



Mecham Air Center Site Development

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Background

The purpose of this project was to provide a full set of civil engineering design drawings representing 50% of the detailed design for the Mecham Air Center: Juliet site development. The project site was an 8.5 acre plot of land located within the Port of Portland to the South of Portland International Airport's (PDX) runways. The plot of land was located directly adjacent to the existing taxiway J also known as "Juliet" that connects to the Southern runway at PDX. This development will function as a maintenance, repair, and overhaul (MRO) facility that will service airplanes as large as a Boeing 737-MAX.

Project Requirements

Create a code-compliant set of civil design drawings that:

- Allows for three buildings of varying sizes that are capable of housing and maintaining aircraft
- Properly account for connection to existing surfaces, namely the neighboring road and taxiway
- Incorporate onsite stormwater systems per Port of Portland design standards



Figure 1. Example of a Rain Garden Stormwater Treatment System

- Provide sufficient parking for employees and customers per state and client requirements
- Incorporate utility design suggestions per client requirements and state standards
- Accounts for FAA (Federal Aviation Administration) guidelines including, but not limited to the clear spacing from the center line of a runway and a maximum grade change of 2% for ramp surfaces
- Ensure that no more than 85% of the site is covered in impervious surfaces

Our Team



Left to Right: Niki Zhang, Austin Cole, Henry Morris, Caleb Christensen, Ethan Moser



Figure 3. Aerial of Project Site and Taxiway J

Final Design

The following site design was finalized in accordance with client directives and code compliant design standards:

- The site will have one large hangar building, large enough to fit one 737-MAX and one Gulfstream G-650, designated for MRO purposes
- The site will also have two smaller buildings, large enough to fit a single Gulfstream G-650, designated for MRO purposes
- Each hangar also has space to be designated for storefront/office/workshop as the client, and future tenants, see fit
- The site will have three access points from the street, all of which become access roads that lead to the East face of each hangar building
- The site will have 132 parking spaces, laid out in a double row across the West face of the three buildings
- The site will have a total of 9 small rain gardens
 - 5 rain gardens will collect the rainwater runoff from the three hangar buildings
 - 4 rain gardens will collect the rainwater runoff from the parking lot
- The site will also have an underground rainwater collection and filtration tank to collect and treat the rainwater runoff from the ramp space, and a portion of the taxiway



Figure 1. Rendered Site Layout of Mecham Air Center: Juliet

Acknowledgements

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Design Criteria

Design Constraints that were specific to this project included:

- Stormwater management with assumed no infiltration due to poor soil conditions
- Stormwater and Landscaping constrictions due to concerns of accumulation of wildlife
- Large hangar must be able to accommodate up to a Boeing 737-MAX in addition to another smaller aircraft
- Smaller hangars must be able to accommodate up to a Gulfstream G650
- Ramp and taxiway must large enough to be able to temporarily store planes outdoors

Final Drawings

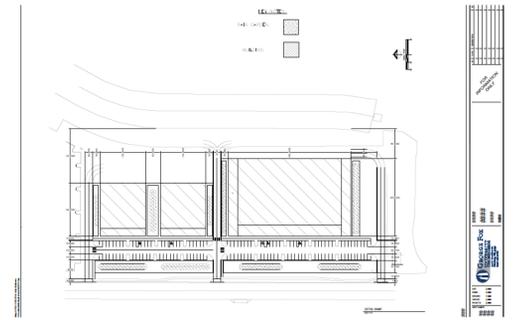


Figure 4. Site Plan

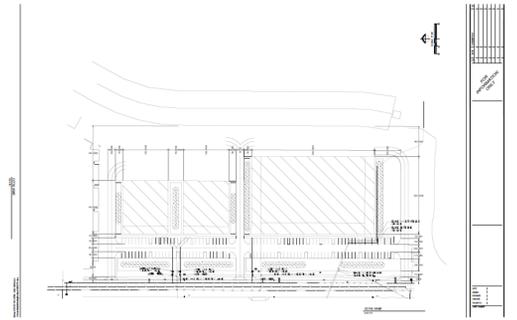


Figure 4. Utilities Plan

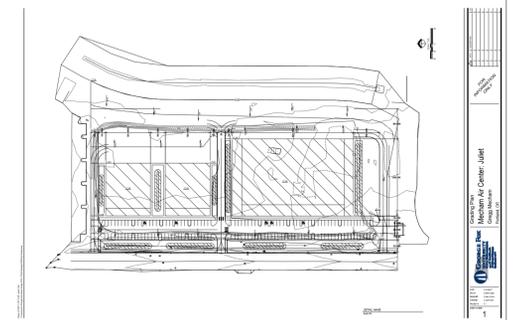


Figure 4. Grading Plan

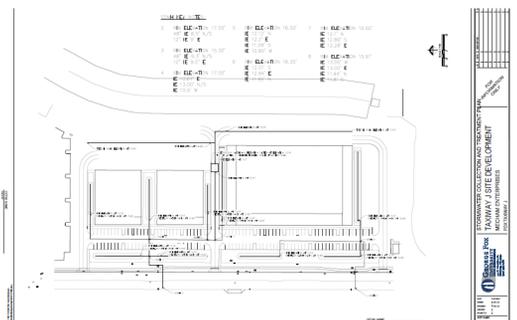


Figure 4. Stormwater Plan

Senior Design

