AUDIT OF COUNTY CAPITAL PROJECT MANAGEMENT (Kaiākea Fire Station Project)

Submitted by

Office of the County Auditor
County of Kaua'i
State of Hawai'i

Report No. 11-03

PREFACE

This audit assesses whether the county is acting efficiently and effectively in performing capital project management duties, using the Kaiākea Fire Station capital construction project as a sample project. The audit questions include whether and to what extent the county has adequate personnel, processes and practices to (1) protect the county from unnecessary delays, cost overruns, litigation and other risk in capital projects, (2) identify risks during capital project implementation and (3) adequately staff and organize the management of capital projects. Two other audits look at the same audit questions from other perspectives. One is a follow-up audit of the recommendations of the former audit of the public works department and the other is an audit of Phase I of the county's 2006-2007 road maintenance capital project.

We are grateful for the cooperation and contributions of the Managing Director, the Purchasing Division of the Department of Finance, the Building and Engineering Divisions of the Department of Public Works and the Fire Department.

Ernesto G. Pasion, County Auditor

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EXECUTIVE SUMMARY

This audit will provide an assessment of the current condition of the county's management of capital projects through examination of the Kaiākea Fire Station capital construction project. The project was selected for testing because it is the latest major building project by the county. The station was constructed as an energy efficient building of approximately 6,573 square feet, built to withstand 191 mile per hour winds.

The fire station was completed under budget and ahead of schedule. The budget for the station was $4,904,946, and it was built for $4,864,886.16, or $40,059.84 less. The certificate of occupancy for the station was issued on September 1, 2010, approximately 168 days ahead of the contract completion date.

The audit found that although the project was completed within budget and ahead of schedule, improvements are needed in project planning and management to ensure projects are constructed that meet public needs at an appropriate price.

The cost of constructing the fire station was high, when compared to other fire station construction both on the mainland and Hawai'i. The 6,573 square foot fire station was built at a cost of approximately $740.13 per square foot. This is significantly higher than RSMeans Data estimates, which range from $146.28 to $168.34 a square foot cost for constructing a 6,000 square foot, one-story fire station in Honolulu with union labor.

Energy efficiency features may have increased costs, but other fire stations built to achieve energy efficiency have cost less. The Livermore-Pleasanton Fire Station in California was built to qualify for LEED Gold certification, at a cost of $424.12 per square foot in 2005. The winning bid for a new 12,000 square-foot fire station at Ewa Beach (awarded in

2010) was $2,100,000, or $383.33 a square foot. This station is being constructed to achieve LEED Silver certification.

User requests may also increase costs, but the Makalei fire station in Kona cost less, even if it appears to have more features, including exercise/work rooms and operating areas for a HazMat Unit. The winning bid for the 11,000 square-foot Makalei Fire Station in Kona in 2010 was about $7 million, or $636 per square foot.

The audit found extensive use of brand name and other restrictive specifications in the bid and change orders, which may have contributed to the relatively high square foot cost. Specifications requiring the use of certain brands are generally discouraged and using brand name specifications may tend to decrease competition or increase cost. The Hawai'i procurement law requires specifications to be based on functional and performance characteristics, whenever practical. Further, the Hawai'i procurement regulations require justification and prior written approval before brand names can be used in bid specifications. In the audit, we did not find written justifications or approvals for each brand name specified.

We recommended that the county provide additional procurement law training for all personnel involved in capital projects, especially concerning the use and misuse of restrictive specifications. As in our follow-up audit of the public works department, we also recommend that the county review and adopt standard (general) specifications, policies and procedures for construction projects. The standards should include a provision stating that the use of a brand name or similarly restrictive specification is not permitted until (1) the purchasing agency makes a written determination that only the identified brand name will satisfy the county's needs and it is not practicable to use a less restrictive specification and (2) the chief procurement officer approves the use of the restrictive specification.

We also recommended that the county consider adopting best practices to ensure that county capital projects are constructed to meet the public needs at an appropriate price. These practices could include (1) using a team approach to design and construction decisions in major capital projects, (2) standardizing specifications for commonly used building material whenever possible, (3) re-using successful design concepts for municipal projects to reduce design costs whenever possible and (4) obtaining independent cost estimates for the project cost as part of the planning and budgeting process.

CHAPTER 1

Introduction

This audit was conducted pursuant to the authority of the Office of the County Auditor, as provided in the Kaua'i County Charter. The audit was included in the county auditor's annual work plan for fiscal year 2010-2011, which was sent to the mayor and the Kaua'i County Council in June 2010.

Background

This audit will provide an assessment of the current condition of the county's management of capital projects through examination of the Kaiākea Fire Station capital construction project.

Audit Objectives

Our audit focused on the Buildings Division of the Department of Public Works and its activities related specifically to the Kaiākea Fire Station construction project with the following objectives:

- Assessing the county's efficiency and effectiveness in the performance of project management duties by comparing the activities to industry best practices and county policies; and
- Identifying recommendations for increased efficiency and effectiveness.

Audit Scope and Methodology

The audit scope consisted of reviewing overall project implementation and management and the establishment, maintenance and adherence to policies and procedures.

Areas examined included the construction bid, contract, change orders, and project management.

We interviewed key county employees involved in this capital project, including the Deputy County Engineer at the time of the interviews, chief of the building division, public works staff involved in the fire station project and the fire chief. The interviews allowed us to obtain an understanding of the county's capital project implementation procedures and processes, as they were applied to this project. We reviewed and analyzed project files and available public works procedures. We reviewed other county policies and records, as appropriate. We also reviewed pertinent ordinances, laws, rules, audits, reports, information from other municipalities and industry best practices as recommended by these jurisdictions and trade organizations.

We also reviewed documents pertinent to the project including invoices, contracts, schedules, meeting minutes, reports and change orders. We reviewed written guidelines and standards and management controls applicable to the project. We reviewed and analyzed the project solicitation and the procurement of the contractor for the project, as well as the construction contract that established the scope of work and total contract amount. Our review also included analyzing payments to the contractor.
The audit was conducted by an external engineering consultant with experience in capital project planning and implementation and staff from the county auditor's office.

The audit was conducted from October 2010 through February 2011. This audit was conducted in accordance with the applicable Government Auditing Standards issued by the Comptroller General of the United States. We conducted this performance audit in accordance with generally accepted government auditing standards. 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.

Based on the results of our review, we prepared specific recommendations for improvement and transmitted them to the administration in a draft report.

General Information

Capital project expenditures are a significant portion of the county's budget. The budget for the 2010-2011 fiscal year includes an appropriation of $100,025,486 for capital projects. Capital projects include a wide range of projects such as building construction, renovations and maintenance, parks improvements, road and bridge maintenance and shoreline studies.

Capital project execution and contract administration are generally responsibilities of the county public works department. The public works department consists of the Solid Waste, Road Construction and Maintenance, Auto Maintenance and Motor Pool, Wastewater Management, Engineering and Building[1] divisions.

About the Building Division

Capital projects involving county buildings are generally handled by the building division of the public works department.[2] The building division is also responsible for building code enforcement, facility development, building maintenance and janitorial services.

When the division is assigned a capital project such as facility development or building construction, it plans and designs the project, prepares bid documents and contracts,

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[1] The Building Division is also sometimes referred to as the Buildings Division.

[2] The parks and water departments are responsible for the facilities under their jurisdictions. However, the parks department may rely on expertise in the public works department in executing capital projects.

monitors, inspects, and reviews project activities and approves invoices for payment.

The building division has three sections, the administration, facility maintenance and building code sections. The administration section has seven authorized positions, two permanent and five temporary. Three of those positions are vacant. The facility maintenance section has 49 authorized positions, 44 permanent FTEs and five part-time positions. Three of those positions are vacant. The building codes enforcement section has 23 authorized positions, 18 permanent full-time positions and five temporary positions. Six of those positions are vacant. The public works department reports that as of April 11, 2011, the division had 12 vacant positions, or an approximately 19 percent vacancy rate when compared to full-time positions. Our follow-up audit on the recommendations of the prior audit of the building division disclosed that the vacancy rate was one of the challenges faced by the division.

CHAPTER 2

AUDIT FINDING AND RECOMMENDATIONS

Finding: The project was completed within budget and ahead of schedule, however, improvements are needed in project planning and management to ensure projects are constructed that meet public needs at an appropriate price.

Background of the Test Project

The test project was the construction of a new fire station located at Keālia, Kaua'i, which was assigned to the building division. The project was selected for testing because it is the latest major building project by the county. The station (called the Kaiākea Fire Station) is an energy efficient building of approximately 6,573 square feet, built to withstand 191 mile per hour winds.

The budget for constructing the station in the 2007 budget ordinance was $4,979,530. The bond fund would provide the project funding. The project budget changed to $4,962,097 in the 2008 budget ordinance, and to $4,904,946 in the 2009 budget ordinance.

Procurement Process

Invitation for Bid No. 2948 (IFB 2948) for the Kaiākea Fire Station was published in The Garden Island newspaper on September 10, 2008. By October 3, 2008, interested bidders had to provide written notice of their intention to bid, together with certification of a Hawai'i state contractor's Type B license. The deadline for submitting sealed proposals was October 15, 2008.

A non-mandatory pre-bid conference was held on September 22, 2008, for interested parties. The pre-bid

conference was followed by a site visit. The pre-bid conference was documented on October 2, 2008 by the building division, however, the attendees were not listed in the documentation.

On October 7, 2008, the county issued addendum no. 1, which changed project plans and specifications and extended the bid opening date and the notice of intent to bid deadlines to October 29, 2008 and October 17, 2008, respectively. In the addendum, the county also said it would issue a second addendum.

On October 23, 2008, the county issued addendum no. 2, changing the bid opening date from October 29, 2008 to November 12, 2008. The addendum changed the deadline for the notice of intent to bid from October 17, 2008 to October 31, 2008.

On October 30, 2008, the county issued addendum no. 3. The three-page addendum changed project specifications and plans including adding a 124 gallon LPG tank, gas lines and revising power requirements for a gas range. Addendum no. 3 also answered bidder questions.

On November 10, 2008, the county issued addendum no. 4, which changed the bid date opening from November 12, 2008 to November 26, 2008, and changed the deadline to submit a notice of intent from October 31, 2008 to November 14, 2008. Addendum no. 4 also notified bidders that the county intended to issue a fifth addendum.

On November 18, 2008 the county issued a 16-page addendum no. 5. The addendum addressed numerous bid items, and extended the bid opening from November 26, 2008 to December 3, 2008. On November 25, 2008, the county issued addendum no. 6, deleting references to "¼" bent steel cont. (stainless steel)" from reference details no. 3, 3A and 5.

The winning bidder was Unlimited Builders, LLC (Unlimited). It had filed a timely notice of intent to bid on October 31, 2008, and a bid on December 3, 2008. Unlimited submitted a bid of $4,701,561.20 for the project. The bid components were: $168,366 for excavation of unsuitable material, $1,739,945 for site work, $143,406.20 for 102,433 square feet of imported amended screen soil, and $2,649,844 for the fire station. Unlimited was issued a notice of award on January 28, 2009.

On February 3, 2009, the county informed Unlimited that a protest of the award had been filed. The protester alleged that the bid award was improper because Unlimited's bid envelope had the name of a different company and the intent to bid form did not identify Unlimited's contractor license number. The finance director rejected the protest by letter dated March 5, 2009. The protesting firm requested a hearing on the finance director's rejection on March 12, 2009. On May 6, 2009, the office of administrative hearings of the State department of commerce and consumer affairs found that the protesting firm failed to prove by preponderance of the evidence that the county's denial of the protest was improper, unlawful, or in violation of the terms and conditions of the solicitation.

Contract No. 7998, dated June 8, 2009, was executed between the county and Unlimited. The notice to proceed was issued by the county on August 18, 2009, specifying August 24, 2009 as the official commencement date. The notice to proceed specified that the work was to be completed within 540 calendar days, or by February 14, 2011.

Change Orders

On December 16, 2009, change order no. 1 was issued for $12,441.96, for ten items. The most costly items involved addition of foam insulation and solar tubes, changes to the Murphy bed cabinets from press wood to hardwood

plywood, alternate finishing for eave soffits and revised grading and dust screen changes.

On March 9, 2010, change order no. 2 was issued for eight items. The largest were for a "shoreline charging system," day lighting systems, electrical modifications and radio infrastructure. The total for the change order was $23,606.

On June 3, 2010, change order no. 3 was issued for 17 items. The change order included detention basin swale revisions, additional painting and coating, installation of a wall behind the kitchen island and upgrading mattresses. The amount of the change order was $92,879.

On July 3, 2010, change order no. 4 was issued for $17,165 to furnish an easement map to the electric utility, change the door swing, relocate roll up door switches, relocate trees, relocate a hose drying rack and pour a concrete slab around the structure and install eight-foot high wind barriers around trees.

On August 9, 2010, change order no. 5 was issued for $17,233 to install Microguard to all ceramic tile surfaces to facilitate cleaning.

The total for all change orders was $163,324.96, bringing the total contract amount up by about 3 percent, to $4,864,886.16, or $40,089.84 less than the $4,904,976 budgeted in 2009.

A certificate of occupancy was issued for the station on September 1, 2010, approximately 168 days ahead of schedule.[3] The total contract price for the 6,573 square foot fire station was approximately $740.13 per square foot.

[3] The contract specified completion within 540 days of the notice to proceed, on August 24, 2009. The project received its certificate of occupancy 372 days after the notice to proceed.

Construction Costs

The construction cost of $740.13 per square foot is significantly higher than the RSMeans Data[4] cost estimates for fire stations. According to this data source, the estimated square foot cost for building a 6,000 square foot, one-story fire station in Honolulu with union labor ranges from $146.28 to $168.34, depending on material and features.[5]

Energy efficiency features and user requests may increase costs. The county is seeking LEED certification for the Kaiākea Fire Station, but construction costs are higher than the Livermore-Pleasanton Fire Station, built to qualify for LEED Gold certification[6] at a cost of $424.12 per square foot in 2005.

The cost of the Kaiākea Fire Station is also high when compared to the winning bids for other Hawai'i fire station projects awarded recently (in 2010). The winning bid for a new 12,000 square-foot fire station at Ewa Beach was $2,100,000, or $383.33 a square foot. This station is being constructed to achieve LEED Silver certification. The winning bid for the 11,000 square-foot Makalei Fire Station in Kona was about $7 million, or $636 per square foot. The Makalei fire station appears to have more features than the Kaiākea Fire Station. Additional features include exercise/work rooms and operating areas for a HazMat Unit.

Restrictive Specifications

The relatively high square foot price for the Kaiākea Fire Station may result from extensive use of brand name specifications in the bid and change orders. Brand name specifications in supply or construction contracts cite a

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[4] RSMeans Data are construction estimates produced by Reed Construction Data, a company providing data to the North American construction industry.

[5] The calculations are based on 2008 statistics.

[6] LEED certification means Leadership in Energy and Environmental Design certification from the U.S. Green Building Council. The council promotes sustainable building and development practices by reviewing and rating buildings for cost and energy savings. The LEED ratings (in ascending order) are Certified, Silver, Gold, and Platinum.

particular brand, model number (or some other identification) as a requirement for the item to be supplied or used. The following are a few examples of brand name specifications in the bid:

> Accessible shower (AC-SHWR): Kohler 'Persona' Model K-9674
> Kitchen Sink: Elkay, Model DLR332212

The use of brand name specifications is generally discouraged since using brand name specifications may tend to decrease competition or increase cost.[7]

In Hawai'i, the procurement law states that specifications should be based on functional and performance characteristics, whenever practical. Hawai'i Revised Statutes (HRS) section 103D-405 states, in part:

> **Maximum practicable competition.** (a) All specifications shall seek to promote overall economy for the purposes intended and encourage competition in satisfying the State's needs, and shall not be unduly restrictive.
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> * * *
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> (b) Specifications, to the extent practicable, **shall emphasize functional or performance criteria while limiting design or other detailed physical descriptions to those necessary to meet the needs of the State.** (Emphases added.)

[7] For example, if this project had been funded under the American Reinvestment and Recovery Act of 2009 (ARRA), brand name specifications would not be allowed. The ARRA guidelines for fire station construction under the ARRA Assistance to Firefighters Fire Station Construction Grants state: "Grantees must, on request, make available to DHS, pre-award review and procurement documents, such as request for proposals or invitations for bids, independent cost estimates, etc., if (1) the procurement specifies a "brand name" product or (2) the proposed award is to be granted to other than the apparent low bidder under a sealed bid process. **Grantees found to be using proprietary specifications may find their expenditures questioned and subsequently disallowed.**" (Emphasis added.)

Further, the Hawai'i procurement regulations require justifications for the use of brand names and written approval of the chief procurement officer before brand names can be used in the bid specifications. Hawai'i Administrative Rules section 3-122-13(b)(3) states:

> (b) Types of specifications include the following, and may be used in combination when developing the specification:
> (3) Brand name specification commonly referred to as restrictive specifications, may be used upon approval of the chief procurement officer **after the purchasing agency makes a written determination that only the identified brand name will satisfy the State's needs, and it is not practicable to use a less restrictive specification**, provided that procurements pursuant to section 103D-305, HRS do not require approval. (Emphasis added.)

The State procurement office has developed form SPO-14 to be used to obtain approval from the chief procurement officer for using a brand name. For each brand name used, form SPO-14 requires the requesting agency to name the branded item, explain what makes it unique, explain why the unique features are necessary and explain why no alternatives are acceptable. The project file for the fire station did not have documentation or written justifications for the use of the brand name specifications or the chief procurement officer's approval of the brand name specification.

Brand Name Specifications

The fire station bid has 35 items which specify only a single brand. This is the most restrictive of brand name specifications, since it requires use of a brand name product, and no other. When a brand name is specified without an allowance for an approved equal, interested bidders cannot substitute any other product from any other source, even if the product performs in the same way as the named brand, and is less expensive.

Specifications Limited to a Single Named Brand

Product	Section
Fertilizer	02950 Landscape Planting
Remote Transmitter	08331 Aluminum Overhead Rolling Doors
Receivers	08331 Aluminum Overhead Rolling Doors
Water Hammer Arrester	15400 Plumbing
Accessible WC - Toilet Seat, open front seat, and cover	15400 Plumbing
Accessible Lavatory and Lavatory - Faucet, handles, and aerator	15400 Plumbing
Accessible Urinal - Flush valve	15400 Plumbing
Urinal - Flush valve	15400 Plumbing
Accessible shower - Metal shower hose	15400 Plumbing
Accessible shower - Wall-mount slide bar	15400 Plumbing
Accessible shower - Adjustable swivel mounting bracket	15400 Plumbing
Accessible shower - Wall-mount hanger	15400 Plumbing
Accessible shower - Vacuum breaker	15400 Plumbing
Accessible shower - Pressure-balancing valve	15400 Plumbing
Accesible shower - Valve trim with lever handles	15400 Plumbing
Shower - Single function shower head	15400 Plumbing
Shower - Pressure-balancing valve, high temperature limit stop for added safety	15400 Plumbing
Shower - Valve trim with lever handles	15400 Plumbing
Kitchen sink - Bowl	15400 Plumbing
Kitchen sink - Faucet	15400 Plumbing
Kitchen sink - Garbage disposal	15400 Plumbing
Hand sink - Bowl	15400 Plumbing
Hand sink - Faucet	15400 Plumbing
Service sink - Bowl	15400 Plumbing
Service Sink - Faucet	15400 Plumbing
Service sink - 3" Trap	15400 Plumbing
Floor sink	15400 Plumbing
Exterior Hose Bib	15400 Plumbing
Low Velocity Ductwork - Flexible connections	15600 Air Condition and Ventilation
Air Distribution System - Finish	15600 Air Condition and Ventilation
Air Conditioning System - Fan Coil Unit-1, UV light	15600 Air Condition and Ventilation
Air Conditioning System - Fan Coil Unit-2, UV light	15600 Air Condition and Ventilation
Air Conditioning System - Fan Coil Unit-3, UV light	15600 Air Condition and Ventilation
Refrigerant Line - Insulation	15600 Air Condition and Ventilation
Diesel-Engine Driven Standby Electric Generator Plant	16210 Engine Generator

The fire station bid had an additional 47 items where only one approved brand name item was listed, with allowance for an "approved equal." This may be a less restrictive specification because it permits alternate products. However, the bid specifications limit the use of approved equals, since substitutions are typically allowed only if considered and

approved before bid opening. Lastly, merely adding the term "or approved equal" may not result in a less restrictive specification. If the procuring agency knows that a specific product has no equivalent but adds the phrase "or approved equal" after the brand name, the specification may still be found to be restrictive or anticompetitive.

Specification Naming One Brand, But Allowing "Approved Equal"

Product	Section
Flexible Tubing	02810 Landscape Irrigation System
Pressure Regulator	02810 Landscape Irrigation System
Pre-Planting Herbicide	02950 Landscape Planting
Plastic Header	02950 Landscape Planting
Root Barriers	02950 Landscape Planting
Vapor Retarder	03300 Cast-In-Place Concrete
Design of Medallions	04720 Ornamental Stones
Cast Stone Ornaments	04720 Ornamental Stones
RidgeVent	07310 Asphalt Shingles Roofing
Solid Vinyl Windows	08620 Solid Vinyl Windows
Acoustical Units	09500 Acoustical Suspended Ceilings
Range Hood - Canopy	11450 Kitchen Equipment
Range Hood - Blower	11450 Kitchen Equipment
Range Hood - Backsplash	11450 Kitchen Equipment
Slide-In Electric Range with Oven	11450 Kitchen Equipment
Refrigerator	11450 Kitchen Equipment
Freezer	11450 Kitchen Equipment
Wall Units	12520 Fold-Up Beds with Wall Units
Fold-Up Beds	12520 Fold-Up Beds with Wall Units
Solar Collectors	13987 Solar System
Solar Hot Water Heater	13987 Solar System
Circulation Pump	13987 Solar System
Programmable Water Heater Timer	13987 Solar System
Check Valve	15400 Plumbing
Interior Hose Bib	15400 Plumbing
Low Velocity Ductwork - Damper	15600 Air Condition and Ventilation
Air Conditioning System - Fan Coil Unit-1	15600 Air Condition and Ventilation
Air Conditioning System - Fan Coil Unit-2	15600 Air Condition and Ventilation
Air Conditioning System - Fan Coil Unit-3	15600 Air Condition and Ventilation
Air Condensing Unit-1	15600 Air Condition and Ventilation
Air Condensing Unit-2	15600 Air Condition and Ventilation
Air Condensing Unit-3	15600 Air Condition and Ventilation
Zone Damper	15600 Air Condition and Ventilation
Zone Control	15600 Air Condition and Ventilation

Product	Section
SMART SENSOR	15600 Air Condition and Ventilation
Exhaust Fan #1	15600 Air Condition and Ventilation
Exhaust Fan #2 & #3	15600 Air Condition and Ventilation
Diesel Fumes Captures System	15600 Air Condition and Ventilation
Storm Louvers	15600 Air Condition and Ventilation
Category 6 Patch Panels	16726 Premise Distribution Cabling System
Telecom Outlets	16726 Premise Distribution Cabling System
Telecom Faceplates	16726 Premise Distribution Cabling System
Blank Outlet Faceplates	16726 Premise Distribution Cabling System
CATV Splitters	16726 Premise Distribution Cabling System
CATV Directional Couplers	16726 Premise Distribution Cabling System
CATV Cable	16726 Premise Distribution Cabling System
CATV Outlets	16726 Premise Distribution Cabling System

The bid also has six specifications that allow several brand names, but no equivalents. Although not as restrictive as naming a single brand, the specification could still be considered restrictive (depending on the facts), since it limits the permitted products to named manufacturers and is not based on performance or functional characteristics.

Specifications Listing Multiple Brands But No Substitutes

Product	Section
Pressure Relief Valve	13987 Solar System
Soil, Waste, Drain, Gas, and Vent Piping - Insulation	15400 Plumbing
Soil, Waste, Drain, Gas, and Vent Piping - All weather jacket over insulation	15400 Plumbing
Insulation	15400 Plumbing
Motors	15600 Air Condition and Ventilation
Refrigerant Line - All-weather Jacket	15600 Air Condition and Ventilation

The bid also has 41 specifications where several brands are named and approved equals are allowed. Although these are less restrictive than the types previously mentioned, they are not as favored in the procurement law, since they are not based on performance or functional characteristics.

Several Brands Listed and "Approved Equals" Allowed

Product	Section
Weed Killer	02282 Soil Treatment for Vegetation
Automatic Irrigation Control - Remote	02810 Landscape Irrigation System
Valve Boxes	02810 Landscape Irrigation System
Swing Joints	02810 Landscape Irrigation System
Flex Risers	02810 Landscape Irrigation System
Wire Connectors	02810 Landscape Irrigation System
Fertilizer - Plant Tablet	02950 Landscape Planting
Organic Soil Amendment	02950 Landscape Planting
Organic Soil Conditioner	02950 Landscape Planting
Pre-Emergent Weed Control	02950 Landscape Planting
Filter Fabric	02950 Landscape Planting
Roofing Shingles	07310 Asphalt Shingles Roofing
Aluminum Overhead Rolling Doors	08331 Aluminum Overhead Rolling Doors
Exterior Finish System	09800 Exterior Finish System (EFS)
Toilet Paper Holders	10800 Toilet Accessories
Paper Towel Dispensers	10800 Toilet Accessories
Soap Dispensers	10800 Toilet Accessories
Mirrors	10800 Toilet Accessories
Shower Rod	10800 Toilet Accessories
Seat Cover Dispenser	10800 Toilet Accessories
Utility Shelf with Mop Holder and Rag Hook	10800 Toilet Accessories
Mop Rack	10800 Toilet Accessories
Robe Hooks	10800 Toilet Accessories
Sanitary Napkin Disposal	10800 Toilet Accessories
Dehydrator	11110 Washer Extractor and Dehydrator
Temperature Sensing and Control System	13987 Solar System
Floor Cleanout	15400 Plumbing
Wall Cleanouts	15400 Plumbing
Outside Cleanouts	15400 Plumbing
Expansion Compensators	15400 Plumbing
Ball Valves	15400 Plumbing
Accessible WC - WC w/ open front seat	15400 Plumbing
Accessible Lavatory and Lavatory - Sink	15400 Plumbing
Accessible Urinal	15400 Plumbing
Urinal	15400 Plumbing
Floor Drain	15400 Plumbing
Relay and Contractors	16010 Electrical Work
Wiring Devices - Receptacles	16010 Electrical Work
Wiring Devices - Switches	16010 Electrical Work
Wiring Devices - Special Receptacles	16010 Electrical Work
CATV Trunk Cable	16726 Premise Distribution Cabling System

Significant concerns can also occur where no brand name is specified, but the description for the product is so exact, equals probably do not exist. In effect, the specification appears to describe the brand name equipment, without naming the brand. For the fire station bid, the specification for the washer extractor in Section 11110 of the bid falls into this category.

Effect of Restrictive Specifications

The audit found evidence that projects costs were affected by the use of restrictive or brand name specifications, which increased even after the bid was issued. On October 7, 2008, the county issued Addendum No. 1 to the bid. The addendum changed the requirements for the kitchen stove from "slide-in electric range with oven" to "Viking VGIC366-6B-35" Wide Range With Six Burners, Single Oven, or Approved Equal." This change is likely to have increased costs. On-line research indicates that slide-in electric ranges can be purchased for less than $1,000. According to Consumer Reports, the replacement description identifies a high-end range with a typical price of $5,660. Additional costs for substitution of gas range also required a new gas tank and gas line, as well as for revised power requirements.

In addition to the example of the Viking range, the construction price increased because of the use of brand name specifications in other instances. The bid specified the following as the beds in the fire station: "[W]all units as manufactured by Murphy Bed Co., Inc. "WC-15D, Full Storage Door Unit" and "WU-30D, Wardrobe Unit," or approved equal," and "Murphy bed and mattress as manufactured by Murphy Bed Co., Inc. "Model SL 39XL," or approved equal." The bid also required plywood and high pressure laminate in the cabinetry. After the award, the contractor found that it could not comply with all specifications, since the named manufacturer (Murphy Bed Co., Inc.) did not make the designated models with the required material. Although the project architect noted

"there are other manufacturers that make the cabinets in wood," a change order was issued for $10,581 to purchase extra cabinetry from the Murphy Bed Company, so the beds could be installed as specified.

Other problems could occur from using overly restrictive specifications. The restrictive specification for the washer extractor could be met by only one product. However, the actual model was a slightly different size, requiring modification to fit into the cabinetry.

The project and procurement records do not document the reasons for the use of brand name specifications, or the finance director's written approval of the restrictive specifications as required by the procurement law. The specifications were reviewed by multiple county agencies.[8] The lack of documentation evidences a need for education about the requirements of the State procurement law. The county should make certain that all personnel involved in the procurement process are aware that brand name or other restrictive specifications should not be used without proper justification and approval.

The documentation required by the procurement law also meets the county's need for greater transparency in procurement decisions. Documented justification for using the restrictive specification will enable project decisions to be better understood by county policymakers and the public.

Documentation also enables the county to improve project execution through lessons learned. For example, if user agency requests caused the many brand name specifications, the county could consider moderating user influence by requiring a team approach for design and construction decisions for major projects. The team could include construction managers and contractors who would be able to provide input to the user agency based on their broad

[8] The specifications were incorporated into the contract, which was reviewed and approved by the county engineer, deputy county attorney, and finance director.

experience with building products and construction methods. Team input could also be weighted to make certain that project specifications and decisions are primarily based on performance or functional criteria, and are not costly, restrictive, or anticompetitive.

The county could also consider adopting several best practices implemented by a consortium of California jurisdictions.[9] One is to standardize and regularly update specifications for building material and fixtures. Standardization helps ensure that the county's capital projects are of consistent quality and price, and may also enable bids and contracts to be prepared more quickly.

Another best practice is to study and re-use successful design concepts of municipal projects such as fire and police stations, maintenance facilities and pump stations when possible. A report by the California consortium indicates that site adaptations of successful design concepts may reduce design costs by half. This practice would also result in building design and material consistent with successful projects in the county and in other jurisdictions.

A third practice that should be considered is obtaining independent cost estimates in planning and budgeting for major projects. Independent estimates help the county determine if its planned projects meet the public need at an appropriate price and assist in evaluating bidders' proposals. Project records produced during the audit did not show how the budget for the fire station was developed, so we are unable to tell if the design for the project was based on necessity, increased as a result of the ample project budget, increased by user (county) preferences for brand name material or other factors. Accurate project budgeting and documentation are needed to obtain reasonable contractor proposals. If the budget is not based on structured, realistic and supportable estimates, the budget estimates for capital

[9] Consortium of the Cities of Long Beach, Los Angeles, Oakland, Sacramento and San Diego and the City and County of San Francisco, "California Multi-Agency CIP Benchmarking Study, Annual Report – Update 2010 (Study)," September 2010.

projects may send incorrect signals to bidders. In the case of the fire station, the project budget of over $4.9 million was publicly known over a year before the project was bid.[10] Therefore, bidders would likely compete with prices close to the project budget. If the project budget is unreasonably high, the county could expect to see high proposals.

Recommendations

We recommend that the county administration consider additional procurement law training for all personnel involved in capital projects, especially concerning the use and misuse of restrictive specifications. As in our follow-up audit of the public works department, we also recommend that the county review and adopt standard (general) specifications, policies and procedures for construction projects. The standards should include a provision stating that the use of a brand name or similarly restrictive specification is not permitted until (1) the purchasing agency makes a written determination that only the identified brand name will satisfy the county's needs and it is not practicable to use a less restrictive specification and (2) the chief procurement officer approves the use of the restrictive specification.

We also recommend that the county consider adopting best practices to ensure that county capital projects are constructed to meet the public needs at an appropriate price. These practices could include (1) using a team approach to design and construction decisions in major capital projects, (2) standardizing specifications for commonly used building material whenever possible, (3) re-using successful design concepts for municipal projects to reduce design costs whenever possible and (4) obtaining independent cost estimates for the project cost as part of the planning and budgeting process.

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[10] Ordinance B-2007-657, which set the budget for constructing the station at $4,979,530, was passed on July 1, 2007. The bid for the fire station project was issued on September 10, 2008. RSMeans Data states that the original estimated project cost was $1,600,000, but the basis for the figure is not known.

AUDITEE RESPONSE

Auditee Response to Findings

The auditee responded to the draft audit report on December 6, 2011. The response is included in its entirety as Appendix 1. The issues raised in the auditee response are summarized as follows.

Auditee issue: The County Engineer, as auditee, questions the audit premise that the Kaiākea Fire Station unit costs are significantly higher than the other fire stations used as comparisons. Auditee states that a significant portion of the winning bid for construction of the fire station was for extensive site work related to unique drainage requirements, therefore site work must be excluded for an "apples to apples" comparison.

Auditor's comment: In the audit, we found that improvements are needed in project planning and management to ensure projects are constructed that meet public needs at an appropriate price. We stand by this finding for the following reasons. First, even under the "apples to apples" figures provided by the auditee, the Kaiākea Fire Station was still the most expensive of the projects reviewed.

Cost Comparison as Calculated by Auditee (Kaua'i County Engineer)

	Building Cost	Site Work Cost	Total Cost	Building Area sq. ft.	Building Cost per sq. ft.
Livermore-Pleasanton	$2,321,292	$997,989	$4,419,282	7,545	$308
Ewa Beach	$4,521,118	$674,382	$5,195,500	12,226	$370
Makalei	$4,290,717	$1,892,751	$6,183,468	12,213	$351
Kaiākea	$2,649,844	$2,051,717	$4,701,561	6,573	$403

Although auditee questions the national benchmarks and other fire station construction projects (in California, Hawai'i

County, and the City and County of Honolulu), we used fire stations of similar cost factors, design and functionality to determine whether the Kaiākea Fire Station costs were reasonable.

Auditee argues that the Livermore-Pleasanton fire station cost less because construction costs are lower on the mainland. However, the Livermore-Pleasanton Fire Station had offsetting high cost factors, because its 2.25 acre site required substantial landscaping work because native and adopted plants were utilized, and invasive species previously on-site had to be eliminated. Additionally, the landscaping for the project was costly because it incorporated a whole systems approach, including bioswales for storm water and minor irrigation runoff to retain water on site as well as utilizing a variety of grasses and sedges to remove contaminants and organic matter from storm water runoff. The landscaped areas included a centrally controlled automatic programmed irrigation system installed, and the parking lot had an oil water separator put in place in the storm water system to reduce water pollution.

Due to location, the Livermore-Pleasanton Fire Station was designed and built for seismic resistance, design conditions similar to those for wind resistance for hurricane force winds, incorporated into the design of the Kaiakea Fire Station. The Livermore-Pleasanton Fire Station also had several other features which were not incorporated in the Kaiākea Fire Station, and which could drive up costs considerably. The building was designed to meet LEED Gold standards, and included the installation of a 12.8 kilowatt grid-tied solar electric system which provides roughly 22 percent of the station's electric needs, and doubled as covered parking. Auditee's calculation does not consider that the construction costs for the photovoltaic system were included in the construction costs for the Livermore-Pleasanton fire station, and excluded in the costs of the Kaiākea Fire Station. The photovoltaic system for the Kaiākea Fire Station was part of a separate project, and the additional cost for the system

($206,859), was not added to the auditee's "apples to apples" comparison.

While the Makalei Fire Station in Kona may not have as much landscaping, it is constructed on relatively fresh, unweathered, 200 year old lava flows, which require significant effort to grade and to accommodate the various utilities and fuel tanks constructed with this project. In addition, this project must also be designed to resist earthquake forces, which are similar to the wind resistance design and construction requirements utilized for the Kaiākea Fire Station.

As noted in the audit report, the county allocated project costs between site work and building construction based on the contractor's allocation. Since the allocation was not based on independent cost estimates, comparing construction costs for this project to other projects may be difficult. For example, the contractor's allocation could have considered subjective factors, such as the need for a certain level of cost recovery in the earlier (site preparation) phases of the contract. This common practice of front end loading is difficult to ascertain in contracts where there are not multiple bidders with detailed unit price bidding. Agencies typically utilize experienced resources to review a schedule of values and compare them to other recent contracts in order to direct modifications in breakdown pricing to eliminate front end loading. A contractor provided schedules of values, is typically how contractors are able to front end load lump sum contracts. Therefore, we adhere to our comparison of total project costs.

The auditee's statements about the high cost of site work calls into question the reasonableness of selecting the Kaiākea site, given the higher site preparation and other expenses associated with the site.[11] However, since the site was selected some time before the project was bid, the

[11] Project documents indicate that maintenance costs may be an issue, since the site has direct exposure to salt air and corrosion was noted as early as August 26, 2010.

reasonableness of the site selection is outside the scope of this audit.

Auditee issue: Auditee also argues that the Ewa Beach and Makalei fire station projects cost less because the stations are larger and the projects benefitted from economies of scale.

Auditor's comment: While economies of scale may apply to some types of construction (such as warehouse construction) we question whether economies of scale result when the additional spaces includes additional features. As the audit report notes, the additional space in the Makalei fire station included operating areas for a HazMat Unit and the Ewa Beach Fire Station included a training tower.

Auditee Response to Recommendations

The auditee responded to the recommendations in the audit report as follows:

Recommendation: Procurement law training for all personnel involved in capital projects, especially concerning restrictive specifications.

Auditee response: The auditee agrees to seek opportunities for procurement law training. Auditee defends its use of brand name specifications by stating that the audit failed to note that one of the special provisions states that each brand name should be deemed to be followed by the phrase "or approved equal."

Auditor's comment: The audit did address that special provision. On page 16 of this report, we state that "merely adding the term "or approved equal" may not result in a less restrictive specification." Our conclusion was based on authoritative sources that contradict the auditee's position

that the mere addition of the phrase "or approved equal"[12] converts a restrictive specification into a competitive one. One source is the Inspector General of the State of Massachusetts, which cautions state agencies that "providing the name of a single vendor and placing the burden on the bidder to discover alternatives does not constitute competitive specifications."[13] Similarly, the federal transit administration cautions its agencies that "allowing an equal product without listing the salient characteristics that the equal product must meet to be acceptable for award is considered to be restrictive of competition."[14]
Since the auditee provides no support for its position, we continue to rely on the authorities above to question whether the extensive use of brand name specifications without the necessary approvals and justifications[15] may have resulted in a county capital project that was not constructed to meet the public needs at an appropriate price.

Recommendation: Review and adopt standard (general) specifications, policies and procedures for construction projects.

Auditee response: The auditee has begun to standardize policies and procedures. With regard to the adoption of standard general specifications, auditee contends that its project volume is insufficient to justify adopting standard

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[12] Such as in "Viking VGIC366-6B-35" Wide Range With Six Burners, Single Oven, or Approved Equal."

[13] Office of the Inspector General, Commonwealth of Massachusetts, Designing and Constructing Public Facilities, page 39 (October 2011). The Inspector General's quote was from an opinion in a case called E. Amanti & Sons, Inc. v. R.C. Griffin, Inc., 53 Mass. App. Ct. 245, 253 (2001).

[14] http://www.fta.dot.gov/13057_6085.html

[15] The state law requires that brand names or similarly restrictive specification cannot be used until (1) the purchasing agency makes a written determination that only the identified brand name will satisfy the county's needs, and it is not practicable to use a less restrictive specification, and (2) the chief procurement officer approves the use of the restrictive specification.

general specifications, and that specifications are prepared by professional consultants.

Auditor's comment: We adhere to our recommendation to consider reviewing and adopting standard specifications, because we believe that even smaller jurisdictions and projects could benefit from some specifications. These could serve the purpose of providing guidance to the hired consultants to enable them to design county projects of consistent quality and cost.

Recommendation: Use a team approach to design and construction decisions in major capital projects.

Auditee response: The auditee reports that this recommendation has been implemented.

Recommendation: Standardizing specifications for commonly used building materials whenever possible.

Auditee response: The auditee states that this recommendation may not be practical with a small staff, and that the county relies on its professional consultants.

Auditor's comment: As we stated previously, we believe that smaller jurisdictions and projects could benefit if some specifications were developed to provide guidance to the professional consultants. The specifications would enable the hired consultants to design county construction projects that are consistent in cost and quality.

Recommendation: Re-using successful design concepts for municipal projects to reduce design costs.

Auditee response: Auditee responds that successful design concepts are reused when possible, and that the Kaiākea Fire

Station design was based on the design of the Kōloa Fire Station.

Recommendation: Obtaining independent cost estimates for the project cost as part of the planning and budgeting process.

Auditee response: Auditee states that independent cost estimates are required from professional design consultants as standard procedure, but often a budget estimate must be provided for a budget ordinance well before the scope of the project is established.

Auditor's comment: We reiterate our recommendation that project management should make certain that budget estimates are accurate and updated. This will make certain that if budget estimates are too high, capital projects are not overbuilt because bidders, design professionals and county users adopt a "use it or lose it" attitude. Again, we believe that more accurate budget estimates may result if specifications can be standardized appropriately.

For the reasons stated in the auditor's comments, we did not make substantive changes to the draft report based on the auditee's responses. However, changes were made to correct inaccuracies (including the typographical error identified by the auditee) and improve style and readability.

Bernard P. Carvalho, Jr.
Mayor

Gary K. Heu
Managing Director

Larry Dill, P.E.
County Engineer

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December 6, 2011

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SIBJECT: Draft audit report – Audit of County Capital Project Management (Kaiakea Fire Station Project)

Dear Mr. Pasion,

This is in response to your memo dated June 30, 2011, referencing the subject matter.

The basic premise of the audit findings and recommendations appears to be that while the project came in under budget and ahead of schedule, when compared to other recently constructed fire stations the Kaiākea Fire Station unit costs are significantly higher. Following is the pertinent information as provided in the audit:

	Total Cost	*Building Area sq. ft.*	*Building Cost per sq. ft.*
Livermore - Pleasanton			*$424*
Ewa Beach [2]	*$2,1000,000*	*12,000*	*$383*
Makalei	*$7,000,000*	*11,000*	*$636*
Kaiākea [1]	*$4,864,886*	*6,573*	*$740*

[1] Kaiākea Fire Station Cost includes all contract change orders.
[2] The Audit reports the cost for the Ewa Beach Fire Station as "$2,1000,000" on page 2 and again on page 12.

However, as noted on page 10 of the audit report, a significant portion of the cost of the winning bid for construction of the Kaiākea Fire Station was for extensive site work related to unique drainage requirements. The audit fails to make this distinction when comparing the Kaiākea Fire Station's unit costs to other fire station projects.

As shown in the table below, when the cost of the site work is excluded in order to provide an 'apples to apples' comparison, the building cost per square foot for the Kaiākea Fire Station compares much closer to the other projects. In comparing to the Livermore-Pleasanton Fire Station, it is reasonable to assume that costs to develop a fire station on the mainland would be significantly less than on Kaua'i. In comparing to the Ewa Beach and Makalei Fire Stations, it is

reasonable to assume that fire stations nearly twice the size of the Kaiākea Fire Station would result in a lower unit cost due to economy of scale.

	Building Cost	*Site Work Cost*	*Total Cost*	*Building Area sq. ft.*	*Building Cost per sq. ft.*
Livermore – Pleasanton[4]	*$2,321,292*	*$997,989*	*$3,319,282*	*7,545*	*$308*
Ewa Beach[2]	*$4,521,118*	*$674,382*	*$5,195,500*	*12,226*	*$370*
Makalei[3]	*$4,290,717*	*$1,892,751*	*$6,183,468*	*12,213*	*$351*
Kaiākea[1]	*$2,649,844*	*$2,051,717*	*$4,701,561*	*6,573*	*$403*

[1] Kaiākea Fire Station costs shown are from original bid. Contract change orders increased the total contract amount by about 3%.
[2] Ewa Beach Fire Station bid costs provided by City and County of Honolulu Department of Design & Construction (DDC). DDC indicates that this low bid is not a good representative cost for comparison purposes, as it was significantly less than the other bids, due to an omitted cost item. Costs shown represent the second lowest bid, with building and site work costs prorated in the same manner as the low bid.
[3] Makalei Fire Station bid costs provided by County of Hawai'i.
[4] Livermore-Pleasanton costs provided by City of Pleasanton Development Services.

Audit Recommendations and Responses:

1. *Procurement law training for all personnel involved in capital projects, especially concerning restrictive specifications*

   The audit states on page 14 that "The fire station bid has 35 items which specify only a single brand. This is the most restrictive of brand name specification, since it requires use of a brand name product, and no other. When a brand name is specified without an allowance for an approved equal, interested bidders cannot substitute any other product from any other source, even if the product performs in the same way as the named brand, and is less expensive." However, the audit fails to note that Item 12 of the Special Provisions of the Kaiākea contract states that "Brand names where used on the plans or in the specifications shall be presumed to be followed by the words 'or approved equal'."

   The audit states on page 15 that "...the bid specifications limit the use of approved equals, since substitutions are typically allowed only if considered and approved before bid opening." However, bidders are allowed sufficient time during the bid process to research "approved equal" options, and extensions of the bid time are granted via addenda if appropriate. Note also that Item 27 of the Special Provisions of the Kaiākea contract provides for the contractor to submit value engineering items to provide additional cost savings to the owner after bid opening.

   The Department will seek opportunities for procurement law training.

2. *Review and adopt standard (general) specifications, policies and procedures for construction projects*

   As the volume of projects managed by the Department of Public Works is small compared to the larger municipalities referred to by the audit, preparation of specifications is done by the professional consultants hired by the County, rather than reviewing and adoption of general specifications. This also allows the County more flexibility in providing for new and

improved technologies within the specifications. The Department has recently begun the process of reviewing and updating our standard policies and procedures for management of construction projects.

3. *Use a team approach to design and construction decisions in major capital projects*

   The recommendation to establish a project team (multi-departmental) for complex projects has been implemented. For example, project teams have been established for the Nāwiliwili-Anahola Bike/Pedestrian Path, the Pi'ikoi Building Renovation and the Līhu'e Civic Center Site Improvements projects.

4. *Standardizing specifications for commonly used building materials whenever possible*

   The audit recommends adopting a practice of standardizing and regularly updating specifications for building materials and fixtures, as done by a consortium of the largest cities in California. This may be effective for large municipalities with accordingly large staffs, but may not be practical for a small municipality with a small staff, and as such the County relies on its professional consultants.

5. *Re-using successful design concepts for municipal projects to reduce design costs*

   In our small municipality with our small volume of projects, there is not much opportunity for re-use of successful design concepts; however, this policy is already implemented when possible. Note that much of the Kaiākea Fire Station design was based upon the Kōloa Fire Station design. The County also uses 'standard' design concepts for comfort stations and bus shelters.

6. *Obtaining independent cost estimates for the project cost as part of the planning and budgeting process*

   Independent cost estimates are required from our professional design consultants as a standard procedure. Note that often a budget estimate must be provided for approval in a budget ordinance well before the scope of a project has been firmly established upon which to base a firm cost estimate.

Please contact me at 241-4996 or ldill@kauai.gov if you have any questions.

Very truly yours,

Larry Dill, P.E.
County Engineer

cc: Gary Heu, Managing Director