



## Flavored Brand Flexibility – Meeting the Challenge of Increasing Flavor Diversity (Joseph Kolodzinski, Symbiont, Booth #509)

### Abstract

The diversity of flavors, ABV, and brewing styles is increasing the complexity of brewhouse operations, and expanding the demand for specialty malt handling and flavor additions in the brew kettle, fermenters, aging, and finishing tanks. Facilities that previously handled a limited number of wort streams, product lines and flavors are now faced with facility modifications required for specialized flavor additions for the delivery of spices, teas, coffee, nuts, dried herbs and plants, and other exotic ingredients to every part of the brewing train from delivery to packaging.

Key considerations when planning specialty ingredient delivery systems in an existing facility includes modifications to existing:

- Brewhouse
- Fermenting
- Filtration
- Aging
- Finishing Trains

Extensive planning is required to overcome the implementation challenges associated with process and central modification at an existing facility.

Facility flexibility is key to the future of brewing at all volume levels. The diversity of ingredients and flavor additions will continue to grow. If not planned for and implemented properly, brewhouse operations and throughput can be severely reduced and beer quality will suffer.

### Delivery Methods & Locations

#### Brewhouse

- Dry Ingredients (peels, spices, powders, hops)
  - Direct Dump into Kettle (manual)
  - Pneumatic Delivery System (automated)
  - Slurry System (automated)
- Wet Ingredients (honey, molasses, juice concentrates)
  - Direct Injection (automated)

#### Fermenting

- Wet Ingredients (fruit puree)
  - Direct Injection (automated)

#### Aging (Dry Hop System)

- Dry Ingredients (hops, coffee)
  - Direct Injection (automated)

#### Package Release

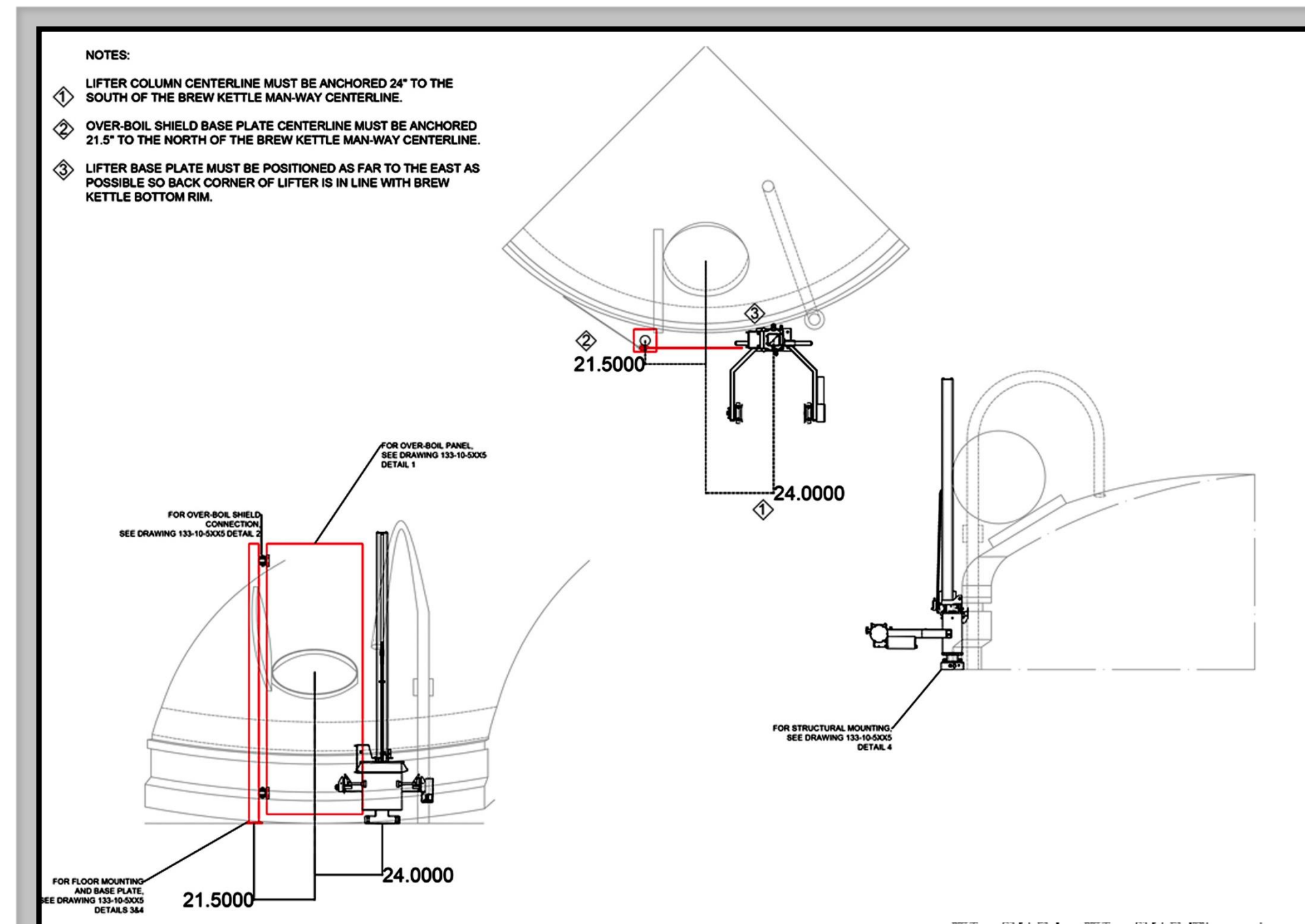
- Wet Ingredients (fruit flavors, herb extracts)
  - Direct Injection (automated)

### Brew House Kettle Manual Dump

#### Dry Ingredients Delivery Methods

Kettle Lift Assist (manual)

- Floor Space
- Overhead Space
- Location to Maintain Manway Access
- Ingredients Amount & Weight
- Timing of Ingredients Addition before Knockout

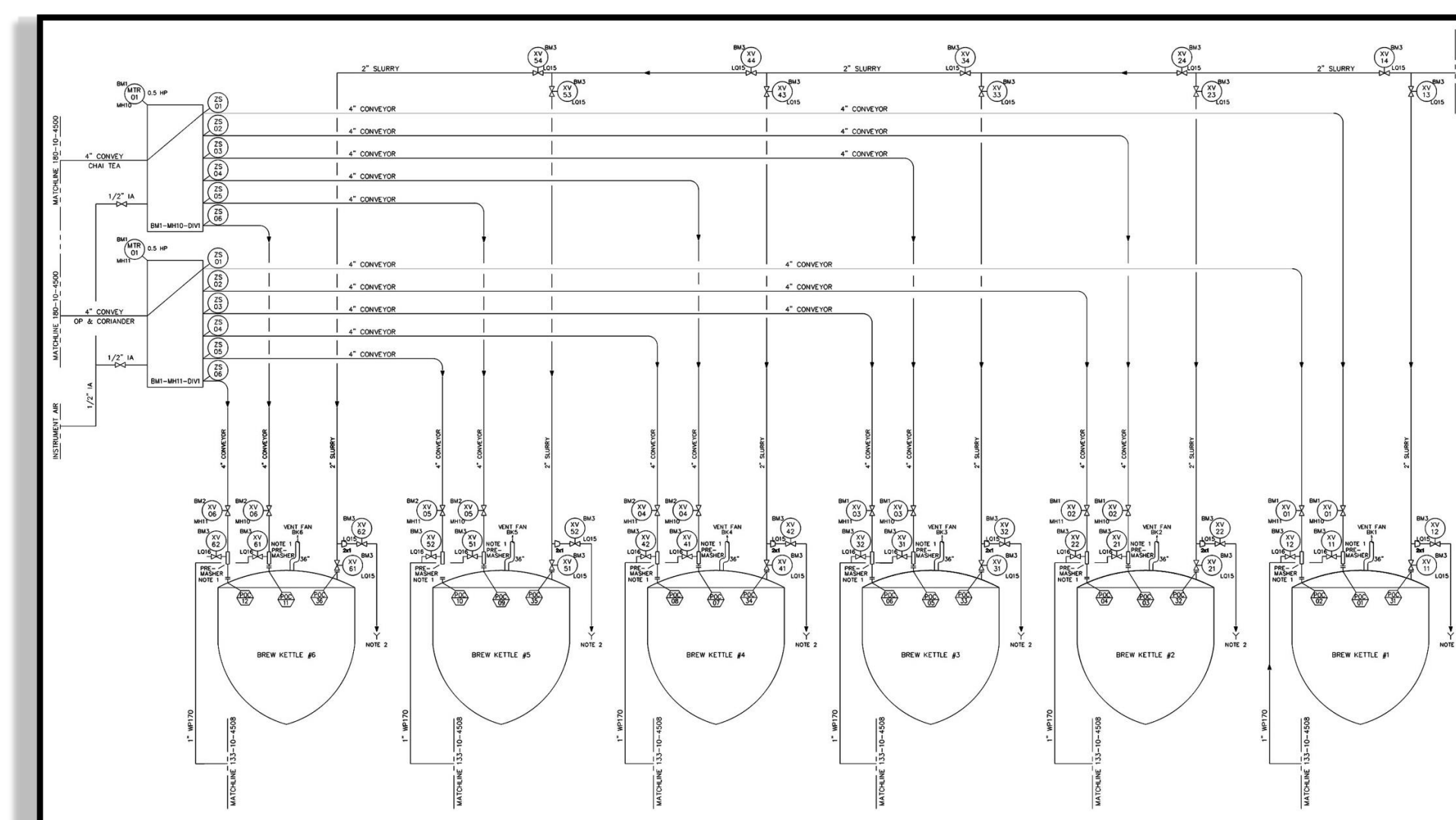


### Brew House Dry Ingredients

#### Dry Ingredients Delivery Methods

Pneumatic Delivery (automatic)

- Dense Phase vs. Dilute Phase
- Delivery Time/Convey Rate (delivery before knock out)
- Number of Sources, Destinations
- Number of Ingredients, Ingredients Staging
- Pre-mash of Ingredients
- Explosive Concerns (Kst, Pmax, MIT testing)
- Material Properties
- Electrical Design Considerations/Classification
- Housekeeping
- Bulk Density, Degradation Concerns, "Flow Ability"
- Integration into Brewhouse Control System

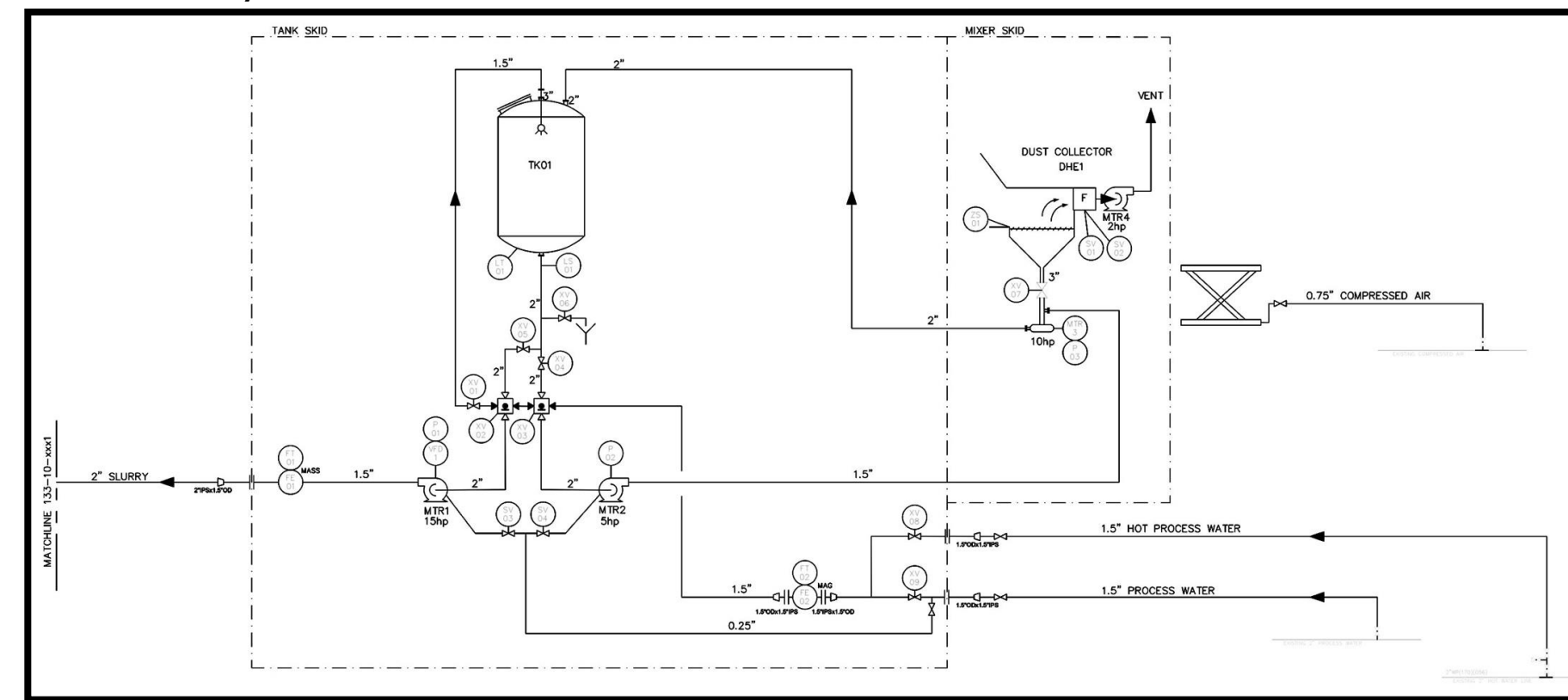


### Brew House Slurry Injection System

#### Dry Ingredients Delivery Methods

Slurry System (automatic)

- Slurry Percentage, Viscosity
- Water Volume Added to Brew
- Explosive Concerns (Kst, Pmax, MIT testing)
- Electrical Design Considerations/Classification
- Delivery Rate
- Loading Materials/ Operator Limitations (lift assist)
- Cleaning
- Housekeeping
- Logistics
- Dust Control
- Staging

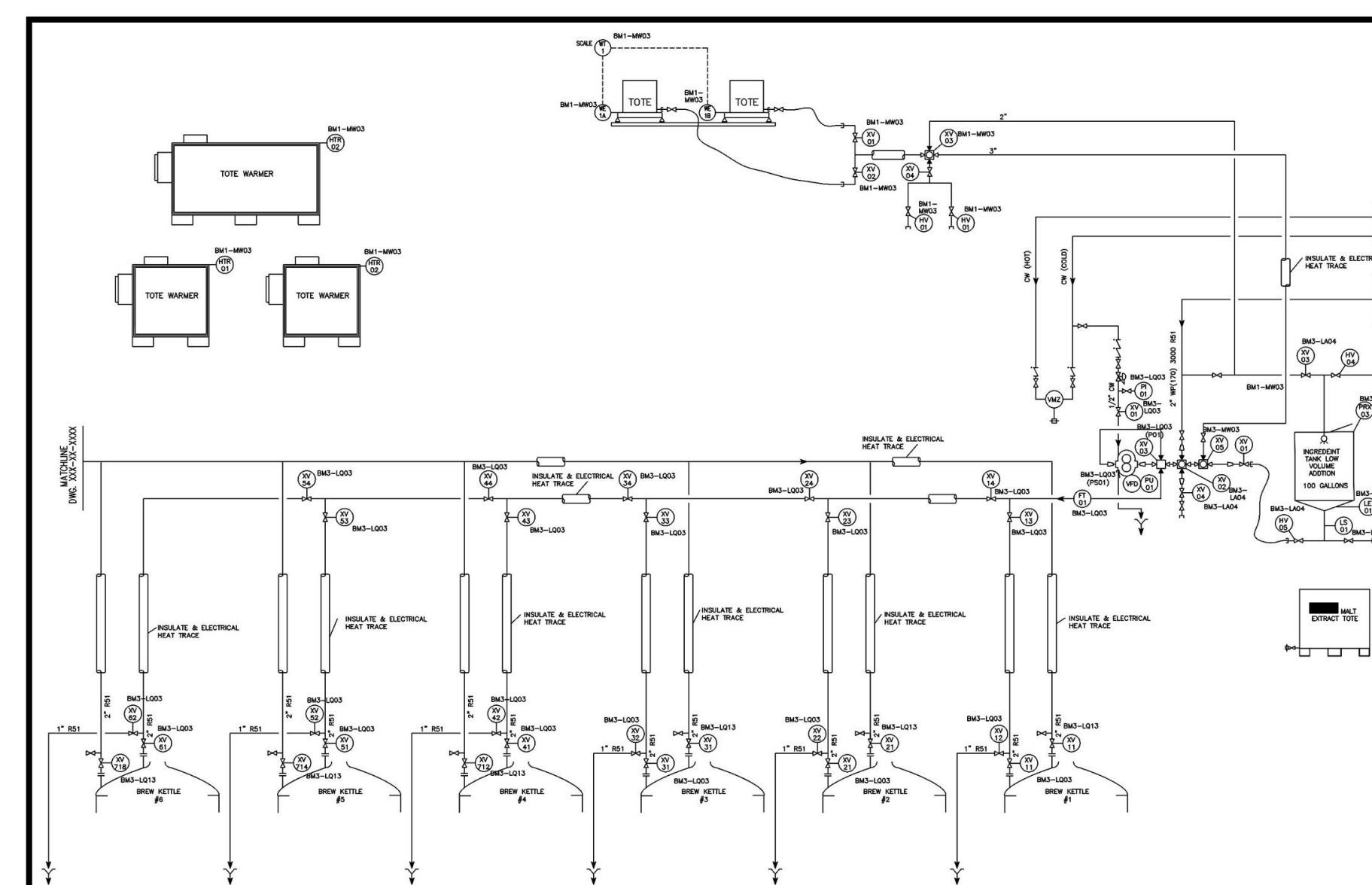


### Brew House Kettle Liquid Ingredients

#### Wet Ingredients Delivery Methods

Direct Injection (automatic)

- Viscosity/Material Properties
- Heated or Non-Heated
- O<sub>2</sub> Pickup (packaging release)
- Line Rinsing/CIP
- Batch Addition or Flow Pace
- Timing/Schedule vs. Knockout
- Diluent or Water Addition/ Push Volumes

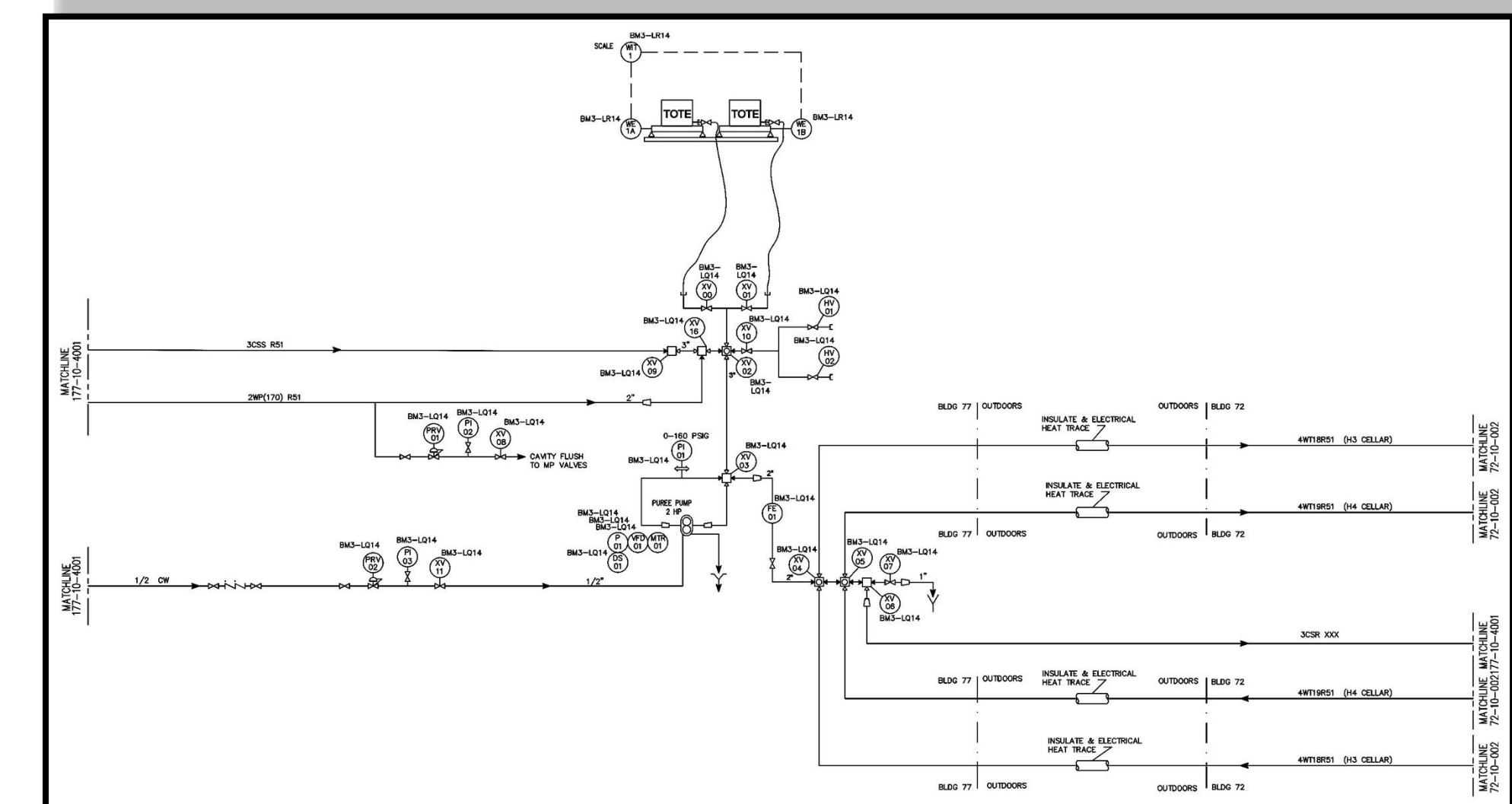


### Fermenting

#### Wet Ingredients Delivery Methods

Direct Injection (automatic)

- Viscosity/Material Properties
- Heated or Non-Heated
- Line Rinsing/CIP
- Batch Addition or Flow Pace
- Timing/Schedule vs. Knockout
- Diluent or Water Addition/ Push Volumes



### Aging

#### Dry Ingredients Delivery Methods

Direct Injection (automatic)

### Package Release

#### Wet Ingredients Delivery Methods

Direct Injection (automatic)

- Viscosity/Material Properties
- Heated or Non-Heated
- O<sub>2</sub> Pickup (packaging release)
- Line Rinsing/CIP
- Batch Addition or Flow Pace
- Timing/Schedule vs. Knockout
- Diluent or Water Addition/ Push Volumes

