COA AVIATION CAMPUS

Project Priorities

Existing Conditions, Program, Equipment

2019 07 10

Contents

Project Priorities

Primary Priorities

- HVAC
- General Classrooms
- Doors
- Code Compliance
- FAA Compliance

Secondary Priorities

- Security
- Visual Presence
- Parking
- Plumbing
- Water Intrusion
- Electrical
- Attractiveness

Programs and Enrollment, Design Implications

Programs and Enrollment

Current Programs

Aviation Maintenance Technology ("AMT"). Maintenance technicians are the interface between engineers and mechanics.

- Curriculum and facilities are subject to FAA requirements.
- Instruction is by cohort. Each cohort is limited to 25 students per FAA.
- Each cohort takes two 3-hour classes per day, for a total of 6 hours, Mon-Fri.
- All current cohorts are taught in the evening.
- Cohort quantity
  - 2 cohorts when the EDA grant was written.
  - 3 cohorts now.
    - Department is making it work but existing is not really ok.
    - Current student headcount is 100, but some are part time (per EC).
    - Still need the new classrooms for quality, allow space reversion to lab/shop.
    - HVAC is a big issue for instruction.
  - 5 cohorts: could do it with existing space but would need another instructor.
  - 6 cohorts: maximum with existing + AEDA project space (3 cohorts day, 3 cohorts evening).
- Student demographics
  - Many students are coming to school after a full day of work, often carrying a 50 lb. tool box.
  - Students range from 18 to 48 years old, averaging approximately 30 years old.
  - Full and large size adults, different bodies than typical high school graduate.
- Current program is supported by 2 full time faculty (soon to be 3), 6 part time faculty, 1 staff/part time faculty.

Future Programs

- **AMT**: Current demand could easily support 5-6 cohorts of AMT.

- **Avionics**: Avionics are the electronic management systems for aircraft, including communications, navigation, controls, systems status information.
  - There is strong industry and student interest to support an avionics program.
  - Avionics was previously offered by COA but is not currently available from COA or from any other institutions in the local area.
  - Class sizes can be 30 students, not limited by FAA mandate.

- Avionics is compatible with the existing facility.
- Instruction requires one lab and one classroom, which could be combined and overlapped with electrical. The lab component is more like a science lab, less like a hangar, but requires robust and plentiful power and data outlets. It is less important for avionics to be directly adjacent to the high bay space at ground level.
- Depending on course schedule, could increase parking load.

Instruction Logistics

- Instruction at the aviation campus currently starts at 3pm.
- Air quality and seating is important for long classes.
- Keeping indoor temperature reasonable is important for long classes.
    - Typical personal protection equipment is required in labs/shops.
    - Students are required to wear coveralls and cannot wear tank tops or shorts.
- Appropriate lighting is important for instruction in the indoor labs/shops and also in the outdoor ramp/tarmac area.
- The FAA will require the AMT program to provide a plan demonstrating that instruction will not be interrupted during construction.

Architectural Layout

- Typical airline maintenance hangar is a U-shaped layout, with a large open area (airplane access to outside), surrounded by shops. Maintenance hangars often include a mezzanine and overhead hoist. Ideal adjacencies provide a "work loop".
- Faculty offices are ideally positioned to provide supervision to lab/shop areas, but it is also ideal to maximize lab/shop area immediately adjacent to the high bay space on the ground level.
- Each hangar building needs at least one big hangar door ("double") with reliable functionality.
- Interior doors for classrooms and shops should be sized to enable movement of equipment using a forklift.
- FAA requires classrooms and shops to be separated by a partition.

Existing Facilities

Campus

The aviation campus is located on ~1 acre acquired in the 1960s from the Oakland Airport for use as a community college aviation maintenance training facility. The campus entry is at 970 Harbor Bay Parkway. The campus is surrounded on three sides by Airport property. There is a golf course across the street.

Harbor Bay Parkway is a wide street with a long stretch between stoplights and intersections, with mature trees on both sides. There are very few property entrances along this road and no street lighting. Traffic tends to be fast and driver attention focused on the road directly ahead.

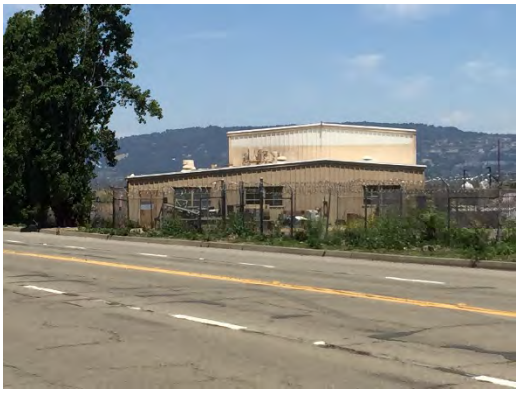
There is no directional signage for the campus from nearby intersections and the entry is inconspicuous from a driver's perspective.

Campus approach from the west

Campus approach from the east

View from campus entry to the west

View of campus entry from across the street



View of campus from across the street, west of entry (Hangar A). This view occurs very briefly when driving towards campus from the west.

Views from aviation campus to adjacent airport property.

View of OAK control tower from campus street

Airport property to the west of campus, view from

Site

- **Campus Entry, Front Door for Program**

There is a lot of speeding and drag racing on Harbor Bay Parkway at night. Safety for vehicles entering and exiting the campus is an issue. The noise also impacts instruction.

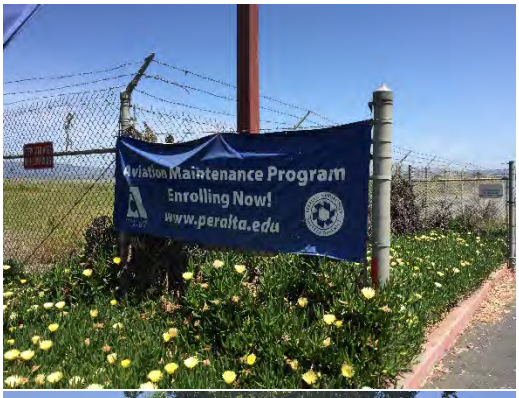
Campus entry, towards campus

Campus entry, toward road

Campus visibility from the street could be improved by street front signage improvements, landscape revisions, signage high on the buildings, a different exterior paint scheme, or other adjustments visible to drivers.

Existing District-standard campus entry sign has a light fixture but there is no site electrical available to connect.

College of Alameda sign at campus entry, no electrical connection for sign light





Other signage at campus entry: recruitment, program awareness, industry partners.

The “front door” for the program is on the east side of Hangar B, past Hangar A, and is not visible from the street or from the entry gate.


View of Hangar A at campus entry


Going past Hangar A towards Hangar B

Approaching Hangar B

Front door to program, Hangar B

Campus entry from Hangar B

Passing Hangar A towards Harbor Bay Parkway

- **Parking for Personal Vehicles**

Parking stall quantity is already an operations issue. The existing 60 general stalls + 5 faculty stalls + 2 ADA stalls cannot accommodate 75 students and 2 full time and 6 part-time faculty and 1 faculty/staff without double-parking. Students currently double park by class so they can coordinate

departure. Typical current double-parking quantity is 10-15 cars, organized by class to facilitate departure.

A minimum of 85 stalls are needed for current enrollment, not including ADA, a net increase of 20 stalls. Ideally, an additional 30+ stalls would better support expansion for aviation industry programs beyond AMT. There may be an opportunity to lease some adjacent, unimproved property for parking personal vehicles and to improve the total stall count by improving the shape of the area available for parking.



Personal vehicle parking at Hangar A and Hangar B


Accessible Parking at Hangar B

The area between the Hangar A parking lot, ramp area, and property line, which is currently occupied by discarded items, might be an opportunity to expand the area available for parking personal vehicles.

- **Program Use of the Exterior Space**

There is a large paved area adjacent to each Hangar ("the ramp area"). "Ramp" refers to function for aviation purposes, not to slope/grading. The ramp area is flat.

Between Hangar A and Hangar B

Airplane storage at Hangar B

Instruction is also conducted outside (see also Site Lighting). "We are aircraft technicians. Being out in the weather is not a problem." However, appropriate lighting, equipment, and security are required to work safely and efficiently.

Airplanes, chemicals, engines, discarded items, supplies, jet fuel, and hazmat are stored outside. Jet fuel is currently stored in a white shed adjacent the chemical storage shed. The chemical storage shed is divided into separate spaces for open containers and sealed containers.

Chemical storage, jet fuel storage between Hangar A and Hangar B

The main access for large items (such as airplanes) is through a taxiway on airport property to the west.

The engine tie-downs in the paved area between Hangar A and Hangar B are used daily as part of the engine testing process. The staff also tie-down items (such as airplanes) stored in this outdoor area during winter break. See also Engine Area.


Misc discarded items stored near Hangar A

This site light does not function. The ground is also uneven near the pole due to tree roots.

- **Site Lighting**
    - Instruction: the paved yard between Hangars is used intensively for instruction. Instruction on airplanes prefers to be outside but relocates to inside when the sun goes down (6pm winter, 7:30 summer) because it gets too dark outside to work. Existing site lighting inadequate / non-functional / too difficult to maintain.
    - Security and general operations: per EC, “pitch black at night, can’t see my hand, we use flashlights to lock up.” There is no ambient light from adjacent properties.
    - Maintenance access: the light pole is too tall, cannot access even with existing lift. Existing lift is also based at the main campus, not at the aviation campus.

Light Pole at campus entry

- **Site Drainage:** Both faculty and engineers report significant water intrusion to the interior of both Hangars on the side of each building containing the hangar doors (see also Building

Components, below). The paved yard suffers occasionally from ponding. The current drain system collects the water in a hole and then pumps it out to the street (see also Utilities, below). Weeds grow in the many cracks.

Paved yard, sump pump/lift station access cover

- **Security**

Theft is a significant problem. Per EC, the program files an average of two police reports per year. In addition to small tool theft, there was an incident in which thieves cut through the chain link facing Harbor Bay Parkway and stole an entire engine. A calibrated wrench costs about $1000 – the program used to have 20, now has 6. "If we purchased a power washer, it would be gone within a week." Fake cameras currently being used as a deterrent. Staff would like to be able to monitor all doors.

Fence between Ramp Area and Parking

Engine theft access point at main road

Unauthorized entry unrelated to theft is also a problem. The pull chain for the overhead hoist at Hangar B mezzanine is hooked to the mezzanine level exit door to prevent entry after unauthorized people were found sleeping in the facility last winter.

Buildings

The program spaces have evolved over time, with rooms changing purpose in response to changes in curriculum requirements and to opportunity.

The faculty and maintenance teams concur that Hangar A is the more problematic building although both hangars have significant problems.

Hangar A

The construction drawings for Hangar A are dated 1968, with stamps from the State Fire Marshal and the Office of the State Architect. The original structure and buildings systems appear to be substantially intact, with some relatively minor and informal interior remodeling.

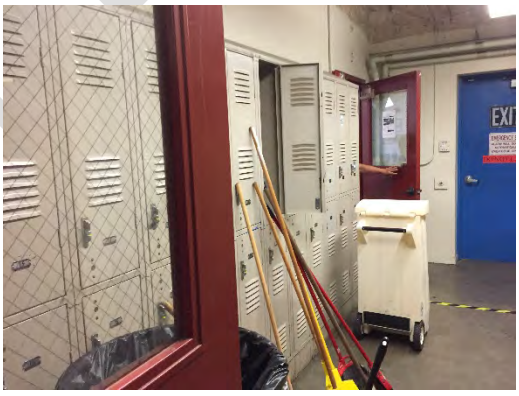
Front of Hangar A

Hangar doors at Hangar A

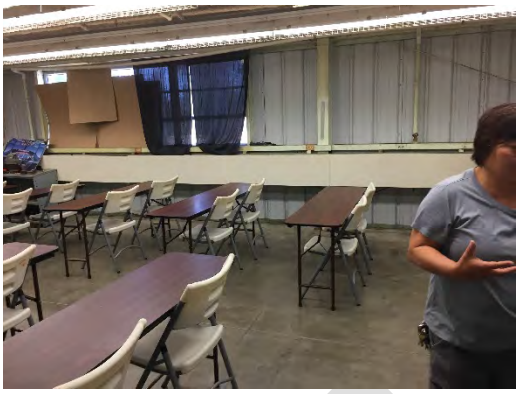
- Hangar A is the older building, higher priority for replacement.
- Electrical problems – outlet capacity/layout may be inadequate for instructional use, especially in the Electrical Shop.
- Glare and temperature issues in the shops and classrooms.
- The dimensions of one space currently being used as a general classroom in Hangar A required the acquisition of unusually narrow depth tables in order to accommodate 25 full size students.
- High bay space needs an overhead lift. Program is currently using a portable hoist.


Interior of Hangar A, high bay space

Faculty offices, utility room, storage above

Student lockers at Hangar A high bay space and hallway to third general classroom



Glare and temperature issues at general classroom near Electrical Shop, Hangar A

Required clear pathway markings, high bay space at Hangar A

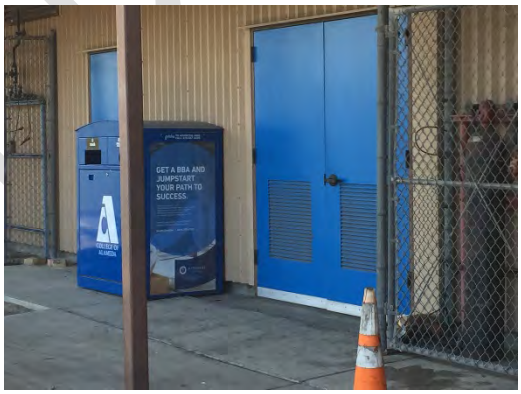
Hangar B

The construction drawings for Hangar B are dated 1977, with stamps from the State Fire Marshal and the Office of the State Architect. The original structure and building systems appear to be substantially intact, with some relatively minor and informal interior remodeling.

Front of Hangar B

Two double hangar doors at Hangar B

Vending near front door



Cylinder supply, utility room access, recycling near front door

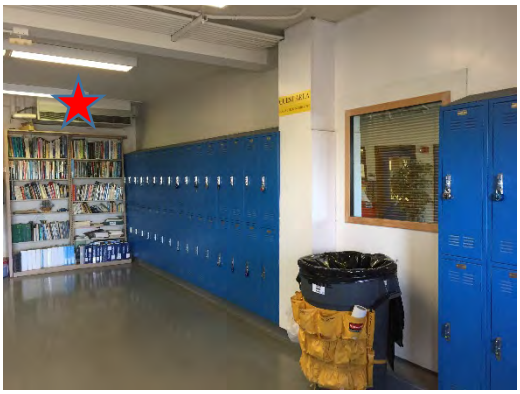
The cylinder supply system near the front door is abandoned and can be demolished.

Drinking water deliveries are occasionally stored adjacent to the front door (and then moved to Hangar B mezzanine).

Hangar B roll-up door, paved area between Hangar B and Hangar A

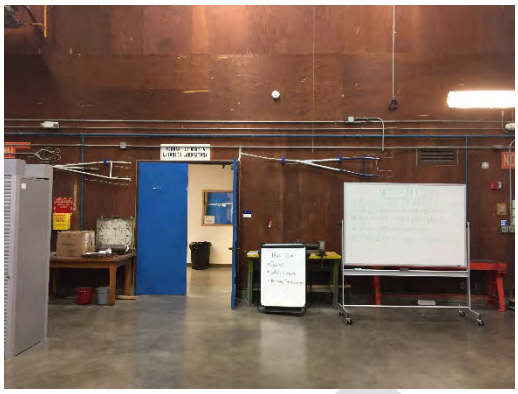
Exterior exit stair from Hangar B mezzanine. Maintenance staff access the roof using a ladder from this location.

Program entry lobby, Hangar B

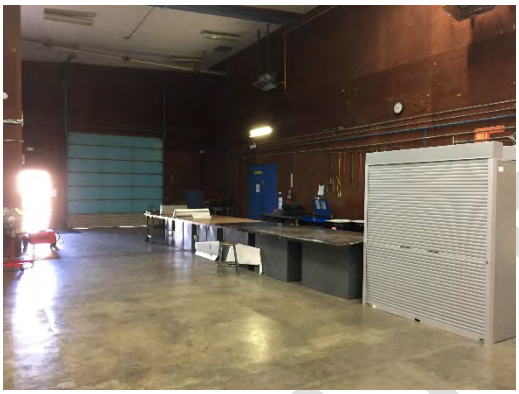


Student lockers at entry lobby, Hangar B

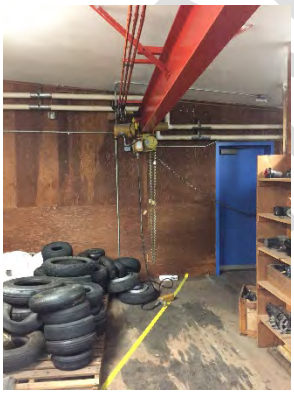
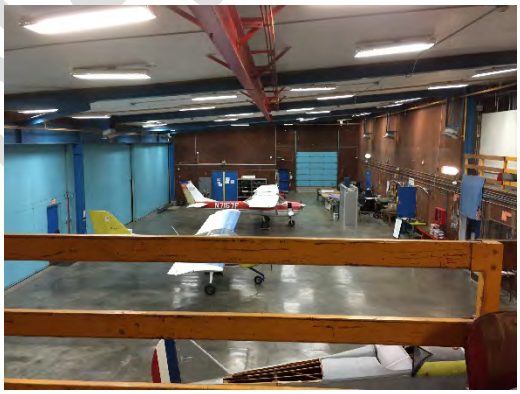
★ This HVAC unit does not work. See HVAC, below.



Interior of Hangar B: views of mezzanine, airframe area, high bay space, access to department chair office



Roll-up door at Hangar B, from interior

Overhead hoist at mezzanine and overview of hoist at airframe area

Storage Sheds

Supplies and hazmat are stored in a brown shed in the paved area between the two hangar buildings. The brown shed is divided into two compartments. Jet fuel is stored in a white shed adjacent to the brown shed.

Brown shed with two compartments

Jet fuel storage

Hazmat storage, left side of brown shed

Misc. supply storage, right side of brown shed

Program Spaces

The “machine shop” and “airframe” programs are currently in separate buildings, each with its associated shops, labs, and other support spaces. These two program clusters are required to be separated, to reduce the potential for contamination. Each cluster requires general classroom space.

Space usage has changed over time. Some shop/lab programs have changed location. Some former shops and labs are currently being used for storage and some are currently being used as general classrooms.

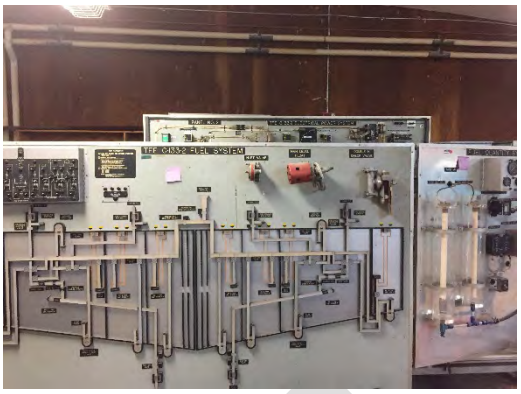
Program Spaces Currently Located in Hangar B (“Airframe”)

- **Airframe:** this is the only area where entire airplanes need to be indoors. Most airframe instruction is in the open area of Hangar B. This program area is significantly impacted by functionality issues with the hangar doors. Design of the high bay space needs to accommodate clearances required to move airplanes around within this area and between indoors and outdoors. Indoor movement requirements would be reduced if both sets of hangar doors were functional.

  The FAA still requires instruction regarding wooden airframe structures. The wood structures are currently stored at the B mezzanine.

Airframe Area, Hangar B

Wooden airframe storage at Mezzanine

System models stored at airframe and at mezzanine. Model boards are on casters.

- **Composites Shop:** the AMT curriculum involves a lot of fiberglass work. The existing suction system was fabricated in-house. This space needs at least 15 snorkels, total. Ideally, the filtration system would be a built-in air filtration system, such as the one used by the AMT program at Solano CCD. Filtration system for this area is on the AEDA project equipment list but might need to be reclassified as building HVAC. The Composites Shop is in Hangar B.

Suction Heads (Snorkels) in Composites Lab

- **Metal Shop:** This program space is currently directly adjacent to a general classroom. Cutting metal yields metal filings and metal dust. Current procedure is to sweep it up with a broom but it would be better to have a built-in vacuum system. See also SLIP Roll Machine and Circle Cutter under FF+E. The Metal Shop is in Hangar B.

Metal Shop

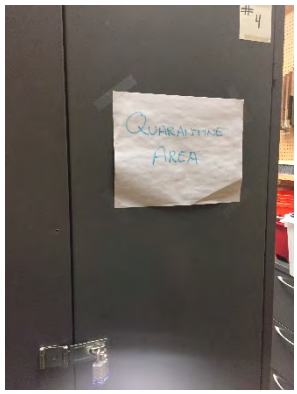
Metal Shop Workstations

Sheet metal cutter, older, functional

Sheet metal cutter, newer, non-functional

Note: maintenance staff would like to have the older sheet metal cutter if it is discarded by the instructional program.

- **Tool Room:** FAA requires broken/unevaluated tools to be located in a "quarantine area", which is currently a cabinet. There is an inventory of tools that gets checked out for student use. Students also bring their own tools. The Tool Room function is currently in two parts: an enclosed room and a securable cabinet in the Airframe area. See Bar Code System under FF+E. Staff would like to create a The Tool Room is in Hangar B.



Program Spaces Currently Located in Hangar A ("Machine Shop")

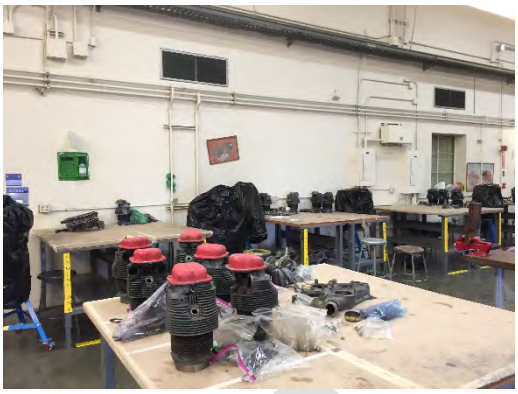
- **Engine Area, Carburetor Area, Carburetor Shop:** Engine testing is daily, outside. Exterior lighting, hoisting, and exterior access is important. Engine overhaul and carburetor areas are currently sharing space due to what is available. The existing adjacency is not required for instructional purposes. The Carburetor area needs ventilation improvement (filtration?). There is also a separate Carburetor Shop. The portable hoist should be replaced with an overhead hoist system (see also FF+E). Engine and Carburetor are in the high bay space of Hangar A. See also Engine Test Stands in FF+E.

Engine on display stand

Engine on display stand (stand made in-house)

Small engine stands at student workstations, Engine Area

Workstations, Engine and Carburetor Areas



Workstations, Carburetor Area

Carburetor Shop

Portable Hoist

Engine test tie-downs in outside yard

- **Magneto Shop:** Workstations in the Magneto Shop need to be anti-static but this can be achieved with a separate material that can be placed on top of existing tables. Work is done here on spark plugs and carburetors. The magaflux equipment (see also FF+E) used to be located here, but needs its own room or area (5' x 5') – it can erase data stored on credit cards. The Magneto Lab is in Hangar A, adjacent to the Engine and Carburetor areas.

Magneto Shop

- **Machine Shop:** includes machining equipment and welding equipment. "Only the minimum" welding is taught. The Machine Shop is in Hangar A.


Machine shop, views both ways.

Some equipment requires "plenty of water."

"Just the basics" welding instruction station

Hazmat storage notice at machine shop

- **Propeller Area:** the Propeller Area is located adjacent to Engine Overhaul, in the high bay space in Hangar A.

Propeller area

Propeller on stand

Propeller on stand

- **Corrosion Room**: per the FAA, must be a separate room. This area currently includes solvent tank and sand blasting equipment. Needs air quality improvement (filtration?). The corrosion room was created in Hangar A in 2018.

Corrosion room

Solvent tank

Eyewash

Sandblasting equipment at corrosion room

Ventilation and ductwork at corrosion room

- **Paint Shop**: The paint shop was converted to the valve grinding room. Current program paints outside in the ramp area. Per EC, an indoor paint shop is not required.

- **Valve Grinding Room:** per the FAA, valve grinding must be a separate room. The new magaflux machine will be located here, with its enclosure. The valve grinding room was created in Hangar A in 2018 by in-house staff.

Valve Grinding Room (former paint shop)


Valve grinding equipment

- **Electrical Shop:**. The existing space for the electrical shop is directly adjacent to a general classroom but both rooms have glare and temperature issues. Power supply to this room is inadequate for instructional purposes although power supply to the campus overall may be adequate.

  Workstations in the electric shop need to be anti-static but this can be achieved with a separate material that can be placed on top of existing tables.

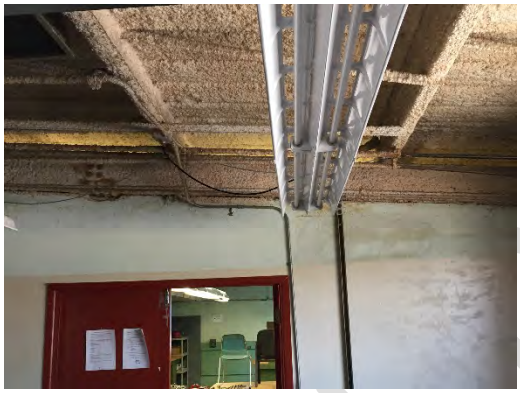
  The partition between the Electrical Shop and the adjacent classroom appears to have been constructed informally and may need some structural reinforcement.

  Avionics could be taught in the same classroom and shop space as electrical, although ideally the total space allocated to these two subjects would be increased. Avionics was previously taught in the space subsequently subdivided to create the department chair office, with the balance of the area converted to storage.

  The Electrical Shop is located in Hangar A but does not require adjacency to any other program spaces located in Hangar A, so it could be relocated to Hangar B, at either level.


Electrical Shop


Electrical Shop




Structural reinforcement at informal partition between general classroom and Electrical Shop

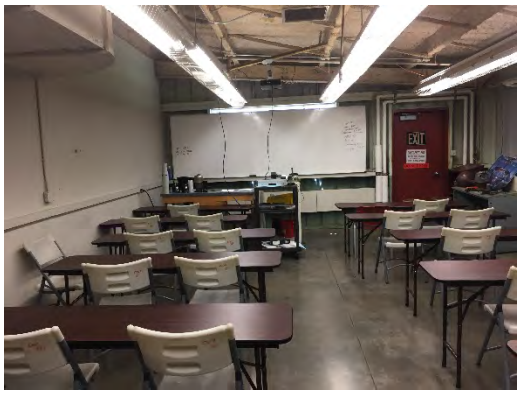
Other Program Spaces (Classrooms, Offices, Storage)

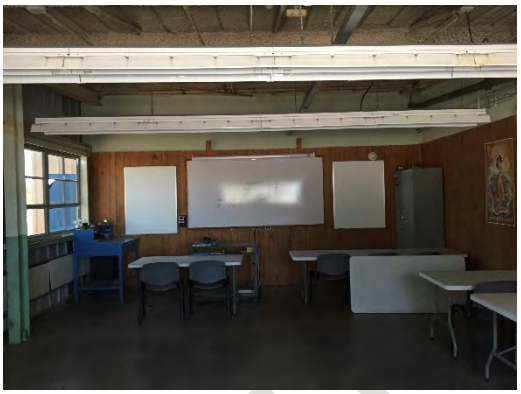
- **General Classrooms:** there are four to five rooms currently used as general classrooms.

  The spaces to be created on the Hangar B mezzanine by the grant-funded project would allow some existing general classrooms with direct access to the high bay space on the ground levelto be returned to lab/shop functions although in general, the preference is to keep general classrooms in close proximity to shop and lab spaces.

  Air quality, temperature, and circulation is important for 3-hour classes. All rooms currently used as general classrooms need better air. There are two existing spaces used as general classrooms in Hangar B and three in Hangar A (one in A is infrequently used because the lighting is inadequate). The program needs a total of 6 spaces that can be used as general classrooms (perhaps 7, with avionics, see Future Programs, above). Three existing spaces currently used as general classrooms at the ground level can be reverted to shop/lab space.

  “One bigger classroom is better than two smaller classrooms.”

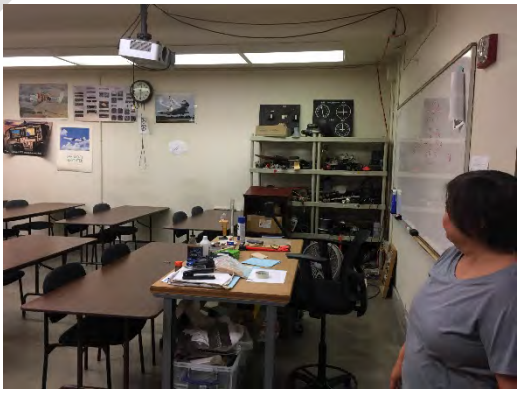




General Classroom, Hangar A* General Classroom near Electrical Shop, Hangar A

*This room was previously a shop, and is not well designed for general classroom use.

Third general classroom, Hangar A



General Classrooms, Hangar B

25th student seat

Computer Lab: used for taking certification tests. Computer station data connections must be hardwired (not wifi) because they connect to the FAA website. The student stations were previously arranged in a circle but the layout was recently changed to two long rows so that supervisor can more easily see who is in the room. The Computer Lab is in Hangar B.

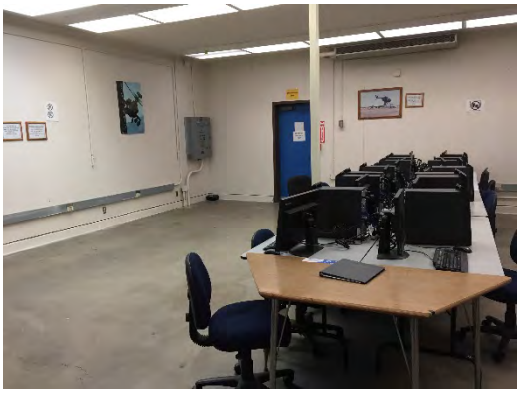
There is a shared printer. Faculty would like to add some book storage for manuals, other reference books.

Currently have 21 student stations, need total of 25, ideally 30. It would be better to have more work surface space per station. Overall this room has more space than needed for this program function.

Counselors from the main College of Alameda campus use the desk and visitor station in the corner of this room.

The sump pump control panel is located in this Computer Lab. It is old and noisy, disruptive for instruction and testing, even when the pump failure alarm is not triggered. The pump failure alarm is a "loud foghorn."

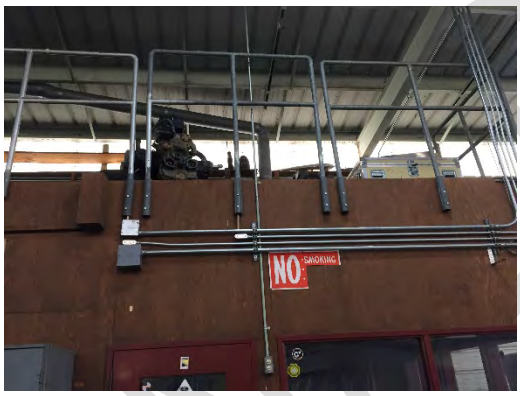
Computer Lab



More space than needed for this function

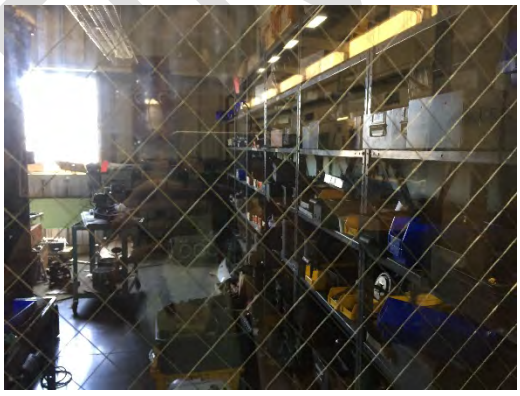
Counselor workstation

- **Instructional Storage:** Storage of a wide variety of instructional items is located throughout the campus. Stored items include instructional videos, tools, engines, airplanes, parts, instructional supplies. Some discarded items are also stored on site.



Storage above offices, Hangar A

Storage at Hangar B mezzanine



Parts storage room, Hangar A

Storage at electrical room at mezzanine

The partitioned/screened area at the Hangar B mezzanine is a quarantine area for donated parts and supplies that need to be inventoried.

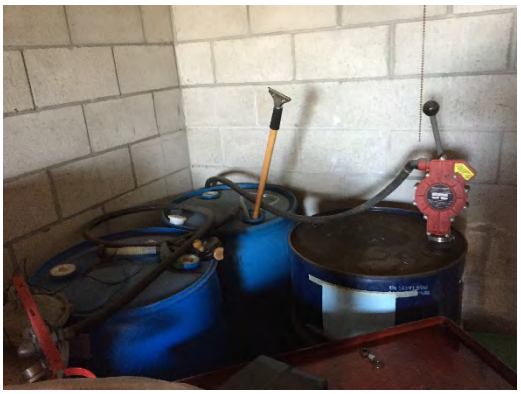
Donated parts at mezzanine, awaiting inventory

- **HazMat:** There is hazmat storage in a shed outside (one compartment for unopened containers, one for opened) plus jet fuel storage in adjacent shed. There are also flammable storage cabinets in the Hangars. The hazmat storage strategy should be reviewed.

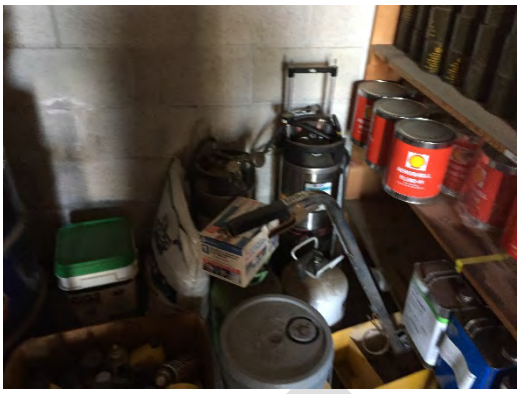

Hazmat storage shed in yard


Jet fuel storage in yard

Oil and resin storage


Barrel storage

Penetrant storage



Cylinder storage

There is a sink and eyewash station in the Hangar B entry and in the Hangar A high bay space. There is an eyewash at the corrosion room in Hangar A. Sink and eyewash station location and type should be reviewed.

Sink + eyewash, Hangar A

Flammables cabinet, Hangar A

The chemical / gas supply assembly at the exterior, near the Hangar B main door, is not currently used and can be demolished.

- **Offices**

The department chair office was created approximately 3 years ago by adding partitions in a space that had previously been used for instruction. Ideally, the department chair office (and other faculty offices) have a clear view into high bay spaces and shops.

There are three offices In Hangar B: department chair office (occupied), staff/faculty office (occupied), other office (unoccupied).

There are two faculty offices in Hangar A, both located in an area partitioned off from the high bay space, between the engine and propeller areas. The partitioned area has an office on either side of a utility/storage room. Water intrudes into both of these offices.

Faculty Offices, Hangar A

Faculty Office, Hangar A

- **Student Lounge:** the Student Lounge is located at the Hangar B mezzanine. There are no restaurants or other food near by. The aviation program needs an eating area. However, the lounge area can be more easily housed in temporary space in a two-project scenario.

Student Lounge area at Hangar B Mezzanine

Furnishings, Fixtures, and Equipment

(AEDA) = items that are on the equipment list for the grant-funded project.

- **General Classroom Furniture + Equipment (AEDA)**

  Typical existing general classroom furniture is folding tables and stacking or folding chairs. Some chairs have cushioned seats (important for long classes and large bodies).


General Classroom, Hangar B, near Airframe

General Classroom, Hangar A

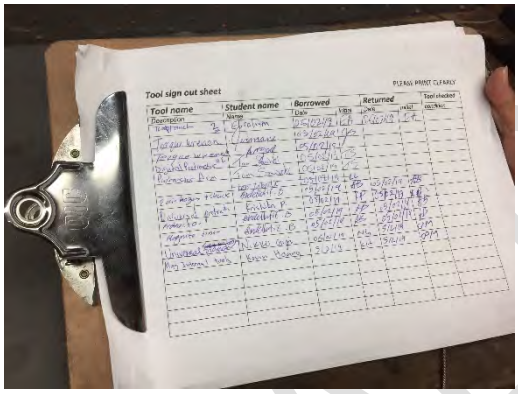
Document Camera, General Classroom, Hangar A

- **Computer Classroom Furniture + Equipment (AEDA – furniture)**

  21 student stations existing but need a minimum of 25, ideally 30, plus instructor/supervisor station.

- **Bar Code System (AEDA)**

  FAA requires accurate tracking of student time in/out and inventory control. The program is currently using a punch card system and paper notes.



  Tool checkout sheet

- **Air Filtration System (AEDA)**

  See also Composites Lab.

  Existing fan (and filter?) on Hangar B mezzanine, over Composites Lab.


House-made suction heads (snorkel) in Composites Lab.

- **Forklift (AEDA)**

  Existing forklift was obtained by trading scrap metal. Repaired / re-built in-house. Inadequate for tasks.

- **SLIP Roll Machine (AEDA)**

  Machine for sheet metal work required by the FAA curriculum. Might be possible to combine with circle cutting function as a single machine.

- **Hydraulic Test Stand (AEDA)**

  Equipment for testing psi for hydraulic lines fabricated as part of curriculum. Existing one doesn't work, is very old (per EC, from the 1950's), and parts are not available.



Existing hydraulic test stand, abandoned, exterior and interior

- **Magaflux (AEDA)**

  A machine for non-destructive testing of engines. No longer existing – previous one was already too old, was a hazmat disposal. The old magaflux machine was located in the Magneto Shop but the new one will be located somewhere else. The old 10' long machine was corroded, would not roll, so it has already been discarded. New ones are 3' to 4' long. A magaflux requires a separate room or area (it can erase data stored on credit cards), approximately 5' x 5'. Staff is currently planning to locate the new magaflux machine in the Valve Grinding Room.

- **Engine Test Stands (AEDA)**

  Many existing ones were fabricated in-house, but it would better to have ones that are commercially manufactured. Need 25 total, in a variety of sizes. Per EC, currently have 12 small ones, 3 large, 1 extra large. A large one would cost $40-50k to purchase. Of the existing ones, 14 are in good condition. Engine test stands are generally located in the Engine Area, Hangar A. Engine test stands are not the same as engine tie-downs, which are also used for testing engines (see Site).


Engine test stands, large


Engine test stands, small

- **Hoist for Engine Area**

Existing method is to use a combination of portable hoist and forklift. This system should be replaced with an overhead hoist capable of lifting the largest loads.

Portable hoist, Hangar A Engine Area

- **Digital Projector/Recorder/Display Systems (AEDA)**

  Existing total of 3: one good, two old. Existing projectors are not adequate to support existing cohorts. Instructors currently take turns using the one good one. Need a total of 6.

  The program is still using VHS tapes (although already converted to digital) because there is no digital display available.

  A digital display is also needed to support recruitment events, job fairs, graduation, video conferencing. (These purposes may require different systems?)

- **PA System (AEDA?)**

  Current PA system is "Department Chair + bullhorn."

- **Circle Cutter Machine (AEDA)**

  Making an access hole cover is part of the curriculum. There is an existing machine but the hole diameter is not adjustable so the program is currently cutting circles by hand. The circle cutter machine is located in the Metal Shop.

Existing circle cutter

- **Floor Scrubber (AEDA)**

  A floor scrubber would be used to clean oil spills, etc. on the floor. Students currently sweep but floor needs to get really clean. Program requests floor sealing annually but the sealing is rarely performed. Maintenance hangars in industry normally have white floors which reflect the underside of fuselage, allowing maintenance staff to more easily see what is leaking and other conditions at the underside of the fuselage.

  No existing equipment. Previously had one but when the program re-opened in 2013, discovered it was missing, along with some other things.

- **Lockers**

  There are student lockers located at the Hangar B entry, in the Hangar A high bay space, and the hallway to the third classroom in Hangar A. Existing locker quantity is adequate to support 3 cohorts but staff report that locker condition is poor.

- **Label Maker(s)**

  Tape is no longer available for the label maker used by faculty to make room signage. Other labeling, for a variety of purposes, and for a range of scales, is a constant need.

- **Scantron**

  Located in computer lab. Staff would like to replace (but is not on AEDA equipment list). Currently located in the Computer Lab.

Scantron

Building Components

Water intrusion is a substantial issue for both buildings. Maintenance engineers note that the primary source of water intrusion is not the roof but from the air handling units and gaps in other parts of the building envelope. The water intrusion is most significant at ground level, and for spaces on the side of the buildings with the sliding hangar doors. The assistant chief engineer mentioned that "the instructor was standing on a crate as water entered Hangar B room 101" (one of the primary general classrooms).

"Doors" are among the top five overall project priorities from the assistant chief engineer.

- **Roof**

  The roof in Hangar A has some leaks although maintenance engineers note that the roofs overall are tight.

  Maintenance staff request better roof access for Hangar B. They are currently using a ladder at the exterior exit stair for the mezzanine.

- **Walls**

  Water enters the hangar door side of Hangar B, floods room 101, which is otherwise the best existing general classroom. The maintenance engineers describe this situation as "substantial", "we have tried sand bags…", and suggest it may be related to the hangar door side of the building not being level to the adjacent grade.

  Water enters the hangar door side of Hangar A and floods the faculty offices in the high bay area.

  The maintenance engineers note that pigeon intrusion is also an issue.

- **Windows**

  Glare is an issue at classrooms and shops at Hangar A. Classrooms and shops in Hangar B generally lack any windows.

Glare control at Hangar A general classroom, views from interior and exterior

- **Doors**

  The maintenance staff note that door problems are among the top five most common/pressing work orders for this facility.

  - Hangar Doors

    Two sets of hangar doors in Hangar A – one has not been functional in a very long time ("never" per one of the engineers). Carburetor and electrical work stations are relatively stationary. Engines get moved in and out but the hangar door adjacent to the Engine area does not get used much because the closing mechanism is unreliable. Most movable items (engines, sometimes also airplanes) go through the door on the propeller side because the door is in better condition. Hangar A might only need one hangar door but reliable functionality is essential.

Hangar Doors, Hangar A

Hangar Doors, Hangar B

Hangar door not functional

Pigeon entry

Water intrusion at ground level

Two sets of hangar doors in Hangar B – the one on the mezzanine side has been out of operation for two years because it is broken but otherwise would be used. To restore functionality requires, at a minimum: replace entire track and motor plus new seals and controls. It might be a better investment to replace the hangar doors in their entirety.

Frequency of airplane movement varies during the semester – during the second half, it is daily in and out. Because only one door is available, a larger amount of the paved yard needs to be kept clear for staging items during the moving process. Hangar B needs two hangar doors. However, if both hangar doors are reliably functional, the Hangar B roll-up door can be eliminated.

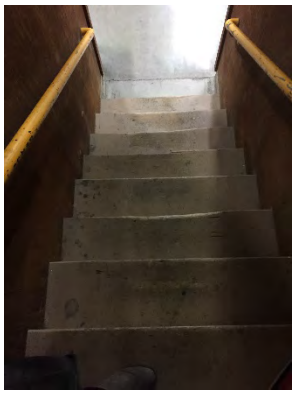
- Exit door at Hangar B mezzanine and exterior doors elsewhere do not function properly – frames are bent and doors are warped, perhaps due to differential expansion of materials. It takes tremendous force to open some of the doors. Doors that are in constant use have fewer problems but all need to function properly for emergency exiting and accessibility.

- Both entry doors to Hangar B, Room 110 are bad ("mangled").

- Locks – Review keying, including boiler room(s), IT room, electrical (Hangar B exterior), storage sheds, and fence gates. Replace hardware and lock systems. Include salt environment ratings for exterior doors, frames, and hardware.

- **Floor**

  Access to the Hangar B mezzanine is a worn, wooden stair. (AEDA project intends to install an elevator).



Worn wood stair is sole indoor access to mezzanine

- **Exterior Fencing**

Consider replacing and/or upgrading existing chain link fence.

Utility Systems

"Boilers", "Sump and Lift Station", "Fire Panel", and "HVAC" are among the top five overall project priorities from the assistant chief engineer.

- **BMS**

  The aviation campus mechanical control systems have no connection to the central monitoring and control located at the main campus. The aviation campus does not have its own full time maintenance staff. This delay in responsiveness could be mitigated by system connection to the main campus.

- **HVAC**

  The air handlers are original (1968, 1977). The existing air handlers are highly inefficient and have no economized air or stages. Many of the joints have been repaired with multiple layers of tape. The valves have no adjustable settings (only fully open, fully closed).

  AHU-1 for Hangar A is located over the hallway between the bathrooms and a classroom. The assistant chief engineer reports that although it is ok that there are no re-heat coils (VAVs), this AHU has bad leaks.

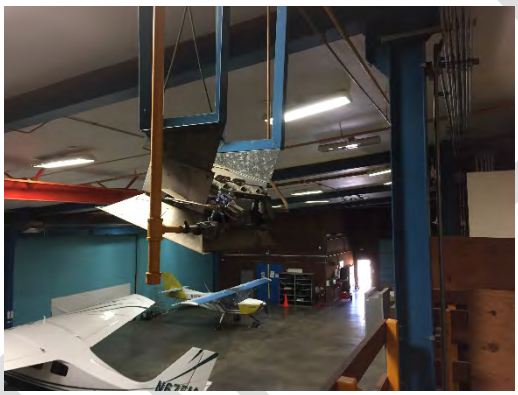
AHU-2 for Hangar A is located over the Electrical Shop and Magneto Shop. Per the assistant chief engineer, the seals are bad, there is no nuance to the control (just open/closed), the stages don't work and it is inefficient.

For the Hangar B mezzanine, both fans are original and neither is functional. The assistant chief engineer recommends CO monitor interlocks be included with exhaust fans.

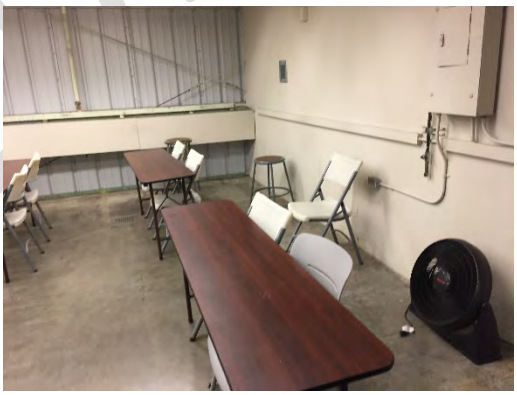
Fan coil notes for Hangar B from the assistant chief engineer:

- Room 102A: bad fan coil unit(s).
- Room 102B: bad fan coil unit(s).
- Room 110: 2 non-functional coils
- Room 111: coil is ok.
- Room 112: coil is leaking.
- Department Chair office: coil is bad, and has no exhaust.
- Unoccupied office: bad fan coil unit.

The existing space heaters are fired by natural gas but the vent pipes do not have an induced draft motor, which yields a carbon monoxide hazard. Existing heaters also emit sparks. Per the assistant chief engineer, the high bay space in Hangar B needs new space heater(s).



Overhead heating unit, Hangar B



Floor Fan, general classroom, Hangar A

Heater and fan, general classroom, Hangar A Fan and curtains, general classroom, Hangar A

The exhaust fans are original (1968, 1977). Approximately 10% of the existing exhaust fans are functional. All of the exhaust fans need to be evaluated. Due to the type of program use, the maintenance engineers strongly recommend a CO2(?) interlock (existing does not have interlock).

Two fans at the Hangar B mezzanine serving Rooms 102B, 103, and 104: if the program use remains the same, these need to be replaced. The motors are bad, the pulleys are bad, and they consume a huge amount of power.

HVAC at Hangar B mezzanine, over Composites Lab

The ductless air conditioner in the IT Room in Hangar B does not work (replacement parts are not available). The program is currently using portable AC.

Of the approximately 11 to 14 local air units, only 3 are currently functional. (See also photo of building entry interior under “Hangar B”, above).

See above regarding air filtration system for the Composite Lab.

None of the shops need direct access to the exterior if ventilation is adequate.

- **Boilers**

The boilers are original (1968, 1977) and need to be replaced. The existing boilers are inefficient, drafty (a lot of combustion odor), probably not AQMD compliant. The boiler often shuts down and does not come back on, requires manual re-start. 90% of the individual coils in the rooms (throughout or just Hangar B?) are shut down due to leaking coils. Indoor units also need to be replaced.

Hangar B boiler room is at the mezzanine, but accessed from the exterior. Per the assistant chief engineer, it is original and shuts down without any relationship to outside air temperature. Expansion tanks flood (they don’t expand), which has caused ceiling damage below.

The maintenance staff note that heat is among the top five most common/pressing work order requests for this facility. The system does not currently respond to outside air and turning the heat off requires turning the boiler off. The heat is set by a local timer. There is no remote monitoring or control of the boiler and no engineer assigned fulltime on-site for this facility, which is further complicated by the relationship of engineering shifts (most engineers work 7am-3pm) and the instruction schedule at the aviation campus (most instruction is 3pm-10pm). The current temperature adjustment process involves waiting for a complaint to arise and be processed, followed by dispatching engineering personnel to the site.

"The boilers" are among the top five overall project priorities from the assistant chief engineer.

- **Compressed Air**

The air compressor is very old and uses too much power. Its valves and pipes are leaking. Compressor room is at the Hangar B mezzanine but is accessed from exterior.

Compressed air spigot at exterior, near Valve Grinding Room

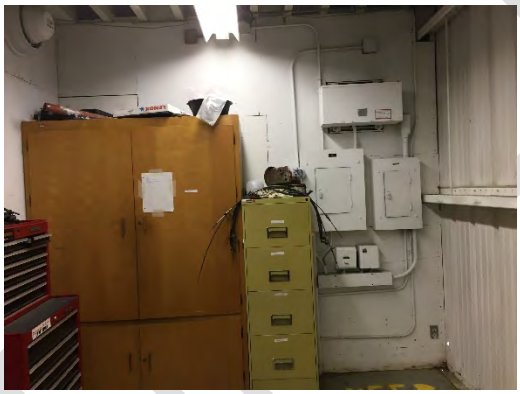
- **Electrical**

Electrical system loads have been added over time and major loads have also been relocated over time, leading to some imbalance in specific areas. In Jun 2019, the maintenance engineers confirmed that the breaker labels are correct regarding areas served. The preliminary opinion of the assistant chief engineer is that the overall service capacity for the aviation campus is adequate although distribution/balance may need to be reviewed.

Panel breakers cannot be replaced (no longer manufactured). Main electrical room and MDP are located in the small tool room between the faculty offices at the high bay space in Hangar A. There is another MDP near the Electric Shop.

The assistant chief engineer suggests that the electrical panel in the propeller area of Hangar A needs to be updated but that it might also be possible to find more breaker spaces because it appears that some areas are over-served for program use in the present.

The assistant chief engineer notes that the electrical panel and transformer at the Hangar B mezzanine need to be re-indexed and perhaps refreshed and that the panels near Hangar B Room 104 are disorganized and that the panel doors are broken.



Electrical room at high bay space, Hangar A

Electrical room at mezzanine, Hangar B

Lamps at the site lighting poles are out but can't be replaced because they are too high to reach.

The room with a "hydraulic" sign at the entry contains an electrical panel, storage, and an IT closet. This room does not contain hydraulics or hydraulics instruction.

Insulation on exterior wiring is deteriorated and should be replaced to the extent possible.

The assistant chief engineer strongly recommend a lighting system conversion to LED.

- **Fire Alarm**

  Staff describe the main fire alarm panel as looking like pieces are hanging out of it and that it needs to be upgraded. There is a fire alarm panel in each Hangar. (Is one of them primary for the aviation campus overall? Does the FA system at the Aviation campus report back to the main campus and/or the central station at the District Office?).

  The main fire alarm panel for Hangar A is noisy, and is located inside a faculty office in the high bay space. The assistant chief engineer also describes this panel as being in disrepair and notes that it has constant troubles, software issues, and that the location in close proximity to an instructor magnifies the impact of the problems.

  The main fire alarm panel for Hangar B is located in/near the unoccupied office. The assistant chief engineer also describes this panel as being in disrepair.

  The maintenance staff note that fire panel troubles are among the top five most common/pressing work orders for this facility. "Fire panel" is among the top five overall project priorities from the assistant assistant chief engineer.

- **Plumbing**

  Restrooms in Hangar A need to be replaced. Existing fixtures use 3-4 gallons per flush, which is a burden on the pump station. There is no hot water at the sink.

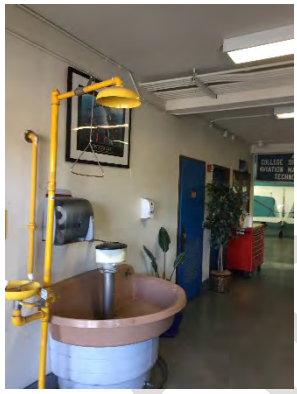
  The sewer in Hangar B frequently backs up, at least twice per year. Maintenance staff confirm that plumbing back-ups impacting restrooms are among the top five most common/pressing work order requests for this facility. The tap water is occasionally unsafe to drink (2-3x/year) when the building water is shut down due to toilet malfunction (the broken pipe below is not fixable because it is ceramic). Drinking water is stored in large jugs outside the front door to Hangar B and/or on the Hangar B Mezzanine.

Drinking water storage at Mezzanine

  There is a sump pump under square maroon access covers in the yard between Hangar A and B.

The lift station is located in the paved area between the two hangars. It needs two motors replaced and all new floats. The maintenance staff note that problems with the lift station are among the top five most common/pressing work orders for this facility. The lift station control panel is in Hangar B Room 111, which is currently used as the Computer Lab. It is very old and has a tugboat style alarm that is extremely loud when it trips.

There is an emergency shower/eyewash and hand sink at the Hangar B entry lobby, the Hangar A high bay space, and the Corrosion Room. Emergency showers and eyewashes are required by the FAA and by OSH. Existing emergency showers and eyewashes are not connected to drainage. Emergency (?) shower needed for women's restroom.

Sinks, emergency shower and eyewash stations at Hangar A high bay space and Hangar B entry lobby.

Handwashing stations may be inadequate.

Irrigation system exists but is not functional currently (between Hangar A and Hangar B, near the picnic table).

The cylinder tank supply system at the exterior of the Hangar B entry is not used and can be removed in its entirety.

Cylinder tank supply system

FDC at Hangar A

“Sump and lift station” are among the top four project priorities from the assistant chief engineer.

Misc. Options + Information

HK (26 Jun 2017): perhaps

- Metal Shop and Composites could be combined.
- Consider adding a partition between the two existing general classrooms in B
- Result of two actions above: 1 general classroom, 2 labs.

Per HK/EC (26 Jun 2017):

- The three new classrooms described by the EDA grant application would be in the unoccupied (walled off) area of the mezzanine.
- HK and EC offices could be relocated, allowing restoration of storage room to shop. This space was the avionics lab in the past.
- Computer Lab could also be restored to a lab (and could be smaller than existing).
- Ideally all of ground floor level of B would be shops. Classrooms, offices, lounge on mezzanine.
- Ideal to have department chair office upstairs, with view of high bay space.

Per CT:

Maintenance could be improved throughout the facility with the presence of a lift with an articulating crane and a person basket like the one used by the property management company at 860 Atlantic. This would improve access to the roof, to the mezzanine level in Hangar B, to the high ceilings in both of the hangar spaces, and to the site lighting.

Acknowledgements

This report was prepared by Sharon Millman. The information is from site visits and interviews with Esther Cheng (Faculty/Staff, Aviation), Hoi Ko (Department Chair, Aviation), Curtis Tod (Assistant Assistant chief engineer, College of Alameda), Vitus Nnanna (Stationary Engineer, College of Alameda), Freddy Colon (Utility Engineer, College of Alameda), Ted Hoffman (Stationary Engineer, District).

Thank you to everyone who contributed their insight and knowledge regarding the program and facilities, and to Regina Davis (Staff Assistant, General Services) for assistance with obtaining documents from the District archive.

COA AEDA

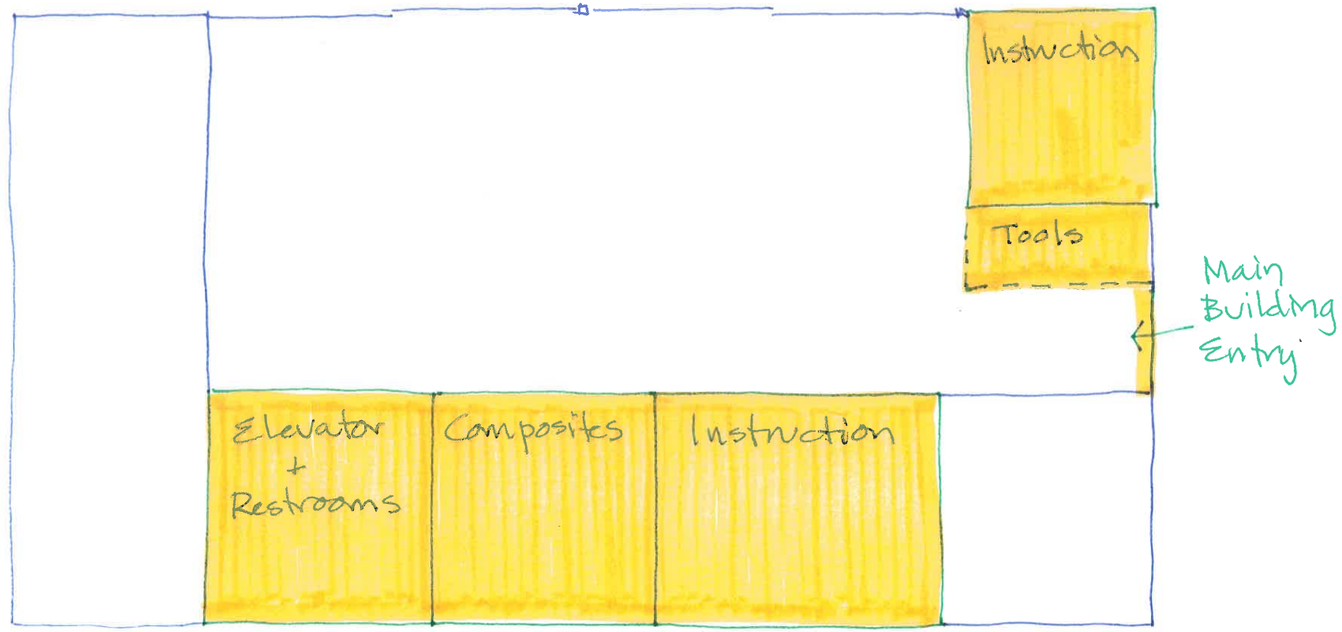
Proposed Space Changes : Grant-Funded Project

2019 07 05

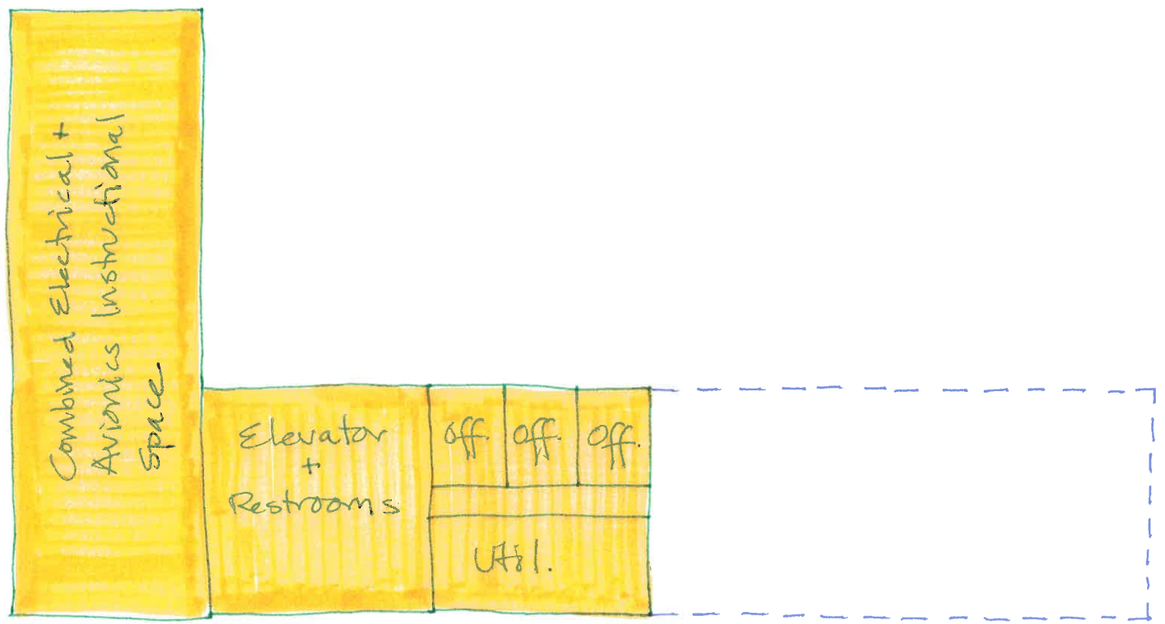
- All grant-funded work limited to Hangar B
- Grant-funded project reallocates space but does not add to total SF

1. Relocate Hangar B main entry at ground level
2. Relocate and expand Composites at ground level
3. Relocate and expand restrooms at ground level, add restrooms at mezzanine level, add elevator at both levels
4. Relocate three offices from ground level to mezzanine level
5. Convert former location of offices and adjacent large storage room to instruction
6. Reconfigure/relocate utility space at mezzanine level
7. Convert remainder of active mezzanine to combined instructional space for electrical and avionics (relocate electrical from Hangar A).
8. Convert Tool Room to instruction at ground level.
9. Relocate Tool checkout and storage at ground level, adjacent to relocated main entry

HANGAR B – Grant-Funded Changes



Grand Level



Mezzanine Level

COA AEDA Project

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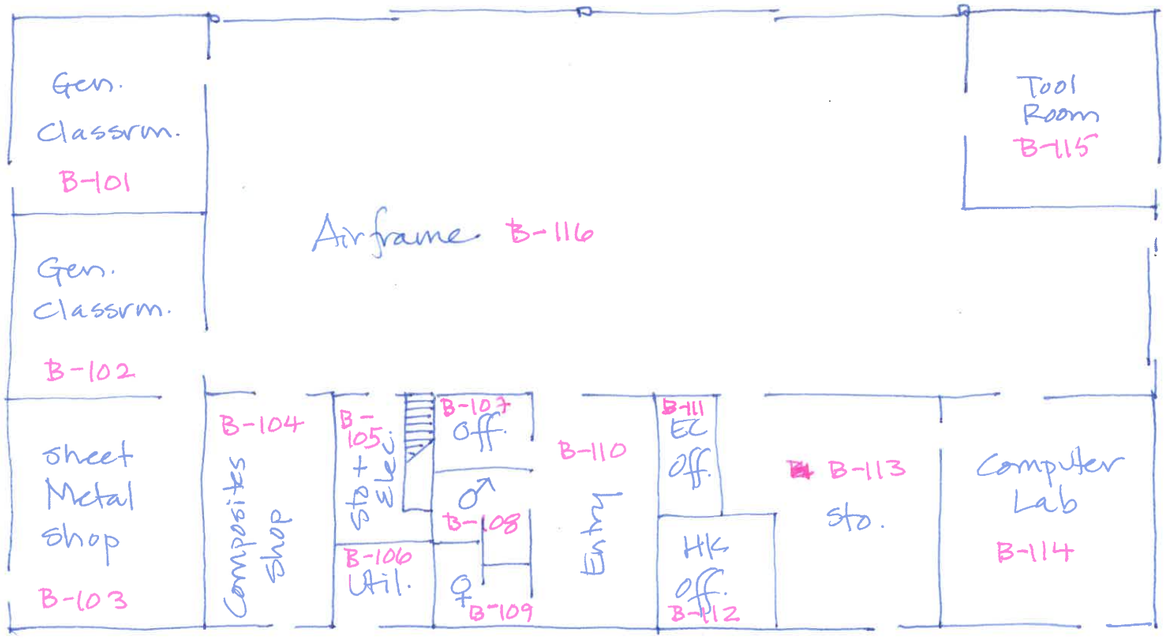
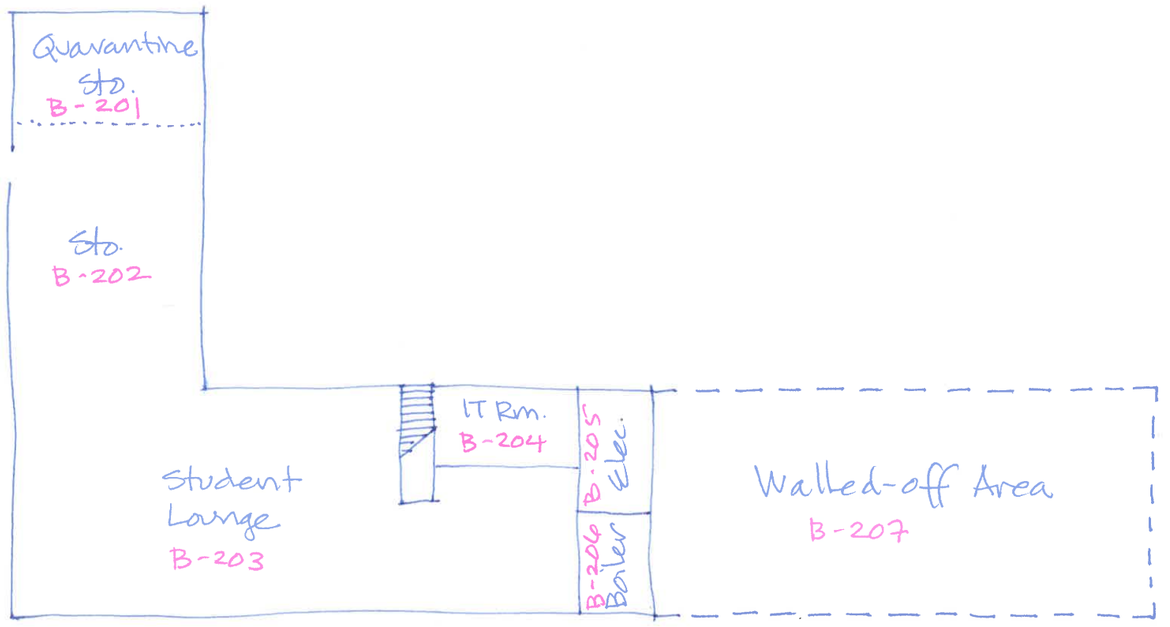
HANGAR B - EXISTING PROGRAM OCC.



GROUND LEVEL



MEZZANINE LEVEL