Reference Implementations

AOFS provides **validated, non-mandatory engineering reference designs** demonstrating how AOFS-compliant systems may be physically implemented.

Reference implementations illustrate safe and practical deployment patterns. They do not define additional normative requirements.

Scope

This section contains documented engineering examples aligned with:

- System Architecture Overview
- operations
- safety
- data_model

These examples translate architectural principles into physical infrastructure layouts, hydraulic systems, and energy configurations.

Normative Status

Reference implementations are **informative**.

AOFS compliance is determined exclusively by adherence to:

- Control architecture requirements
- Safety and fail-safe principles
- Data model compatibility
- Operational constraints defined elsewhere in this standard

Replication of specific physical designs is not required for compliance.

Local engineering approval, regulatory compliance, and structural validation remain the responsibility of the deploying entity.

Categories

Reference Implementations are organized as follows:

Infrastructure Blueprints

Physical structures supporting irrigation and control systems.

Examples:

- Water towers
- Ground-level reservoirs
- Pump houses
- Control enclosures
- Solar mounting structures
- Pipe manifolds

Each blueprint documents:

- Functional purpose
- Structural concept
- Hydraulic characteristics
- Safety considerations
- Manual operation pathways
- Controller integration points

Hydraulic Reference Designs

Water distribution and flow system layouts.

Examples:

- Gravity-fed drip systems
- Pressure-regulated zonal irrigation
- Multi-reservoir configurations
- Overflow and drainage safety layouts

Each design includes:

- Flow assumptions
- Pressure constraints
- Failure modes
- Safeguards
- Manual override procedures

Electrical & Energy Layouts

Energy system reference configurations.

Examples:

- Solar + battery irrigation systems
- Pump starter protection layouts
- Surge protection and grounding schemes

- Brownout-tolerant control wiring

Each layout documents:

- Power assumptions
- Protection mechanisms
- Safety boundaries
- Manual bypass provisions

Complete Farm Reference Architectures

Integrated examples combining infrastructure, hydraulics, control, energy, and data logging.

These serve as deployment templates and training references.

Versioning

Each reference implementation:

- Is versioned independently
- Specifies compatible AOFS versions
- Documents assumptions and constraints
- Records revision history
- May be revised or deprecated

Relationship to Databases

Reference implementations may use parameters from:

- Global Agricultural Knowledge Database (GAKD)

Databases provide structured data and defaults. Reference implementations provide applied engineering examples.

These functions remain separate.

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