

## **Design Build Proposal # 1336**



**for a  
new Organic Dairy  
in Maine**



**Food Tech, Inc.**  
300 LedgeWood Place, Ste. 304  
Rockland, MA 02370  
Phone: 781.261.9700  
[www.foodtech.com](http://www.foodtech.com)

December 10, 2013

**Maine's Own Organic Milk (MOOMilk)**

170 US Route 1, Ste 209  
Falmouth, ME 04105

Attn: Bob Sessums  
Chief Operating Officer

RE: Design-Build Proposal #1336 for a new Organic Dairy in Maine

Dear Bob:

We are pleased to present this study for your proposed new organic milk plant in Maine. Thank you for your interest in Food Tech and Design-In-Place. Based on our meeting, discussions with Keenan Murphy, and e-mail correspondence, we have good understanding of your needs and expectations. Our Food Tech team is very experienced in the specialized requirements of dairy plants and our proposal follows including these Sections:

- Section 1 - Executive Summary
- Section 2 - Drawings
- Section 3 - Construction Cost Estimate
- Section 4 - Schedule
- Section 5 - Outline Specifications
- Section 6 - Recommended Actions

We look forward to reviewing this Design-Build proposal with you in detail.

Sincerely,  
**Food Tech, Inc.**

Luke Heffernan, PE  
President

CC: Keenan Murphy



**SECTION 1**

**EXECUTIVE SUMMARY**

Project Description:

MOO Milk is planning the construction of a new organic dairy processing facility in Maine. Currently product is co-packed at Smiling Hill Farm in Westbrook, ME. The proposed new plant will produce skim milk, 1%, 2%, whole milk, cream, powders, and ice cream mix. Products will be packaged in 300 gal totes, 5 gal buckets, 5 gal bags, pints, quarts and half-gallon paper. These smaller items will be manually cased in corrugated boxes. The new dairy will also be planned to run kosher product. Initial production volumes will be 20,000 gal/week growing to 45,000 gal/week over the next three years.

Design-Build Proposal Description

All fluid milk processing equipment and process piping is included in this proposal under scope by Design-In-Place. The Food Tech construction estimate does not include packaging equipment at this time. When requesting quotes from Nimco, they responded that they have already quoted directly to you. If you prefer, Food Tech can provide this filling and packaging equipment at cost plus 5% fee.

The plant will have the appearance of a New England farm building and will be visitor friendly. Staffing will be 10-15 people and visitors will be accommodated in groups of 15 or fewer.

Energy Usage:

Monthly operating cost of energy is anticipated at \$15,000/mo for electric usage and \$8,000/mo in natural gas usage. Waste water charges can be estimated once an actual site is determined. These energy estimates are based on our experience with similar projects and updated to reflect energy costs in Maine; \$0.13/ kwh (electricity) and \$1.20/therm (natural gas).

Proposed Organic Dairy Description:

The proposed main building would be a 188' x 124' pre-engineered metal building (PEMB) with eave height of 24 ft. Color of siding and roofing would be by the Owner, perhaps barn red siding with dark bronze or dark green roof. The utility building and tank halls would be of masonry construction and painted in a complementary color. Floors would be sloped to stainless steel drains, and flooring in all wet areas would be ¼" urethane. Again, there is a wide color selection, commonly red or grey. Walkable ceilings would be provided over all process



areas. Utilities would be installed in this “attic” space, with vertical drops to equipment. This greatly reduces the amount of horizontal piping within sanitary process areas. The goal is to achieve sanitary finishes in all wet areas, suitable for severe washdown and exposure to cleaning chemicals, and be FDA and PMO compliant. Vitrified tile could be provided in lieu of urethane for an upcharge of \$200,000.

Process area walls and ceilings will be insulated metal panels, prefinished white. Concrete curbs will protect the wall panels and they will be urethane coated. Functional areas include tank truck receiving, raw and pasteurized tank halls, process room, filling room, packaging room, CIP room, cooler, dry storage, office area and employee area. Utility areas include refrigeration, boiler, electrical, and maintenance rooms. There will be a viewing gallery or elevated hallway for visitors. In all, the proposed building is approximately 25,000 square feet.

#### Core utilities:

The proposal includes a new 2500 amp 480v/3 phase/4 wire electric service, a racked freon refrigeration system having 120 tons of refrigeration with glycol chiller, and a 200 BoHP boiler. Hot and cold domestic water and a 30 HP air compressor is included. Process areas are air conditioned with 30% filters. Positive pressure CPA make-up air units could be provided for ultra-conditioned air, but there would be a substantial added cost of about \$240,000.

#### Construction Cost Summary:

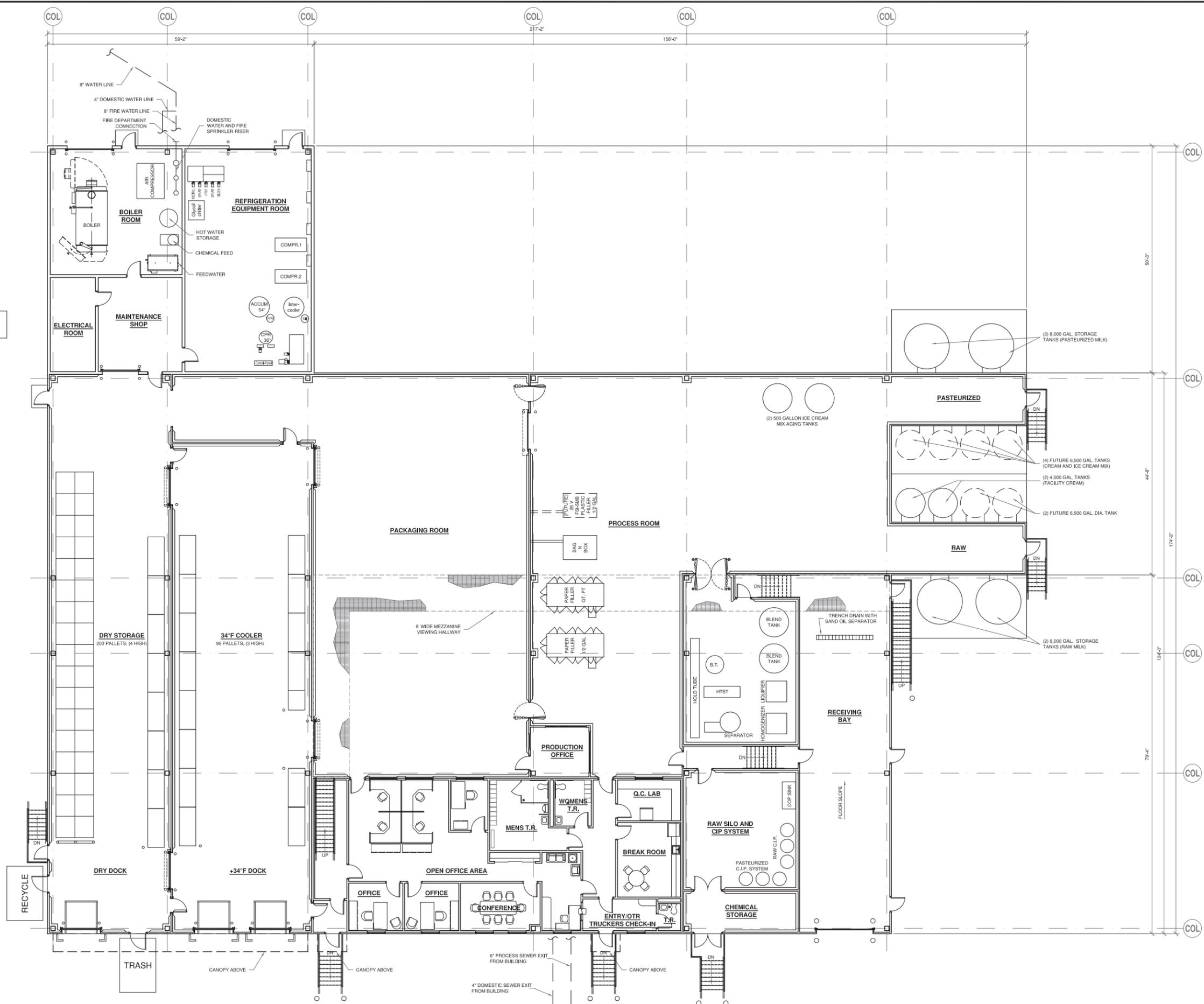
The following Sections show the proposed floor plan layout, building elevations, preliminary process flow diagram, GC construction cost estimate, preliminary process equipment, and process budget. In summary, we estimate the cost of the building and core utilities at \$6.0 million plus \$2.7 million for process equipment and installation. \$9.0 million including alternates and LEED Silver Certification.

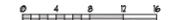


## SECTION 2

### DRAWINGS

- ✓ A-1: Proposed Floor Plan
- ✓ A-2: Building Elevations
- ✓ Preliminary Process Schematic




**OVERALL FLOOR PLAN**  
 SCALE: 1/8"=1'-0"  


ACTION	DATE	DESCRIPTION
E	12-09-13	REVIEW
D	12-02-13	REVIEW
C	11-26-13	REVIEW
B	11-25-13	REVIEW
A	11-08-13	REVIEW

**Planning Study for:**  
**Maines Own Organic**  
**Falmouth, Maine**

**PROPOSED**  
**FLOOR PLAN**

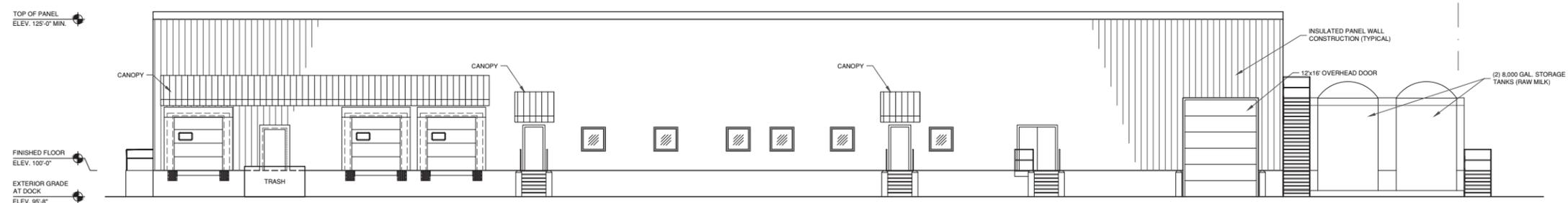

**Food Tech**  
 An EMCOR Company  
 300 LEDGENWOOD PL., STE 304, ROCKLAND, MA 02370  
 Tel: (781) 281-5700 foodtech.com

DATE:	11-6-13
DESIGNED BY:	TLD
DRAWN BY:	TLD
CHECKED BY:	

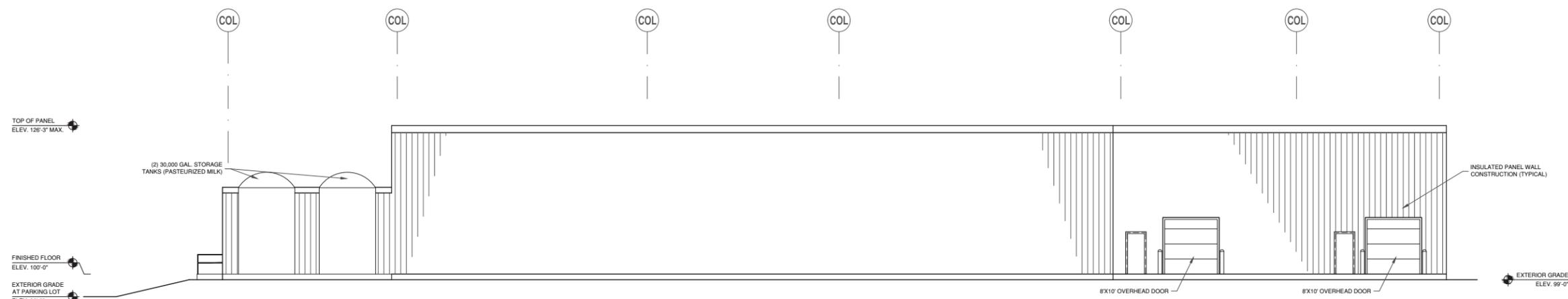
DRAWING NO.

**A-1**

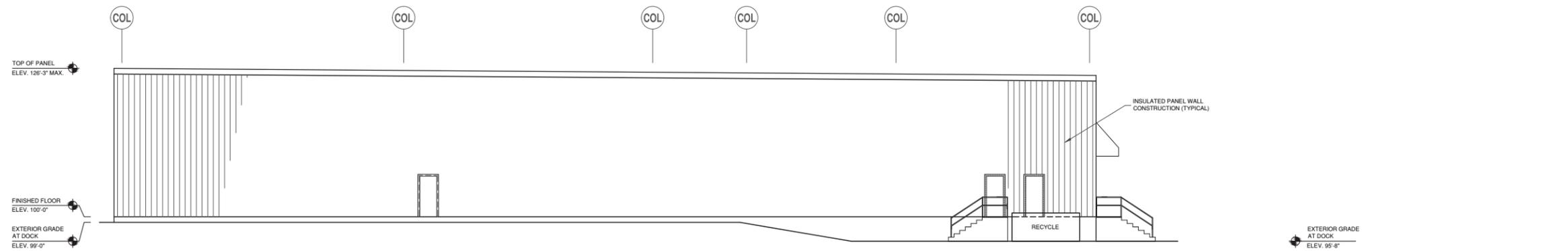
1325



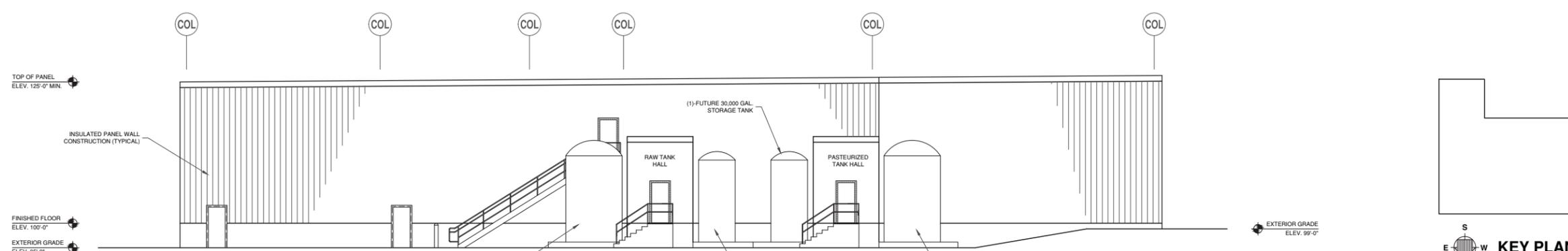
**NORTH ELEVATION**  
SCALE: 1/8"=1'-0"



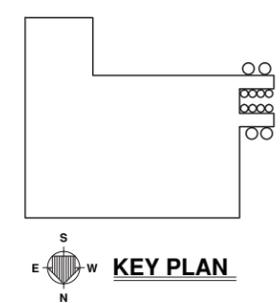
**SOUTH ELEVATION**  
SCALE: 1/8"=1'-0"



**EAST ELEVATION**  
SCALE: 1/8"=1'-0"



**WEST ELEVATION**  
SCALE: 1/8"=1'-0"



ACTION	DATE	DESCRIPTION
B	12-09-13	REVIEW
A	11-08-13	REVIEW

Planning Study for:  
**Maines Own Organic**  
Falmouth, Maine

**PROPOSED**  
**BUILDING ELEVATIONS**

**Food Tech**  
An EMCOR Company  
300 LEDGEWOOD PL., STE 304, ROCKLAND, MA 02370  
Tel: (603) 281-9700 foodtech.com

DATE:	11-5-13
DESIGNED BY:	TLD
DRAWN BY:	TLD
CHECKED BY:	

DRAWING NO.

**A-2**

1325





## SECTION 3

### CONSTRUCTION COST ESTIMATE

- ✓ General Construction
- ✓ Process Summary & Budget

Maines Own Organic (MOO)  
Construction Cost Estimate

WORK ITEM	\$/SF	\$
GENERAL CONDITIONS	13.10	343,500
SITE WORK	12.05	316,115
CONCRETE	26.41	692,812
MASONRY	7.57	198,528
STEEL	24.62	645,847
ROOFING	1.66	43,480
DOORS & WINDOWS	5.92	155,300
FINISHES	13.26	347,797
SPECIALTIES	0.19	4,934
EQUIPMENT	2.39	62,640
SANITARY WALL-CEILING PANELS	19.37	508,090
PLUMBING	5.57	146,100
HVAC	18.12	475,160
SPRINKLERS	5.17	135,592
REFRIGERATION	21.30	558,800
ELECTRICAL SYSTEM	15.10	396,160
SUBTOTAL COST OF WORK		\$5,030,854
<b>PROFESSIONAL FEES</b>		
ARCHITECTURE/ENGINEERING	9.59	251,500
PRECONSTRUCTION SERVICES	0.61	16,000
PROJECT MANAGEMENT & SUPERVISION	6.86	180,000
DESIGN-BUILDER FEE	19.18	503,100
<b>TOTAL GC CONSTRUCTION COST ESTIMATE</b>	<b>\$228.04</b>	<b>\$5,981,454</b>
Area =		26,230 sf
<b>ALTERNATES</b>		
PROCESS EQUIPMENT BUDGET (DESIGN-IN-PLACE)		\$2,439,200
PROCESS MOTOR CONTROLS (DESIGN-IN-PLACE)		\$103,200
D-B FEE ON PROCESS SYSTEM IF SINGLE SOURCE		\$127,100
<b>TOTAL CONST. ESTIMATE WITH ABOVE ALTERNATES</b>		<b>\$8,650,954</b>
LEED SILVER CERTIFICATION		\$400,000

# Maines Own Organic (MOO)

## Construction Cost Estimate

AREA SUMMARY (Drawing A-1)	Area (SF)	Wet	Refrigerated	Ambient
Receiving Bay	1,600	1,600		1,600
Utility Areas: Elec, Refrig, Maint, Boiler	3,000			3,000
Process Areas, Raw, Pasteurized, CIP	6,900	6,900		6,900
Tank Halls	600	600		600
Packaging	4,220	4,220		4,220
Dry Storage	3,830			3,830
Cooler	3,460		3,460	
Offices	2,620			2,620
Viewing Gallery (Mezzanine)	1,300			1,300
<b>TOTAL FOOTPRINT</b>	<b>26,230</b>	<b>13,320</b>	<b>3,460</b>	<b>22,770</b>

CSI	DISCIPLINE	UNITS	QUANTITY	UNIT PRICE \$	SUBTOTALS \$	TOTALS \$
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<b>1</b>	<b>GENERAL CONDITIONS</b>					
	FIELD OFFICE-TRAILER-TOILETS-TRAVEL-TRUCKING	MO	9	18,000	162,000	
	TESTING FEE (ALLOWANCE)	MO	6	7,000	42,000	
	BUILDING PERMIT (ALLOWANCE)	LS	1	40,000	40,000	
	BUILDERS RISK (ALL-RISK) INSURANCE (ALLOW)	LS	1	5,000	5,000	
	PROJECT OVERHEAD AND INSURANCE	MO	9	10,500	94,500	
	<b>TOTAL GENERAL CONDITIONS</b>					<b>343,500</b>

<b>2</b>	<b>SITE WORK</b>					
	SITE WORK FOR PROPERTY: CLEAR-GRADE-CUTS-FILLS-UTILITIES-PAVE (ALLOWANCE)				240,000	
	SITE CONCRETE-ENTRY PADS	EA	3	800	2,400	
	EXCAVATE & BACKFILL FOR INTERIOR FOOTINGS	EA	10	400	4,000	
	EXCAVATION & BACKFILL FOR STRIP FOOTINGS	LF	740	16	11,840	
	EXCAVATE & BACKFILL FOR SILO PADS	SF	1,560	8.00	12,480	
	FIRE WATER ENTRANCE TO 6" RISER	LF	100	80	8,000	
	GRAVEL BASE FOR SLABS	SF	24,930	1.50	37,395	
	<b>TOTAL SITE WORK</b>					<b>316,115</b>

<b>3</b>	<b>CONCRETE</b>					
	STRIP FOOTINGS	LF	900	60	54,000	
	INTERIOR FOOTINGS	EA	11	400	4,400	
	WALL PIERS	EA	32	600	19,200	
	FOUNDATION WALLS	LF	900	120	108,000	
	SLOPED FLOORS	SF	13,320	12	159,840	
	FLAT FLOORS	SF	12,910	10.00	129,100	
	ELEVATED SLAB	SF	1,300	16	20,800	
	CONCRETE PLANK AT TANK HALLS	SF	600	12	7,200	
	SILO PADS	EA	8	16,000	128,000	
	24" CURBS	LF	1,946	32	62,272	
	<b>TOTAL CONCRETE</b>					<b>692,812</b>

<b>4</b>	<b>MASONRY</b>					
	CIP-TANK HALLS-RECEIVING BAY-UTILITY AREAS	SF	12,408	16	198,528	
	<b>TOTAL MASONRY</b>					<b>198,528</b>

# Maines Own Organic (MOO)

## Construction Cost Estimate

CSI	DISCIPLINE	UNITS	QUANTITY	UNIT PRICE \$	SUBTOTALS \$	TOTALS \$
<b>5</b>	<b>STEEL</b>					
	STEEL FRAME	SF	22,630	9.00	203,670	
	SLOPED STEEL ROOF -W/ VINYL FACED F'GLASS	SF	23,312	11.00	256,432	
	SNOW & ICE GUARDS	LS	1	8,000	8,000	
	MEZZANINE STEEL	SF	1,300	16	20,800	
	STEEL STAIRS FOR MEZZANINE	EA	2	12,000	24,000	
	STEEL EXIT STAIRS	EA	6	4,500	27,000	
	CANOPY AT TRUCK DOCK	LF	60	250	15,000	
	GOAL POSTS	EA	12	800	9,600	
	BOLLARDS	EA	20	600	12,000	
	CATWALK AND AND SWING STAIRS FOR TANKER	EA	1	30,000	30,000	
	MISC STEEL	SF	26,230	1.50	39,345	
	<b>TOTAL STEEL</b>					<b>645,847</b>
<b>7</b>	<b>ROOFING</b>					
	TPO ROOF & INSULATION	SF	3,600	8.50	30,600	
	GRAVEL STOP-GUTTERS-DOWNSPOUTS	LF	560	8.00	4,480	
	PENETRATIONS - PIPE	EA	24	250	6,000	
	FLASH CURBS	EA	6	400	2,400	
	<b>TOTAL ROOFING</b>					<b>43,480</b>
<b>8</b>	<b>DOORS &amp; WINDOWS</b>					
	PROCESS AREA MAN DOORS	EA	8	3,000	24,000	
	PROCESS AREA IMPACT DOORS - SINGLE	EA	2	2,200	4,400	
	PROCESS AREA IMPACT DOORS - DOUBLE	EA	1	3,500	3,500	
	FAST TRAX COOLER DOORS	EA	5	13,000	65,000	
	PROCESS AREA & GALLERY WINDOWS	EA	18	1,200	21,600	
	HOLLOW METAL DOORS	EA	25	800	20,000	
	HOLLOW METAL DOORS - DOUBLE	EA	3	1,200	3,600	
	SECTIONAL OVERHEAD DOORS	EA	6	2,200	13,200	
	<b>TOTAL DOORS &amp; WINDOWS</b>					<b>155,300</b>
<b>9</b>	<b>FINISHES</b>					
	CONCRETE SEALER	SF	9,730	0.75	7,298	
	URETHANE FLOORS	SF	13,320	9.50	126,540	
	URETHANE CURBS	SF	1,050	6.00	6,300	
	PAINT MASONRY	SF	24,816	1.20	29,779	
	PAINT PLANK	SF	600	1.80	1,080	
	FIT UP OFFICE - EMPLOYEE AREAS-GALLERY	SF	4,120	40	164,800	
	PAINT MISC STEEL	LS	1	12,000	12,000	
	<b>TOTAL FINISHES</b>					<b>347,797</b>
<b>10</b>	<b>SPECIALTIES</b>					
	FIRE EXTINGUISHERS	EA	7	240	1,574	
	LOCKER ROOM BENCHES	EA	2	600	1,200	
	LOCKERS	EA	12	180	2,160	
	<b>TOTAL SPECIALTIES</b>					<b>4,934</b>
<b>11</b>	<b>EQUIPMENT</b>					
	DOCK LEVELERS-SEALS-BUMPERS	EA	3	10,000	30,000	
	PALLET RACKS - STANDARD SELECTION	EA	184	60	11,040	
	PALLET RACKS - PUSH BACK	EA	144	150	21,600	
	<b>TOTAL EQUIPMENT</b>					<b>62,640</b>

# Maines Own Organic (MOO)

## Construction Cost Estimate

CSI	DISCIPLINE	UNITS	QUANTITY	UNIT PRICE \$	SUBTOTALS \$	TOTALS \$
13	<b>SANITARY WALL-CEILING PANELS</b>					
	4" WALL PANELS - EXTERIOR	SF	14,050	9.00	126,450	
	4" WALL PANELS - INTERIOR		14,868	10.00	148,680	
	SANITARY WALKABLE CEILINGS	SF	17,480	12	209,760	
	CUT AND TRIM OPENINGS	EA	58	400	23,200	
	<b>TOTAL SANITARY WALLS-CEILING</b>					<b>508,090</b>
15A	<b>PLUMBING</b>					
	SANITARY SEWER & VENT	LF	540	60	32,400	
	FLOOR DRAINS	EA	28	1,600	44,800	
	TRENCH DRAIN	LF	12	150	1,800	
	HOT WATER HEATER	EA	1	3,500	3,500	
	HOT & COLD WATER PIPING- INSULATED	LF	480	40	19,200	
	HOSE STATIONS	EA	6	3,500	21,000	
	HAND SINKS	EA	3	4,000	12,000	
	FOAM & SANITIZE STATIONS	EA	5	1,800	9,000	
	SANITARY SEWER FOR AIR UNIT CONDENSATE	LF	60	40	2,400	
	<b>TOTAL PLUMBING</b>					<b>146,100</b>
15B	<b>HVAC</b>					
	BOILER SYSTEM 200 BoHP	LS	1	126,000	126,000	
	STEAM PIPING	LF	300	80	24,000	
	AIR COMPRESSOR SYSTEM	LS	1	40,000	40,000	
	AIR PIPING	LF	240	32	7,680	
	HEAT-VENT UTILITY AREAS	SF	4,600	6.00	27,600	
	HEAT-VENT DRY WAREHOUSE	SF	3,830	4.00	15,320	
	AIR CONDITION PROCESS AREAS	SF	11,720	16	187,520	
	HVAC OFFICE AREAS	SF	3,920	12	47,040	
	<b>TOTAL HVAC</b>					<b>475,160</b>
15C	<b>SPRINKLERS</b>					
	WET RISER AND BRANCH PIPING	SF	22,770	5.00	113,850	
	DRY PENDANT HEADS	EA	42	150	6,325	
	WET PENDANT HEADS	EA	154	100	15,417	
	<b>TOTAL SPRINKLERS</b>					<b>135,592</b>
15D	<b>REFRIGERATION</b>					
	REFRIGERATION SYSTEM -RACK FREON	TR	120	3,400	408,000	
	GLYCOL CHILLER	LS	1	60,000	60,000	
	GLYCOL PIPING AND CONNECTIONS	LF	1,080	60	64,800	
	REFRIGERATION POWER AND CONTROL	LS	1	26,000	26,000	
	<b>TOTAL REFRIGERATION</b>					<b>558,800</b>
16	<b>ELECTRICAL SYSTEM</b>					
	POWER DISTRIBUTION & WIRING - BLDG	SF	26,230	4.00	104,920	
	PANELS AND FEEDERS	LS	1	50,000	50,000	
	MOTOR CONNECTIONS	EA	21	1,500	31,500	
	LIGHTING	SF	26,230	6.00	157,380	
	LIGHTING ABOVE CEILING	SF	17,480	2.00	34,960	
	LIFE SAFETY GENERATOR	LS	1	12,000	12,000	
	FIRE ALARM	SF	10,800	0.50	5,400	
	<b>TOTAL ELECTRICAL</b>					<b>396,160</b>
	<b>SUBTOTAL</b>					<b>\$5,030,854</b>

Maines Own Organic (MOO)  
Construction Cost Estimate

CSI	DISCIPLINE	UNITS	QUANTITY	UNIT PRICE \$	SUBTOTALS \$	TOTALS \$
18	<b>PROFESSIONAL</b>					
	ARCHITECTURE/ENGINEERING	\$	5.0%	5,030,854	251,500	
	PRECONSTRUCTION SERVICES	MONTH	2	8,000	16,000	
	PROJECT MANAGEMENT & SUPERVISION	MONTH	10	18,000	180,000	
	DESIGN-BUILDER FEE	\$	10.0%	5,030,854	503,100	
	<b>TOTAL PROFESSIONAL</b>					<b>950,600</b>
<b>TOTAL CONSTRUCTION COST ESTIMATE</b>			<b>26,230</b>	<b>\$228.04</b>		<b>\$5,981,454</b>

SF

**EXCLUSIONS - POTENTIAL ADDED BUDGET ITEMS**

- CENTRAL FOAM & SANITIZE PIPING
- CHEMICAL PIPING
- COMPACTORS
- COMPUTER SYSTEM AND CABLING
- CONTINGENCY
- CREDIT FOR ENERGY INCENTIVES
- ENVIRONMENTAL CONTAMINATION OR REMEDIATION
- FURNITURE FIXTURES & EQUIPMENT (FF&E)
- LAB EQUIPMENT
- LEED OR SOLAR DESIGN
- OFFSITE IMPROVEMENTS & OFFSITE UTILITIES
- PACKAGING EQUIPMENT AND CONVEYORS
- PAGING SYSTEM
- POSITIVE PRESSURE MAU'S
- PROCESS EQUIPMENT AND PROCESS PIPING
- PROCESS CONTROLS
- RIGGING OF NEW PROCESS EQUIPMENT
- SITE WORK BEYOND THE BUILDING LINES
- TELEPHONE, SECURITY SYSTEM, PAGING SYSTEM

ALLOWANCE INCLUDED      240,000  
by Owner

# FOOD TECH, INC.

## MOO MILK PROCESSING FACILITY FALMOUTH, MAINE

### PROJECT SUMMARY & BUDGET

December 4, 2013

#### INTRODUCTION

This summary and budget has been prepared for the supply of equipment and installation for the processing requirements for MOO Milk. The equipment & services defined and included in this document are based upon the Design-In-Place Engineering drawing titled "Preliminary Process Schematic" and dated 11-7-2013. The scope of work included in this budget is from the discharge of the tanker truck that delivers milk or cream into the facility out to the filling machines (which would be provided by MOO Milk).

Not included in the scope of this document are any building, refrigeration, heating, or electrical requirements unless specifically indicated in the document.

The budget pricing itself has been estimated at  $\pm 5\%$ . Please account for anticipated increases in pricing as well depending upon when the actual award of contract might be completed.

## SCOPE OF WORK

### 1. Receiving and Raw Equipment, including:

- One (1) Receiving Hose, 3" x 20' long
- One (1) LKH-70 Alfa Laval Receiving Pump c/w Motor
- Two (2) Wedgewire Angle Line Filter/Strainers
- One (1) Manual Alfa Laval Butterfly Valve, 3"
- One (1) Alfa Laval Check Valve, 3"
- One (1) Anderson IZMAG Flow Meter (Note: No Ticket Printer Included)
- Three (3) Automatic Alfa Laval Butterfly Valves, 2"
- Two (2) Truck Wash Hoses, 2" x 10' long each
- Two (2) 8,000 Gallon Raw Milk Silos:
  - Working volume: 8,000 Gal.
  - Approximate inside dimensions : Ø 122", inside straight height 192"
  - Design Pressure: Atmospheric
  - Interior & Exterior : 304 S/S
  - Material thickness:
    - o Conical top head: 12GA
    - o Shell: 12 GA
    - o Sloped flat bottom: 12GA
    - o Sheathing: 16GA (Shell) and 12GA (Top)
  - Interior material finish: #4
  - Exterior material finish: 2B
  - Inside welds finish: Ribbon polished
  - Outside welds finish: Cleaned only (Stain removed)
  - Flanged conical top
  - Sloped flat bottom
  - Shell insulation: 3" (Side and top)
  - Minimum of 4" of urethane insulation on bottom
  - Outer wall overlapped. Vertical weld seams are fully welded and horizontal welds seams are spots welded only (hidden).
  - Stainless steel reinforcing rings
  - 60"x60"x20" Alcove, including:
    - o Oval Manway with manual sampler
    - o One (1) welded projectile thermowell (0.5" NPT connexion, 9" Lg.)
    - o One (1) 3" TC Inlet
    - o One (1) 3" TC Outlet
    - o One (1) 2" NA-Connect for level probe (probe not included)
  - One (1) 48" section dimple jacket, 1.25 NPTF connections
  - Horizontal agitator, 2HP, 480V/3/60

# Design-in-Place

## ENGINEERING

- One (1) spray disc
  - One (1) 2" CIP line
  - One (1) 3" vent line
  - Both line are insulated and have heating wires
  - Adaptor to clean both lines at the same time
  - Carbon steel base covered by stainless steel
  - Two (2) s/s 304 heavy duty lifting lugs;
  - Preparation for shipping
- Two (2) 4,000 Gallon Raw Cream Silos:
    - Working volume: 4,000 Gal.
    - Approximate inside dimensions : Ø 92", inside straight height 155"
    - Design Pressure: Atmospheric
    - Interior & Exterior : 304 S/S
    - Material thickness:
    - Conical top head: 12GA
    - Shell: 12 GA
    - Sloped flat bottom: 12GA
    - Sheathing: 16GA (Shell) and 12GA (Top)
    - Interior material finish: #4
    - Exterior material finish: 2B
    - Inside welds finish: Ribbon polished
    - Outside welds finish: Cleaned only (Stain removed)
    - Flanged conical top
    - Sloped flat bottom
    - Shell insulation: 3" (Side and top)
    - Minimum of 4" of urethane insulation on bottom
    - Outer wall overlapped. Vertical weld seams are fully welded and horizontal welds seams are spots welded only (hidden).
    - Stainless steel reinforcing rings
    - 60"x60"x20" Alcove, including:
      - Oval Manway with manual sampler
      - One (1) welded projectile thermowell (0.5" NPT connexion, 9" Lg.)
      - One (1) 3" TC Inlet
      - One (1) 3" TC Outlet
      - One (1) 2" NA-Connect for level probe (probe not included)
      - One (1) 30" section dimple jacket, 1.25 NPTF connections
      - Horizontal agitator, 2HP, 480V/3/60
    - One (1) spray disc
    - One (1) 2" CIP line
    - One (1) 3" vent line
    - Both line are insulated and have heating wires
    - Adaptor to clean both lines at the same time
    - Carbon steel base covered by stainless steel
    - Two (2) s/s 304 heavy duty lifting lugs;
    - Preparation for shipping

- Four (4) Anderson RTD Transmitters (for Milk and Cream Silos)
- Four (4) Anderson Level Transmitters (for Milk and Cream Silos)
- Eight (8) Alfa Laval 3" Automatic Shut-off Valves
- Four (4) Automatic Ball Valves for CWS (Installed by Others)
- Four (4) Manual Ball Valves for CWS (Installed by Others)
- Eleven (11) Alfa Laval 2-1/2" Automatic Cross Body Shut-off Valves
- Two (2) Alfa Laval 2-1/2" Automatic Shut-off Valves
- One (1) LKH-10 Alfa Laval Raw Milk Pump c/w Motor
- One (1) LKH-10 Alfa Laval Raw Cream Pump c/w Motor
- One (1) Ampco SP-225 Self-priming Centrifugal Pump c/w Motor (for CIPR)
- One (1) Anderson AV-9000- 4 Pen Recorder (for Silo Temperatures)
- One (1) Anderson IZMAG Cream Flow Meter
- One (1) Flexible Hose (for Silo CIP)
- One (1) Raw CIPS Flow Panel
- One (1) Raw Product Distribution Flow Panel
- Process Interconnect Piping as Required
- One (1) Control Enclosure including (1) 10"HMI Panel View for Receiving Area

**Item #1 Budget Price:.....\$ 425,100.00**

## **2. HTST, Separator, & Homogenizer, including:**

- One (1) 2-1/2"Alfa Laval Automatic Shut-off Valve
- Three (3) 2" Air Actuated Butterfly Valves (for water)
- One (1) 50 Gallon Balance Tank with Spray Ball
- One (1) Anderson LN Level Transmitter
- One (1) 3" Alfa Laval Automatic Cross Body Valve
- One (1) Alfa Laval LKH-10 Centrifugal Pump c/w motor (Booster)
- One (1) Alfa Laval LKH-10 Centrifugal Pump c/w Motor (Stuffer)
- Three (3) Anderson Sanitary Gauges
- One (1) Tetra Plex C8-KSH Plate Heat Exchanger (for 50gpm Milk 30gpm Ice Cream Mix pasteurization)
- One (1) Legal Holding Tube

# Design-in-Place

ENGINEERING

- One (1) 2-1/2" Tri-Clover Flow Diversion Valve
- One (1) Anderson AV9900 Recorder with Probe (STLR)
- One (1) DART Temperature Probe and Display
- Two (2) Anderson JD Sanitary Differential Pressure Switch with 4 Sensors
- One (1) Sight Glass (in leak-detect line)
- One (1) Sanitary Restrictor
- One (3) 2-1/2" Alfa Laval Automatic Cross Body Valves
- One (1) 2-1/2" Alfa Laval Automatic Divert Valve
- One (1) 2-1/2" Alfa Laval Automatic Shut-off Valve
- Two (2) 2" Alfa Laval Automatic Shut-off Valves
- One (1) Anderson RTD Temperature Sensor
- One (1) IZMS Magnetic Flowmeter
- One (1) Alfa Laval CIP-able Vacuum Breaker
- One (1) Alfa Laval CPMI Back-Pressure Valve
- One (1) 6-port Flow Panel
- One (1) Tetra Pak H15 Separator
- One (1) Allfast S2 Standardizing System
- One (1) Bos Homogenizer
- HTST System will be Skid-Mounted (except for Homogenizer and Separator)
- Process Interconnect Piping as Required
- One (1) Hot Water Set, including
  - One (1) Separation Tank w/ Anderson High Level Switch & Water Supply Valve
  - One (1) Steam Modulating Valve
  - One (1) Steam Shut-Off Valve
  - One (1) Steam Strainer
  - One (1) Condensate Strainer
  - One (1) Steam Trap
  - One (1) Shell & Tube Heat Exchanger
  - One (1) Anderson RTD Temperature Sensor
  - One (1) Alfa Laval LKH-10 Centrifugal Pump c/w Motor
- One (1) 25 Gallons Cream Surge Tank with Spray Ball
- One (1) Alfa Laval SRU Positive Pump c/w Gearmotor
- One (1) Tetra Pak MS6-SR Plate Heat Exchanger for up to 5gpm 40% Cream Cooling
- One (1) RTD Sensor
- One (1) Control Enclosure including (1) 10" HMI Panel View for HTST and Ice Cream Mixing Area

**Item #2 Budget Price:.....\$ 845,200.00**

### 3. Ice Cream Processing and Blender:

- Two (2) 500 Gallon Ice Cream Processors:
  - Working Volume: 500 Gal.
  - Approximated inside dimensions : Ø 52" x 60" of straight height
  - Design Pressure: Atmospheric
  - Interior & Exterior : 304 S/S
  - Material thickness:
    - o Top, Bottom and Shell: 12 GA
    - o Sheathing: 12GA (Bottom and Shell)
  - Interior & Exterior material finish: #4
  - Inside welds finish: Ribbon polished (#4)
  - Outside welds finish: Cleaned only (Stain removed)
  - Dome top head, including:
    - o Four (4) 2" TC connections
    - o One (1) 3" TC vent
    - o One (1) 18" round manway
  - Flat sloped bottom, including:
    - o One (1) 2.5" TC connection at 20" from the floor
  - Side wall, including:
    - o One (1) 2" TC connection
    - o One (1) thermowell (0.5" NPT connexion, 9" Lg.)
  - Vertical agitator, including :
    - o NORD Gear motor, 3HP, 480V/3/60
    - o Bottom steady guide with nylon bushing
  - One (1) Baffle
  - One (1) 48" section dimple jacket, 1.25 NPTF connections
  - 2" insulation (fiberglass) on shell and bottom
  - Two (2) lifting lugs on top
  - Mounted on four (4) cylindrical legs with adjustable legs and anchor plates
  - Preparation for shipping
  
- Two (2) Anderson RTD Sensor and Transmitters (for Processors)
- Two (2) Anderson Level Transmitters (for Processors)
- Two (2) Alfa Laval 2-1/2" Automatic Shut-off Valves
- Two (2) Automatic Ball Valves for CWS (Installed by Others)
- Two (2) Manual Ball Valves for CWR (Installed by Others)
- One (1) Stainless Steel Platform with FRP Deck, Rated for 10 000lbs.
- Eight (8) Alfa Laval 2-1/2" Automatic Cross Body Shut-off Valves
- One (1) Alfa Laval 2-1/2" Automatic Shut-off Valves
- Three (3) LKH-10 Alfa Laval Centrifugal Pumps c/w Motor
- One (1) 150 Gallon Ice cream Blend Tank

**Item #3 Budget Price:.....\$ 214,900.00**

#### 4. Raw and Pasteurized CIP:

Raw & Pasteurized CIP Equipment, Specified per System

- Three (3) 250 Gallon Tanks, Type 304s/s
- Three (3) Anderson Level Transmitters
- Three (3) Alfa Laval Automatic Butterfly Valves, 2" (for Water)
- One (1) Manual Ball Valve (for Water)
- Three (3) Alfa Laval 2-1/2" Automatic Shut-off Valves
- Two (2) Alfa Laval 2-1/2" Automatic Divert Valves
- One (1) Rosemount Conductivity Sensor and Transmitter
- One (1) LKH-10 Alfa Laval Centrifugal CIPS Pump c/w Motor
- One (1) Angle Line Strainer
- One (1) IZMAG 2" Magnetic Flow Meter
- Two (2) Anderson Temperature Transmitters
- One (1) Anderson Temperature Recorder
- One (1) Negele Proof-of-Flow Switch
- One (1) Shell and Tube Heat Exchanger, Type 304 s/s
- One (1) Steam Modulating Valve
- One (1) Steam Shut-off Valve
- One (1) Steam Strainer
- Three (3) Manual Steam Ball Valves
- Two (2) Steam Pressure gauges with Pig Tail
- Two (2) Manual Condensate Ball Valves
- One (1) Condensate Strainer
- One (1) Steam Trap
- One (1) Condensate Check Valve
- Three (3) Wilden P0.025/PZPP/TNL/TF/PTV Diaphragm Pumps (Chemicals)
- One (1) Sanitizer Injection Check Valve
- Three (3) Chemical Drum Suction Wands with Foot Check Valve
- CIP System to be Skid Mounted

#### COP

- One (1) COP tank 30W x 72L x 24H with Cover, Centrifugal Pump, and Steam Control Valve with Temperature Sensor

**Item #4 Budget Price:.....\$ 241,200.00**

## 5. Pasteurized Equipment:

- Two (2) 8,000 Gallon Pasteurized Milk Silos:
  - Working volume: 4,000 Gal.
  - Approximate inside dimensions : Ø 92", inside straight height 155"
  - Design Pressure: Atmospheric
  - Interior & Exterior : 304 S/S
  - Material thickness:
  - Conical top head: 12GA
  - Shell: 12 GA
  - Sloped flat bottom: 12GA
  - Sheathing: 16GA (Shell) and 12GA (Top)
  - Interior material finish: #4
  - Exterior material finish: 2B
  - Inside welds finish: Ribbon polished
  - Outside welds finish: Cleaned only (Stain removed)
  - Flanged conical top
  - Sloped flat bottom
  - Shell insulation: 3" (Side and top)
  - Minimum of 4" of urethane insulation on bottom
  - Outer wall overlapped. Vertical weld seams are fully welded and horizontal welds seams are spots welded only (hidden).
  - Stainless steel reinforcing rings
  - 60"x60"x20" Alcove, including:
    - Oval Manway with manual sampler
    - One (1) welded projectile thermowell (0.5" NPT connexion, 9" Lg.)
    - One (1) 3" TC Inlet
    - One (1) 3" TC Outlet
    - One (1) 2" NA-Connect for level probe (probe not included)
    - One (1) 30" section dimple jacket, 1.25 NPTF connections
    - Horizontal agitator, 2HP, 480V/3/60
    - One (1) spray disc
    - One (1) 2" CIP line
    - One (1) 3" vent line
    - Both line are insulated and have heating wires
    - Adaptor to clean both lines at the same time
    - Carbon steel base covered by stainless steel
    - Two (2) s/s 304 heavy duty lifting lugs;
    - Preparation for shipping
- Two (2) Anderson Temperature Transmitters (for Milk Silos)
- Two (2) Anderson Level Transmitters (for Milk Silos)

- Two (2) Alfa Laval 3” Automatic Shut-off Valves
- Two (2) Automatic Ball Valves for CWS (Installed by Others)
- Two (2) Manual Ball Valves for CWR (Installed by Others)
- Twelve (12) Alfa Laval 2-1/2” Automatic Cross Body Shut-off Valves
- One (1) Alfa Laval 2” Automatic Cross Body Shut-off Valves
- Three (3) Alfa Laval 2” Automatic Shut-off Valves
- Two (2) LKH-10 Alfa Laval Pasteurised Milk Centrifugal Pumps c/w Motor
- Four (4) Ampco SP-225 Self-priming Centrifugal pumps c/w Motor (for Filler CIPR with Details TBD)
- One (1) Anderson AV-9000- 4 pen Temperature Recorder (for Pasteurized Silos)
- One (1) Flexible Hose for Pasteurized Silo CIP
- One (1) CIPS Flow Panel
- One (1) Stainless Steel Platform Scale with Digital Readout & Ethernet Interface
- One (1) Control Enclosure including (1) 10” HMI Panel View to be located in filler area

**Item #5 Budget Price:.....\$ 304,300.00**

## **6. Mechanical Installation & Commissioning:**

- Type 304s/s Process Piping & Fittings
- All CPUs and HMI’s are Allen Bradley. Communication will be via DeviceNet and/or Ethernet.
- Start-up and Commissioning
- Travel & Living Expenses
- Freight
- Process Engineering & Project Management

**Item #6 Budget Price:.....\$ 408,500.00**

## 7. Pricing Summary

Receiving & Raw Equipment	\$ 425,100.00
HTST, Separator, & Homogenizer	\$ 845,200.00
Ice Cream Processing & Blender	\$ 214,900.00
Raw & Pasteurized CIP	\$ 241,200.00
Pasteurized Equipment	\$ 304,300.00
Installation & Commissioning	<u>\$ 408,500.00</u>

Total Budget Estimate = \$2,439,200.00

## 8. Items Not Included

- Electrical Power or Interconnect Control Wiring
- Motor Control Center or Motor Disconnect Switches
- Process Piping Insulation
- Receiving Bay Catwalk (Tanker Top Access)
- Lab Equipment
- Cooling/Refrigeration Systems and Interconnect. As noted, we have included chilled water supply and return valves for installation by others.
- Water Piping. We will provide the water supply header and valves required for the CIP Skid and the water valve for the HTST Balance Tank only.
- Steam and Condensate Piping. As noted, we have included steam equipment for process related heating equipment.
- Any Building Construction.
- Chemicals or Chemical Storage.
- Fillers or any Packaging Equipment.
- Taxes.
- Anything not specifically indicated in the Scope of Work defined in this document.

## 9. Optional Motor Control

We have included budgetary pricing on the motor control requirements for the liquid processing side of the facility only. A central MCC could be provided in place of individual motor control cabinets if the final design dictates this.

### 9.1 Motor Control Enclosure for Receiving Area

- Stainless Steel Enclosure
- One (1) 25HP VFD (for Receiving Pump)
- E-Stop

**Item 9.1 Optional Budget Price:.....\$ 9,700.00**

### 9.2 Motor Control Enclosure for Raw Area

- Stainless Steel Enclosure
- Four (4) 3HP Starter (for Silo Agitators)
- One (1) 15HP Starter (for CIPR Pump)
- Two (2) 7-1/2HP VFD's (for Silo Transfer Pumps)
- E-Stop

**Item 9.2 Optional Budget Price:.....\$13,100.00**

### 9.3 Motor Control Enclosure for HTST Area

- Stainless Steel Enclosure
- One (1) 10HP Starter (for HTST Hot Water Pump)
- One (1) 20HP Starter (for Blender)
- Three (3) 5HP VFD's (for 2 Agitators and 1 Cream PD Pump)
- Four (4) 7-1/2HP VFD's (for Booster Pump, 3 IC Mix Centrifugal Pumps)
- One (1) 10HP VFD (for Stuffer Pump)
- One (1) 100HP VFD (for Homogenizer)
- E-Stop
- Note: Separator Motor Control Provided with Separator

**Item 9.3 Optional Budget Price:.....\$58,300.00**

**9.4 Motor Control Enclosure for CIP Systems**

- Stainless Steel Enclosure
- One (1) 7-1/2HP Starter (for COP Pump)
- Two (2) 10HP VFD's (for CIPS Pumps)
- E-Stop

**Item 9.4 Optional Budget Price:.....\$11,700.00**

**9.5 Motor Control Enclosure for Pasteurized Area**

- Stainless Steel Enclosure
- Two (2) 7-1/2HP Starters (for Silo Agitators )
- Four (4) 15HP Starters (for Filler CIPR Pumps)
- Two (2) 7-1/2HP VFD's (for Silo CIPR Pumps)
- E-Stop

**Item 9.5 Optional Budget Price:.....\$10,400.00**

**Total Budget Price for Process Motor Control.....\$103,200.00**



**SECTION 4**

**SCHEDULE**

	Months										
Activity	1	2	3	4	5	6	7	8	9	10	11
Detailed Design & Construction Documents	■	■									
Building Permits			■								
Concrete & Steel				■	■						
Thermal Insulation					■	■					
Refrigeration & Plumbing						■	■				
Process Equipment & Piping							■	■			
Electrical & Sprinkler								■	■		
Occupy										■	■



## SECTION 5

### OUTLINE SPECIFICATIONS



The following Outline Specifications represent Food Tech's design recommendations for the quality, grade, installation methods and approved manufacturers of the required site work, materials of construction and mechanical systems for your proposed project. The divisions of work are in CSI format and match the associated line items in the Construction Cost Estimate included in this *Design Report*.



## General Conditions

*Project Approach:* To achieve high quality and timely completion, we recommend a single source, total responsibility, design/build approach. Food Tech will serve as design/builder and will perform the architecture and engineering design as required for permitting and/or contractor bidding. Competitive bids will be solicited for all work at the supplier/installer level. This eliminates middlemen or pyramiding of fees. Food Tech will hold the subcontracts and supervise all work thru completion and start-up as indicated below.

*Project Management:* Immediately upon commission to proceed an experienced Food Tech Project Manager will be assigned. This person will manage all communication between our companies and coordinate/manage all design and construction activities.

An experienced Food Tech Superintendent will be assigned to the project to provide full time on site supervision for the duration of the project.

Subcontractors/vendors/service providers will be pre-qualified. You will be asked for any names of entities that you want or don't want on the bid lists. We will solicit a minimum of three competitive bids for all work. Bid summary sheets will be forwarded to you for review and approval of Food Tech recommended subcontract awards.

Food Tech will perform building department interface, design coordination, shop drawing review, and subcontractor coordination. We will draft, execute and hold all contracts, and submit monthly payment applications. Certificates of insurance and lien releases will be obtained from all subs/vendors.

A monthly Project Report will be prepared and submitted to you, which indicates:

- *Engineering Status*
- *Permitting Status*
- *Procurement Status*
- *Subcontractor/Vendor Directory*
- *Project Budget Summary*
- *Schedule*
- *Payment Application*
- *Project Photos*



*Field Office:*

Food Tech will place a construction office trailer at the site that will be staffed with the appropriate level of construction support personnel required to supervise the work and administer the contract documents for each trade. The trailer will be equipped with the required computer, reproduction and communication equipment necessary to administer the work. A copy of all project documents will be available in the trailer for owner review at any time.

*QA/QC/Safety:*

Food Tech will provide daily field inspection and quality control assurance while on site. Food Tech. will review all shop drawings and vendor submittals for their conformance with the design intent. The appropriate submittal drawings will be maintained at the job trailer on-site for all to use.

Food Tech will develop and maintain a project schedule and supervise the work performed by the various contractors so that the completion of the work is achieved by the scheduled completion date of each activity. A pro-active safety program will be established per OSHA guidelines. We will seek Owner commitment to our safety program including zero injuries – Zero for Life. We will assist in obtaining the building permit for construction and certificate of occupancy.

Food Tech will have in place and in effect the required professional liability, general liability and workers compensation insurance per state requirements. All subs/vendors/suppliers shall also have in effect and provide copies of certificates demonstrating compliance.

*Cleaning:*

Food Tech shall maintain a clean and safe work site. Subs/vendors/suppliers will be rigorously policed by our Site Superintendent. At the completion of the project a cleaning contractor or temporary labor service will be engaged to present the facility to you in a sanitary condition for food related operations.

*Close Out:*

At the completion of the project we will collect warranties and operations manuals for all required systems and materials. A final punch list will be prepared and its completion will be administered by our Site Superintendent. Food Tech will assist in start- up services as required



## **Division 2 – Site Work**

- General:* The construction limits shall be defined as the areas encompassing the construction of the building and paved parking areas.
- Concrete Paving:* Site concrete including transformer pad will have a minimum compressive strength of 3,000 PSI at 28 days.
- Concrete paving in truck maneuver areas will be 8" thick, reinforced with #4 rebar at 16" on center, each way (ocew).
- Asphalt Paving:* Asphalt paving will include 3" binder and 1.5" finish
- Water Lines:* 8" Fire water line shall be installed from the public main. Gated hydrants shall be provided at 300' +/- along the water main.
- Sewer Lines:* Gravity Sewer line shall be installed from the building to the public main.
- Gas:* Gas piping shall be installed from the building to the public supply.

## **Division 3 – Concrete**

- General:* All concrete will be ready mixed concrete in accordance with ASTM C-94 and proportioned as determined by approved mix designs. Various thicknesses of the concrete will be based on an analysis of imposed loading conditions or other specific criteria. All work shall be in accordance with ACI 318, latest revision.
- Concrete for the following items shall have the indicated compressive strengths in twenty-eight (28) days.
- ✓ Footings: 3,000 PSI
  - ✓ Floor slabs, Silo pads: 4,000 PSI
  - ✓ Miscellaneous concrete: 3,000 PSI



*Concrete Slabs:*

All areas subject to fork truck traffic such as the Docks, Cooler, Dry Storage, and Process Area floors shall have conventionally placed concrete floors, 6" thick.

Floors shall be six inches thick, monolithic, reinforced per ASTM A615 grade 60 deformed billet steel bars and machine troweled to a uniformly smooth and dense surface.

*Curbs:*

Bumpers or curbs, 2' high, will be installed adjacent to all insulated wall panels

Behind all pallet racks curbs shall be four and one-half inches (4 1/2") high against the panel, three and one-half inches (3 1/2 ") high at the low end, and a width of twelve inches (12") will be installed adjacent to all insulated panels in the storage areas (behind racks). Curbs at all exposed insulated panel walls shall be twenty-four inches high (24").

*Pads:*

New concrete pads for condensing units and generator will be provided.

**Division 4 – Masonry**

Electric Room, Maintenance Room, Refrigeration Room and Tank Halls, shall be constructed of 8" and 12" concrete masonry units (CMU)

**Division 5 – Steel**

*Steel Frame:*

The steel framing systems will be designed in accordance with local and state building codes. The main building area will be a pre-engineered metal building (PEMB) designed and erected by a licensed metal building contractor. The roof will be colored standing seam roof with 20 year kynar finish. Snow guards will be provided to protect doorways and sidewalks.

All structural steel members will conform to the latest design standards and specifications for structural steel by the American Institute of Steel Construction (AISC) and Standard Specifications for Joists and Joist Girders by the Steel Joist Institute (SJI).

Structural steel furnished will be shop primed with a 2-mil light gray rust inhibitive paint acceptable for use in food storage areas and touched-up as necessary after erection.



- Metal Joists:* Steel joists will be provided for the utility area and tank hall building additions and new mezzanine areas, designed in accord with the Steel Joist Institute (SJI) standards.
- Metal Decking:* Metal decking will be one and one-half inches (1½”) deep, 20 gauge, galvanized type-B, wide-rib deck.
- Steel Protection:* New door openings and other exposed corners will receive bollards, 4’ high. Large door openings will receive “goal post” type steel protection.
- All pipe used for bollards will be six inch (6”) I.D. Anchoring will be below or within the finished slab.
- Miscellaneous:* All lintels, sill angles, overhead door frames, stairs, stair railings, roof hatches, trench grates and frames, ladders, roof and wall frames for mechanical equipment and other items required for trim and support will be furnished and installed.

## **Division 6- Carpentry**

Furnish and install all finish carpentry items. Including cabinets and base units with associated hardware and counters for rest rooms and break areas.

Furnish and install all interior casework hardware, anchorage accessories, etc.

Install all miscellaneous items and materials, provided under this and other specification sections. This includes finish hardware and hollow metal doors.

## **Division 7 – Thermal & Moisture Protection**

- Roof Membrane:* Roof membrane shall be 60 mil TPO, mechanically attached with 15 year system warranty.



*Roof Penetrations:* Roof penetrations will be cut and patched, insulated and sealed to prevent water and vapor transmission.

Galvanized metal gravel stop, necessary flashing, cant strips, expansion joints and wood blocking will be installed as required. Roof drainage will be exterior via metal scuppers and downspouts piped to the underground storm drains.

## **Division 8- Doors & Windows**

*Personnel Doors:* Personnel egress doors shown on the floor plan in non-refrigerated areas will be three feet by seven (3' x 7'), hollow metal doors and frames.

*Windows:* Exterior windows will be provided consisting of tempered insulated glass in aluminum or pressed steel frames. Window frames in process areas shall be two piece stainless steel with sloped sills.

## **Division 9 – Finishes**

*Office Fit-Up:* Employee area interior walls shall be 3-5/8" metal stud construction, with 5/8" drywall. These walls shall be insulated and carried to the underside of deck. All drywall shall be taped, sanded smooth and finished such that no joints are visible. Use Durock moisture resistant drywall in all areas adjacent to cold storage construction, and at all restrooms and other wet locations.

A suspended acoustical ceiling system will be provided in the new employee areas. The suspended ceiling panel will be integrated with the ceiling lighting. A 2' x 4' suspended mineral acoustical ceiling system 5/8" thick shall be provided. The ceiling grid shall be white factory baked-on enamel finish.

*Urethane Flooring* If scheduled on the Drawings furnish and install ¼" trowel applied urethane material suitable for 140 Deg F wash down water. Provide "orange peel" finish and 4" high integral cove base.

Blast track concrete floor in preparation to receive urethane flooring. Provide 10' x 10' test area for approval prior to work.



Provide manufacturers standard 2 year Warranty covering blistering and delamination.

Maintain 60 deg minimum temperature of materials and area of work. Maintain work area in dry condition.

Check slab for proper minimum vapor transmission prior to start of work. RH shall be 85% or below prior to starting work.

*Painting:*

All wall surfaces in the employee areas shall receive two (2) coats of paint. All masonry and dry wall shall be painted. Masonry shall receive two coats of block filler and one finish coat.

All steel for bollards and other protective devices shall receive two (2) coats of OSHA yellow enamel. Or at the Owner's option, Ideal-Shield PVC bollard covers, prefinished yellow.

**Division 10 – Specialties**

*Fire Extinguishers:*

Type ABC portable fire extinguishers shall be provided for the expansion area at the rate of one (1) unit per 3,000 sq ft.

**Division 11 – Equipment**

*Pallet Racks:*

Pallet racks shall be provided at locations shown on the drawings. Both single selection rack and 2 deep push back rack are required. Racks will be anchored to the floor with a minimum of (3) 5/8" x 3 1/2" expansion bolts.

**Division 13 – Cold Storage Insulation**

*Wall Panels:*

Insulated wall panels shall be provided where shown and shall be attached to structural steel framing system.

Panels shall consist of a core of foamed-in-place urethane insulation faced with prefinished 26-gauge stucco embossed galvanized steel.

Interior walls shall have a USDA approved white on all exposed surfaces.

Panels shall be FM Class I approved and UL Class A approved manufactured by All Weather, Metl-Span or Kingspan. Panels shall be installed to provide for a positive



thermal and vapor barrier seal for low temperature application.

Panels shall be 4" thick, R32.

*Ceiling Panels:*

Ceiling panels are provided in all process and refrigerated areas as shown on the Drawings. These suspending insulated ceilings shall be 4" panels, suspended by threaded rods with a live load capacity of 25 psf and 300 lb point load. (5 psf suspended dead load)

*Cold Storage Doors:*

Fast-acting Rite Hite Fastrax cooler doors or equal (8' x 12') shall be provided at all areas subject to forklift traffic. Doors will be activated using a BEA Falcon motion sensor and have an adjustable time delay to provide automatic closing after vehicle has traversed the opening. Doors shall also be able to be opened via pushbutton control for pedestrians. Doors shall stop 1" above floor to prevent dripping due to wet floors.

**Division 15 – Mechanical**

*Plumbing:*

The plumbing system shall be designed in accordance with the governing codes and shall include the following:

Cold and hot water delivery to new plumbing fixtures.

Provide plumbing services and connections to all process equipment per the Process Drawings. Provide vacuum breakers and RPZ valves as required. Provide vertical drops from suspended walkable ceilings.

Above ground sanitary drainage system shall be no-hub cast iron soil pipe or schedule 40 ABS or PVC (with solvent weld joints) if approved by local authorities having jurisdiction.

Vent piping will be located such that they are protected from vehicular or mechanical damage. All risers within 2' of finish floor shall be cast iron or stainless steel. (No PVC in the crush zone)

All equipment and fixtures supplied will be connected and made operational.

Potable water piping will be routed parallel and perpendicular to column lines.



All piping subject to freezing shall be insulated and heat traced with self-regulating heat cables. Provide piping identification on all systems at 40' intervals.

Sinks shall be Elkay or equal equipped with knee control faucets.

Floor drains shall be stainless steel by *Kusel, Henry, ACO, or Polydrain*.

Trench drains shall be ACO S300K with heavy duty epoxy coated ductile iron grating.

*Fire Protection:*

The building shall be provided with an automatic, hydraulically designed sprinkler system in accordance with applicable NFPA guidelines and insurance company requirements. Sprinkler lead-ins will support hydraulically sized risers, complete with gate valves, alarm check valves, water motor alarms and flow and tamper switches as required.

Fire protection assumptions: Product is stored in single and double row racks and aisles are a minimum of 8'. Commodity Class II, non-encapsulated storage. Assume storage height is 25' in coolers, and ambient.

All hydraulic calculations shall include an allowance of five hundred (500) GPM for inside and outside hose streams. All pipe and fittings for dry pipe systems shall be galvanized. Placards will be provided on all sprinkler risers indicating the hydraulic design data. Bare piping, whether plumbing, HVAC, or fire protection is not painted.

The employee areas will be designed for light hazard occupancy with semi-recessed sprinklers and hose stations.

In-rack fire protection is required in two deep racks. Sprinklers are standard type, 286 deg heads, design density of 0.42 gpm/2600 sf with overall demand of 1750 gpm.

*HVAC:*

The employee areas shall be served by rooftop packaged electric air-conditioning and heating unit, by Carrier, Trane, or equal.

The employee areas shall be air conditioned for summer and heated for winter to maintain individual room temperatures



as follows:

- ✓ Summer: 72°F ± 3°F within each room
- ✓ Winter: 70°F ± 3°F within each room

Humidity control will be provided as required to maintain comfort. Summer, 50% RH to design A.C. systems.

Design criteria for all heating, ventilating and air conditioning systems in all areas shall be as defined by ASHRAE and shall meet all local and state energy conservation codes. HVAC design calculations shall be based on windows having no interior blinds or shades.

*Process Steam:*

A 200 BoHP boiler is included with connections to two CIP's and two hot water sets. No condensate return.

### ***Division 16 – Electrical***

*General:*

All materials and equipment shall be new and shall comply with the applicable standards of the following authorities:

National Building Code (SBC)  
National and/or State Electrical Code (NEC)  
Underwriters Laboratories, Inc. (UL)  
National Electric Manufacturers Association (EMA)  
Institute of Electrical & Electronic Engineers (IEEE)  
American Society of Testing and Materials (ASTM)  
United States American Standards Institute (USASI)  
National Board of Fire Underwriters (NBFU)  
Insulated Cable Engineers Association (ICEA)  
Factory Insurance Association (FIA)  
National Electrical Safety Code (NESC)  
Occupational Safety & Health Administration (OSHA)  
American National Standards Institute (ANSI)  
Power Company (PC)

*Switchgear:*

The existing switchgear is assumed to be adequate for the expansion.

Distribution breakers shall be group mounted molded case type. The circuit breakers are to be mounted in the switchboard to permit installation and maintenance. Transformers shall be U.L. listed and shall be General Electric Type ML or QL.



*Panelboards:*

All distribution, lighting and receptacle panelboards shall be provided as required. All panelboards shall be bolt-in type, surface or flush mounted as required with NEMA 1, general-purpose enclosures. Panelboards shall be UL listed and labeled and shall be C-H, Westinghouse, GE, or Square D. Transient Voltage Surge Suppressor Filters shall be added to all panelboards serving office areas.

*Breakers:*

Distribution breakers shall be bolted on molded case type. Breakers used for panel switching of lighting shall be SWD rated. Breakers will be rated type HACR for air conditioning circuits.

*Wire/Cable:*

All wire and cable shall be copper. Color-coding of all wiring shall be provided. All wiring shall be installed in a raceway with a separate grounding conductor. The minimum size of conductors for power and lighting circuits shall be No. 12 AWG. All motors and control conductors shall be stranded.

The following wire types shall be utilized in environments where the average ambient temperature is 28°F or greater:

THHN-THWN or Teflon insulated shall be used in the following applications:

- ✓ Interior feeder and branch wiring.
- ✓ Interior control wiring.

Wire type RHH/RHW/USE shall be used in the following applications:

- ✓ Exterior feeder, branch and control wiring.

The following multi-conductor wire types shall be used as follows:

Type SO shall be used in the following applications:

- ✓ RTD wiring.

Type SJ shall be used in the following applications:

- ✓ Warehouse lighting (from ballast to receptacle)

Type PVC or Teflon insulated shall be used in the following applications:



- ✓ Thermostat wiring.

*Conduit/Raceways:*

All conduit and fittings shall be provided. All conduits shall be sized in accordance with code requirements.

Rigid galvanized steel conduit shall be installed for all wiring systems in the following areas:

- ✓ Areas subject to damage (i.e., vandalism, fork trucks, traffic, etc).
- ✓ Building exterior on walls and roof.
- ✓ Feeders to 15' AFF.

Electrical metallic tubing with compression fittings shall be installed for all wiring systems in the following areas:

- ✓ At building roof steel.
- ✓ All branch circuits not otherwise specified.
- ✓ Office areas.
- ✓ At heights 15' AFF and greater.

Rigid PVC conduit with PVC coated rigid galvanized steel elbows shall be installed for all wiring systems in the following areas:

- ✓ Process areas and all wet locations
- ✓ Exterior lighting and power circuits installed below grade.

Raceways installed exposed shall be run parallel or perpendicular to the building structure. Standoff 1" in all wet locations.

Flexible metallic conduit shall be used for final connection to equipment subject to movement in dry locations.

Liquid-tight flexible steel conduit shall be used for final connection to equipment subject to movement in wet and damp locations as well as in areas subject to oil contamination.

Flexible conduit for lighting fixtures shall be maximum 6 feet in length. Otherwise flexible conduit shall be maximum 2 feet in length.



Penetrations of insulated walls, ceilings and floors shall be via PVC conduit with care to patch the vapor seal. When crossing expansion joints in the building, expansion fittings or loops in the conduit runs shall be used. Conduit seals shall be installed in all conduits passing through insulated walls, ceilings, or floors. Sealing compounds shall be Crouse-Hinds, or equal.

*Disconnects:*

Disconnect switches, wiring and connections to all electrically operated devices shall be provided.

*Grounding:*

Unless otherwise specified, all electrical equipment installed shall be grounded and bonded through conduit or other conductors to the common raceway system. Grounding shall include all required connections to completely ground all the conduit of power, lighting, and other systems. This shall include all bonds as required. Grounding shall be in accordance with all applicable codes. Grounding will be provided to waterlines per code.

*Miscellaneous:*

Where electrical components, such as panelboards, starters and disconnect switches, are group-mounted, they shall be mounted on an electrical equipment rack. Unless specified otherwise, all equipment racks shall consist of 1" thick plywood painted ANSI standard gray and bolted to a Unistrut frame. The frame shall be securely bolted and braced to the masonry wall or the structural building frame. Equipment racks shall not be mounted to insulated panel walls.

*Lighting:*

Lighting systems shall be designed to provide the following average maintained horizontal illumination levels measured in foot-candles at a height of three feet (3') above the floor for finished areas and at a height of four feet (4') for all others:

<b><u>Area</u></b>	<b><u>Foot-candle</u></b>	<b><u>Type</u></b>
Process Areas	50-60	Fluorescent T8
Storage Areas	15-20	Fluorescent T5
Cold Docks	15-20	Fluorescent T8HO
Coolers	15-20	Fluorescent T8HO
Maintenance	40-50	Metal Halide
Offices	70-80	Fluorescent

Aisle lighting type fixtures will be used in warehouse aisles, Warehouse lighting shall be controlled by panel operated breakers.



Office lighting shall be fluorescent type with both lamps and ballast of the "energy saving" type. Several night light fixtures which will remain on at all times. All lighting will be turned on and off by conventional light switches.

Lamps shall be compatible with the fixtures in which they are to be installed.

Incandescent lamps shall be inside frosted, except for PAR lamp, and shall be rated 2,000 hours minimum. PAR shall be of the type called for in the fixture.

HID lamps shall be the type and rating as required.

All fixtures except incandescent fixtures shall be fused unless otherwise specified.

Fixtures shall be securely hung in place, properly wired, connected to the branch circuits and lamped. Safety chains will be provided on warehouse lights.

All lighting fixtures shall be grounded by grounding screw and/or grounding wire to the branch circuit outlet box or raceway. Pendant mounted lighting fixtures shall be grounded through the conduit or provided with a green ground conductor with the branch conductors.

#### Exterior Area Lighting:

- ✓ All exterior emergency exit doors shall be equipped with a wall mounted high-pressure sodium or metal halide fixture centered over the door. Exterior lights shall be controlled by means of a photocell mounted on the roof facing north.

Illuminated exit signs shall be installed at all egress doors and in conformance with the local codes.

#### *Receptacles:*

Each office to have a minimum of three 120V duplex outlets. In the cubicle type offices, the outlets will be part of the partition system furnished and installed by the Owner. Warehouse areas shall be equipped with duplex outlets on interior columns not exceeding 100 feet between columns.

#### *Fire Alarm Wiring:*

Provide a fire alarm supervisory system with audible alarms



throughout the area of new construction.

Wiring for all valve tamper switches to the fire protection panel shall be provided. This includes tamper switches on sprinkler risers in the building as well as those at wall post indicating valves, and PIV's.

*Refrigeration Wiring* All wiring, starters, disconnects and power connections to all refrigeration equipment shall be provided as required. Controls and control wiring is by the Refrigeration contractor.

*HVAC wiring* All HVAC equipment with combination starter disconnects, disconnects or starters shall be included. All power and connections to all mechanical equipment shall be provided. Controls and control wiring is by the HVAC contractor.

## **Division 17 – Refrigeration**

*Refrigerant:* Freon R404A or R507

*Temperatures:* 34°F at Cooler areas and for glycol HX for processing

*Compressors* Kramer, Bohn, Century or equal, dual circuited rack system with electric defrost.

*Evaporative Condenser:* BAC or Evapco. Roof Mounted on steel frame

*Air units:* Krack, Kramer, Century or equal, suspended from joists with electric defrost. Coated stainless coils in process area

*Piping & Insulation:* Copper pipe with braised joints. Armaflex insulation with white PVC jacketing in exposed areas. 1" thick insulation on suction lines, ½" thickness on liquid lines.

*Controls:* Computer control system

*Equipment connections:* The scope includes refrigeration connections to six tanks, HTST, cream cooler, and two ice cream processors. Total refrigeration tonnage for processing is 100 TR.



## SECTION 6

### RECOMMENDED ACTIONS

Having now completed the preliminary planning for the proposed project, we recommend that you continue using Food Tech and Design-In-Place in the implementation phase through a single source, total responsibility, Design/Build approach described as follows.

The next step needs to be site selection, which may be raw land, or perhaps an existing building and site suitable for renovation and expansion. Food Tech can assist in site selection and evaluation as an additional service.

Once the site is selected, Food Tech recommends proceeding as outlined below. We would be happy to engage Design-In-Place as the process subcontractor, or you are welcome to work with them directly. If Design-In-Place is under Food Tech, we would expect a 5% fee on the process scope of work. This is shown as an Alternate add on our Construction Cost estimate.

#### ***Detailed Architectural and Engineering Proposal***

Food Tech will perform the design and detailed architectural and engineering work required for permitting and contractor bidding. We will prepare the required detailed drawings sealed and signed by our registered architects and licensed engineers. Specifications would be prepared for all divisions of work.

We anticipate the required engineering disciplines to be:

- Civil Engineering
- Architectural Engineering
- Thermal Insulation Design
- Structural Engineering
- Mechanical Engineering
- Refrigeration Engineering
- Electrical Engineering
- Process Engineering



We will perform the required engineering expeditiously. We feel confident in preparing proper permit and construction documents based on our 20+ years' experience designing similar facilities.

If desired due to scheduling considerations, long lead items such as process equipment and refrigeration equipment, can be placed on order prior to award of subcontracts.

We will endeavor to work with the building officials to expedite permitting of the project. A meeting is recommended with the local authorities to review the scope of work and iron out any technical or code issues they may have. A separate meeting with your insurance underwriter is also recommended.

### ***Design-Build Proposal***

In addition to the professional architectural and engineering services Food Tech offers, we also provide construction services, thus providing full design-build services and single source responsibility. All elements of the project are competitively bid by our project manager and then administered at the site by our full time construction supervisor.

This approach eliminates the duplication or pyramiding of fees by prime and subcontractors. It also provides us greater schedule and quality control since all contractor foreman report directly to our superintendent. Owners generally prefer this method since before any contract award is made we have provided them with a bid summary/recommendation and ask for their approval before any commitment is made.

We also like to point out that professional construction services is a natural extension of our engineering work. Food facility construction is a specialized field in which most general contractors lack expertise. Single source design-build also eliminates the adversarial relationship that unfortunately frequently occurs in the traditional Architect-GC-Owner relationship.

Our design-build process is one in which our services support the needs and interests of your company. These services include pre-qualifying subcontractors, solicit/review/award/administer contracts, and supervise on-site quality, safety, and schedule requirements.



These basic services include:

- Value engineering
- Constructability analysis
- Construction estimating
- Scheduling
- Subcontractor qualification
- Subcontractor bid solicitation, review, and award
- Contract Administration
- Shop drawing review
- Building department interface
- Insurance company interface
- Quality control
- Proactive safety programs
- Full time on site supervision, field engineering & reporting

Food Tech looks forward to the opportunity of continuing to work with you on this project.