



**MCA**  
ARCHITECTS

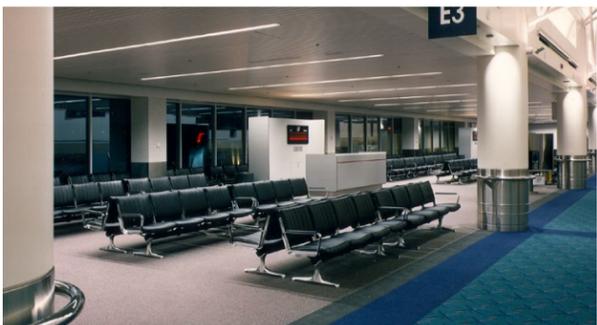
## Qualifications & Selected Representative Projects

*Aviation and Industrial Work*



**4.5 MILLION  
SQUARE FEET OF  
AVIATION-RELATED  
FACILITIES**

**48 YEARS  
IN BUSINESS**



**WORK COMPLETED  
AT 65  
INTERNATIONAL  
AND REGIONAL  
AIRPORTS**



## FIRM PROFILE

### Background

MCA Architects, PC provides a full range of architectural design services to clients on local, national and international levels, designing complex and highly specialized facilities under a variety of scopes. With a focus on client service, the Oregon-based firm works to build a cooperative relationship with each client and to produce designs that respond to the unique needs and goals of each project. Since its establishment in 1974, MCA has earned a reputation for consistent delivery of thoughtful design, on time and within budget. As a result, the majority of the firm's work is with repeat clients and client referrals.

### Specialized Expertise

MCA is experienced with a broad range of project types, from mixed-use residential developments to historic restorations, however, the firm specializes in design for the aviation industry. We have designed over 4.5 million square feet of aviation-related facilities, including:

- over 3,283,000 sf of aircraft maintenance hangars, GSE facilities and cargo buildings
- over 200,000 square feet of terminal facilities
- over 1,000,000 square feet of flight kitchen facilities

The specific, aviation-related project types MCA is experienced with include:

- aircraft maintenance hangars, ground service equipment facilities and air cargo buildings
- operations facilities, including offices, training and conference rooms, emergency operations centers, and employee break, locker and lunch rooms
- terminal improvements, including ticket counters, passenger lounges, hold rooms, info display systems; security baggage scanner installations and baggage belts
- commercial flight kitchens
- retail and food/beverage concessions

### Sustainable Design

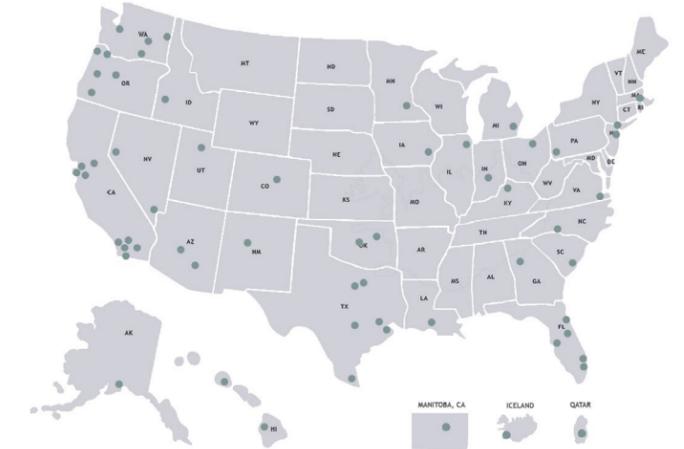
As a member of the US Green Building Council, sustainable practices are a part of MCA's overall design philosophy. Our strength is in incorporating sustainability and efficiency as integral parts of our design, whether our clients pursue certification or not. With our clients' budget and goals in mind, we strive to decrease long-term building costs, including water & energy usage and maintenance, through incorporation of innovative strategies in each design. We work with clients to thoroughly integrate green and sustainable design throughout the process and realize buildings that are sustainable in a technical sense, and also in the sense that each building is designed to maintain its value to building users over time.

### Ability to Respond

MCA provides services to both public and private clients under a variety of contract types. MCA's team includes LEED™ Accredited Professionals and architects licensed in the following states:

- |              |                 |                |
|--------------|-----------------|----------------|
| • Arizona    | • Illinois      | • New Jersey   |
| • California | • Indiana       | • New York     |
| • Colorado   | • Massachusetts | • Ohio         |
| • Florida    | • Michigan      | • Oregon       |
| • Georgia    | • Minnesota     | • Pennsylvania |
| • Hawaii     | • Montana       | • Texas        |
| • Idaho      | • Nevada        | • Washington   |

MCA has worked at 64 regional and international airports across the country and is experienced in providing documents and drawings specifically tailored to individual agency standards. Below is a map of airports where the firm has completed design work:



Whether a project is in San Francisco, Newark, or our hometown of Portland, OR, MCA Architects can design and manage it with confidence — from preliminary planning through construction administration.

Aviation design work is deeply ingrained in the fabric of our company, so MCA's airport projects rarely start from scratch. Instead, our staff draw upon our robust library of documents, resources, and collective insights regarding the various local airports, DOA, port authorities, city and state agencies. Our approach includes the involvement of sub-consultants local to each project site. Over the years, we have developed strong relationships with sub-consultants nationwide. Their familiarity with local codes, governing agencies, and the airport adds to the strength of the quality of our construction documents and helps expedite permitting and review processes.

## REPRESENTATIVE PROJECT EXPERIENCE

### AVIATION SUPPORT FACILITIES

#### AERO PORTLAND / AEROTERM

- Remodel & As-built drawings for 2 Cargo/Distribution Facilities
- Cargo/Distribution facility Addition/Renovation for DHL (tenant)
- Air Cargo/Distribution Facility Addition

#### AEROTEC

- Aircraft Staging Hangar, Preliminary Design & Feasibility; Grant County Int'l Airport, Moses Lake, WA

#### AIRTRAN AIRWAYS

- ATL: Maintenance Hangar and Support Facility
- ATL: Maintenance Hangar Expansion

#### ALASKA AIR / HORIZON

- SEA: GSE / GSE Annex Tug Lift
- SEA: North Cargo Training Facility

#### AMERICAN AIRLINES

- PDX: Cargo Relocation and Expansion
- SEA: Cargo Offices Remodel

#### EVERGREEN INTERNATIONAL AVIATION

- General Aviation Hangar & Office; McMinnville Municipal Airport, OR
- Helicopter Maintenance Hangar (thru CDs & permitting), Chris Crusta Memorial Airport; Abbeville, LA
- Helicopter Maintenance Hangar (thru CDs & permitting), Scholes Int'l Airport; Galveston, TX
- 747 Aircraft Hangar (thru schematic design); Marana Regional Airport, AZ
- Boeing Dreamliner Shipping Mechanical Equipment (SME) Facility (thru SD); Charleston Int'l Airport, NC
- Helicopter Maintenance Facility Office Tenant Improvement; McMinnville Municipal Airport, OR
- Space Museum Tenant Improvements; McMinnville Municipal Airport, OR

#### HAWAIIAN AIRLINES

- HNL: Peer Review of Construction Docs & Best Practices for Maintenance Complex
- HNL: Office Furniture Systems layout and programming for Maintenance Complex

#### HAWAIIAN DEPT. OF TRANSPORTATION (FOR HAWAIIAN AIRLINES)

- HNL: Aircraft Maintenance/Cargo; Site selection through bridging documents

#### MESA AIRLINES

- DFW: New Aircraft Maintenance Hangar

#### PORT OF PORTLAND

- PDX: Quick Pay Parking Facility
- PDX: Airport Maintenance Facility
- PDX: South Cargo Buildings Rehabilitation

#### SOUTHWEST AIRLINES

- OAK: Provisioning Facility

#### SPIRIT AIRLINES

- DTW: Aircraft Maintenance Hangars Assessment & Recommendations; Detroit

#### UNITED AIRLINES

- JFKL: Air Cargo and GSE Facilities
- LAX: Air Cargo Facility (and subsequent PMO office build out)
- HNL: Air Cargo Facility
- MIA: Air Cargo Facility
- EWR: Air Cargo Facility
- OAK: Oakland Maintenance Center
- ORD: Ground Equipment Maintenance Facility
- SFO: Ground Service Equipment Facility
- DEN & MIA: Flight Training Facilities

#### WINNIPEG AIRPORTS AUTHORITY

- Wide-Body Aircraft Paint Hangar Winnipeg Int'l Airport, Manitoba

### MILITARY / DEPT. OF DEFENSE

#### U.S. ARMY CORPS OF ENGINEERS

- Aircraft Maintenance Facility; Al Udeid Air Base, Qatar - As Architect of Record for this 95,460 sf aircraft maintenance facility project, MCA reviewed the work of the Italian design team and directed modification of design and contract documents. Facilities included a two-bay aircraft maintenance hangar, chiller yard, fire pump house, fuel shop building, security forces facility, backshop facility, and transformer buildings.

#### U.S. CUSTOMS & BORDER PROTECTION

- Schematic Design for Aviation Hangar and Offices; Yuma, AZ

#### OREGON MILITARY DEPARTMENT

- Flight Operations Facility Schematic Design (Design/Build); Salem, OR
- Supply Distribution Warehouse; Camp Withycombe, OR
- Medford Armory Addition/Remodel; Medford, OR
- Kliever Armory Addition/Remodel; Portland, OR
- Kliever Rifle Range Modification; Portland

#### OREGON AIR NATIONAL GUARD

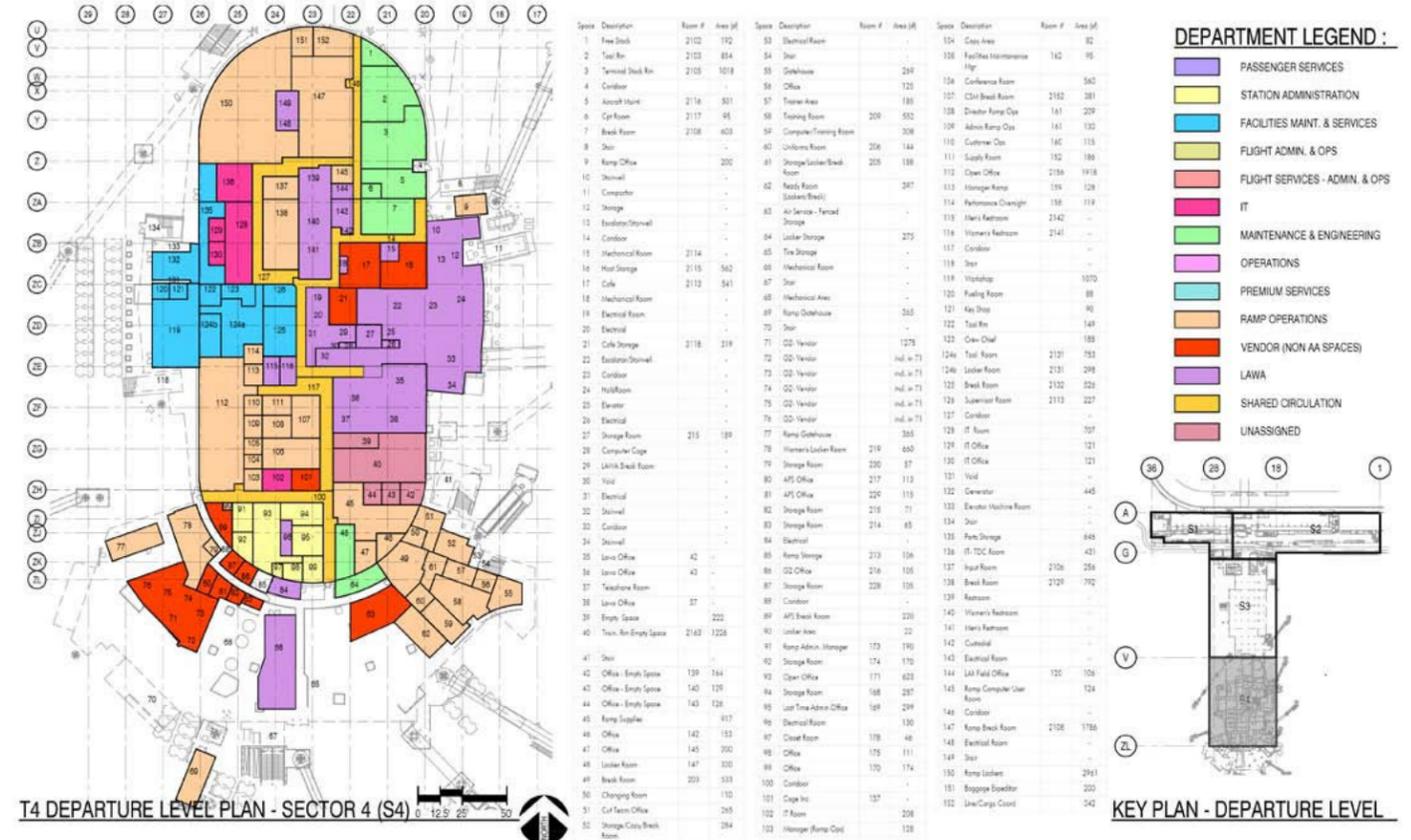
- Flight Simulator Building Renovation; Kingsley Field, Klamath Falls, OR
- Joint Reserve Forces Dining Hall/ Admin. Facility Schematic Design; Portland Air Base, OR
- Multi-Improvement Stage Projects; Portland Air Base, OR
- Fuel Cell Dock Hangar Addition/Remodel; Portland Air Base, OR
- Fall Arrest System at Fuel Cell Dock; Portland Air Base, OR
- Survival Equipment Building Relocation; Portland Air Base, OR
- Alert Shelter Complex; Portland Air Base, OR
- Corrosion Control Maintenance Hangar (C-130); Portland Air Base, OR
- Helicopter Maintenance Hangar; Portland Air Base, OR
- Medical Facility; Camp Rilea, Warrenton, OR

- Multiple Project IDIQ Contracts; Portland Air Base & Camp Rilea, OR
  - \* Interior Remodel for Building 142 Conference Room
  - \* Roof and HVAC Remodel for Building 142
  - \* Hangar Door Replacement for Building 255
  - \* Communications Center Addition for Building 155
  - \* New Maintenance Building 140 and BCE Compound Storage and Compound Pavement Improvements for Building 140
  - \* Overend Gate for Building 470
  - \* Repair Shop Remodel for Building 235
  - \* Roof/Compound Improvements for Building 145
  - \* Communications Building Addition for Building 115
  - \* Outdoor Recreation Facility
  - \* Security Forces Facility Construction/Repair
  - \* HVAC Upgrade for Building 125
  - \* Mobility Storage Addition for Building 188
  - \* AT/FP Parking
  - \* Wing Operations Building Alterations, Building 300
  - \* Structural and Maintenance Shop Addition at Building 374
  - \* Test Stand HVAC Installation for Building 365
  - \* Server Room and Offices Remodel at Building 373
  - \* Window Replacement in Building 360
  - \* Ice Storage for Building 255



**OPERATIONS AND CARGO FACILITIES EXPANSION/RELOCATION FOR AMERICAN AIRLINES**  
PDX, Portland, Oregon

This project consisted of several components, both in the terminal and South Cargo West. At the terminal, MCA designed new flight operations facilities on the deplaning level, including offices, meeting room, lunch room, locker and shower rooms. Also in the terminal, MCA designed a new baggage claim room, remodeled the ticket counter area and adjacent TI room, and replaced podiums and finishes in two hold rooms. At South Cargo West, MCA relocated the American Cargo operations facilities, including new offices and cargo area, and created a new two-bay ground service equipment maintenance facility with bulk fluid system and monorail crane.



**OPERATIONS SPACE ANALYSIS STUDY FOR AMERICAN AIRLINES**  
LAX, Los Angeles, California

American Airlines' operations at LAX are increasing substantially, with staff growth projected at 400+ new employees for 2016 and 2017. When this project began, AA had various operations and employee support spaces located on the ramp level, concourse level and mezzanine level of Terminals 4 and 6, and the remote Eagle Terminal. MCA Architects was hired to analyze the current use, capacity and condition of existing operations areas, and determine what changes are needed to support the increased staff at LAX. MCA documented existing as-built conditions and compared them to AA space standards and LAX requirements. Information was gathered from department representatives by walking with them through each space, issuing detailed programming questionnaires about current uses and goals, and following up with interviews. MCA developed projections of space needs into the future, along with programming recommendations, and presented it all in a comprehensive report. The report included findings from the programming questionnaires, department representative interviews, space requirements calculations, narratives, security, power, signal, lighting, and ventilation requirements, and furniture fixture and equipment requirements for all spaces identified.



## OREGON AIR NATIONAL GUARD (OANG)

Various locations throughout Oregon

MCA has worked on 55 Oregon Air National Guard projects throughout the state. These projects have included:

- Alert Crew Complex at Portland Air Base
- Fuel System Corrosion Control at a Portland Air Base C-130 Maintenance Hangar
- Joint Reserve Forces Dining Facility at the Portland Air Base
- Various projects completed under two consecutive two-year IDIQ contracts
- Aircraft Maintenance Hangar at the Portland Air Base
- Survival Equipment Building at the Portland Air Base
- Flight Simulator Addition, Kingsley Field, Klamath Falls, OR



## OANG AIRPORT CREW ALERT BASE

Portland Air Base

MCA designed the Alert Crew Complex with drive-through hangar bays to accommodate F-15 aircraft on full-alert status and quarters to house the alert crews, in attendance on a 24-hour basis. The design provides housing, eating, sleeping and recreation facilities for up to 12 people at a time. All areas are laid out to provide ease of access to the aircraft under high stress conditions. During alert conditions, electrical systems are designed to automatically shut down cooking facilities, activate corridor, work area and hangar lights, and open hangar doors. As the facility is a secure area, a guard station and secure perimeter are included. The security guard station has unobstructed views of the area and equipment for monitoring sophisticated seismic, microwave and televised security systems. The lounge/living area doubles as an observation area for military aircraft takeoffs and landings.



## OANG FUEL SYSTEM / CORROSION CONTROL

Portland Air Base

The C-130 hangar was designed and constructed to provide fuel cell and corrosion control maintenance for a flight of C-130 aircraft for the AFRES Search and Rescue contingent. Vertical skylights inset into the east and west sloping roofs provide constant natural light in the hangar bay. This, combined with light reflective floor, walls and structure dramatically reduces lighting loads.

The exterior elements of the building were chosen for durability, ease of maintenance and to expedite construction. The exterior walls are precast prestressed textured concrete wall panels.



## OANG AIRCRAFT MAINTENANCE HANGAR

Portland Air Base

A major concern in the design of this building was to fit its large size into a complex of smaller buildings. The architectural theme of the complex specified a sloped roof over the width of the hangar doors and through the ridge of the building. The balance of the roof plane is stepped down twice on each side of the ridge. The vertical walls of the steps incorporate translucent panels providing an even distribution of natural light over the entire hangar, reducing energy consumption.

The berm on the south side continues the reduction of scale in this direction and extends into the landscape wrapping around the building, concealing service spaces. In addition, the berms visually tie the hangar to the buildings to the east and south.

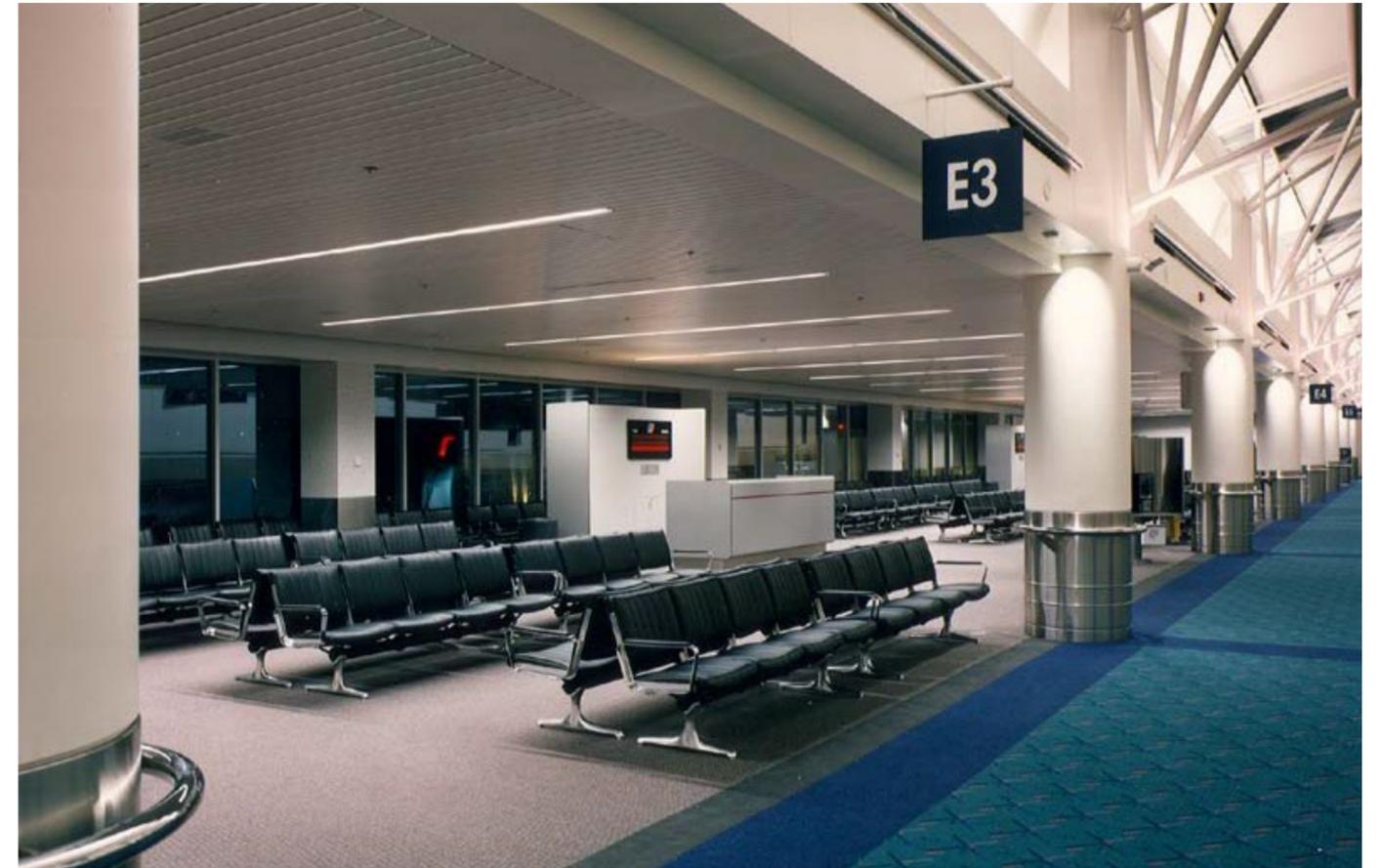
This project received a Merit Award from the U.S. Department of the Air Force.



## UNITED AIRLINES T.I.

Ontario, CA

MCA Architects designed United Airlines' tenant improvements in all the public and non-public areas of Ontario's new Terminal Building II. Public areas were designed to maintain a consistent theme throughout the airport. The scope of work included ticket counters, ticket offices, baggage conveyor system, baggage service office, break room, training room, offices and control room.



## UNITED AIRLINES TERMINAL EXPANSION NORTH, PDX

Portland, OR

MCA designed tenant improvements for the Terminal Expansion North project at PDX, accommodating United Airlines' growing presence in Portland. Work on the concourse was completed in phases. The first phase consisted of 8,144 sf of holdroom space, 839 sf of upper level office space and 25,539 sf of lower level operations. In the second phase, United added additional gates, incorporating 25 ticket counter positions, a 15,077 sf baggage handling facility and new 4,350 sf Red Carpet Room.



## OREGON MILITARY DEPT. - ADDITION & REMODEL OF ARMORIES

Portland and Medford, OR

### KLIEVER ARMORY ADDITION & REMODEL

The existing Kliever Armory was expanded and remodeled to accommodate additional troop units and their equipment. The addition provided 24,000 sf of office and recruiting area, classrooms, medical and storage facilities. The 10,000 sf of remodel updated existing spaces and provided an automated indoor rifle range.

### MEDFORD ARMORY ADDITION & REMODEL

The existing Medford Armory was expanded to fulfill not only a growing military mission, but also to facilitate the use of the building as an exposition and recreation facility. By the addition of 11,000 square feet of office and training space, the facility can now function as an armory while other parts of the building are being used for public functions. Remodeling of 8,800 square feet included upgrading the auditorium, provision of handicapped restrooms, extensive storage areas and a kitchen facility capable of serving 200 persons.



## COMMUNICATIONS CENTER & EMERGENCY OPERATIONS CENTER

Portland International Airport, OR

MCA Architects worked with Ross & Baruzzini to design this 4,500 sf suite of flexible work spaces, to be used as emergency command center, information dispatch center, conference space and training facilities. Communications and electrical wiring runs through raised floors, allowing easy access for modifications and additions as systems are updated. Additionally, individual users have control of their environment, from lighting level, to warmth of feet, to height of keyboard and monitors. Break area, toilet and shower facilities are immediately adjacent, allowing dispatchers to stay close to their work. The center is served by a range of communications media, from high-tech plasma screens to low-tech pin-up and marker boards. The whole facility can be supported by an independent power source and HVAC system in the event of a power system failure.



## AIRPORT MAINTENANCE & DISTRIBUTION FACILITY

Portland International Airport, OR

MCA designed this facility to adapt to the varied services and functions required to maintain a major international airport. Facilities include offices; distribution center; shops for carpentry, electrical, landscape, vehicle maintenance and metal; vehicle storage; bulk storage and a fuel island. A central circulation corridor with a skylight is used as a greenhouse for rejuvenation of plants for the airport terminal. The structure is oriented on its site to accommodate wind and to maximize passive solar benefits and future active solar power. Landscape surrounding the exterior pre-cast concrete walls is bermed to soften the scale of the building and to improve energy conservation. The design also worked around existing large native oak trees that were retained as a focal point of the design



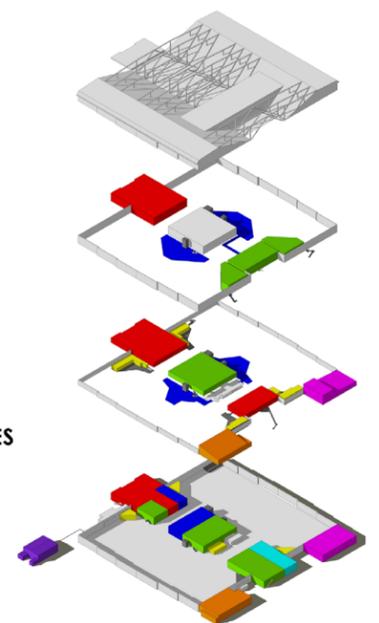
## OAKLAND MAINTENANCE CENTER AT OAKLAND INTNL. AIRPORT

Oakland, CA

This facility, originally built in 1971 as a maintenance base for wide-body aircraft, grew too small for the required United Airlines' workload. MCA's work involved design of 56,000 sf of space inside the hangar on two levels of mezzanines. Shops, storage, engineering offices, planning centers, work areas, chair maintenance and staging areas were all arranged on these work platforms. The platforms are also the support structure for pylon cranes used to move aircraft engines. Platform lifts were installed for transfer of equipment and materials between levels. All new and remodeled office areas were fitted with new modular furnishings. Finally, the entire facility was upgraded to comply with current ADA requirements. All of this work was completed while the facility remained fully operational.

Other improvements to the OMC included a facility to produce and distribute compressed air for aircraft engine testing. The system was designed to eliminate the need to fly the aircraft in order to perform the testing, saving much time and thousands of dollars. As a part of this project, MCA also completed the design of a 13,000 sf facilities shop building addition and a vehicle maintenance shop renovation.

- OFFICE SPACE
- FACILITIES SHOP
- PLANNING / RESOURCE CENTERS
- SHOP SPACE
- LAB SPACE
- TOOL, EQUIPMENT, AND MATERIAL STORES
- COMPRESSED AIR PLANT
- EQUIPMENT MAINTENANCE





## MIAMI INTERNATIONAL AIRPORT AIR CARGO FACILITY

Miami, FL

This air cargo facility includes a 95,000 sf cargo area with 52,000 additional sf for future warehouse expansion, as well as 13,000 sf of operations offices, conference and training spaces and 5,400 sf of locker room, lunch room and other employee support areas. A light weight fabric roof system over the cargo area allows for wide column spacing, satisfying the open area requirements of a warehouse. The translucent fabric-covered framework allows natural light into the facility, reducing the need for artificial lighting.



## AIRTRAN MAINTENANCE HANGAR & OFFICES

Atlanta, GA

MCA Architects worked with their client, AirTran Airways, to develop an aircraft maintenance facility that would serve their operational needs into the future, as well as communicate the dynamic nature of the company to passersby, customers and employees. With an innovative and thoughtful approach to design and detailing, the team developed a functionally sophisticated facility that is also aesthetically compelling and injected with energy.

The facility includes a two-bay, 56,000 sf hangar with a translucent fabric membrane roof stretched across a series of arched metal trusses. The fabric roof allows natural day-lighting of the hangar and reduces energy consumption. The hangar will hold three B-717 aircraft or one B-757. Operational and administrative support functions are housed in an adjoining, conventionally steel-framed structure. The ground floor of this structure has direct access to the hangar and supports maintenance operations, with numerous shops, storage areas, locker rooms and break areas. The second floor of this structure houses management offices, conference rooms, lunchroom, engineering and administrative areas. This 20,000 sf building has an expansive curved glass curtain wall with operable windows, allowing both natural light and fresh air into the space.



## NEWARK INTERNATIONAL AIRPORT AIR CARGO FACILITY Newark, New Jersey

MCA Architects designed the main warehouse of this facility with pre-manufactured steel trusses clear spanning 130 feet, leaving the entire area free of columns. The high-tech translucent fabric roof allows for natural lighting during the day, thereby reducing energy expenses. The remainder of the building is conventional steel frame with precast concrete panels cladding the entire facility. The support core of the facility contains the customer service lobby, cargo sales offices, conference and training facilities, employee locker rooms, a lunch/break room and a building support plant.

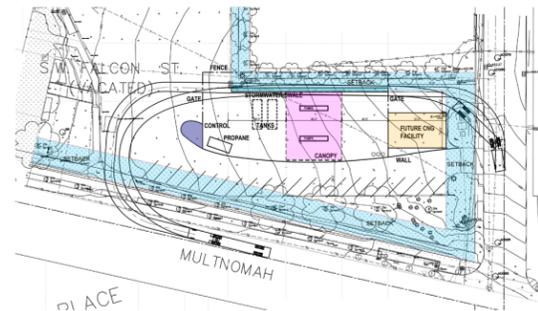
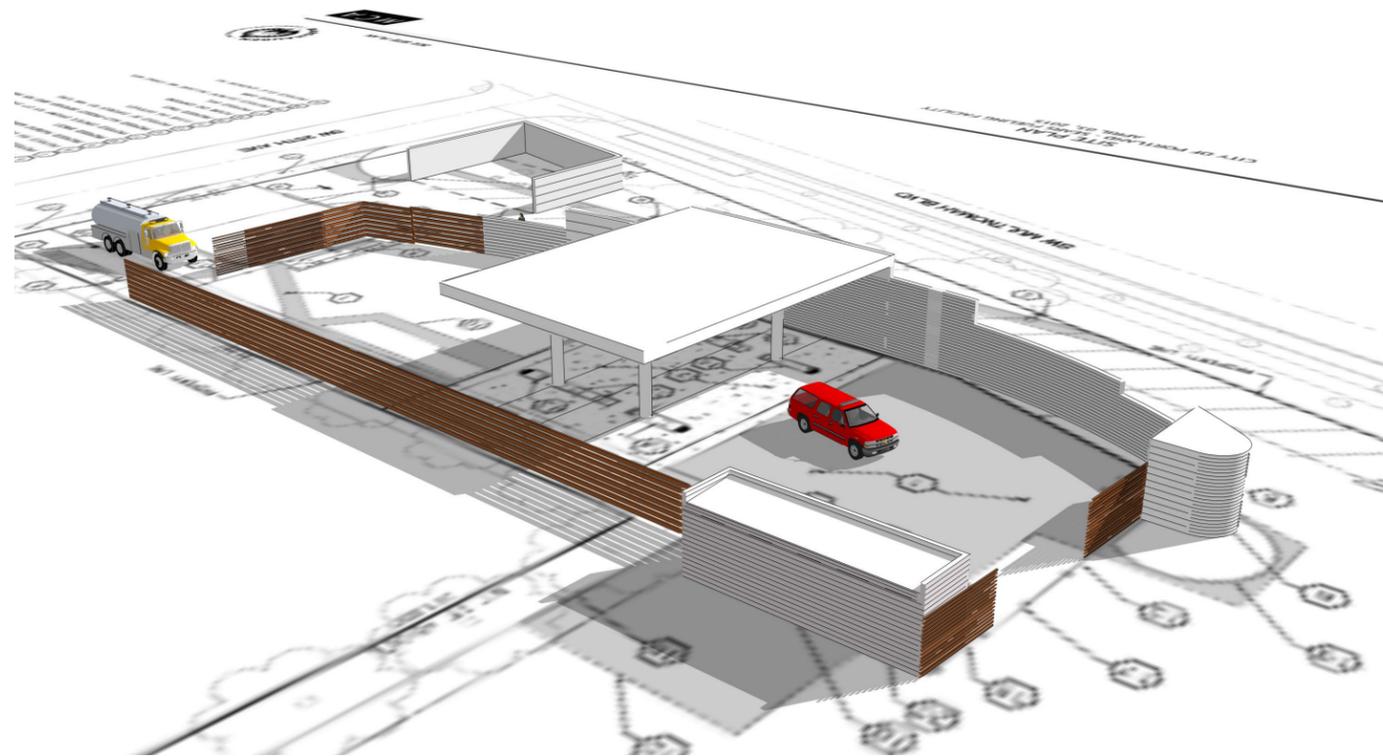


## HAWAIIAN AIRLINES AIRCRAFT MAINTENANCE & CARGO COMPLEX Honolulu, Hawaii

MCA was hired by the State of Hawaii (DOT-A) to assist with relocation of an Air Cargo and Aircraft Maintenance Complex, to be occupied by Hawaiian Airlines (HA). MCA's scope was to study site alternatives, design the new facility and prepare Design/Build RFP documents. The challenge was to design a facility that could be constructed within their fixed budget of \$78M (after a previous design team had exceeded the budget by over 50%).

The new complex includes an aircraft hangar, aircraft maintenance shops, supply management offices and warehouse, ground service equipment shops, aircraft fleet servicing operations area, facilities maintenance shop, training facilities, administrative offices, credit union, central employee support areas, and cargo processing management offices and warehouse, as well as several out buildings. Total building area is 282,695 sf. The Maintenance Hangar at the north end of the complex is designed to enclose a wide-body A350-800 and two B717 aircraft. The facility has a fabric roof, supported by a galvanized steel, arched-truss structure. This allows ample natural daylighting and a large unobstructed clear span inside. At the south end of the complex, the Air Cargo Operations and High-bay Supply Storage share a similar fabric-roofed structure. A circulation spine connects the entire facility.

MCA lead this design effort, working with a wide range of user groups and stakeholders from Hawaiian Airlines (the tenant), as well as representatives of State of Hawaii (the owner). Throughout the project, MCA collaborated closely with AvAirPros (the project/construction manager for this portion of the work), while also coordinating work with the Terminal Modernization Plan (a collection of projects in various stages of development at HNL).



**SEARS FUELING FACILITY**  
Portland, OR

MCA provided a site analysis and a schematic design report to the City of Portland for a new fueling facility located at the Sears Reserve Center site. The City's goal is to develop a fuel facility that will be operational after the Cascadia Subduction Zone Earthquake. As such, the design will meet the structural standards established for essential facilities. Elements of the design include vehicle circulation, fuel island canopy, fuel tanks, fuel pumps, other small tanks, storm water swales, screen walls, security enclosure, signage, parking lots and lighting. Phase I was completed in 2015; Phase II, which includes full design and construction administration, is ongoing.



**SFO GROUND SERVICE EQUIPMENT BUILDING**  
San Francisco, California

MCA designed a new Ground Service Equipment (GSE) building that consolidates United Airlines' ground services under one roof. The program includes 18 service bays, overhead cranes, engine/chassis de-grease bays, parts room, tire shop, battery shop, paint shop, welding shop, wash down bays, locker rooms, employee support areas, bicycle repair shop, parking and circulation for employee vehicles. The administrative area includes offices, classrooms, lunchroom and technology training area.

PROJECT HIGHLIGHTS

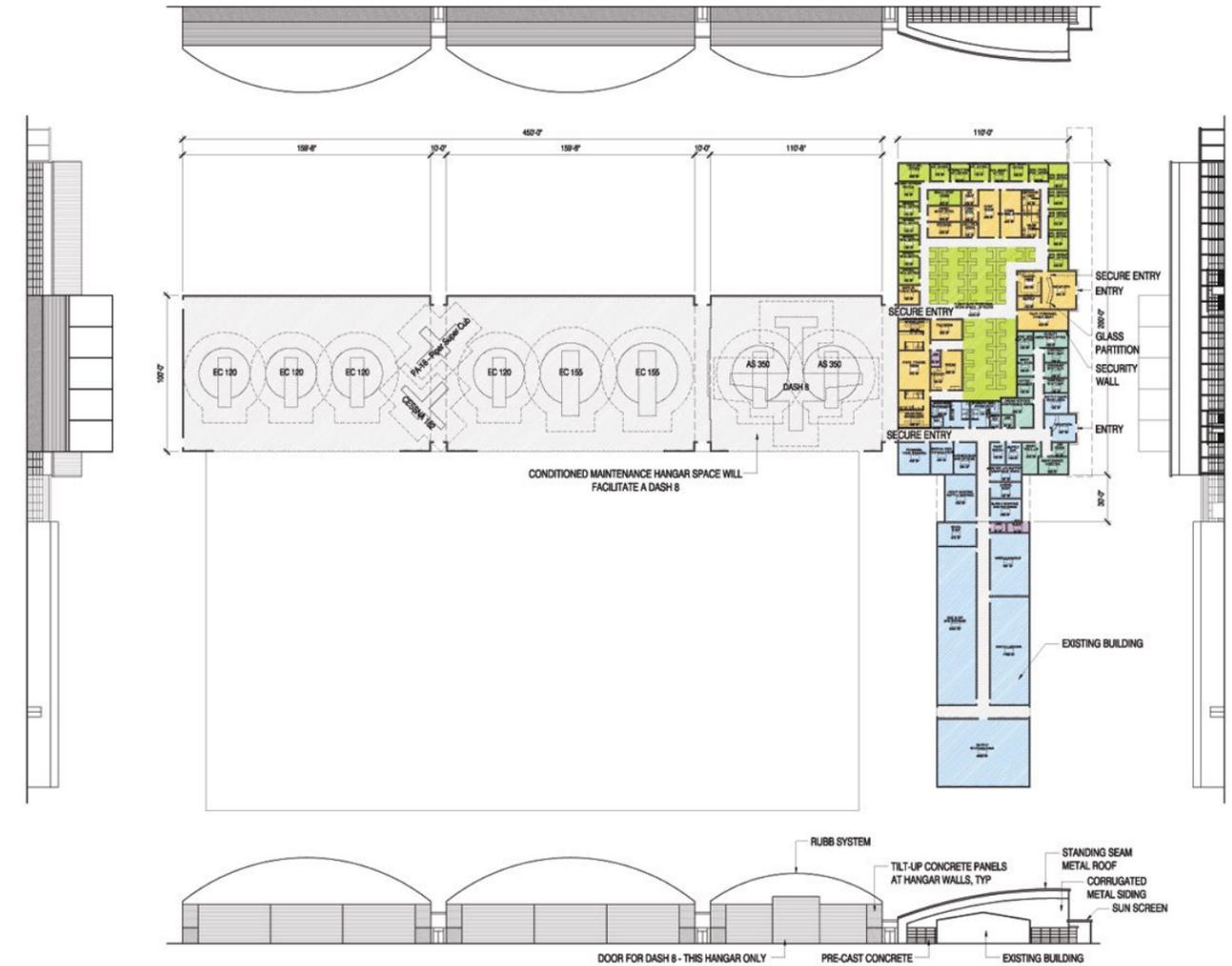
TYPE: New Construction

SIZE: 70,000 SF



## GROUND EQUIPMENT MAINTENANCE FACILITY, O'HARE INTL AIRPORT Chicago, Illinois

This comprehensive shop facility was designed to hold all of United Airline's ground equipment maintenance operations under one roof. The facility, which is one of the largest of its kind, neatly contains operations that had previously been spread throughout the airport. The building incorporates maintenance and wash bays, glass and welding shops, engine remanufacturing and parts departments, fuel dispatch and bulk fluids rooms, paint booth, storage, administrative offices, locker rooms, lunchroom and kitchen. State-of-the-art technology has been provided in all areas, including overhead bridge cranes, parallel lift floor hoists, automatic parts retrieval towers and explosion-proof fueller maintenance bays. The design includes abundant day lighting to increase energy efficiency and create a pleasant working environment.



1 SCHEMATIC DESIGN OVERALL FLOOR PLAN AND ELEVATIONS  
21 1" = 40'-0"

## AVIATION HANGAR & OFFICES, U.S. CUSTOMS & BORDER PROTECTION Yuma, Arizona

MCA Architects provided schematic design services for this project.



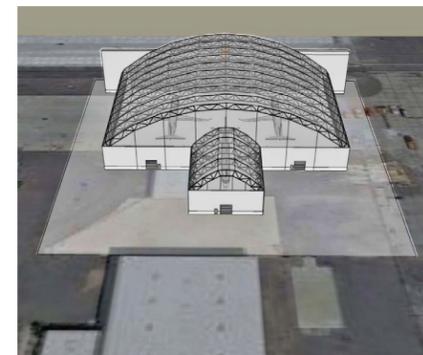
## EVERGREEN CORPORATE OFFICES & HANGAR

McMinnville, Oregon

MCA led the design of Evergreen International Aviation's new corporate offices and general aviation hangar, based at their McMinnville campus.

The two-story office and administration building is finished with rich, earthy materials such as timber and natural stone. The front lobby is open to the second-story ceiling above and is filled with natural light from a full-height wall of exterior windows. An elegantly curved, open staircase connects the lobby's main floor to an open landing on the second floor. A helicopter suspended from the lobby ceiling creates a dramatic visual feature. The building is designed with numerous interior windows and a central open corridor that runs through the second floor offices. This allows the natural daylight pouring into the lobby to be carried throughout the interior, and also provides views of the helicopter from the far end of the building.

The adjacent open hangar space was configured to accommodate two Gulfstream IV aircraft. Expansive windows in the hangar provide plentiful natural light. The interior finishes were selected for durability and cleanliness. Aircraft access is provided via a 28' by 120' sliding hangar door.

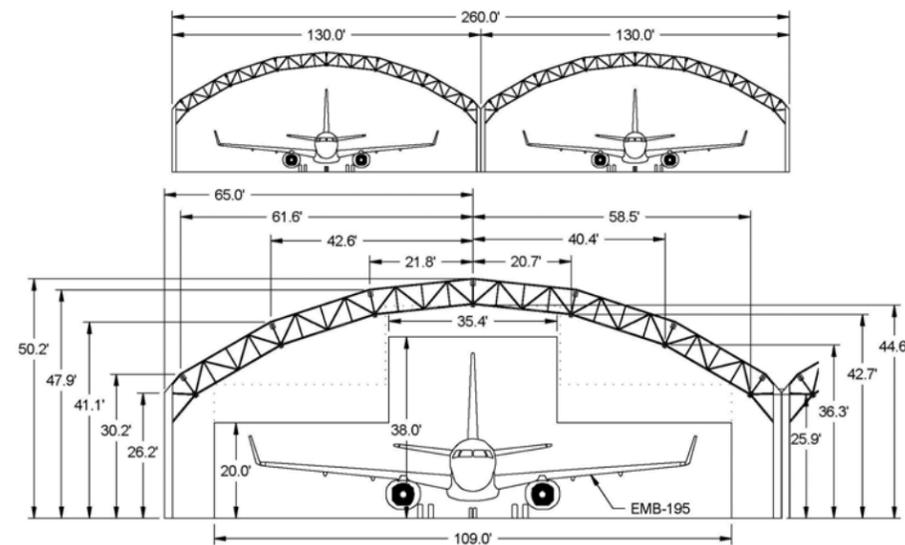


## AIRCRAFT STAGING HANGAR, GRANT COUNTY INTERNATIONAL AIRPORT

Moss, WA

MCA worked with AeroTEC to provide preliminary planning through schematic design services for a new aircraft testing hangar. This new facility would enhance the efficiency of AeroTEC's operations and allow them to take on new aircraft certification projects, testing aircraft in an environment protected from wind and weather. MCA's services culminated in a report with initial construction cost estimates that the client could use to evaluate the viability of their project, before investing more resources.

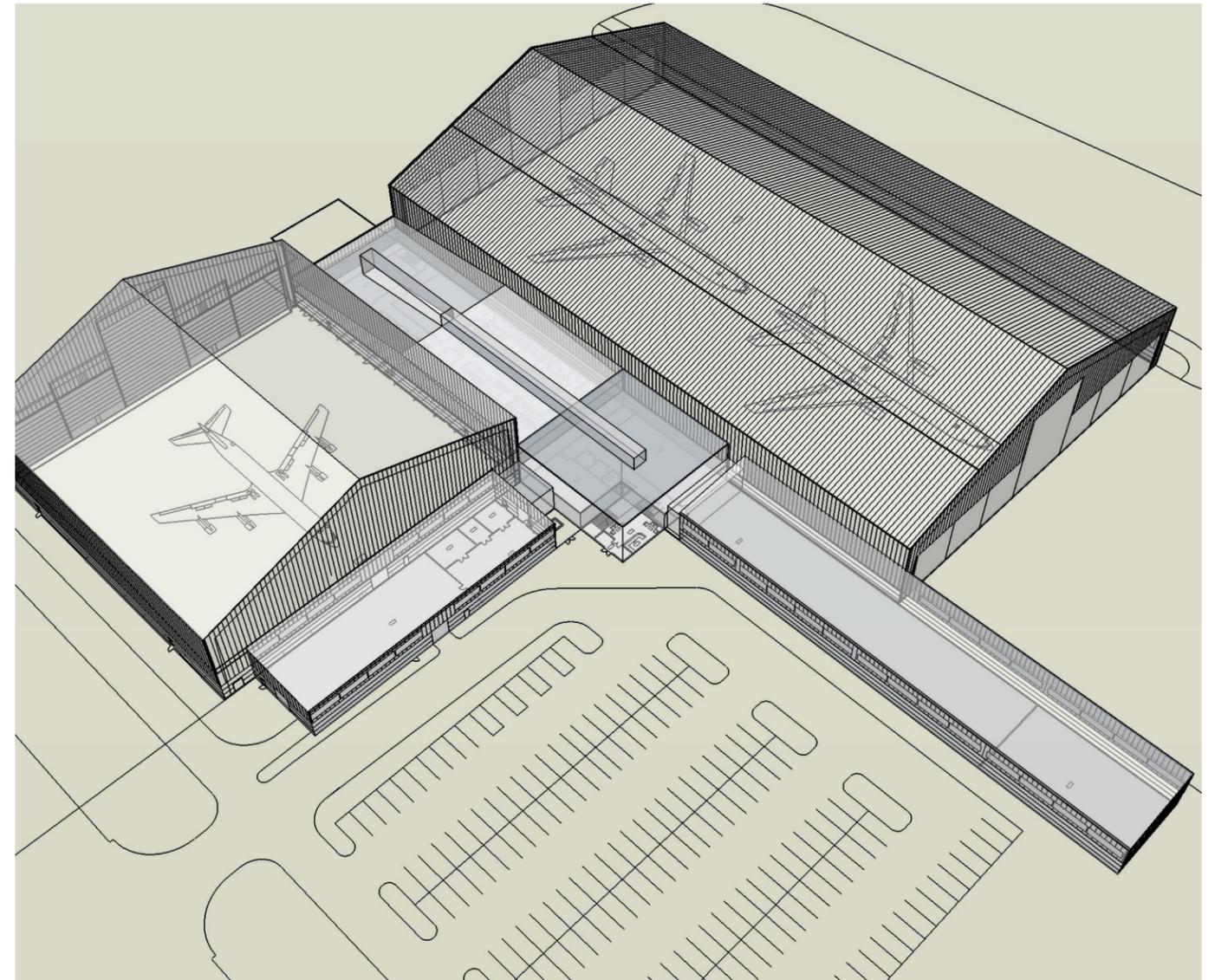
The hangar is designed to accommodate three Mitsubishi MRJ 90 aircraft. The facility has a RUBB translucent fabric roof, supported by a galvanized steel, arched truss structure. The hangar will house approximately 60,000 square feet with an additional square footage available onsite for future hangar expansion. The overall dimensions of the building are 200' x 266' in the principal volume, with a 75' x 75' nose pocket at the south end. A small area within the hangar will be enclosed to provide toilet facilities. All other offices, shops and storage are located within an adjoining building.



## MESA AIRLINES AIRCRAFT MAINTENANCE HANGAR

Dallas Fort-Worth International Airport, Texas

MCA Architects assisted Mesa Airlines with the phased development of a new aircraft maintenance hangar facility. The 39,000 sf hangar accommodates Embraer 190 and Bombardier CRJ 900 aircraft. Included with in the hangar is a small office, restrooms and a hangar support utility room. The hangar foot print is 260' x 150' and consists of two arched truss structures, married together. These galvanized steel structures are covered by a RUBB translucent fabric roof, which allows ample natural daylighting of the interior. MCA provided preliminary planning and design development services.



## ARINC AIRCRAFT MAINTENANCE SUPPORT

Will Rogers World Airport, Oklahoma City, OK

MCA provided schematic design services for two separate projects for Arinc at Will Rogers World Airport. The first of these projects was a two-bay Aircraft Maintenance Hangar with a 27,000 sf Fabrication Support Facility. Finished common spaces included ground floor lobby, elevator lobby at ground and upper floors, elevator, hallways, toilet rooms, (1 set) stairs from lobby to second floor, utility, mechanical & electrical equipment rooms associated with new facilities. The second project, adjacent to the first, entailed the interior build out and upgrade of a hangar support facility.



## EVERGREEN 747 HANGAR

Marana Regional Airport, Arizona

MCA provided Investigation and schematic design services for a new maintenance hangar (87,070 sf) and support facilities (38,560 sf) for the Boeing 747 Large Cargo Freighter (Dreamlifter) aircraft. The hangar footprint was designed to be 314' x 275' with a 55' x 260' hangar door and 25' tall tail door. The adjoining support building houses the various shops: sheet metal, paint, composite and other miscellaneous spaces. The second story over the shops is for support offices.



## CITY OF PORTLAND FIRE STATION 18

Portland, OR

On this LEED Gold Certified project, we used high efficiency heat pump systems with economizer cycle ventilation and high efficiency tankless gas water heaters to conserve energy. Ventilation systems use occupancy sensors to operate only as needed and solar powered attic ventilation. Daylighting is optimized by using a combination of shade controlled fenestration and skylights with both light and occupancy sensors to automatically control the high efficiency artificial lighting. Special dual window shades were specified to provide glare reduction and black-out shades for daytime sleeping. The station uses a photovoltaic array on the roof to harvest solar energy (designed to be supplemented in future). A system to capture rainwater and re-use it for vehicle wash down and toilet flushing was devised and incorporated into the building design to reduce water consumption and provide significant cost savings on an ongoing basis. Products with high recycled content were used, including steel framing, gypsum board, concrete, carpet and other finish materials. "Green" products included low VOC paints (including epoxy flooring) and low toxicity adhesives and finishes such as linoleum flooring, carpeting and casework with formaldehyde free core materials. PF&R's Station 18 is also an excellent example of reuse and recycling. Large amounts of brick and premium wood wall paneling were re-used on site. An extensive program to maximize recycling of the project's construction waste was implemented.



## CITY OF PORTLAND FIRE STATIONS 15, 24, AND 30

Portland, OR

MCA led the complete seismic upgrade and renovation of three fire stations, concurrently. All stations were converted from dormitory type crew quarters with group showers and restrooms to new style quarters with individual sleeping rooms, showers and restrooms, in keeping with the needs of contemporary mixed-sex fire crews. Other common program elements included ADA upgrades, remodeled equipment bays, locker rooms, utility rooms, kitchens and equipment rooms.