

WESTERN AIRCRAFT HANGAR

NEUDESIGN ARCHITECTURE, BOISE, ID
INDUSTRIAL

BOISE, IDAHO • WWW.WESTAIR.COM

Tamarack Grove provided a foundation design for a pre-engineered steel building utilizing nearly 300ft free spanned moment frames, the second largest free span moment frames in the state of Idaho.



CHALLENGE

Complexities included foundation design for the large moment frames, heated slab, soil frost considerations, snow design, and saturated soils. Due to the snow loading applied to these vast spanning frames the forces at the base of the columns were extremely large and needed to be adequately tied to resist the outward thrust. The heated slab created an additional set of constraints such as allowable slab thickness, location of reinforcement, and location of grade beams.

SOLUTION

We started by developing multiple design solutions based on the complexities with the owner's budget in mind. The final design determined was a long grade beam tying shallow footings together. The key achieved for the grade beams was to not interfere with the heated slab. Value engineering was considered throughout the design to minimize foundation depths and sizes while ensuring the project could keep within the owner's budget. We worked closely with the contractor to ensure that the final design was a success for the owner. We quickly solved construction issues that typically occur through site visits and on-site design changes working with the architect and contractor.

TEAM MEMBERS

DOUG HARDIN, P.E.
Director of Engineering,
Principal

DEREK PECK, P.E.
Engineering Manager

GARRETT DAVIS, E.I.
Project Engineer

CHAD DICKENSON
BIM Manager


SERVICES

VALUE ENGINEERING
STRUCTURAL DESIGN
& ANALYSIS

PRE-ENGINEERED
METAL BUILDING
FOUNDATION
REVIT

CONSTRUCTION
OBSERVATION
CONSTRUCTION
ADMINISTRATION

 92,000
square feet

 300 feet long
2nd largest free-
spanning moment
frames in Idaho

 2,000 cubic
yards of
concrete in
slabs alone

 350,000
pounds of
rebar used in
foundation

TAMARACK GROVE

812 S. La Cassia Drive
Boise, Idaho 83705

208.345.8941

TAMARACKGROVE.COM

THE EBB & FLOW OF THE WASTEWATER + STRUCTURAL ENGINEERING CONNECTION

Wastewater treatment plants are essential to process effluent and return it safely to the environment. Design of these facilities represents a large public infrastructure investment; yet, if the critical connection between wastewater operations and structural engineering is not made it can lead to unnecessary capital expenditures to replace or repair a facility that ages out before its time.



CHALLENGE

The ability to safely and efficiently process wastewater output while safeguarding public funds is a balancing act. While the average life expectancy of a wastewater treatment plant (WWTP) is 40 – 50 years, processing equipment typically lasts only 20 years. Facilities designed to treat – and potentially repurpose – millions of gallons of water daily must easily and cost-effectively replace large, bulky processing equipment that is failing or operating inefficiently.

SOLUTION

Wastewater effluent may be discharged safely once treated or may be repurposed into fertilizer for agricultural purposes; used as gray water for irrigation; or even reused as potable water. Therefore, efficient civil and structural designs of these processing plants is crucial. Design of the facility and for the discharge/removal of the end product must:

- Handle the constant influx of millions of gallons of water daily
- Process and accommodate discharge of treated waste or removal via tanks, forklifts, pallettes, or docks without compromising facility space
- Withstand structural stresses caused by the specialized use of reinforced concrete
- Facilitate removal and replacement of failing equipment

The factors above were particularly important when Tamarack Grove Engineering (TGE) provided consulting for a WWTP with solid waste that would be turned into fertilizer. The sheer size and limited 10-year lifespan of this particular equipment, along with the small facility footprint, led the TGE team to examine the structure for stability and devise a solution for future equipment replacement.

TGE's creative solution called for the removal of the facility's roof negating the need to overdesign the structure or design massive overhead doors that both came with unique challenges and large price tags. TGE leveraged their experience to develop a forward-thinking design solution that employed reinforced concrete for equipment pads, foundations, and tanks; also satisfying regulatory design requirements that accompany such mission-critical facilities.

Specifying the proper materials and devising creative solutions that consider facility operations over time takes a firm that understands the unique design components of the WWTP, is fully cognizant of the end product and its removal, and knows how to navigate the regulatory environment while serving as good stewards of public funds.

TEAM MEMBERS

DOUG HARDIN, P.E.
Director of Engineering

SERVICES

STRUCTURAL DESIGN & DRAFTING

FACILITY INSPECTIONS

CONSTRUCTION ADMINISTRATION

TAMARACK GROVE

812 S. La Cassia Drive
Boise, Idaho 83705

208.345.8941

TAMARACKGROVE.COM