estimate and more susceptible to change when designs are incomplete. However, we identified sections of the cost estimate, that in our opinion, did not appear to align with industry practice and in some cases appeared excessive.

This issue is discussed in more detail beginning on page six.

We extend our appreciation to Capital Development and to the Port's Fire Department for their assistance and cooperation during the audit.



Glenn Fernandes, CPA  
Director, Internal Audit

### RESPONSIBLE MANAGEMENT TEAM

Ralph Graves, Senior Director, Capital Development  
Wayne Grotheer, Director, Aviation Project Management Group

## BACKGROUND

On February 27, 2018, Port Commission approved the construction of an interim fire station on the west side of the airport for an estimated cost of \$5.5 million. The project's anticipated completion date is October 2019, and will be utilized for an estimated life of four years until a permanent facility is built.

The interim fire station's living quarters, of about 2,500 modular square feet, will consist of five bunkrooms, a day room, a kitchen, male and female bathrooms with showers, laundry facilities, and an exercise room. The station will require necessary improvements to the insulation, windows, seals, and filtration to minimize jet noise and exhaust. The station will also include a 3,200 square foot structure for two ARFF vehicles. It will be equipped with electronically operated panel bay doors, an alerting system, lighting, heating (to prevent freezing of firefighting media), and a 100% exhaust capture system.

The Port of Seattle Fire Department is required by Federal Aviation Administration regulations (Chapter 14 § 139.319) to respond to an emergency, within three minutes from the time of the alarm, to the midpoint of the farthest runway. All other vehicles must respond within four minutes.

Completion of the third runway in November 2008 impacted the Fire Departments ability to respond to an emergency within three minutes from the main fire station. As a result, in August 2015, the Port has subleased two small office rooms and storage space for one emergency response vehicle from Weyerhaeuser (now Paccar). Paccar requested that the Port's firefighters be segregated from Paccar operations.

## AUDIT SCOPE AND METHODOLOGY

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards and the International Standards for the Professional Practice of Internal Auditing. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The period audited was January 2017 – June 2018. We used a risk-based approach from the planning phase to the testing phase. We assessed risks and identified controls to mitigate those risks. We gathered information through document requests, research, interviews, and observations. Our audit included the following procedures:

### Budgeted Project Costs

- Inquired with Port management (including the project manager and cost estimator) to understand how estimated project costs were derived.
- Reviewed and assessed supporting documentation.
- Used third party sources (RS means) to assess Port management's estimated shell costs.
- Obtained a description and financial expenditure data from six regional fire stations for cost comparisons (see Appendix B).

### Personal Service Vetting Process

- Obtained an understanding of the Central Procurement Office's selection process of project management services.
- Reviewed Service Directives and Service Agreements.
- Documented and tested key controls to validate compliance with Port Policy and State Law.

### Lease Terms

- Reviewed lease terms, including the assignment of lease, and its impact on the Port's decision to build a temporary facility.

## SCHEDULE OF FINDINGS AND RECOMMENDATIONS

### 1) RATING: MEDIUM

The cost of construction at SeaTac Airport is inherently higher than equivalent construction outside the airport. Additionally, conceptual cost estimates are difficult to estimate and more susceptible to change when designs are incomplete. However, we identified sections of the cost estimate, that in our opinion, did not appear to align with industry practice and in some cases appeared excessive.

Our approach was not to request management to lower their cost estimate, but to offer an objective opinion, using concepts from literary reference guides. We also compared the cost per square foot to recently completed fire stations in the Seattle area and vicinity. The estimated cost per square foot for the Westside Fire Station exceeded that for all recently built fire stations. (See Appendix B)

We identified the following for management's consideration:

Upon initial review, we observed that total allowances and contingencies total \$1.24 million of the \$5.5 million. When we researched these costs, we felt that they did not align with industry practice or appeared excessive.

#### Allowances - Design Development - \$513,000 (30%)

According to third party cost information, allowances could be as high as 20% during the conceptual stage and reduced to 3% at the final working drawing stage. Accordingly, we offered using a 20% allowance and reducing it as the design progresses.

#### Construction Contingency - \$467,000 (15%) / Project Contingency - \$263,000 (5%)

Contingencies generally refer to costs due to unforeseen circumstances and can be used for minor non-scope changes. Although a standard contingency amount/rate has been established, they usually range between 0 – 5% of a project's budget. It is not uncommon for contingencies to be high when designs are incomplete, but as the project nears completion, the standard contingency usually ranges between 0 – 5% of a project's total budget. Therefore, reducing total contingencies to 5% appears like a more reasonable estimate.

#### **Recommendations:**

We recommend that for smaller capital projects such as the fire station, that Capital Development completes a more substantial design, prior to requesting full project funding from the Commission. If necessary, Commission authorization may be required for associated design costs. This will assure that project estimates provided to the Commission are more refined and complete.

We also believe opportunities exist to reduce future construction costs. Accordingly, we offer the following:

Due to the complexities with security at the airport and the additional cost that is incurred by complying with various security requirements, we recommend that Capital Development engage the Lean team to identify opportunities that would minimize costs and related inefficiencies resulting from the requirements of building within a secure area.

**Management Response:**

We appreciate the work done by Internal Audit to review the conceptual cost estimate of this project and to increase their understanding of construction cost estimation practices. As with any of the airport capital projects, our cost estimates evolve with more knowledge as we proceed through development of design and detailed sponsor and stakeholder requirements to the engineers' estimate used as the basis of getting construction bids from prospective contractors. We have just updated the estimate based on the 60% design recently submitted by our designer to the Port for review.

Based on our experience with construction cost estimation and construction costs at Sea-Tac airport, we believe that the design development allowance, construction contingency, and project contingency were appropriate at the conceptual cost estimate level (i.e., prior to start of design) that was the subject of this audit and now at the 60% level. Our cost estimates are either developed or reviewed by our cost estimating manager, who has over 25 years of cost estimation experience for a variety of owners and contractors.

As for opportunities to improve our processes, we are continuously seeking to improve our processes, the most significant of which require working with the many sponsors, stakeholders and project delivery partners involved in doing projects at the airport. We have employed LEAN in the past in these efforts and will likely do so again.

Allowances - Design Development - \$513,000 (30%)

Scope development throughout planning and design is accounted for via Design Development Allowance (DDA). We include a (DDA) ranging from 20% to 30% at the conceptual planning stage of a project. The higher range was used because the project is located within the Airfield Operating Area and there were numerous risks and unknowns. RS Means lists several factors that should be added to the project cost, including but not limited to dust protection, security requirements, and job conditions. The DDA is reduced as the project scope is further defined and the design enhanced. We reduce the DDA at each major design phase and it is removed from the engineer's estimate when the project goes out to bids for construction contractors.

At 60%, the DDA has been reduced to 15%. This is the direct result of having more detailed drawings. However, the direct costs for mechanical, electrical, and sitework have increased. This is mainly due to power having to come from a further location, increased fencing requirements, additional plumbing fixtures in the apparatus bays, and communication room needs. These were not anticipated during the initial conceptual level of the project, especially the power (it was previously anticipated to come from the much closer Paccar building). The overall project is now estimated to be approximately \$5.8M. As we work towards 100% design, anticipated mid-November 2018, DDA will be reduced to 0% and the estimate further refined. If the project's final defined scope cannot be accommodated for the current budget of \$5.5M, the project will request additional funding.

**South Satellite Structural Improvement Project - Example**

Another example of the evolution of DDA is from our South Satellite Structural Improvement Project. During the notebook development, DDA was 30%. As is typical at this early stage in the project, as-built drawings and some site investigations were performed, but significant concerns regarding access to structural framing, working within operational constraints, and the amount of asbestos to be abated remained.

**West Side Fire Station**  
**January 2017 – June 2018**

During the 60% estimate, the DDA had decreased to 15%. However, the direct costs had increased. Current building codes increased the amount of strengthening and the number of steel members requiring that strengthening.

At 100%, direct costs remained in-line with the 60% estimate. Construction phasing was removed from the estimate and the DDA was reduced to 0%.

*Construction Contingency - \$467,000 (15%) / Project Contingency - \$263,000 (5%)*

There are 2 different contingencies being discussed above. The first is the construction contingency, or change order contingency, which is a percentage of the construction bid amount. This is to cover the cost of potential change orders and is a common industry practice. The percentage typically ranges from 5% for new construction on a greenfield site to 15% on a renovation project and/or brownfield sites. Port construction management agreed to reduce this to 12% since these are new structures being built on an existing, occupied site. Although the airfield may not be considered a “brownfield” site, it is an already developed site with the potential of contaminated soil within the active airfield operations area. This contingency is not reduced as a matter of routine as the project nears completion, but is depleted as change orders are issued.

The second contingency, the project contingency, is based on the total project cost and is intended to cover unanticipated circumstances or cost overruns. These costs could be related to construction cost overruns, fees related to the project (for example, recently imposed sewer connection fees), operational fees, or other jurisdictional complications. If unused, this money is returned to the Aviation Division’s capital allowance CIPs to fund future capital projects. This is a common contingency carried by a project Owner and within industry standards. This contingency is not reduced as the project nears completion as a matter of routine but may be depleted to cover unanticipated costs or cost overruns.



## APPENDIX A: RISK RATINGS

Findings identified during the course of the audit are assigned a risk rating, as outlined in the table below. The risk rating is based on the financial, operational, compliance or reputational impact the issue identified has on the Port. Items deemed “Low Risk” will be considered “Exit Items” and will not be brought to the final report.

Rating	Financial	Internal Controls	Compliance	Public	Port Commission/ Management
<b>HIGH</b>	Large financial impact  Remiss in responsibilities of being a custodian of public trust	Missing, or inadequate key internal controls	Noncompliance with applicable Federal, State, and Local Laws, or Port Policies	High probability for external audit issues and/or negative public perception	Important  Requires immediate attention
<b>MEDIUM</b>	Moderate financial impact	Partial controls  Not adequate to identify noncompliance or misappropriation timely	Inconsistent compliance with Federal, State, and Local Laws, or Port Policies	Potential for external audit issues and/or negative public perception	Relatively important  May or may not require immediate attention
<b>LOW/ Exit Items</b>	Low financial impact	Internal controls in place but not consistently efficient or effective  Implementing/enhancing controls could prevent future problems	Generally complies with Federal, State and Local Laws or Port Policies, but some minor discrepancies exist	Low probability for external audit issues and/or negative public perception	Lower significance  May not require immediate attention
<b>Efficiency Opportunity</b>	An efficiency opportunity is where controls are functioning as intended; however, a modification would make the process more efficient				

## APPENDIX B: FIRE DEPARTMENT TOTAL PROJECT COST COMPARISONS

FIRE STATION - PROJECT COST COMPARISON / BENCHMARK					
Building	Year Completed	Square Feet	Total Project Cost*	Cost / SQ FT (\$)	Description
North Shore	2010	30,000	\$19,110,719	637	Permanent - 5 vehicle bays, office space, gym, kitchen
Central Pierce 60	2017	21,500	13,313,557	619	Earthquake Structural Upgrades, Emergency Generator
Seattle Fire 32	2017	18,000	16,368,766	909	Permanent - office space, gym, laundry
Central Pierce 72	2018	16,449	9,014,148	548	Permanent - 4 vehicle bays
Snohomish	2018	11,860	6,303,600	532	Permanent - 3 vehicle bays, office/training space, dormitory
Central Pierce 63	2017	8,378	5,730,724	684	Permanent - 3 vehicle bays, living areas, six sleeping rooms
POS Westside	2019	5,670	5,500,000	970	Temporary - 2 vehicle bays, gym, laundry, dormitory

\* Adjusted for Inflation and Escalation through 2019 (Cost Index: Turner Building, Mortenson Construction, Rider Levett Bucknall)

### Note:

All of the projects presented are larger than the West Side Fire Station project. Management indicated that economies of scale are gained and therefore, cost per square foot will generally be lower as the size of the building increases. Conversely, cost per square foot will generally be higher as the size of the building decreases. Accordingly, the above table is sorted by square footage.

Management also indicated that Airport construction is proven to be more expensive than typical building construction costs and for a more meaningful comparison, the cost of the above fire stations should be adjusted to take into consideration airfield operations, working within a 24 hour facility, and security constraints.

### Management Response:

When comparing similar projects across agencies, it is important to acknowledge the differences in costs that are considered a “total project cost.” In our experience, costs beyond the physical construction (i.e., contractor) vary widely, which makes comparing total project cost challenging.