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VISIONING + SITE ANALYSIS



VISIONING + SITE ANALYSIS

Executive Summary

Vision Statement and Initiative

This project establishes a meat processing extension, teaching, and research facility to increase the capacity of The University of Tennessee Institute of Agriculture to **enhance workforce development and support the growing meat industry in the state**. The meat processing facility will increase the resilience of the Tennessee meat industry.

This project aims to develop a **state-of-the-art meat processing extension, teaching, and research facility** at the University of Tennessee Institute of Agriculture near the main campus in Knoxville. The facility will be focused on workforce development for the Tennessee meat fabrication and processing industry, education for students in the Herbert College of Agriculture and the College of Veterinary Medicine, research that will **enhance the quality and safety of Tennessee meat products, and increased industry adaptability and resiliency during times of distress**(e.g., responding to a national health crisis). This facility will allow demonstration of the practices that may be implemented to maintain the health and bio-security for workers during pandemics.

The UTIA meat processing extension, teaching, and research facility will **directly support the goals of our livestock industries** by increasing the **use, value, and safety** of Tennessee meat products, improving the strength and resiliency of the Tennessee meat industry, and by preparing a strong workforce for sustained industry growth.

Team

UTSA & UTIA Representatives

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HASTINGS

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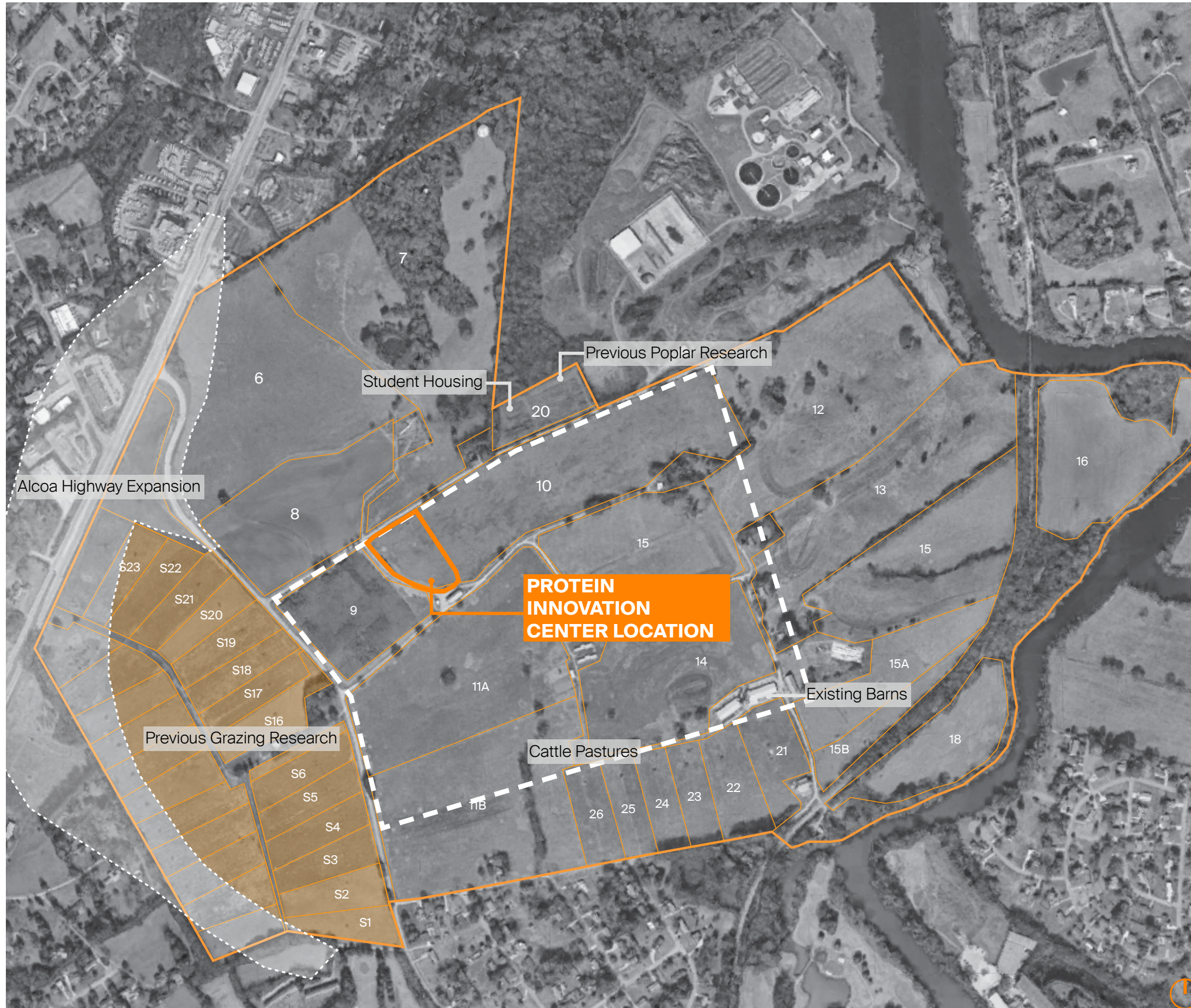
HASTINGS

SANDERS PACE ARCHITECTURE



VISIONING + SITE ANALYSIS

Site Selection



Blount Unit Protein Innovation Center Location

Blount Site - Site Location

At the Blount AgResearch unit, a building site has been located just off the interstate in an open field. This site would provide an optimal location for the Protein Innovation Center because of its topography, proximity to site utilities, and relative low-visibility from TN-129.



UTIA Blount Unit Aerial View



Legend

Affected Site Area

SCALE: 1" = 200'-0"

Project Limits



VISIONING + SITE ANALYSIS

Visioning

01 Wants, Needs, and Must Have's

Participants were asked to consider the biggest challenges and opportunities related to the future Protein Innovation Center.

Participants noted the following:

MUST HAVE's

- Biosecurity measures
- Truck Circulation priority
- Covered exterior holding pens
- USDA approves facility
- 40-50 person classroom
- Loading dock
- Break room for employees
- Small conference room for 25 people
- Locker room with showers and restrooms
- Parking for 60-80
- Coolers and Freezers
- 2 offices for current REC staff (Now 5 offices for staff)
- Processing equipment list
- Office space for Blount unit manager

NEEDS:

- Viewing hallways
- Transparency between processing and classrooms
- Observation room (Like a hospital surgery room)
- Lobby with interactive display

WANTS:

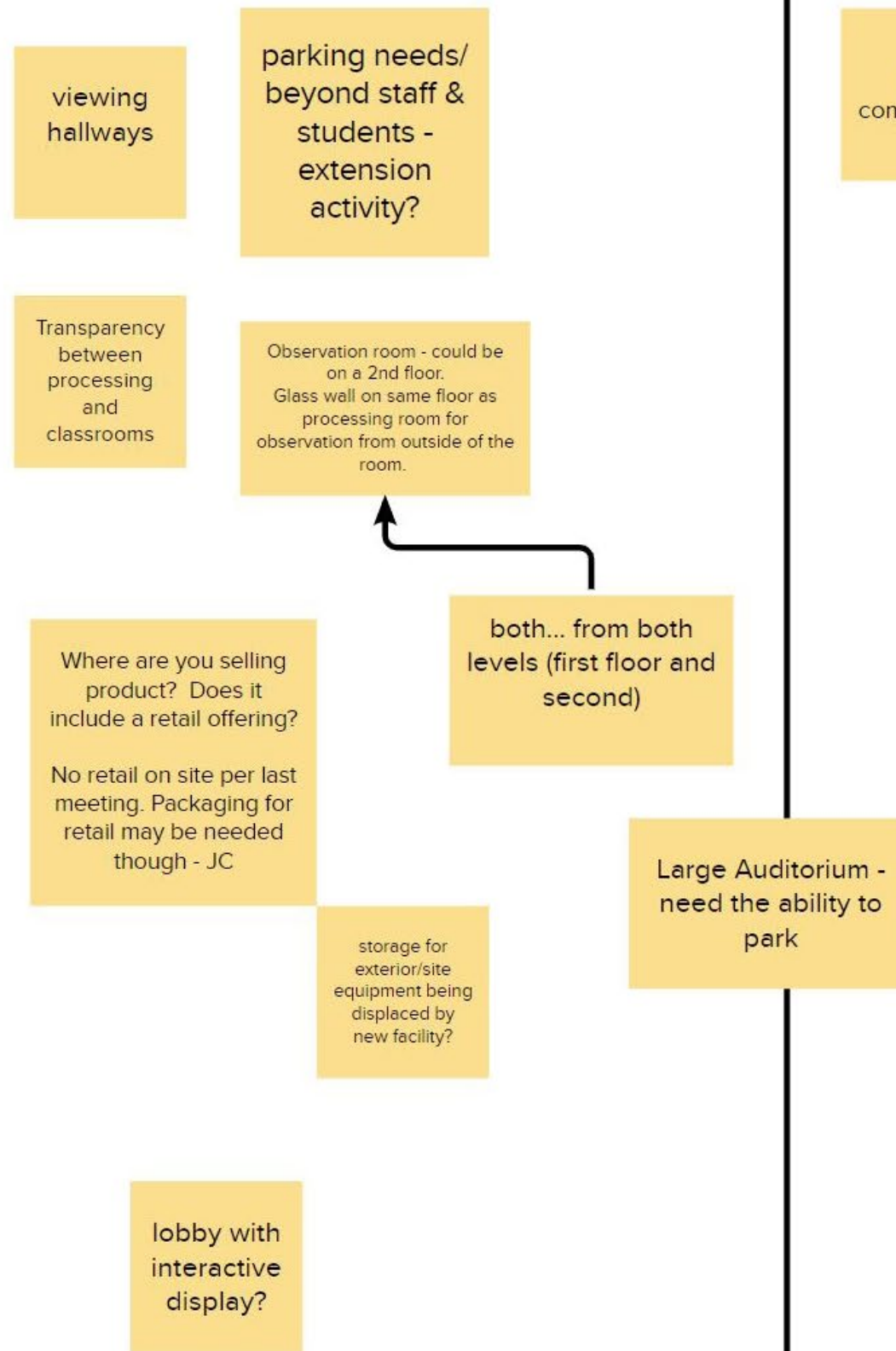
- Online teaching and conferencing spaces and technology
- Demonstration kitchen

MUST HAVE'S

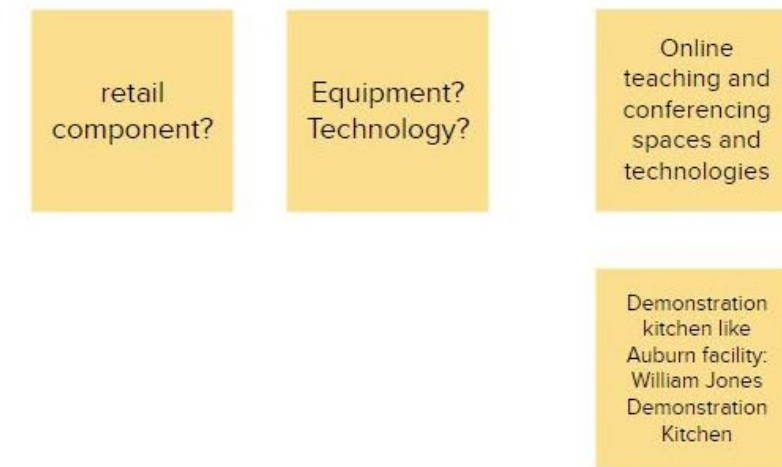


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NEEDS



WANTS



03 Activities and Functions

Participants placed sticky notes across the main **activities and functions** this building will be used for to tell us what they desire to be within each space.

Participants noted the following:

LEARNING

- Daily use for teaching
- Research use daily
- 100 person classroom/seminar room
- Extension research teaching
- Extension programs used after hours
- Top priorities are teachers, students, grad-students, and producers

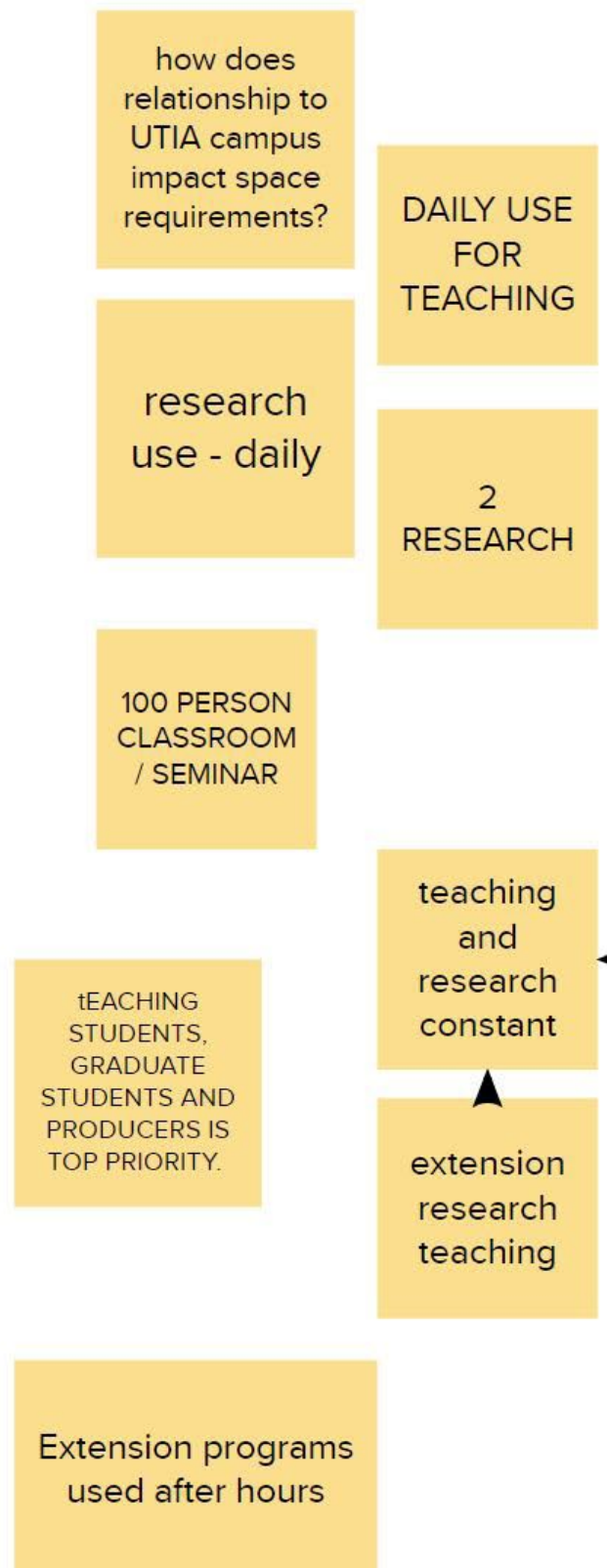
PROCESSING

- Kill floor is double height
- Need 6 cutting tables
- Slaughter for research
- Swine nutrition
-

ANIMAL STAGING

- Needs water access overnight
- Priority is humane care, stress free handling, and training the workforce to practice these standards of practice

LEARNING



PROCESSING



ANIMAL STAGING



Extracted from MURAL Session



VISIONING + SITE ANALYSIS

Comparable Facility Plans



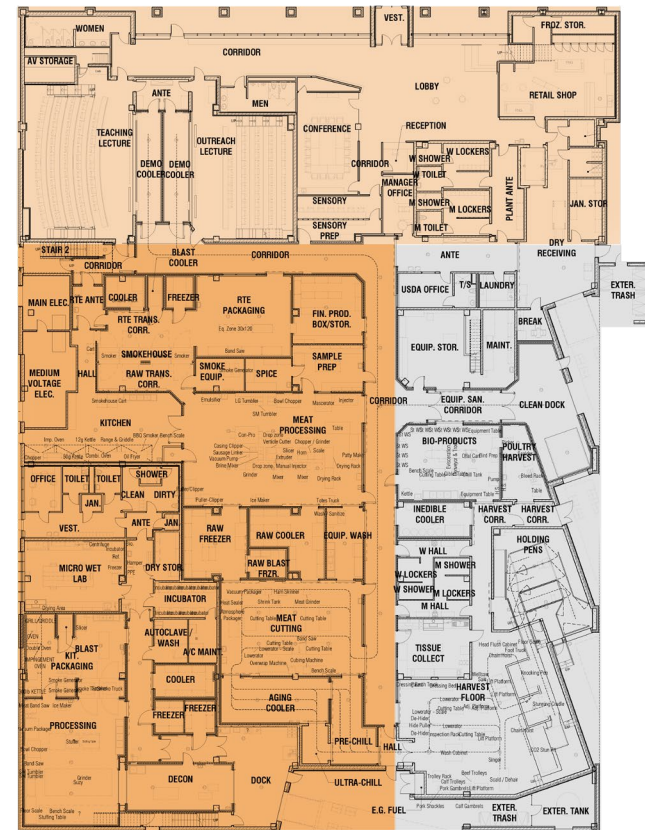
Cal Poly Meat Processing

Learning ~ 1,500

Processing ~ 13,000

Staging ~ 500

Project TOTAL SF: 15,000 SF
 Project Cost: \$6.5 Million
 Year Completed: 2011



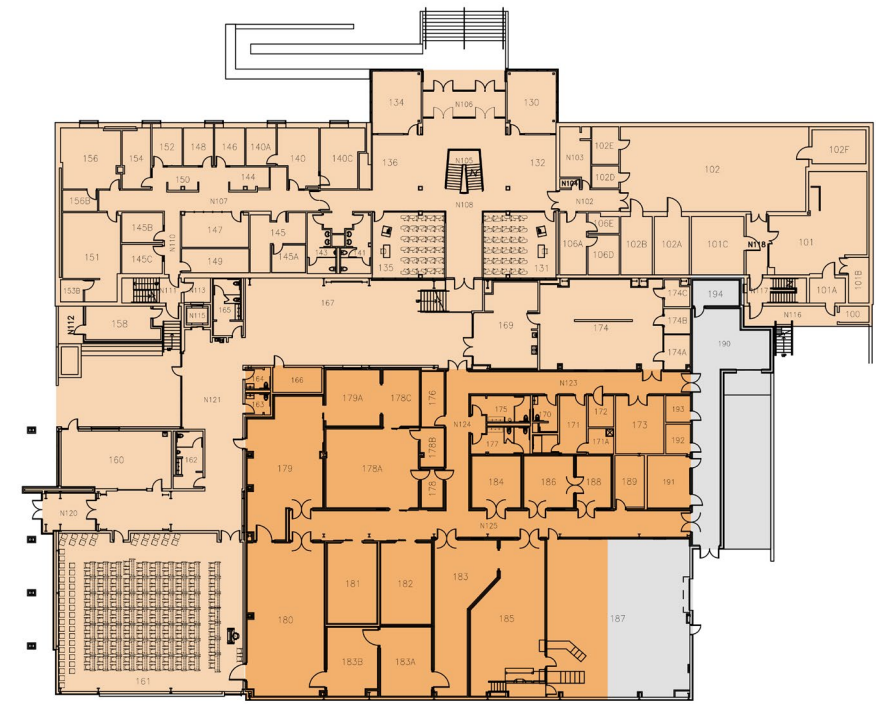
University of Wisconsin - Madison Meat Science Center

Learning ~ 14,000

Processing ~ 20,000

Staging ~ 10,000 *on the ground floor

Project 1st floor SF: 44,000 SF
 Project TOTAL SF: 67,540 SF (due to second floor of learning spaces)
 Project Cost: \$49.5 Million (4 mil. due to excavation finds)
 Year Completed: 2020



Colorado State Global Food Innovation Center

Learning ~ 24,000

Processing ~ 15,500

Staging ~ 1,500

Project TOTAL SF: 41,000 SF
 Project Cost: \$21 Million
 Year Completed: 2019



VISIONING + SITE ANALYSIS

Case Study Projects

Comparable Facilities



01

Auburn Lambert-Powell Meats Laboratory

Auburn, Alabama



02

J and G Lau Family Meat Processing Center

San Luis Obispo, California

Cost and Architect Unknown



VISIONING + SITE ANALYSIS

Case Study Projects

Industrial Facilities

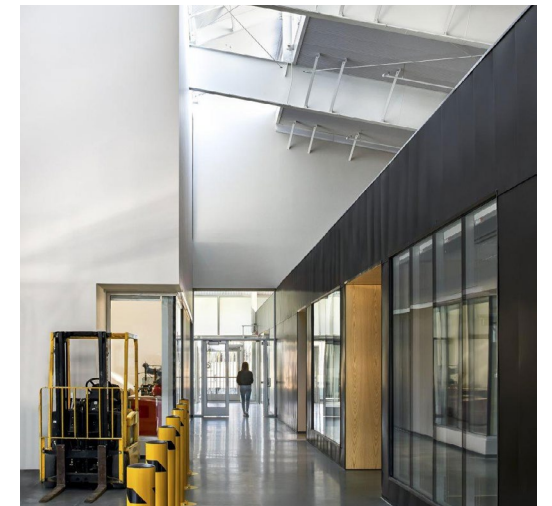


03

Highlander Accelerator

Omaha, NE
 Architect: El Dorado
 Completed: 2018

Project SF: 73,300 SF on 4.3 acre site
 Project Cost: \$24.7 Million



04

MCC Blue River East

Independence, MO
 Architect: BNIM
 Completed: 2022

Project SF: 25,500 SF
 Project Cost: ~\$11 Million



PROGRAM SPECIFICS

Adjacency Diagram

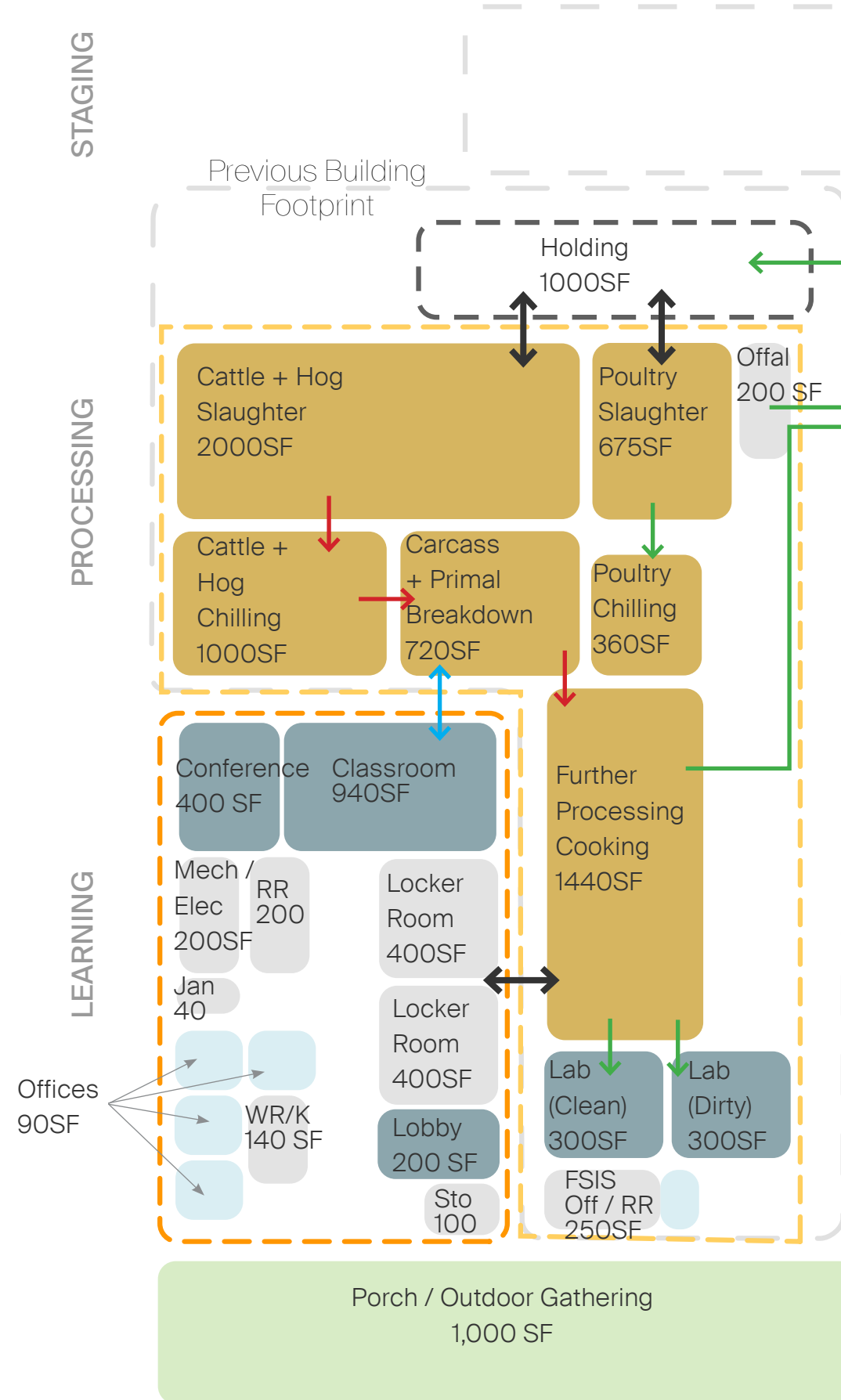
Scheme 03

- Legend:**
- Outdoor Space
 - Classroom
 - Office Space
 - Processing
 - Support Space
- Direct access required
- Visual connection preferred
- Connected by Rail
- Cart Access

STAGING

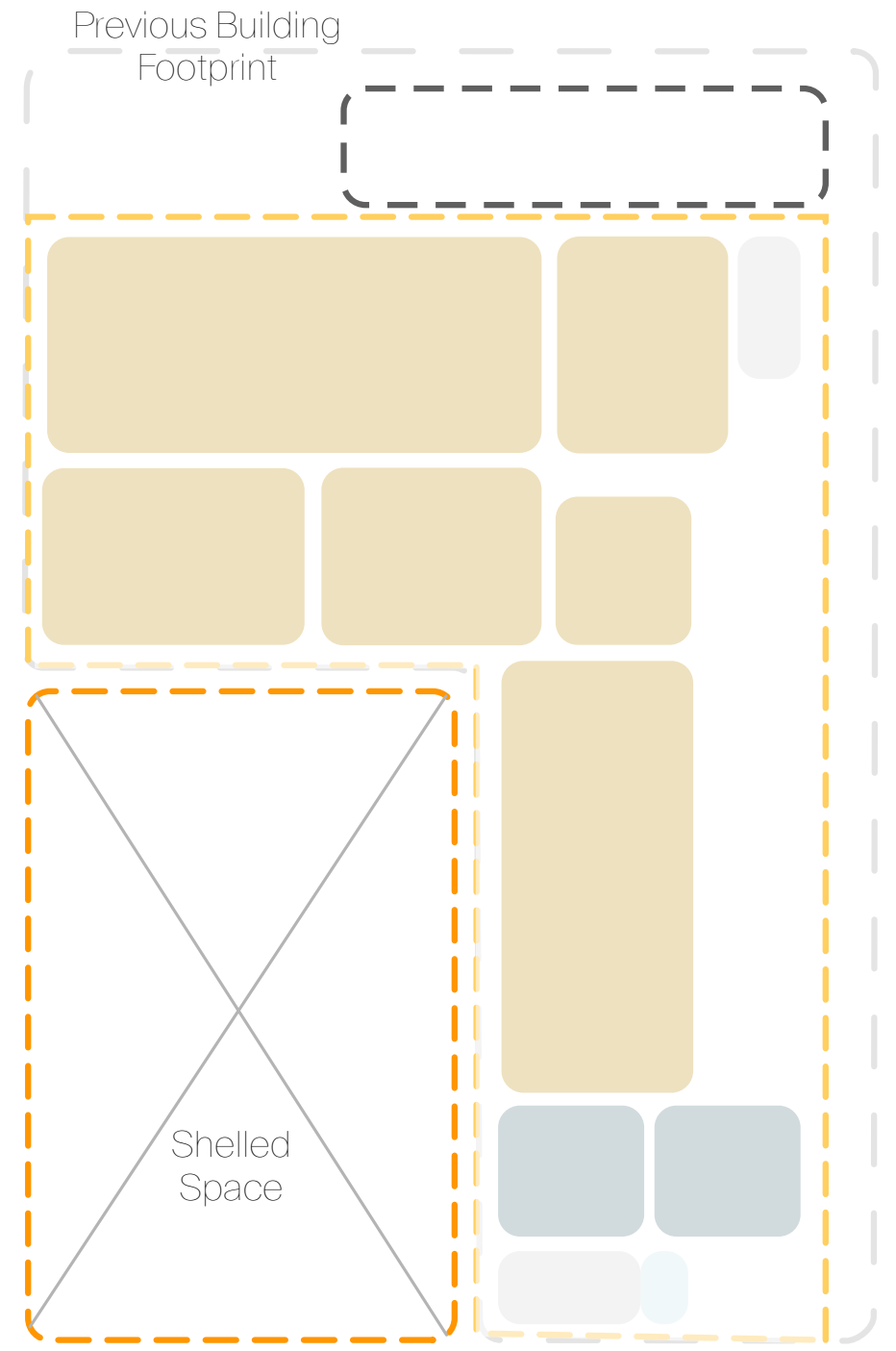
PROCESSING

LEARNING



UNLOADING

LOADING



Upper Volume



PROGRAM SPECIFICS

Room Data Sheets



Room Data Sheets

Program spaces and needs are specifically outlined in the following room data sheets, however, the design team should take note that a 40% circulation factor and infrastructure contingency has been allocated to the total building net square footage. Building support spaces, circulation and general room sizes are anticipated to flex in size during the design phases.

Special attention should be paid to the additional notes for each space which include stakeholder comments, considerations, and future coordination needs.

Space Lobby / Reception

Quantity 1

Area TBD (included in grossing factor)

| | |
|------------------------------------|---|
| Function | Primary Entrance |
| Adjacency Requirements | Adjacent to Offices, Classroom, and Front Porch |
| Finishes | (Lobby to Receive a High Level of Finish) |
| Floors & Base | Non-porous; hard; durable; cleanable i.e. polished concrete topping, terrazzo |
| Walls | Painted Drywall, Level 5 Finish, Specialty/accent wall considered |
| Doors & Frames | Aluminum Storefront Entry Doors |
| Ceilings | Sound Absorptive Finish with specialty ceiling design considered |
| Windows | Required; Capture view of Garden |
| Window Treatments | Not Required |
| Millwork | AWI Custom Grade Millwork; Wood Veneer and Quartz Information desk |
| Furnishings & Equipment | Miscellaneous seating and lounge furniture |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Ventilation per ASHRAE Std 62, TN HPBR, Min-2007, and local code requirements |
| HVAC Noise Level | NC-35 |
| Space Control | Thermostat control for space. Space fed from separate VAV or HVAC unit. |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 18.6 fc for general illumination with LED light fixtures. Additional adjustable lighting for display areas. Controls shall contain manual on wall switch with dimmer and with automatic off vacancy sensors. Additional lighting zones for specialty lighting, daylighting, and display lighting may be required. |
| Power | General duplex receptacles located around perimeter and at Information desk. Floor boxes possible (layout dependent). |

| | |
|---|---|
| Fire Alarm | Audible/Visible annunciation; Manual pull station may be required if this includes an exit. |
| Plumbing | No Plumbing is assumed |
| High Performance Building Space Definition | Densely occupied, regularly occupied space, shared multi-occupant space |
| Specialty Systems | |
| Audio/Visual | Speaker System; Power/Data for Screens and/or Projection |
| Security | Cameras/Access Control as required by 2020 UTK Design Guidelines |
| Additional Notes | <ul style="list-style-type: none"> • Ample, natural, south-facing sunlight • Consider ability to transition into indoor/outdoor space as much as possible and interior fans when room is open to exterior • Include 1 bottle refill station • Consider appropriate walk off material adjacent to all entrances (6' minimum) • Consider trash/recycling management • Consider acoustics of space |

Space Classroom

Quantity 1
 Seats 60-80
 Area ~~1,500 SF~~ 940 SF
 *Revised per Amendment 01

| | |
|------------------------------------|---|
| Function | Large Divisible Space to accommodate class/trainings as well as large gatherings. |
| Adjacency Requirements | Adjacent to Lobby Space and visual adjacency to Processing |
| Finishes | (Classroom to Receive a High Level of Finish) |
| Floors & Base | Non-porous; hard; durable; cleanable i.e. polished concrete topping, terrazzo |
| Walls | Painted Drywall, Level 5 Finish; Acoustic Wall Panels, 25% Coverage |
| Doors & Frames | Aluminum Storefront Entry Doors |
| Ceilings | Minimum 15' Clear Ceiling Height; Acoustic Wood Ceiling or Sound Absorptive Finish to achieve NRC .85 Min, CAC 30+ |
| Windows | Required; Capture view of Pastures |
| Window Treatments | Dual Roller Motorized Mechoshade or Equal - Blackout and 5% Openness |
| Millwork | AWI Custom Grade PLAM base cabinetry with Quartz Counter top and built in trash/recycling Millwork should be designed with minimum 24" Depth and ventilation to house computer/AV Systems for screen control |
| Furnishings & Equipment | Option 1: tiered seating with built in tables Option 2: 15' High Skyfold Zenith 55 Operable, Motorized Partitions (or equal) Training Tables and Chairs to Accommodate (2) Simultaneous 40-person classes |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Ventilation per ASHRAE Std 62, TN HPBR, Min-2007, and local code requirements |
| HVAC Noise Level | NC-35 |
| Space Control | Thermostat control for space. Space fed from separate VAV or HVAC unit. |

| | |
|---|--|
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 18.6 fc for general illumination with LED light fixtures. Additional adjustable lighting for display areas. Controls shall contain manual on wall switch with dimmer and with automatic off vacancy sensors. Additional lighting zones for daylighting and presentation areas may be required. |
| Power | General duplex receptacles located around perimeter. Power for projector, screen, monitor, and podium possible. Floor boxes possible (layout dependent). |
| Fire Alarm | Audible/Visible annunciation; Manual pull station may be required if this includes an exit. |
| Plumbing | No Plumbing is assumed |
| High Performance Building Space Definition | Densely occupied, regularly occupied space, shared multi-occupant space |
| Specialty Systems | |
| Audio/Visual | Speaker System; Power/Data for Screens and/or Projection |
| Security | Cameras/Access Control as required by 2020 UTK Design Guidelines |
| Additional Notes | <ul style="list-style-type: none"> • See Adjacency Diagrams for more notes about the function of the Classroom • Consider option to have tiered seating vs. operable partition to divide space • Ample, natural, south-facing sunlight • Consider ability to transition into indoor/outdoor space as much as possible and interior fans when room is open to exterior • Consider how room opens to the outdoor porch • Consider appropriate walk off material adjacent to all entrances (6' minimum) |

Space Conference Room

Quantity 1
 Seats 25-30
 Area ~~500 SF~~ 400 SF
 *Revised per Amendment 01

| | |
|------------------------------------|---|
| Function | Large conference room space |
| Adjacency Requirements | Visual adjacency to Processing floor |
| Finishes | (Conference to Receive a High Level of Finish) |
| Floors & Base | Non-porous; hard; durable; cleanable i.e. polished concrete topping, terrazzo |
| Walls | Wood Accent Wall Paneling; Painted Drywall, Level 5 Finish; Acoustic Wall Panels, 25% Coverage |
| Doors & Frames | Aluminum Storefront Entry Doors |
| Ceilings | Minimum 15' Clear Ceiling Height; Acoustic Wood Ceiling or Sound Absorptive Finish to achieve NRC .85 Min, CAC 30+ |
| Windows | Not required, but preferred; secondary to views of Processing |
| Window Treatments | Dual Roller Motorized Mechoshade or Equal - Blackout and 5% Openness |
| Millwork | AWI Custom Grade PLAM base cabinetry with Quartz Counter top and built in trash/recycling Millwork should be designed with minimum 24" Depth and ventilation to house computer/AV Systems for screen control |
| Furnishings & Equipment | Large conference table and chairs to comfortably seat 25 people |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Ventilation per ASHRAE Std 62, TN HPBR, Min-2007, and local code requirements |
| HVAC Noise Level | NC-35 |
| Space Control | Thermostat control for space. Space fed from separate VAV or HVAC unit. |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |

| | | |
|---|---------------------|--|
| | Illumination | 18.6 fc for general illumination with LED light fixtures. Additional adjustable lighting for display areas. Controls shall contain manual on wall switch with dimmer and with automatic off vacancy sensors. Additional lighting zones for daylighting and presentation areas may be required. |
| | Power | General duplex receptacles located around perimeter. Power for projector, screen, monitor, and podium possible. Floor boxes possible (layout dependent). |
| | Fire Alarm | Audible/Visible annunciation; Manual pull station may be required if this includes an exit. |
| | Plumbing | No Plumbing is assumed |
| High Performance Building Space Definition | | Densely occupied, regularly occupied space, shared multi-occupant space |
| Specialty Systems | | |
| | Audio/Visual | Speaker System; Power/Data for Screens and/or Projection |
| | Security | Cameras/Access Control as required by 2020 UTK Design Guidelines |
| Additional Notes | | <ul style="list-style-type: none"> • See Adjacency Diagrams for more notes about the function of the Conference Room • Space to be considered as a secondary teaching space • Visual connection to Processing Floor as a viewing area for teaching |

Space Locker Rooms (Men's and Women's)

Quantity 2
 Capacity 10
 Area ~~700 SF~~ 400 SF
 *Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Preparation and decontamination for Processing area Multi-User restroom, shower and changing rooms, and locker storage |
| Adjacency Requirements | Located between the Learning and the Processing areas |
| Finishes | |
| Floors & Base | Epoxy Flooring and Integral Base |
| Walls | Porcelain tile to 8'AFF min on all wet wall locations |
| Doors & Frames | Painted Hollow Metal Frames and Wood Doors |
| Ceilings | Moisture Resistant Drywall and ACT |
| Windows | Not Required |
| Window Treatments | Not Required |
| Millwork | AWI Custom Grade Quartz Counter top with undermount lavatories |
| Furnishings & Equipment | Toilet Partitions - Stainless steel, Phenolic or Hard Wall Stainless Steel Toilet Accessories: Recessed Trash Receptacles, Automatic countertop soap dispensers, Electric hand dryers Lockers for personal items Shower curtain and rod |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Exhaust to meet codes |
| HVAC Noise Level | NC-40 |
| Space Control | No direct control of space, feed from adjoining zone |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 18.6 fc for general illumination with LED light fixtures. |
| Power | General duplex receptacles located around perimeter. |

| | |
|---|--|
| Fire Alarm | Audible/Visible annunciation; |
| Plumbing | Provide low flow and low flush plumbing fixtures meeting UT standards and TN High Performance Building Requirements for Flush and Flow Rates Provide showers and drainage |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Consider high use and durability of all finishes and fixtures Consider a small secure storage area for restocking toilet paper and misc. janitorial supplies Consider trash/recycling management |

Space Multi-User Restroom (Men's and Women's)

Quantity 2
 Capacity 2
 Area 250 SF

| | |
|------------------------------------|---|
| Function | Multi-User restrooms to serve the classrooms and offices Separate facilities from the Processing preparation spaces |
| Adjacency Requirements | Accessed by lobby near classrooms and offices |
| Finishes | |
| Floors & Base | Epoxy Flooring and Integral Base |
| Walls | Porcelain tile to 8'AFF min on all wet wall locations |
| Doors & Frames | Painted Hollow Metal Frames and Wood Doors |
| Ceilings | Moisture Resistant Drywall and ACT |
| Windows | Not Required |
| Window Treatments | Not Required |
| Millwork | AWI Custom Grade Quartz Counter top with undermount lavatories |
| Furnishings & Equipment | Toilet Partitions - Stainless steel, Phenolic or Hard Wall Stainless Steel Toilet Accessories: Recessed Trash Receptacles, Automatic counter top soap dispensers, Electric hand dryers |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Exhaust to meet codes |
| HVAC Noise Level | NC-40 |
| Space Control | No direct control of space, feed from adjoining zone |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 18.6 fc for general illumination with LED light fixtures. |
| Power | General duplex receptacles located around perimeter. |
| Fire Alarm | Audible/Visible annunciation; |

| | |
|---|--|
| Plumbing | Provide low flow and low flush plumbing fixtures meeting UT standards and TN High Performance Building Requirements for Flush and Flow Rates |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Consider high use and durability of all finishes and fixtures Consider a small secure storage area for restocking toilet paper and misc. janitorial supplies Consider trash/recycling management |

**ELIMINATED FROM THE PROGRAM
 PER AMENDMENT 01**

Space Family Restroom / Gender Neutral Restroom

Quantity 1 2*
 Capacity 1
 Area 100 SF
 *Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Single User, Accessible, Family Restrooms |
| Adjacency Requirements | Adjacent to Multi-User Restrooms |
| Finishes | |
| Floors & Base | Non-porous; durable; cleanable i.e. polished concrete topping, terrazzo |
| Walls | Porcelain tile to 8'AFF min on all wet wall locations |
| Doors & Frames | Painted Hollow Metal Frame and Wood Door with Privacy Lock |
| Ceilings | Moisture Resistant Drywall and ACT |
| Windows | Not required |
| Window Treatments | Not required |
| Millwork | AWI Custom Grade Quartz Countertop with undermount lavatory |
| Furnishings & Equipment | Stainless Steel Toilet Accessories: Recessed Trash Receptacles, Automatic countertop soap dispensers, Electric hand dryers, Baby Changing table, Grab Bars |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Exhaust to meet codes |
| HVAC Noise Level | NC-40 |
| Space Control | No direct control of space, feed from adjoining zone |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 10 fc for general illumination with LED light fixtures. Sink/vanity area to be lit with recessed led downlights. Controls shall contain manual on wall switch and automatic off vacancy sensors. |
| Power | General duplex receptacles located near door to facilitate cleaning. GFI duplex receptacles to be located near sink above counter. |

| | |
|---|--|
| Fire Alarm | Audible/Visible annunciation; |
| Plumbing | Provide low flow and low flush plumbing fixtures meeting UT standards and TN High Performance Building Requirements for Flush and Flow Rates |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Consider high use and durability of all finishes and fixtures Consider trash/recycling management |

Space Inspector Office

Quantity 1
 Capacity 1
 Area 120 SF

| | |
|------------------------------------|---|
| Function | Enclosed private office space for Inspector |
| Adjacency Requirements | Adjacent to Processing and Inspector Bathroom |
| Finishes | |
| Floors & Base | Non-porous; durable; cleanable i.e. polished concrete topping, terrazzo |
| Walls | Painted Drywall |
| Doors & Frames | Glass Demountable Wall System and Glass Pivot Door w/ Acoustic Seals |
| Ceilings | Exposed; ACT with min NRC .85, CAC 30+ |
| Windows | Desired; View of Window Required |
| Window Treatments | Mechoshade or Eq. |
| Millwork | Not Required |
| Furnishings & Equipment | One workstation; two guest chairs |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Ventilation per ASHRAE Std 62, TN HPBR, Min-2007, and local code requirements |
| HVAC Noise Level | NC-35 |
| Space Control | Thermostat control shared with adjacent office or conference room space. During SDP evaluate adding thermostat to individual office based on HVAC system type and budget (adjust to be (1) per room) |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 28 fc for general illumination with LED light fixtures. Controls shall contain manual on wall switch with dimmer and with automatic off vacancy sensors. Additional lighting zones for daylighting areas may be required. |

| | |
|---|---|
| Power | General duplex receptacles located around perimeter. Provide quad receptacle for each workstation. Per ASHRAE 90.1-2010 Automatic Receptacle control is required for 50% of receptacles within open office. Care is required to coordinate with the Furniture Vendor. |
| Fire Alarm | Annunciation should be covered by area outside private office. |
| Plumbing | No Plumbing |
| High Performance Building Space Definition | |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | Discuss flooring and furniture options with UTIA Consider Acoustics |

COMBINED WITH REGULATORY USDA ERSIS SPACE PER AMENDMENT 01

Space Inspector's Bathroom

Quantity 1
 Capacity 1
 Area ~~100 SF~~ 50 SF
 *Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Bathroom for the Inspector |
| Adjacency Requirements | Adjacent and only accessible to Inspector's office and Processing |
| Finishes | |
| Floors & Base | Epoxy Flooring and Integral Base |
| Walls | Porcelain tile to 8'AFF min on all wet wall locations |
| Doors & Frames | Painted Hollow Metal Frames and Wood Doors |
| Ceilings | Moisture Resistant Drywall and ACT |
| Windows | Not Required |
| Window Treatments | Not Required |
| Millwork | AWI Custom Grade Quartz Countertop with undermount lavatories |
| Furnishings & Equipment | Toilet Partitions - Stainless steel, Phenolic or Hard Wall Stainless Steel Toilet Accessories: Recessed Trash Receptacles, Automatic countertop soap dispensers, Electric hand dryers |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Exhaust to meet codes |
| HVAC Noise Level | NC-40 |
| Space Control | No direct control of space, feed from adjoining zone |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 18.6 fc for general illumination with LED light fixtures. |
| Power | General duplex receptacles located around perimeter. |
| Fire Alarm | Audible/Visible annunciation; |

| | |
|---|--|
| Plumbing | Provide low flow and low flush plumbing fixtures meeting UT standards and TN High Performance Building Requirements for Flush and Flow Rates |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Consider high use and durability of all finishes and fixtures Consider trash/recycling management |

Space AV Closet

Quantity 1
 Capacity -
 Area 50 SF

| | |
|------------------------------------|---|
| Function | Support Large Classroom |
| Adjacency Requirements | Adjacent to Classroom |
| Finishes | |
| Floors & Base | Sealed Concrete and Rubber Base |
| Walls | Painted Drywall |
| Doors & Frames | Painted Hollow Metal Frame and Wood Door |
| Ceilings | Exposed |
| Windows | Not required |
| Window Treatments | Not required |
| Millwork | Not required |
| Furnishings & Equipment | Misc. AV Equipment |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max. Confirm with owner Humidification is not required |
| Ventilation Requirements | None - not an occupied space |
| HVAC Noise Level | NC-45 |
| Space Control | Thermostat control from independent HVAC unit (VRF/Mini-Split) |
| HVAC Additional Notes | |
| Electrical | |
| Illumination | 10 fc for general illumination with LED light fixtures. Controls shall contain manual on wall switch with automatic off vacancy sensor. |
| Power | Provide single duplex receptacle on each wall for maintenance of equipment. Provide quad outlet and dedicated circuit for server rack. |

| | |
|---|--|
| Fire Alarm | Audible/Visible annunciation; smoke detector |
| Plumbing | No Plumbing is assumed |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |

Additional Notes

ELIMINATED FROM THE PROGRAM PER AMENDMENT 01

Space Copy Room / Classroom Storage

Quantity 1
 Capacity 2
 Area 200 SF

| | |
|------------------------------------|--|
| Function | Office Supply Storage and Printer Area; Coffee and Sink |
| Adjacency Requirements | Adjacent to Offices |
| Finishes | |
| Floors & Base | Polished Concrete and Rubber Base |
| Walls | Painted Drywall |
| Doors & Frames | Not enclosed |
| Ceilings | Exposed; ACT with min NRC .85, CAC 30+ |
| Windows | Not required |
| Window Treatments | Not Required |
| Millwork | AWI Custom Grade PLAM base cabinetry with Solid Surface Countertop with built in Trash/Recycling |
| Furnishings & Equipment | Copy Printer |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Provide exhaust above copier |
| HVAC Noise Level | NC-35 |
| Space Control | No direct control of space / zone with adjacent office area |
| HVAC Additional Notes | |
| Electrical | |
| Illumination | 10 fc for general illumination with LED light fixtures. Controls shall contain manual on wall switch with automatic off vacancy sensor. |
| Power | Provide single duplex receptacle on each wall for maintenance of equipment. Provide dedicated circuit for copier. Provide duplex receptacles above counter for device charging |

| | |
|---|---|
| Fire Alarm | Audible/Visible annunciation |
| Plumbing | No plumbing is assumed |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Placement of room should allow ease of access to classrooms and offices |

ELIMINATED FROM THE PROGRAM PER AMENDMENT 01

Space Janitorial

Quantity 1
 Capacity 1
 Area ~~100 SF~~ 40 SF
 * Revised per Amendment 01

| | |
|------------------------------------|---|
| Function | Building Support; Maintenance |
| Adjacency Requirements | Convenient to Public Outreach Spaces and Multi-User Restrooms |
| Finishes | |
| Floors & Base | Sealed Concrete and Rubber Base |
| Walls | FRP; Walls must extend and be sealed to the structural deck above |
| Doors & Frames | Painted Hollow Metal Frame and Wood Door with Closer |
| Ceilings | Exposed |
| Windows | Not Required |
| Window Treatments | Not Required |
| Millwork | Not Required |
| Furnishings & Equipment | None |
| HVAC | |
| Inside Design Conditions | --- |
| Ventilation Requirements | Exhaust to meet code or effective negative pressure of at least .50 cfm/SF (whichever is greater) |
| HVAC Noise Level | NC-40 |
| Space Control | Passive control of space temp by exhaust of adjacent space |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 10 fc for general illumination with LED light fixtures. Controls shall contain manual on wall switch with automatic off vacancy sensor. |
| Power | Provide single duplex receptacle on each wall for maintenance of equipment |

| | |
|---|--|
| Fire Alarm | Audible/Visible annunciation; Provide manual pull station. |
| Plumbing | Service Sink |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Adequate sizing and space requirements should be discussed and confirmed with Building Services to determine actual needs for floor cleaning equipment, storage, supplies, etc. during the design phase. |

Space Mechanical/Electrical

Quantity 1
 Capacity -
 Area ~~300 SF~~ 200 SF
 * Revised per Amendment 01

Function Building Support

Adjacency Requirements

Finishes

Floors & Base Sealed Concrete and Rubber Base

Walls Painted Drywall

Doors & Frames Painted Hollow Metal Frame and Wood Door

Ceilings Exposed

Windows Not Required

Window Treatments Not Required

Millwork Not Required

Furnishings & Equipment

HVAC

Inside Design Conditions 85 - 60 degrees F / max RH 60%

Ventilation Requirements Ventilation for any mechanical room with steam.

HVAC Noise Level N/A

Space Control Heater and limited ventilation or AC to maintain setpoints

HVAC Additional Notes

Electrical

Illumination 10 fc for general illumination with LED light fixtures. Controls shall contain manual on wall switch.

Power Provide single duplex receptacle on each wall for maintenance of equipment

Fire Alarm Audible/Visible annunciation; Provide manual pull station; smoke detector

Plumbing Floor drains for Mechanical equipment, backflow preventer for HVAC system makeup

High Performance Building Space Definition None

Specialty Systems

Audio/Visual

Security

- Additional Notes**
- Pending the interior/exterior location of the mechanical and electrical equipment, appropriate scaling and re-sizing of the mechanical and electrical rooms should be anticipated during the design phase.
 - Confirm additional Zone Maintenance Storage Requirements with Facilities Services

Space Faculty Break Room / Kitchen

Quantity 1

Capacity

Area 700 SF 140 SF

*Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Faculty break room and kitchen to store, prepare and eat food |
| Adjacency Requirements | Adjacent to Offices |
| Finishes | |
| Floors & Base | Polished concrete and Rubber Base |
| Walls | Painted Drywall |
| Doors & Frames | Painted Hollow Metal Frame and Wood Door |
| Ceilings | Vinyl Coated ACT |
| Windows | Not Required |
| Window Treatments | Not Required |
| Millwork | AWI Custom Grade PLAM base cabinetry with Solid Surface Countertop with built in Trash/Recycling |
| Furnishings & Equipment | Tables and chairs to accommodate full time faculty Kitchen appliances to be verified with client in design Revised per Amendment 01: ADD ALT future Kitchenette Build out |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Separate zone and or exhaust to control odors. Our assumption is this is only a catering kitchen without commercial kitchen ventilation (please confirm) |
| HVAC Noise Level | NC-40 |
| Space Control | Thermostat control |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 28 fc for general illumination with 2x2 or 2x4 recessed LED fixtures with lenses and gasketing. Controls shall contain manual on wall switch with dimmer and with automatic off vacancy sensors. |

| | |
|---|--|
| Power | General duplex receptacles located around perimeter. Power for required kitchen appliances |
| Fire Alarm | Audible/Visible annunciation; |
| Plumbing | Plumbing coordinated with typical kitchen appliances including dishwasher, sink, icemaker, coffee maker, and refrigerator Revised per Amendment 01: Plumbing rough in for future appliances |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Consider Trash/Recycling Management and Composting Verify kitchen appliances with UTIA |

Space Office

Quantity 5 4*
 Capacity 1
 Area ~~120 SF~~ 90 SF
 *Revised per amendment 01

| | |
|------------------------------------|---|
| Function | Enclosed private office space for AgResearch |
| Adjacency Requirements | Adjacent to Faculty Break room |
| Finishes | |
| Floors & Base | Polished concrete and Rubber Base |
| Walls | Painted Drywall |
| Doors & Frames | Glass Demountable Wall System and Glass Pivot Door w/ Acoustic Seals |
| Ceilings | Exposed; ACT with min NRC .85, CAC 30+ |
| Windows | Desired; View of Window Required |
| Window Treatments | Mechoshade or Eq. |
| Millwork | Not Required |
| Furnishings & Equipment | One workstation; two guest chairs |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Ventilation per ASHRAE Std 62, TN HPBR, Min-2007, and local code requirements |
| HVAC Noise Level | NC-35 |
| Space Control | Thermostat control shared with adjacent office or conference room space. During SDP evaluate adding thermostat to individual office based on HVAC system type and budget (adjust to be (1) per room) |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 28 fc for general illumination with LED light fixtures. Controls shall contain manual on wall switch with dimmer and with automatic off vacancy sensors. Additional lighting zones for daylighting areas may be required. |

| | |
|---|---|
| Power | General duplex receptacles located around perimeter. Provide quad receptacle for each workstation. Per ASHRAE 90.1-2010 Automatic Receptacle control is required for 50% of receptacles within open office. Care is required to coordinate with the Furniture Vendor. |
| Fire Alarm | Annunciation should be covered by area outside private office. |
| Plumbing | No Plumbing |
| High Performance Building Space Definition | Regularly occupied |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Discuss flooring and furniture options with UTIA Consider Acoustics |

Space Kitchenette for Students

Quantity 1
 Capacity -
 Area 400 SF

| | |
|------------------------------------|--|
| Function | Kitchenette for students to store, prepare and eat food |
| Adjacency Requirements | Adjacent to Lobby and Classroom |
| Finishes | |
| Floors & Base | Polished Concrete and Rubber Base |
| Walls | Painted Drywall |
| Doors & Frames | Cased opening |
| Ceilings | Vinyl Coated ACT |
| Windows | Not Required |
| Window Treatments | Not Required |
| Millwork | AWI Custom Grade PLAM base cabinetry with Solid Surface Countertop with built in Trash/Recycling |
| Furnishings & Equipment | Kitchen appliances to be verified with client in design |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Separate zone and or exhaust to control odors. Our assumption is this is only a catering kitchen without commercial kitchen ventilation (please confirm) |
| HVAC Noise Level | NC-40 |
| Space Control | Thermostat control |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 28 fc for general illumination with 2x2 or 2x4 recessed LED fixtures with lenses and gasketing. Controls shall contain manual on wall switch with dimmer and with automatic off vacancy sensors. |
| Power | General duplex receptacles located around perimeter. Power for required kitchen appliances |

| | |
|---|--|
| Fire Alarm | Audible/Visible annunciation; |
| Plumbing | Plumbing coordinated with kitchen appliances including sink and refrigerator |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |

- Additional Notes**
- Consider Trash/Recycling Management and Composting
 - Verify kitchen appliances with UTIA

ELIMINATED FROM THE PROGRAM PER AMENDMENT 01

Space Retail Space

Quantity 1
Capacity -
Area 500 SF

| | |
|------------------------------------|--|
| Function | Retail space for the purchase of protein processed in the facility and UTIA merchandise. |
| Adjacency Requirements | Contiguous with Lobby and entry |
| Finishes | (Retail Space to Receive a High Level of Finish) |
| Floors & Base | Non-porous; durable; cleanable i.e. polished concrete topping, terrazzo |
| Walls | Acoustic Wall Panel; Painted Drywall, Level 5 Finish |
| Doors & Frames | Aluminum Storefront Entry Doors |
| Ceilings | Acoustic Wood Ceiling or Sound Absorptive Finish |
| Windows | Desirable |
| Window Treatments | Not Required |
| Millwork | AWI Custom Grade Wood Veneer base cabinetry and Quartz Cash Wrap |
| Furnishings & Equipment | Product Displays and Limited Seating |
| HVAC | |
| Inside Design Conditions | 70-75 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Ventilation per ASHRAE Std 62, TN HPBR, Min-2007, and local code requirements |
| HVAC Noise Level | NC-35 |
| Space Control | Thermostat control for space. Space fed from separate VAV or unit. |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 28 fc for general illumination with LED light fixtures. Additional lighting in cafe and at point of sale with recessed LED downlights and decorative wall sconces. Controls shall contain manual on wall switch with dimmer and with automatic off vacancy sensors. Additional lighting zones for daylighting display areas may be required. |
| Power | General duplex receptacles located around perimeter, and at point of sale locations. Power for required food service equipment. |

| | |
|---|--|
| Fire Alarm | Audible/Visible annunciation; Manual pull station may be required if this includes an exit. |
| Plumbing | Need confirmation of food service requirements. Provide plumbing and drainage for retail food displays |
| High Performance Building Space Definition | Densely occupied, regularly occupied space, shared multi-occupant space |
| Specialty Systems | |
| Audio/Visual | Speaker System |
| Security | Cameras/Access Control as required by 2020 UTK Design Guidelines |
| Additional Notes | <ul style="list-style-type: none"> Consider keeping views open/make space feel connected to entry for outside patrons Ability to keep the rest of the building locked and secure while selling at the retail space |

ELIMINATED FROM THE PROGRAM PER AMENDMENT 01

Space ~~Retail~~ Storage

Quantity 1
 Capacity 1
 Area ~~200-SF~~ 100SF
 *Revised per Amendment 01

| | |
|------------------------------------|---|
| Function | Support Retail Shop; Secure Merchandise Storage |
| Adjacency Requirements | Near or adjacent to Retail |
| Finishes | |
| Floors & Base | Sealed Concrete and Rubber Base |
| Walls | Painted Drywall |
| Doors & Frames | Painted Hollow Metal Frame and Wood Door |
| Ceilings | Exposed |
| Windows | Not Required |
| Window Treatments | Not Required |
| Millwork | Not Required |
| Furnishings & Equipment | Refrigerators and Coolers to store packaged protein |
| HVAC | |
| Inside Design Conditions | 68-78 Degrees F / 55% RH max no humidification |
| Ventilation Requirements | Ventilation per ASHRAE Std 62, TN HPBR, Min-2007, and local code requirements |
| HVAC Noise Level | NC-35 |
| Space Control | No direct control of space temp, feed from adjacent spaces |
| HVAC Additional Notes | CO2 Monitoring Required; For thermal comfort reference Ashrae 55-2010 |
| Electrical | |
| Illumination | 10 fc for general illumination with LED light fixtures. Controls shall contain manual on wall switch with automatic off vacancy sensor. |
| Power | Provide single duplex receptacle adjacent to entry door |
| Fire Alarm | Audible/Visible annunciation; smoke detector |

| | |
|---|--|
| Plumbing | No Plumbing is assumed |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> Necessary size to be coordinated with UTIA based on projected need |

Space Front Porch

Quantity 1
 Capacity 20
 Area 1,000 SF

| | |
|------------------------------------|---|
| Function | Serve as an entry to the building and a space for outdoor teaching and collaboration |
| Adjacency Requirements | Front entry |
| Finishes | |
| Floors & Base | Sealed Concrete or Decking |
| Walls | N/A |
| Doors & Frames | Open |
| Ceilings | Exposed decking |
| Windows | Not required |
| Window Treatments | Not required |
| Millwork | Not required |
| Furnishings & Equipment | Outdoor lounge furniture and tables |
| HVAC | |
| Inside Design Conditions | N/A |
| Ventilation Requirements | |
| HVAC Noise Level | |
| Space Control | |
| HVAC Additional Notes | |
| Electrical | |
| Illumination | 10 fc for general illumination with LED light fixtures. Controls shall contain manual on wall switch with automatic off vacancy sensor. |
| Power | Provide single duplex receptacle on each wall for maintenance of equipment. |
| Fire Alarm | Audible/Visible annunciation |

| | |
|---|--|
| Plumbing | No Plumbing is assumed |
| High Performance Building Space Definition | None |
| Specialty Systems | |
| Audio/Visual | |
| Security | |
| Additional Notes | <ul style="list-style-type: none"> To be coordinated with Landscape Architect |

Space Cattle + Hog Slaughter

Quantity 1

Area ~~2,300 SF~~ 2,000 SF

*Revised per Amendment 01

| | |
|------------------------------------|---|
| Function | Stun, kill and evisceration |
| Adjacency Requirements | Holding pens to Chilling |
| Finishes | |
| Floors & Base | Concrete w Urethane topping sloped to stainless drains. |
| Walls | IMP walls mounted on 12" curbs |
| Doors & Frames | Stainless doors and frames |
| Ceilings | IMP above rail supports |
| Windows | Stainless frames |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | Equipment to be determined - see appendix |
| HVAC | |
| Inside Design Conditions | 60 - 80 F |
| Ventilation Requirements | 10 air changes /hr min. |
| HVAC Noise Level | N/A |
| Space Control | N/A |

| | |
|---|---|
| HVAC Additional Notes | Higher rate for cleaning, room negative to cooler |
| Electrical | |
| Illumination | 60 FC - 200 FC at inspection |
| Power | 120V , 208 3P, 480 3P |
| Fire Alarm | . |
| Plumbing | CPVC lines 4" minimum, stainless area drains or sanitary slot drains |
| High Performance Building Space Definition | |
| Specialty Systems | Overhead rail system |
| Audio/Visual | |
| Security | Standard campus security |
| Additional Notes | <ul style="list-style-type: none"> Users to verify final equipment in design |

Space Cattle + Hog Chilling

Quantity 1

Area ~~1,200 SF~~ 1,000 SF

*Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Cooling down the carcasses |
| Adjacency Requirements | Slaughter to Further processing |
| Finishes | |
| Floors & Base | Concrete w Urethane topping sloped to stainless drainings. |
| Walls | IMP walls mounted on 12" curbs |
| Doors & Frames | Insulated doors on stainless frames |
| Ceilings | IMP above rail supports |
| Windows | Stainless frames |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | |
| HVAC | |
| Inside Design Conditions | 28F |
| Ventilation Requirements | Only during cleaning |
| HVAC Noise Level | N/A |
| Space Control | N/A |

| | |
|---|---|
| HVAC Additional Notes | High velocity in first room. Ceiling hung split systems |
| Electrical | |
| Illumination | 30 - 40 FC |
| Power | 120V, 480 3P |
| Fire Alarm | |
| Plumbing | CPVC lines 4" minimum, stainless area drains or sanitary slot drains |
| High Performance Building Space Definition | |
| Specialty Systems | Overhead rail system |
| Audio/Visual | |
| Security | Standard campus security |
| Additional Notes | <ul style="list-style-type: none"> Users to verify final equipment in design |

Space Poultry Slaughter

Quantity 1

Area ~~750 SF~~ 675 SF

*Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Stun, kill, pluck and evisceration |
| Adjacency Requirements | Poultry Chilling |
| Finishes | |
| Floors & Base | Concrete w Urethane topping sloped to stainless drainings. |
| Walls | IMP walls mounted on 12" curbs |
| Doors & Frames | Stainless doors and frames |
| Ceilings | IMP |
| Windows | Stainless frames |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | |
| HVAC | |
| Inside Design Conditions | 60-80F |
| Ventilation Requirements | 10 air changes /hr min |
| HVAC Noise Level | N/A |
| Space Control | N/A |

| | |
|---|---|
| HVAC Additional Notes | Higher rate for cleaning, Hood over scalding |
| Electrical | |
| Illumination | 30 - 40 FC |
| Power | 120V, 208 3P |
| Fire Alarm | |
| Plumbing | CPVC lines 4" minimum, stainless area drains or sanitary slot drains |
| High Performance Building Space Definition | |
| Specialty Systems | Scalding and singeing |
| Audio/Visual | |
| Security | Standard campus security |
| Additional Notes | <ul style="list-style-type: none"> Users to verify final equipment in design |

Space Poultry Chilling

Quantity 1

Area ~~400 SF~~ 360 SF

*Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Cooling down the carcasses |
| Adjacency Requirements | Poultry slaughter to Further processing |
| Finishes | |
| Floors & Base | Concrete w Urethane topping sloped to stainless drainings. |
| Walls | IMP walls mounted on 12" curbs |
| Doors & Frames | Insulated doors on stainless frames |
| Ceilings | IMP |
| Windows | Stainless frames |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | |
| HVAC | |
| Inside Design Conditions | 28F |
| Ventilation Requirements | Only during cleaning |
| HVAC Noise Level | N/A |
| Space Control | N/A |

| | |
|---|---|
| HVAC Additional Notes | High velocity in first room. Ceiling hung split systems |
| Electrical | |
| Illumination | 30 - 40 FC |
| Power | 120V, 480 3P |
| Fire Alarm | |
| Plumbing | CPVC lines 4" minimum, stainless area drains or sanitary slot drains |
| High Performance Building Space Definition | |
| Specialty Systems | |
| Audio/Visual | |
| Security | Standard campus security |
| Additional Notes | <ul style="list-style-type: none"> Users to verify final equipment in design |

Space Further Processing + Cooking

Quantity 1

Area ~~1,600 SF~~ 1,440 SF

*Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Prep meat into retail products |
| Adjacency Requirements | Chilling areas and Carcass breakdown. |
| Finishes | |
| Floors & Base | Concrete w Urethane topping sloped to stainless drainings. |
| Walls | IMP walls mounted on 12" curbs |
| Doors & Frames | Stainless doors and frames |
| Ceilings | IMP |
| Windows | Stainless frames |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | Equipment to be determined - see appendix |
| HVAC | |
| Inside Design Conditions | 45F |
| Ventilation Requirements | 10 air changes per hour minimum. 20 during cleaning |
| HVAC Noise Level | N/A |
| Space Control | N/A |

HVAC Additional Notes Ceiling hung split system. Washable coil and drain pan

Electrical

Illumination 60 FC

Power 120V , 208 3P, 480 3P

Fire Alarm

Plumbing CPVC lines 4" minimum, stainless area drains or sanitary slot drains

High Performance Building Space Definition

Specialty Systems Overhead rail system

Audio/Visual

Security Standard campus security

Additional Notes

- Users to verify final equipment in design

Space Carcass + Primal Breakdown

Quantity 1

Area ~~800 SF~~ 720 SF

*Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Initial breakdown into main or primal cuts |
| Adjacency Requirements | Chilling and Further processing |
| Finishes | |
| Floors & Base | Concrete w Urethane topping sloped to stainless drainings. |
| Walls | IMP walls mounted on 12" curbs |
| Doors & Frames | Insulated doors on stainless frames |
| Ceilings | IMP above rail supports |
| Windows | Stainless frames |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | Equipment to be determined - see appendix |
| HVAC | |
| Inside Design Conditions | 45F |
| Ventilation Requirements | 10 air changes per hour minimum. 20 during cleaning |
| HVAC Noise Level | N/A |
| Space Control | N/A |

| | |
|---|---|
| HVAC Additional Notes | Ceiling hung split system. Washable coil and drain pan |
| Electrical | |
| Illumination | 60 FC |
| Power | 120V , 208 3P, 480 3P |
| Fire Alarm | |
| Plumbing | CPVC lines 4" minimum, stainless area drains or sanitary slot drains |
| High Performance Building Space Definition | |
| Specialty Systems | Overhead rail system |
| Audio/Visual | |
| Security | Standard campus security |
| Additional Notes | <ul style="list-style-type: none"> Users to verify final equipment in design |

Space Regulatory USDA FSIS

Quantity 1
Area 250 SF

| | |
|------------------------------------|-------------------------------|
| Function | USDA FSIS inspectors office |
| Adjacency Requirements | Slaughter areas (short walk) |
| Finishes | |
| Floors & Base | Tile or epoxy |
| Walls | Non hollow |
| Doors & Frames | Stainless doors and frames |
| Ceilings | Acoustic tile or susp ceiling |
| Windows | |
| Window Treatments | |
| Millwork | |
| Furnishings & Equipment | |
| HVAC | |
| Inside Design Conditions | 65-70F |
| Ventilation Requirements | |
| HVAC Noise Level | |
| Space Control | |
| HVAC Additional Notes | |
| Electrical | |

| | |
|---|---|
| Illumination | 50FC |
| Power | 120V |
| Fire Alarm | |
| Plumbing | NA |
| High Performance Building Space Definition | |
| Specialty Systems | |
| Audio/Visual | |
| Security | Standard campus security + USDA access lock. |
| Additional Notes | <ul style="list-style-type: none"> Users to verify final equipment in design |

Space Clean & Dirty Lab

Quantity 2
 Area ~~400 SF~~ 300 SF
 *Revised per Amendment 01

| | |
|------------------------------------|--|
| Function | Intimate Laboratory Space to accommodate class/trainings |
| Adjacency Requirements | Adjacent to Further Breakdown |
| Finishes | |
| Floors & Base | Concrete w Urethane topping sloped to stainless drainings. |
| Walls | IMP walls mounted on 12" curbs |
| Doors & Frames | Insulated doors on stainless frames |
| Ceilings | IMP above rail supports |
| Windows | Stainless frames |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | Equipment to be determined - see appendix |
| HVAC | |
| Inside Design Conditions | 45F |
| Ventilation Requirements | 10 air changes per hour minimum. 20 during cleaning |
| HVAC Noise Level | N/A |
| Space Control | N/A |
| HVAC Additional Notes | Ceiling hung split system. Washable coil and drain pan |

| | |
|---|--|
| Electrical | |
| Illumination | 60 FC |
| Power | 120V , 208 3P, 480 3P |
| Fire Alarm | |
| Plumbing | CPVC lines 4" minimum, stainless area drains or sanitary slot drains |
| High Performance Building Space Definition | |
| Specialty Systems | |
| Audio/Visual | S |
| Security | |
| Additional Notes | • |

Space Holding Pens

Quantity 1

Area ~~2,000 SF~~ 1,000 SF

*Revised per Amendment 01

| | |
|------------------------------------|-------------------------------------|
| Function | Animal corral under roof |
| Adjacency Requirements | Cattle and Hog slaughter |
| Finishes | |
| Floors & Base | Concrete wash to drain |
| Walls | Concrete up to approx 3ft |
| Doors & Frames | Swing gates and Overhead doors |
| Ceilings | NA |
| Windows | Roll down curtain walls |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | Pens and gates. Watering stations |
| HVAC | Min temp 40 F |
| Inside Design Conditions | Open with fan assisted at high temp |
| Ventilation Requirements | N/A |
| HVAC Noise Level | |
| Space Control | |

| | |
|---|---|
| HVAC Additional Notes | Mister for evaporation cooling |
| Electrical | |
| Illumination | 30 FC |
| Power | 120 water resist conv outlets |
| Fire Alarm | |
| Plumbing | Drain and manure pit |
| High Performance Building Space Definition | |
| Specialty Systems | |
| Audio/Visual | |
| Security | Gate locks, camera |
| Additional Notes | <ul style="list-style-type: none"> Users to verify final equipment in design |

Space Offal Chilling

Quantity 1

Area 200 SF

*Added per Amendment 01

| | |
|------------------------------------|--|
| Function | Cool down |
| Adjacency Requirements | Along exterior for truck pickup |
| Finishes | |
| Floors & Base | Concrete w Urethane topping sloped to stainless drainings. |
| Walls | IMP walls mounted on 12" curbs |
| Doors & Frames | Insulated doors on stainless frames |
| Ceilings | IMP |
| Windows | Stainless frames |
| Window Treatments | N/A |
| Millwork | N/A |
| Furnishings & Equipment | |
| HVAC | |
| Inside Design Conditions | 28F |
| Ventilation Requirements | Only during cleaning |
| HVAC Noise Level | N/A |
| Space Control | N/A |

| | |
|---|--|
| HVAC Additional Notes | High velocity in first room. Ceiling hung split systems |
| Electrical | |
| Illumination | 30 - 40 FC |
| Power | 120V, 480 3P |
| Fire Alarm | |
| Plumbing | CPVC lines 4" minimum, stainless area drains or sanitary slot drains |
| High Performance Building Space Definition | |
| Specialty Systems | |
| Audio/Visual | |
| Security | Standard campus security |
| Additional Notes | <ul style="list-style-type: none"> Users to verify final equipment in design possible future mini-digester at exterior adjacent to space |



PROGRAM SPECIFICS

Building System Narratives



Narratives:

| | |
|--------------------------------|-----|
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Applicable Codes and Standards

The building should be designed to meet all state and federally mandated codes, requirements, and regulations as well as any applicable standards as required by the University of Tennessee.

Code (IPMC), 2012 edition, published by the ICC;

The International Fire Code (IFC), 2012 edition, published by the ICC;

For commercial buildings: the International Energy Conservation Code (IECC), 2012 edition, published by the ICC, except that the provisions of the IECC, 2006 edition, shall apply to the following occupancy classifications:

- Moderate-hazard factory industrial, Group F1
- Low-hazard factory industrial, Group F-2
- Moderate-hazard storage, Group S-1
- And, Low-hazard storage, Group S-2

For state buildings, educational occupancies and any other occupancy requiring an inspection by the State Fire Marshal for initial licensure, NFPA 101 Life Safety Code, 2012 edition, published by the National Fire Protection Association (NFPA); and,

The National Electrical Code (NEC), 2017 edition, published by the NFPA, except that:

1. Section 110.24, Available Fault Current

- shall be optional; and
2. Arc Fault Circuit Interrupters (AFCIs) shall be optional for bathrooms, laundry areas, garages, unfinished basements, which are portions or areas of the basement not intended as habitable rooms and limited to storage, work or similar area, and for branch circuits dedicated to supplying refrigeration equipment;

No provision of the preceding cited publications shall be adopted that conflicts with:

1. The installation and service standards of portable fire extinguishers and fixed fire extinguisher systems in Tenn. Comp. R. & Regs. 0780-02-14-.02; and,
2. The standards for engaging in the liquefied petroleum gas business in Tenn. Comp. R. & Regs. 0780-02-17-.02.

Codes effective November 2019

The codes currently adopted by the Tennessee State Fire Marshal's Office are:

International Building Code (IBC), 2012 edition, published by the International Code Council (ICC), except for:

1. Chapter 11 Accessibility; and,
2. Chapter 34, Section 3411 Accessibility for Existing Buildings;

The International Fuel Gas Code (IFGC), 2012 edition, published by the ICC;

The International Mechanical Code (IMC), 2012 edition, published by the ICC;

The International Plumbing Code (IPC), 2012 edition, published by the ICC;

The International Property Maintenance

Design Assumptions

The new building will have a gross area of approximately 20,000 SF.

Occupancy: Business with Assembly and Classroom accessory occupancies

Fully sprinklered

Applicable Codes and Standards (Continued)

The University of Tennessee Design & Construction Guidelines

The building will not be held to the UTK Campus Design Standard. The design team should reference the material section in the Architectural narrative for reference.

The following standards, specifications, and guidelines are available on fs.utk.edu/guides/

The project must abide by:

2020 Design Standards & Guidelines

2020 OIT Guidelines

2020 OIT Communications Specifications

Brand Guidelines

Campus Landscape Vision and Site Standards

Campus Master Plan

Electrical Specifications

Elevator Design Guidelines

Interior Signage Guidelines

No Sign Zones

Storm water Guidelines

Temporary Signage

UT BIM Execution Plan

State of Tennessee Guidelines & Initiatives

The TN High Performance Building Requirements (TN HPBr) (Issue Date of January 17, 2020)

TDEC Guidelines

Drive to 55 (reference Architectural Narrative)

Civil and Landscape

Site Design Considerations

Although the Blount site is located a distance from the Knoxville campus, the design of the hard-scape and landscape features shall draw inspiration from the Knoxville campus aesthetic to tie the site elements visually to the UT Knoxville brand. The design shall incorporate elements from the Campus Landscape Vision and Site Standards document that guides development on the Knoxville campus. Additional site and landscape considerations include:

Provide a clear, welcoming entrance to the building, especially where the public enters to access the retail space

Provide opportunities for outdoor classroom and event gathering spaces both during and after hours

Utilize site elements such as seat walls, fencing, and landscaping to provide a buffer or separation between the building site and the surrounding working farm

Outdoor Space

The outdoor space shall be a balance of paved surface with landscape and lawn areas sized to fulfill the building program requirements. This area is envisioned to be a multi-functional space that may serve as an informal gathering area for building users, an outdoor classroom space, or an event space. A portion of the outdoor space shall be covered to protect from the elements during use in inclement weather and to provide shade. Considerations should be given to provide event power and water to accommodate a variety of programming or event functions.

Horticulture

Landscape planting selections shall emphasize the use of native and adaptive plant species with low maintenance requirements in line with the University campus landscape design standards. Due to this project's proximity within the working farm there is a unique opportunity to broaden and strengthen the landscape fabric as follows:

Use evergreen plants to reinforce or strengthen desired viewsheds and screen undesirable views

Plant selections shall avoid plants that are toxic to livestock

Reinforce the dynamic and functional uses of landscapes to encourage infiltration/containment and clean storm water, recharge the ground water system, improve and diversify the landscape aesthetic qualities, provide habitats for beneficial insects, and increase uptake of rain water

Develop plantings which increase the diversity of wildlife habitat

Develop plantings which are aesthetically pleasing and approachable

Campus Design Standards

All landscape and hardscape site improvements shall be in accordance with the following:

University of Tennessee Knoxville Long

Range Master Plan

University of Tennessee Campus Landscape Vision and Site Standards – January 2018

University of Tennessee Stormwater Management Policies and MS4 Requirements

State of Tennessee High Performance Building Requirements v1.01

Civil and Landscape (Continued)

Overview

This project will involve the construction of the UTIA Protein Innovation Center. The proposed development includes the construction of a new classroom and processing facility. The development will be located on the existing UT Agricultural facility off of Alcoa Highway in Blount County. The project is located on the UT Farm Road on the east side of Singleton Station Road. The project will include site demolition, building construction, sidewalk additions, road improvements, parking, grading, drainage, paving, and utility extensions. All information related to existing infrastructure that is discussed in the Site & Utilities scope is derived from maps and data provided by local utility providers.

Site Demolition

Prior to any construction activities, the contractor shall contact utility providers to locate all utilities. Existing swine barns and manure pits

shall be removed along with other attached structures. All relocation shall be coordinated with UTIA. The existing gravel parking surface will also be removed. All existing building and paved surfaces shall be removed to subgrade. Other ancillary utilities such as power, site lighting, sewer or water services will also be removed. The Contractor will notify the owner if any material to be disposed of is found to contain hazardous or toxic substances. Rubbish and debris will be removed from the site daily to avoid accumulation at the project site. The contractor will need to coordinate with the utility owners prior to demolition of utilities. All demolished materials will be disposed of at an approved and appropriate facility.

Site Layout

The project will consist of the site preparation and construction of the new Protein Innovation Center that is approximately 20,000 SF. A new 24ft wide driveway (approximately 1,400 LF) will also be installed to serve as access to the new

facility. The site layout will consist of a new sidewalk and paving for a parking lot. The surface of the driveway and access area will consist of heavy-duty pavement (8-in base, 3-in binder, 2-in surface). The parking lot will be light duty pavement (6-in base, 2-in binder, 1.5-in surface). An 8-inch extruded curb shall be installed around the perimeter of the parking lot. The site will also have sidewalks to provide access from the building to the parking lot. There will also be concrete pavement in the loading dock on the east side of the building for truck access. The section will consist of 8-inches of concrete and 4-inches of base stone layer. The sidewalks will consist of 4-inches of concrete with a 4-inch thick base stone layer.

Grading

Prior to commencing grading activities, the site shall be cleared and grubbed of all surface materials. There shall not be boulders, stumps or other obstructions remaining on the site. This type of unsuitable material shall be removed to a depth of 2 feet below subgrade (or

in accordance with the geotechnical engineer's recommendations). Material that is not to be used during final construction is to be disposed of in a location approved by the Owner. Any topsoil on the site shall be stripped to full depth and stockpiled at an approved location. The grading for the site shall be necessary in order to set the building and aprons at the proper elevation. All areas to receive fill shall be proof rolled prior to placement. Any proof rolled area that exhibits weak or unsatisfactory material shall undercut and backfilled using a method approved by the geotechnical engineer (e.g. #57 or #67 stone). Fill material shall be placed in lifts not exceeding 8 inches. Areas beneath the building shall be compacted to 100% maximum dry density. Where required, topsoil shall be placed a minimum of 6 inches in depth. During construction the contractor will be required to maintain a free draining site, do not allow water to accumulate on the site.

Civil and Landscape (Continued)

Storm Water System

Storm drainage on the site shall consist of areas drains, swales, headwalls, and piping. There will be approximately 10 drainage structures installed in the parking lot and around the building. The pipe system that connects the drainage structures will be 15-inch HDPE or RCP pipe. Roof drainage from the building shall be connected together with downspout boots and 6-inch or 8-inch pvc pipe and connected to the storm structures. The building drainage will be combined with the storm system in the parking lot and carried to north where the natural drainage system goes. The drainage structures would be standard TDOT No. 12 area drain structures (fit appropriately for the pipes to be installed), precast catch basins, or small precast concrete landscape drains.

Erosion Control Measures

A Storm Water Pollution Prevention Plan (SWPPP) will be developed to provide direction and instruction for maintaining

appropriate erosion controls in accordance with the Tennessee Department of Environmental Quality. During construction, measures will be taken to prevent unnecessary erosion of the exposed soil and to prevent sediment from leaving the site. These measures will include properly built construction access drives, storm sewer inlet protection and perimeter silt fence. Erosion and sediment measures and other protective measures will be maintained by the contractor in effective operating condition. Temporary structural practices will be removed once the corresponding disturbed drainage area has been permanently stabilized unless they are designed to remain in place.

Utilities

The water supply for the building will come from the existing line that runs along the Singleton Station Road. A 6-inch tap and gate valve will be installed on the existing line to provide domestic and fire water service to the building. The 6-inch line will follow the proposed driveway up the building. A 2-inch domestic connection will

branch from the 6-inch near the building to serve as the domestic feed. The 2-inch domestic water line shall be copper or HDPE. The contractor shall be responsible for testing all new lines and connections. The sewer service from the building will connect to the existing force main line on Singleton Station following the alignment of the proposed driveway. The sewer system for the proposed building and facility will consist of a pump station and force main. The pump station will be a duplex 5hp system. The force main will be a 3-inch PVC or HDPE.

Preliminary Plumbing Counts

A preliminary plumbing count calculation based on the Program Summary is included below. The Room Data sheets and program include suggested restroom and plumbing counts based off of the following table. As the design adapts, the design team should make necessary adjustments reflective of local, state, and federal codes as well as end user requirements.

Campus Design Standards

All landscape and hardscape site improvements shall be in accordance with the following:

University of Tennessee Knoxville Long Range Master Plan

University of Tennessee Campus Landscape Vision and Site Standards – January 2018

University of Tennessee Stormwater Management Policies and MS4 Requirements

State of Tennessee High Performance Building Requirements v1.01

- Develop plantings which are pleasing and approachable.

Architectural

Siting and Context

The UTIA Blount Unit is located in Louisville, TN, east of Alcoa Hwy and north of Interstate 140 (Pellissippi Parkway) approximately 8 miles south of the UTIA main campus. The former swine research barns location within the Unit was determined to be the best of two options considered based on the minimal impact to the existing research/farm operations, and access from Alcoa Highway via Singleton Station Road. The Maryville Wastewater Treatment facility sits adjacent to the Blount Unit to the north, near the Little River and accessed by Wheeler Rd, which also runs through the Blount Unit to the north of the proposed development area. A new Amazon distribution center is located to the southwest, which has brought recent upgrades to S. Singleton Station Rd and utility infrastructure. Proposed TDOT interchange and improvements for Alcoa Hwy / Singleton Station access are in the planning stages and should improve vehicular access Singleton Station and the Blount Unit.

The primary barn structure within the proposed development area houses the current office and support spaces for the management of the Unit research and farm operations, and the remaining farm structures within the designated development area are derelict former swine barns. The structures are to be demolished to receive the new facility. UT Farm Road, an existing gravel road, provides primary access to the Blount Unit operations and residential structures within the Unit property. It is also used for movement of equipment and livestock to support farm & research operations. The existing Quonset hut structure on UT Farm Rd between Singleton Station Rd and the swine barn site houses the primary maintenance and repair facility for the Unit Operations and shall remain. Any road improvements made to UT Farm Rd will need to preserve this structure's function in supporting the Unit operations.

The development area for siting the new facility been established by existing pasture fence lines, farm operations service roads, and abandoned farm uses available for redevelopment. A new access road paralleling the fence line between pasture

Tract 11A and 11B has been identified for improving truck/vehicular access while allowing current farm operations to be maintained and minimally impacted long term. This route will also provide for a shorter and more direct connection for extending existing infrastructure and utilities along S. Singleton Station to the proposed site. Civil confirmation will be needed to address existing stormwater management that occurs in this area of the Blount Unit.

Building Site Design considerations should include management of various truck sizes, including 18-wheelers, maneuvering and delivery of livestock, facility parking, public parking, arrival sequences and pedestrian circulation. In addition, the future building design within the site and farm/research operations should be encouraged so that each function successfully, maintaining their distinct uses, while becoming an integrated UTIA East Tennessee AgResearch and Education Center.

Key Goals and Objectives

The Protein Innovation Center (PIC) will serve future generations of UTIA students through several key components. Above all, the Center will act as a training mechanism for future workforce development, providing support and resiliency for the State's growing meat industry. In addition, the facility will provide a means to study and research a wide range of agricultural topics. The location is critical in this regard and is intended to work symbiotically with the PIC programming.

Functionality

The programming for the PIC has been divided into three basic elements:

1. The Learning Program – This portion of the program captures all aspects of Research, Learning, General Academic, and other related support zones. Classroom, Lecture, Conference, Study, and Office space will occur here. Additionally, the Learning portion of the program is intended

Architectural (Continued)

to overlap with Processing, as these functions are inherently linked and crucial to the success of UTIA's initiatives. The option of viewing the Processing floor from classrooms has been discussed as a potential learning component to strengthen this link.

2. The Processing Program – This portion of the program is intended to replicate and function as a meat processing zone where cattle, pork, poultry, and various (other) animals will be processed. Spaces have been laid out in accordance with industry standards and have been compared against benchmarked examples at multiple institutions.

3. The Staging Program – While the Learning and Processing aspects of the program are of high importance, the Staging area is a key factor in the delivery and implementation of the animal processing sequence. The location and adjacencies of this zone must be properly linked to both the processing and cargo arrival procession on the site.

Security Considerations

The preferred PIC site is at the heart of UTIA pastureland. The program as designed would be centered on the Blount acreage, where existing barns are currently located. A new, dedicated road will serve the facility directly, in order to limit cross-traffic with existing farming vehicle routes. Basic security on and around the site, should be considered and this includes the evaluation of security gates / access, as well as building-centric options.

Design Considerations

Considerations discussed with UTIA

- Options to promote interaction between Learning and Processing
- Potential for public-facing retail, sourced from on-site processing
- Consideration of contemporary and simplified design expressions
- Indoor and outdoor gathering spaces for students, faculty, and staff
- Areas for collaboration and 'collision'

among PIC users

- Consideration of threshold conditions (material, sound, visual) between main programmed zones

Materials

As the building will sit close to Alcoa Highway, it is vital that the Protein Innovation Center material palette should take inspiration from utilitarian farm structures, massing and materials. Strategic areas of glass will be placed for classrooms and to elevate the building from strictly functional to a building for students, professors, staff and the public. As well as a front lawn area to host any small scale events.

Structural

The UTIA Protein Innovation Center Programming includes building Scheme 01, Scheme 02, and Scheme 03 with massing studies. The building includes processing areas for cattle/hog chilling, cattle/hog slaughter, poultry slaughter, poultry chilling, carcass/primal breakdown, lab space, and further processing/cooking. Railing systems with a secondary structure supported on a thickened slab-on-grade could be used in the processing areas.

The learning area includes a classroom, restrooms, locker rooms, retail, offices, conference room, and kitchenette. A covered porch/outdoor gathering area and an on-grade loading dock are planned for the facility.

Structural Systems

The buildings in each scheme could be constructed using a modified pre-engineered metal building (PEMB) structure. The second floor in Scheme 01 and Scheme 02 could be constructed using a concrete slab-on-metal deck supported by the steel framing. Horizontal Z-girts spanning between the PEMB frames could

be used to backup metal cladding and support roofing materials.

The PEMB steel moment frames could be used to support the lateral loads parallel to the frames and rod x-bracing could be used to support lateral loads perpendicular to the frames. Concrete grade beams could be used to connect the frame columns for support of thrust forces.

An 8" thick concrete slab-on-grade reinforced with epoxy coated reinforcing steel on compacted gravel and vapor barrier could be used in the processing area to support forklift traffic and heavy equipment. A flooring system such as UCRETE could be used to provide resistance to aggressive chemicals, heavy impact, and traction slip. Xypex waterproofing admixture could be added to the concrete to provide waterproofing and increase durability. An increased amount of epoxy coated reinforcing steel could be placed in the slab to eliminate sawn and pour joints.

A 4" thick concrete slab-on-grade on compacted gravel and vapor barrier could be used in the learning areas.

Geotechnical Report

A geotechnical engineer will be required to perform a subsurface investigation of the proposed site and provide foundation recommendations along with site preparation requirements. However, spread footings could be used to support the columns and a turned down slab could be used to support perimeter walls. The subgrade characteristics listed with the geotechnical report along with the applied loading should be reviewed to confirm slab-on-grade requirements.

Mechanical

The University of Tennessee Institute of Agriculture (UTIA) Protein Innovation Center. This narrative is for the non-processing areas only, refer to separate narrative for Mechanical/HVAC requirements for processing area.

The intent of the Mechanical system is to provide a low energy and sustainable HVAC system to provide owner with lowest life cycle costs.

System Options

Provide a life-cycle cost analysis in schematic design to provide the owner with a minimum 3, low energy sustainable HVAC systems. Possible system options include but not limited to

Geothermal Heat Pumps

Variable Refrigerant Flow Heat Pumps

High SEER packaged units (20 SEER or greater)

Look at possible system that could

integrate with processing refrigeration equipment. Look at options for domestic water or heating heat recovery.

Campus Utilities

Building is not adjacent to any campus utilities all systems should be stand alone.

Controls

Provide DDC controls for all HVAC systems per UT standards. Integrate all HVAC systems into main campus front end system.

Special Building Considerations

Keep all non-processing areas positively pressurized with outside air to all processing facilities.

Consideration shall be given to temperature

differences between processing and non-processing facilities. Due to colder temperatures in processing areas, there is a risk for condensation on surfaces and windows between processing and non-processing facilities. Controls to prevent condensation shall include but not limited to insulated walls and glass, directed air movement, and HVAC system dehumidification. There will be viewing window between classroom and processing areas of particular concern for condensation.

Provide UL listed kitchen hood for all cooking equipment to meet codes. Provide conditioned makeup air for all cooking areas.

Sustainability

Provide a sustainable HVAC system with the following features:

Individual zone control where feasible.

Low Energy to meet or exceed ASHRAE 90.1 - 2010

CO2 monitoring for high occupancy zones.

Evaluate operable windows as part of the design. Integrate operable windows into the HVAC system with window sensors and integration into the automation system.

Low noise to meet or exceed UT standards.

Meter all HVAC energy usage for tracking at energy management system.

Standards

Ventilation to meet or exceed ASHRAE Standard 62

HVAC systems designed to meet ASHRAE standard 55 for thermal comfort

All ductwork shall be constructed per SMACNA Standards

All systems shall meet UT Campus Standards

Electrical

Narrative Overview

The University of Tennessee Institute of Agriculture (UTIA) Protein Innovation Center. This narrative encompasses the electrical scope of work for the entire facility.

Standards

All systems shall meet UT Campus Standards

All work that is part of this project will be installed in compliance with all applicable locally enforced codes and amendments. This includes, but is not limited to:

National Electrical Code (NFPA-70) – 2017 edition

Life Safety Code - NFPA 101 – 2015 edition

International Building Code – 2018 edition

International Fire Code -2018 edition

International Energy Conservation Code –

2018 edition

Other applicable NFPA codes

ADA requirements

State of Tennessee High Performance Building Requirements

Contractor shall comply with applicable requirements of recognized industry associations which promulgate standards for the various trades.

All materials and equipment used in carrying out these specifications shall have U.L. listing, or listing by other recognized testing laboratory when such listings are available. Construction materials shall meet Factory Mutual guidelines.

Building Electrical Service

Electrical service to the facility shall originate from an Alcoa Electric overhead line on South Singleton Station across farm along path designated for utilities toward new building location to a pad-mounted

transformer. From the secondary of the pad-mount transformer the contractor shall provide 4 sets each 4#350MCM, 3-1/2”C and one 3-1/2”C spare to a new panelboard MDP. MDP shall be 1200A, 480/277V, 3-phase, 4-wire panelboard with main breaker. Additional panels shall be provided for lighting and power serving mechanical and processing loads. Dry type transformers shall be provided to feed 120/208V panelboards to serve receptacle and plug loads.

Panelboards shall be specified for sequence phase connection to evenly balance electrical loads on each phase. Bus bars shall be copper. Loads up to 400 amperes shall utilize panelboards. Circuit breakers to be molded case, bolt-on type. Panelboards shall have 20 percent spare capacity and 20 percent spare breakers. A detailed short-circuit analysis shall be prepared during the design phase, and all overcurrent devices shall be coordinated so that downstream devices will trip to clear any fault.

An emergency standby engine generator system shall be provided to power life safety loads and any other equipment

desired to have emergency power like refrigeration equipment or research equipment. The system shall be completely automatic for unattended operation for the duration of any loss of normal utility power. System shall be capable of reaching operating range within 10 seconds of initial start signal. Unit shall be sized appropriately for loads determined during the design. For programming the anticipated size of the unit shall be a continuous standby 300 KW/KVA capacity. Unit to meet the requirements of NFPA 110. Unit shall be equipped for outdoor installation. Unit to be equipped with a sound attenuated housing. Starting batteries to be heavy-duty lead acid type with an automatic battery charger. A double wall diesel belly tank shall be provided with 72 hours of run capacity. The system shall be provided with a generator control panel and a remote annunciator (remote annunciator to be housed in the building). Transfer switch(es) shall be provided. Switch to be double throw actuated by a single operator. Interlocked molded case circuit breakers, contractors or transfer devices with dual solenoid operators are not acceptable. Provide an automatic exerciser to operate the unit for a period of

Electrical (Continued)

30 minutes every 168 hours. Additionally, a portable generator connection point shall be provided to allow for a portable generator to be brought to the site in the event it is needed and connected to the electrical distribution system to comply with NEC requirements.

Lighting Systems and Controls

Lighting systems for the facility shall be LED type and shall be specified to serve the associated function of the space. Lighting levels shall be designed to meet Illuminating Engineering Society of North America (IESNA) Lighting Handbook requirements. Lighting types shall be dimmable and controlled by occupancy sensors and daylight sensors where applicable. Provide general use duplex outlets where required. Provide outlets to best serve equipment in Processing and any kitchen served via GFI protected breakers. Locate general use receptacles around all walls of classrooms and offices to provide flexibility and best serve furniture. Provide general use receptacles every 50' in corridors. Provide weather proof/GFI

receptacles outside of the building at each door. Additional outlets shall be located to best serve equipment and user needed locations.

Provide starters as shown on mechanical drawings and scheduled on electrical drawings. Division 23 to furnish and install line- and low-voltage control wiring including conduit, conductors, and terminations for same. Starters used on 480V systems shall have individual 480/120V control transformer with two cartridge fuses in the primary and one in the secondary. Starters used inside to have NEMA-1 enclosures, starters used in damp locations or exposed to weather to have NEMA-3R enclosures.

Conductors and cables utilized for interior building installation shall be copper. Temperature rating of conductors shall be 90 degrees C. Insulation shall be THHN, THHW, or XHHW, 600 volt rated, 90 degrees C. Branch circuit wiring for all dimming systems will be required, one neutral per circuit, no common neutrals allowed.

Wiring Devices and Distribution

General purpose convenience receptacles shall be NEMA 5-20R, 20-amp 125-volt duplex, specification grade. Duplex convenience receptacles will be provided throughout all areas of the facility. Additional general use duplex outlets will be provided where required to serve specific equipment. Wiring device cover plates shall be nylon with color as selected by the interior designer. Refer to programming sheets for detailed information.

Exterior GFCI receptacles with weather proof while in use covers will be required to support the outdoor activities and maintenance. All receptacles at bathrooms, janitors' closets, and those located within 6' of a water source shall be GFI type. All exterior receptacles shall be GFI type and provided with "in-use" covers.

Connections to owner furnished equipment, A/V equipment, HVAC equipment, plumbing equipment will be provided as described in the architectural, mechanical, and plumbing narratives. Disconnects will be provided for all hard-wired equipment, unless

provided by equipment manufacturer. All disconnects located inside shall have NEMA-1 enclosures and those located exposed to the weather shall have NEMA-3R enclosures.

All wiring devices and lighting circuits shall be routed in EMT conduit from panel to final device.

All line and low-voltage control wiring for mechanical equipment shall be furnished, installed, and terminated by division 23.

Provide electrical connections to processing equipment per manufacturer recommendations. Provide electrical connection to walk-in coolers and refrigerators.

Telecomm service for the facility shall route overhead from South Singleton Station Road along the determined utility path to the new facility underground from a pole near the new facility to the Main Distribution Frame (MDF). Additional Intermediate Distribution Frames (IDFs) shall be located based on building layout to best serve all new telecom drops within distance requirements. Provide data outlets to

Electrical (Continued)

best serve new facility. Provide wireless coverage for entire facility. All cabling shall be UT cabling standards.

Low Voltage Systems

Provide rough-in (backboxes and conduit) for low voltage device locations. Conduit shall be routed concealed in wall and 90 degree out above ceiling or within structure area where there are no ceilings. Provide plastic bushing at the end of the conduit. Provide J-hooks every 5' to route the cabling in a neat manner.

Provide 1 data backbox and conduit, and 1 phone data backbox and conduit for each desk/workstation.

Provide 1 data backbox and conduit for each monitor/TV location.

Provide wireless internet coverage throughout the facility. Gigabit wireless access points shall be concealed where possible with accessible ceiling or access panels.

Grounding Systems

Raceways used in building interiors shall be rigid metal. The minimum conduit size shall be 3/4".

The entire system of raceways and equipment shall be grounded in accordance with Article 250 of the NEC. Separate green grounding conductors shall be installed in all feeder and branch circuits in accordance with Table 250-95 of the NEC.

Fire Alarm System

Provide a new fire alarm system to serve entire facility. System shall be wired, connected and left in first class operating condition. Include sufficient control panels, annunciators, manual stations, automatic fire detectors, smoke detectors, alarm indicating appliances, wiring, terminations, electrical boxes, conduit and all other necessary material for a complete operating system. All occupied spaces shall have

a visible alarm indicating appliance. New visual devices shall be synchronized to strobe at the same time. Provide duct smoke detectors in supply and return ducts of all air-handling units.

System Options

Provide all labor, materials, tools, and services for a complete installation of equipment and systems specified herein. Principal features of work included are:

Primary electrical infrastructure including concrete encased ductbank and transformer pad

Panelboards

Power wiring and secondary distribution

Emergency power generation system and automatic transfer switches

Interior lighting fixtures and control equipment

Exterior lighting fixtures and control equipment

Convenience outlets

Electrical control and interlock wiring as required by Mechanical drawings, specifications, or manufacturer's schematics

Heating, ventilating and air-conditioning equipment power

Plumbing equipment power

Ground bars

Fire alarm system

Processing equipment

Walk-in Coolers/Freezers

Sustainability

As part of the project the designer shall consider providing a solar panels on the roof of the facility and integrated into the electrical distribution system.

Plumbing and Fire Protection

Provide a complete plumbing system meeting all applicable codes and meeting the project sustainability criteria

Sanitary, Waste, and Vent Systems

Provide a complete sanitary waste and vent system utilizing Schedule 40 cast iron pipe and fittings. Floor- or wall-mounted cleanouts will be provided every 80 feet within the building. All new waste and vent piping shall connect to existing sanitary system outside the building.

Provide trap primers or trap guards on all floor drains and cleanouts per plumbing code.

Stormwater Systems

The building will be provided with an internal drainage system. The internal system shall utilize Schedule 40 cast iron pipe and fittings. PVC is acceptable underground. The roof will be provided with cast iron roof drains to collect rainwater from the roof. The roof drains will be collected into stormwater systems throughout the building and piped to the exterior.

Emergency overflow will be provided by a scupper system. Cleanouts will be provided every 50 feet on underground systems and at the base of all rainwater risers. All rainwater leaders and roof drain bodies to be insulated.

Domestic Cold Water Systems

The facility will be provided with a potable and non-potable domestic cold water system utilizing Type "L" copper pipe and fittings. Potable domestic cold water will be distributed throughout the new building to service plumbing fixtures and equipment. Shutoff valves will be provided to isolate fixtures and equipment. Backflow preventers will be provided at all mechanical equipment connections. Shock absorbers will be provided at all flush valve fixtures.

Provide separate backflow preventer(s) for all water sources serving processing facilities in the building to prevent any cross contamination.

Domestic Hot Water Systems

Evaluate the feasibility of different domestic hot water systems. Utilize systems with high energy efficiency to help achieve net zero energy target. Possible systems include

Heat pump hot water systems (possibly integrated into a geothermal system or VRF)

Solar Water Heating

Evaluate possible domestic hot water heat recovery from food processing area refrigeration equipment.

Natural Gas Systems

Coordinate with civil engineer to extend natural gas to the site for cooking, domestic water heating and or HVAC heating.

Special Building Considerations

Provide backflow preventer on all hot and cold water lines serving processing areas.

Provide grease trap for all cooking facilities.

Sustainability

Provide sustainable building features including but not limited to

All plumbing fixtures shall be low flow fixtures meeting "Water Sense" criteria

Pipe storm drainage to cistern on site for rain water reuse.

Evaluate the use of Greywater systems for toilet flushing or on-site irrigation usage.

Provide metering of irrigation and building water usage and meter all rainwater reuse

Fire Protection Systems

Building shall be fully sprinklered. Provide sprinkler system meeting NFPA 13 and all local codes. Provide 6x6 sprinkler riser room with outside access. Provide new 6" sprinkler line from site to feed building sprinkler system.

Processing

Overview

The facility is a teaching and extension facility that will be involved in the slaughter and preparation of land animal proteins. This will be primarily beef, pork and poultry, but may include rabbit, sheep and other farm animals.

System Operations

Cattle and swine will be processed in the same area at separate times. Animals would be received from trucks or trailers and kept in a covered pen with side curtain walls. Animals are conducted to a restraining pen inside the building and rendered unconscious. Processes of bleeding, skinning and evisceration would occur from an overhead rail system for cattle. Swine would be scalded and dehaired prior to evisceration. Offal, hides and any condemned material would be stored in a separate area and shipped elsewhere for processing or disposal.

Hot carcasses would be moved by rail into a “hot room” for air chilling. Once at temperature (40F or lower) they would be moved to a storage cooler for aging. Aged product would be moved by rail to a primary breakdown area into primal cuts.

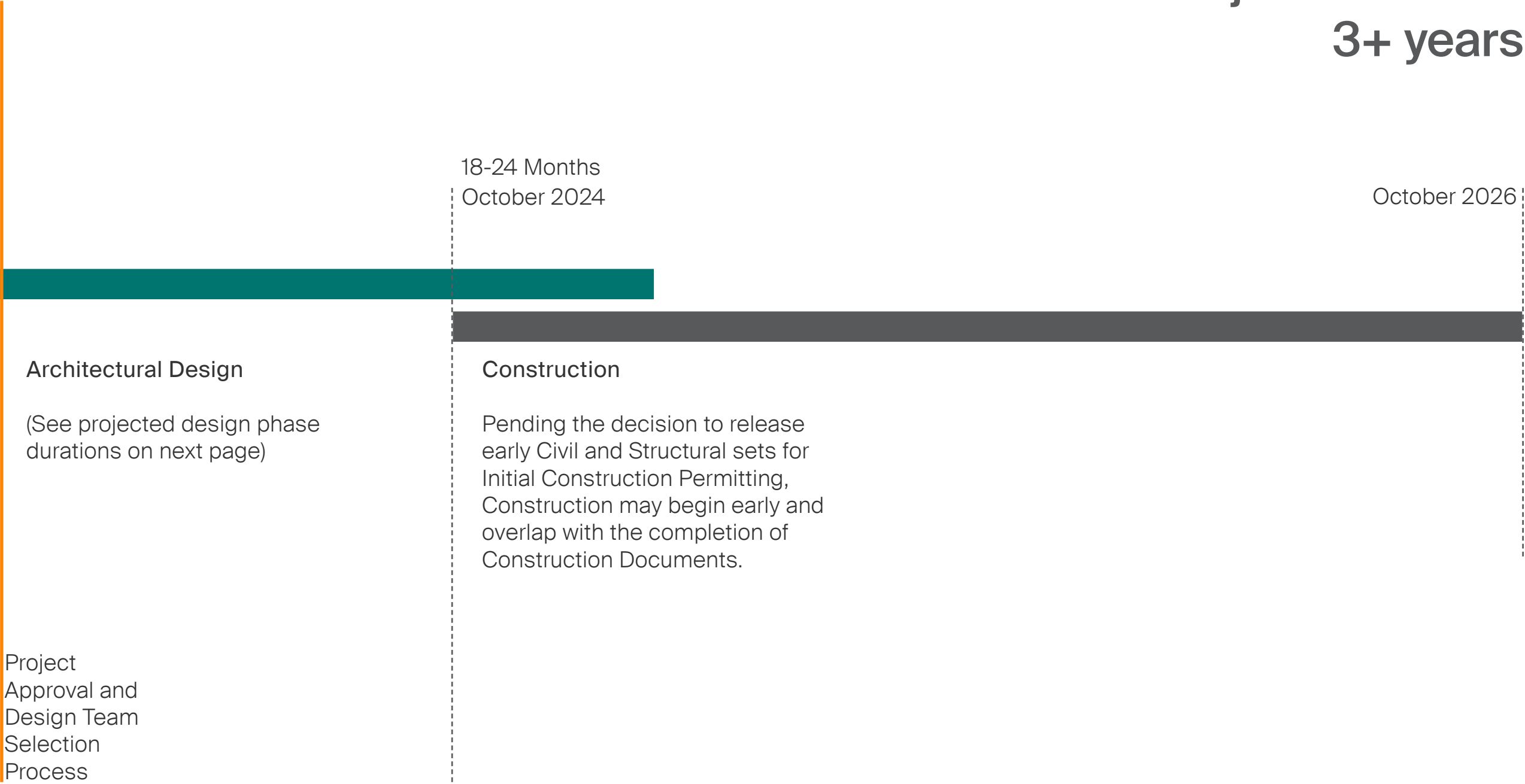
Further breakdown and processing would be conducted as needed. This would include retail cuts, trimming and any grinding operations. A freezer in this area would be used to store the trim or any product that would be sent out frozen. Cooking operations (smoking or any kill step) would separate the ready to eat areas (lunch meats, etc) and the raw meat areas.

Poultry processes would receive crated birds and they would be processed manually in cones and batch scalded and picked in batch equipment. Evisceration would be manual on stationary shackles. Chilling would be in a ice water bath or cold room. Further processing would be in the same areas as beef and pork but not on the same day.



CONSIDERATIONS + COST
Project Timeline

Total Project Duration: 3+ years



Architectural Design

(See projected design phase durations on next page)

Construction

Pending the decision to release early Civil and Structural sets for Initial Construction Permitting, Construction may begin early and overlap with the completion of Construction Documents.

Project Approval and Design Team Selection Process



Grant Funding Update
Amendment 01

Summary of Interior and Exterior Program Requirements

The program summary represents the required spaces to be incorporated into the Protein Innovation Center. The space considerations are based on feedback from the stakeholder group about the desired functionality of the new building.

The program is divided into three categories: Learning, Processing, and Staging.

UTIA Protein Innovation Center Program
University of Tennessee, Institute of Agriculture

Space Summary | Building and Site

| Space | Previous Area (SF) | Revised Area (SF) | Comments | Area Reduction (SF) | UTIA Commentary | Design Team Commentary |
|----------------------------------|--------------------|-------------------|---|---------------------|--|---|
| Learning | | | | | | |
| Lobby Reception | | | | | | |
| Classroom / Conference Room | 1500 | 940 | Options to be tiered or subdivided | 560 | | Ability to subdivide to two classrooms, do not recommend tiering at this size |
| Research Lab (clean) | 400 | 300 | Adjacent to Processing | 100 | | |
| Research Lab (dirty) | 400 | 300 | Adjacent to Processing | 100 | | |
| Conference | 500 | 400 | | 100 | additional chairs for overage as needed / shared with faculty kitchenette/break/copy room | |
| Office 01 | 120 | 90 | | 30 | Brandon, unit manager | |
| Office 02 | 120 | 90 | | 30 | Jacob, asst unit manager | |
| Office 03 | 120 | 90 | | 30 | PIC manager | |
| Office 04 | 120 | 90 | | 30 | Faculty / PI | |
| Office 05 | 120 | 0 | | 120 | | |
| Workroom / Kitchenette | 700 | 140 | | 560 | 10x14 (one corner/side will include copy machine and cabinetry for office supply storage) | Add alternate for future kitchenette build out |
| Women's Locker Rooms | 700 | 400 | Showers | 300 | sparse. Commodes, showers, lockers, bench | |
| Men's Locker Rooms | 700 | 400 | Showers | 300 | sparse. Commodes, showers, lockers, bench | |
| Multi-User Restrooms | 500 | 0 | | 500 | | |
| Family/Gender Neutral Restroom | 100 | 200 | | -100 | (2 separate rooms) one must be ADA compliant | |
| Inspector Office | 120 | 0 | | 120 | | Included as USDA FSIS office in processing |
| Inspector Bathroom | 100 | 50 | Shower provided | 50 | private but small (32"x32" shower, 18" vanity & sink, commode, storage cabinet "locker") | |
| Copy Room / Classroom storage | 200 | 0 | | 200 | remove, add to kitchenette | |
| Mech / Elec | 300 | 200 | MEP to confirm | 100 | Support Classroom | |
| AV Closet | 50 | 0 | Support Classroom | 50 | include cabinet in classroom | |
| Janitorial | 100 | 40 | | 60 | 8x5 or smaller closet instead of room | Assumed this supports education space |
| Kitchenette for Students | 400 | 0 | | 400 | | |
| Lobby Space | 500 | 200 | | 300 | possibly conversion to retail sale space - outdoor bell needed | Previously "Retail Space" |
| Storage Space | 200 | 100 | | 100 | possible conversion to retail space for refrigeration | Previously "Retail Storage" |
| Net Building Subtotal | 8070 | 4030 | | 4040 | | |
| 30% Circulation + Infrastructure | | | * 30% grossing factor includes all circulation, stairs, elevators, lobby, and assembly and partition area | | | |
| Contingency | 3228 | 1209 | | 2019 | Reduced from 40% to 30% | Assumed one story |
| Total Learning | 11298 | 5239 | Assumed \$400 / SF | | | |
| Level 02 Shell Space | | 5239 | | | | Add alternate for shelling out level 02 |

| Processing | | | | |
|------------|--|--------------|--------------|--|
| | Cattle + Hog Slaughter | 2300 | 2000 | 300 offal cooler 10x12 or 10x16, needs external connection, truck will pick-up and should not be around any finished or food products (internal and external cooler doors) <i>future possible mini-digester (exterior of building, future thoughts only)</i> |
| | Offal Cooling Room | | 200 | -200 |
| | Cattle + Hog Chilling | 1200 | 1000 | 200 |
| | Poultry Slaughter | 750 | 675 | 75 |
| | Poultry Chilling | 400 | 360 | 40 |
| | Further processing + cooking | 1600 | 1440 | 160 |
| | Carcass + Primal Breakdown | 800 | 720 | 80 |
| | Regulatory USDA FSIS office | 250 | 250 | inspector processing space, why is this included? Required by 0 USDA? Seems large SF for purpose |
| | Net Building Subtotal | 7300 | 6645 | 655 |
| | 30% Circulation + Infrastructure Contingency | 2920 | 1994 | * 30% grossing factor includes all circulation and assembly and partition area 927 Reduced from 40% to 30% |
| | Total Processing | 10220 | 8639 | Assumed \$400 / SF |
| Staging | | | | |
| | Truck Docks / Unloading (Clean) | | | Depressed and at grade (Confirm) |
| | Truck Docks / Loading | | | Depressed and at grade (Confirm) |
| | Holding Pens | 2000 | 1000 | 1000 |
| | Net Building Subtotal | 2000 | 1000 | |
| | 25% Circulation + Infrastructure Contingency | 800 | 250 | 550 Reduced from 40% to 25% |
| | Total Staging | 2800 | 1250 | 1550 |
| | TOTAL BUILDING GSF | 24318 | 15128 | 9191 38% |
| Site | | | | |
| | Parking | 60 cars | | |
| | New road | | | |
| | Porch / Outdoor Classroom | 20 | 1000 | Landscape Architect to confirm |

| LEVEL 2 ELEMENTAL SUMMARY | Element | \$ | % | Learning | Processing | Staging | Site | | | |
|---------------------------------|---------------|-------------------|-------------|---------------|------------------|---------------|------------------|---------------|----------------|------------------|
| GROSS FLOOR AREA | \$/sf | 15,258 sf | | \$/sf | 5,369 | \$/sf | 8,639 | \$/sf | 1,250 | \$/sf |
| A1 SUBSTRUCTURE | 23.91 | 364,775 | 3% | 16.84 | 90,426 | 29.23 | 252,500 | 17.48 | 21,850 | 0 |
| A2 STRUCTURE | 57.99 | 884,860 | 7% | 51.95 | 278,922 | 64.14 | 554,063 | 41.50 | 51,875 | 0 |
| A3 ENCLOSURE | 143.28 | 2,186,131 | 16% | 105.22 | 564,933 | 183.24 | 1,583,010 | 30.55 | 38,188 | 0 |
| B1 PARTITIONS & DOORS | 41.18 | 628,360 | 5% | 30.76 | 165,130 | 49.19 | 424,995 | 30.59 | 38,235 | 0 |
| B2 FINISHES | 35.76 | 545,620 | 4% | 50.19 | 269,446 | 29.92 | 258,486 | 14.15 | 17,688 | 0 |
| B3 FITTINGS & EQUIPMENT | 43.39 | 662,080 | 5% | 11.52 | 61,850 | 65.36 | 564,665 | 28.45 | 35,565 | 0 |
| C1 MECHANICAL | 142.65 | 2,176,582 | 16% | 152.82 | 820,480 | 156.11 | 1,348,602 | 6.00 | 7,500 | 0 |
| C2 ELECTRICAL | 61.96 | 945,381 | 7% | 70.53 | 378,692 | 63.54 | 548,901 | 14.23 | 17,788 | 0 |
| D1 SITE WORK | 115.71 | 1,765,487 | 13% | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 1,765,487 |
| DIRECT CONSTRUCTION COST | 665.83 | 10,159,276 | 76% | 489.83 | 2,629,880 | 640.72 | 5,535,221 | 182.95 | 228,688 | 1,765,487 |
| Z1 GENERAL REQUIREMENTS | 86.56 | 1,320,706 | 10% | 63.68 | 341,884 | 83.29 | 719,579 | 23.78 | 29,729 | 229,513 |
| Z2 CONTINGENCIES | 119.85 | 1,828,670 | 14% | 88.17 | 473,378 | 115.33 | 996,340 | 32.93 | 41,164 | 317,788 |
| Z3 OTHER COSTS | 0.00 | 0 | 0% | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0 |
| TOTAL CONSTRUCTION COST | 872.24 | 13,308,651 | 100% | 641.67 | 3,445,142 | 839.35 | 7,251,140 | 239.66 | 299,581 | 2,312,788 |

| LEVEL 3 ELEMENTAL SUMMARY | \$/sf | Element \$ | % | Learning \$/sf | 5,369 | Processing \$/sf | 8,639 | Staging \$/sf | 1,250 | Site \$/sf | 0 |
|----------------------------|-------|------------|---|-------------------|---------|---------------------|-----------|------------------|--------|---------------|---|
| GROSS FLOOR AREA | | | | | | | | | | | |
| A1 SUBSTRUCTURE | | | | | | | | | | | |
| A11 Foundations | 15.16 | 231,375 | | 8.20 | 44,026 | 20.50 | 177,100 | 8.20 | 10,250 | | 0 |
| A12 Building Excavation | 8.74 | 133,400 | | 8.64 | 46,400 | 8.73 | 75,400 | 9.28 | 11,600 | | 0 |
| A2 STRUCTURE | | | | | | | | | | | |
| A21 Lowest Floor Structure | 20.39 | 311,131 | | 19.90 | 106,843 | 21.51 | 185,788 | 14.80 | 18,500 | | 0 |
| A22 Upper Floor Structure | 6.11 | 93,153 | | 6.65 | 35,704 | 6.65 | 57,449 | 0.00 | 0 | | 0 |
| A23 Roof Structure | 31.50 | 480,576 | | 25.40 | 136,376 | 35.98 | 310,826 | 26.70 | 33,375 | | 0 |
| A3 ENCLOSURE | | | | | | | | | | | |
| A32 Walls Above Grade | 77.98 | 1,189,820 | | 22.34 | 119,920 | 123.85 | 1,069,900 | 0.00 | 0 | | 0 |
| A33 Windows & Entrances | 16.23 | 247,570 | | 24.40 | 130,990 | 13.49 | 116,580 | 0.00 | 0 | | 0 |
| A34 Roof Covering | 39.24 | 598,741 | | 30.55 | 164,023 | 45.90 | 396,530 | 30.55 | 38,188 | | 0 |
| A35 Projections | 9.83 | 150,000 | | 27.94 | 150,000 | 0.00 | 0 | 0.00 | 0 | | 0 |
| B1 PARTITIONS & DOORS | | | | | | | | | | | |
| B11 Partitions | 33.61 | 512,885 | | 22.75 | 122,150 | 41.50 | 358,500 | 25.79 | 32,235 | | 0 |
| B12 Doors | 7.57 | 115,475 | | 8.01 | 42,980 | 7.70 | 66,495 | 4.80 | 6,000 | | 0 |
| B2 FINISHES | | | | | | | | | | | |
| B21 Floor Finishes | 13.96 | 213,065 | | 19.45 | 104,414 | 10.89 | 94,088 | 11.65 | 14,563 | | 0 |
| B22 Ceiling Finishes | 5.23 | 79,755 | | 10.25 | 55,032 | 2.50 | 21,598 | 2.50 | 3,125 | | 0 |
| B23 Wall Finishes | 16.57 | 252,800 | | 20.49 | 110,000 | 16.53 | 142,800 | 0.00 | 0 | | 0 |
| B3 FITTINGS & EQUIPMENT | | | | | | | | | | | |
| B31 Fittings | 13.38 | 204,225 | | 11.52 | 61,850 | 15.32 | 132,375 | 8.00 | 10,000 | | 0 |
| B32 Equipment | 30.01 | 457,855 | | 0.00 | 0 | 50.04 | 432,290 | 20.45 | 25,565 | | 0 |
| C1 MECHANICAL | | | | | | | | | | | |
| C11 Plumbing & Drainage | 37.32 | 569,466 | | 55.67 | 298,909 | 30.88 | 266,807 | 3.00 | 3,750 | | 0 |
| C12 Fire Protection | 5.43 | 82,895 | | 5.65 | 30,335 | 5.65 | 48,810 | 3.00 | 3,750 | | 0 |
| C13 HVAC | 90.72 | 1,384,140 | | 81.49 | 437,546 | 109.57 | 946,595 | 0.00 | 0 | | 0 |
| C14 Controls | 9.18 | 140,080 | | 10.00 | 53,690 | 10.00 | 86,390 | 0.00 | 0 | | 0 |

| LEVEL 3 ELEMENTAL SUMMARY | \$/sf | Element \$ | % | Learning | Processing | Staging | Site | | | | |
|----------------------------------|---------------|-------------------|----------|-----------------|-------------------|----------------|------------------|---------------|----------------|--------------|------------------|
| GROSS FLOOR AREA | | | | \$/sf | 5,369 | \$/sf | 8,639 | \$/sf | 1,250 | \$/sf | 0 |
| C2 ELECTRICAL | | | | | | | | | | | |
| C21 Service & Distribution | 34.26 | 522,675 | | 36.32 | 195,019 | 37.93 | 327,656 | 0.00 | 0 | | 0 |
| C22 Lighting & Devices | 19.33 | 294,932 | | 25.35 | 136,104 | 16.75 | 144,703 | 11.30 | 14,125 | | 0 |
| C23 Systems | 8.37 | 127,773 | | 8.86 | 47,569 | 8.86 | 76,542 | 2.93 | 3,663 | | 0 |
| D1 SITE WORK | | | | | | | | | | | |
| D11 Site Development | 42.94 | 655,142 | | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | | 655,142 |
| D12 Mechanical Site Services | 28.13 | 429,175 | | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | | 429,175 |
| D13 Electrical Site Services | 44.64 | 681,170 | | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | | 681,170 |
| DIRECT CONSTRUCTION COST | | | | 489.83 | 2,629,880 | 640.72 | 5,535,221 | 182.95 | 228,688 | | 1,765,487 |
| Z1 GENERAL REQUIREMENTS | | | | | | | | | | | |
| Z11 General Requirements | 66.58 | 1,015,928 | 10.0% | 48.98 | 262,988 | 64.07 | 553,522 | 18.30 | 22,869 | | 176,549 |
| Z12 Fee | 19.97 | 304,778 | 3.0% | 14.69 | 78,896 | 19.22 | 166,057 | 5.49 | 6,861 | | 52,965 |
| Z2 CONTINGENCIES | | | | | | | | | | | |
| Z21 Design Contingency | 66.58 | 1,015,928 | 10.0% | 48.98 | 262,988 | 64.07 | 553,522 | 18.30 | 22,869 | | 176,549 |
| Z22 Escalation Contingency | 33.29 | 507,964 | 5.0% | 24.49 | 131,494 | 32.04 | 276,761 | 9.15 | 11,434 | | 88,274 |
| Z23 Construction Contingency | 19.97 | 304,778 | 3.0% | 14.69 | 78,896 | 19.22 | 166,057 | 5.49 | 6,861 | | 52,965 |
| Z3 OTHER COSTS | | | | | | | | | | | |
| Z31 Other Costs | 0.00 | 0 | 0.0% | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | | 0 |
| TOTAL CONSTRUCTION COST | 872.24 | 13,308,651 | | 641.67 | 3,445,142 | 839.35 | 7,251,140 | 239.66 | 299,581 | | 2,312,788 |

ELEMENTAL ESTIMATE

| Description | Quantity | Learning Quantity | Processing Quantity | Staging Quantity | Site Quantity |
|-------------------------------|------------------|----------------------|------------------------|---------------------|------------------|
| GROSS FLOOR AREA | | | | | |
| Level 1 | 15,258 sf | 5,369 | 8,639 | 1,250 | |
| TOTAL GROSS FLOOR AREA | 15,258 sf | 5,369 | 8,639 | 1,250 | 0 |

REPORT NOTES

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|--------------------------------------|-------|------------------|--------------|----------------|-------------|---------------|--------------|----------------|-------------|---------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| A1 SUBSTRUCTURE | | | | | | | | | | | | |
| A11 Foundations | | | | | | | | | | | | |
| Foundations | | | | | | | | | | | | |
| concrete footings to light load | + | 6,619 sf | 8.20 | 54,276 | 5,369 | 44,026 | 0 | 1,250 | 10,250 | 0 | 0 | 0 |
| concrete footings to heavy load | + | 8,639 sf | 20.50 | 177,100 | | 0 | 8,639 | 177,100 | | 0 | 0 | 0 |
| Subtotal Foundations | | 15,258 sf | 15.16 | 231,375 | 5,369 | 44,026 | 8,639 | 177,100 | 1,250 | 10,250 | 0 | 0 |
| Total A11 Foundations | | 15,258 sf | 15.16 | 231,375 | 8.20 | 44,026 | 20.50 | 177,100 | 8.20 | 10,250 | #Num! | 0 |
| A12 Building Excavation | | | | | | | | | | | | |
| Earthwork | | | | | | | | | | | | |
| excavate 4' | + | 2,300 cy | 15.00 | 34,500 | 800 | 12,000 | 1,300 | 19,500 | 200 | 3,000 | 0 | 0 |
| backfill granular | | 2,300 cy | 35.50 | 81,650 | 800 | 28,400 | 1,300 | 46,150 | 200 | 7,100 | 0 | 0 |
| haul away | | 2,300 cy | 7.50 | 17,250 | 800 | 6,000 | 1,300 | 9,750 | 200 | 1,500 | 0 | 0 |
| Subtotal Earthwork | | 2,300 cy | 58.00 | 133,400 | 800 | 46,400 | 1,300 | 75,400 | 200 | 11,600 | 0 | 0 |
| Total A12 Building Excavation | | 15,258 sf | 8.74 | 133,400 | 8.64 | 46,400 | 8.73 | 75,400 | 9.28 | 11,600 | #Num! | 0 |
| TOTAL A1 SUBSTRUCTURE | | | | 364,775 | | 90,426 | | 252,500 | | 21,850 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|---|-------|------------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|---------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| A2 STRUCTURE | | | | | | | | | | | | |
| A21 Lowest Floor Structure | | | | | | | | | | | | |
| On Grade | | | | | | | | | | | | |
| slab on grade 6", 3 psf avg | + | 15,258 sf | 14.80 | 225,818 | 5,369 | 79,461 | 8,639 | 127,857 | 1,250 | 18,500 | | 0 |
| slab extra at freezers | | 1,360 sf | 10.20 | 13,872 | | 0 | 1,360 | 13,872 | | 0 | | 0 |
| pits, pads, details | | 14,008 sf | 5.10 | 71,441 | 5,369 | 27,382 | 8,639 | 44,059 | | 0 | | 0 |
| Subtotal On Grade | | 15,258 sf | 20.39 | 311,131 | 5,369 | 106,843 | 8,639 | 185,788 | 1,250 | 18,500 | 0 | 0 |
| Total A21 Lowest Floor Structure | | 15,258 sf | 20.39 | 311,131 | 19.90 | 106,843 | 21.51 | 185,788 | 14.80 | 18,500 | #Num! | 0 |
| A22 Upper Floor Structure | | | | | | | | | | | | |
| Stairs, Miscellaneous | | | | | | | | | | | | |
| misc metals | | 14,008 sf | 5.10 | 71,441 | 5,369 | 27,382 | 8,639 | 44,059 | | 0 | | 0 |
| sealing, firestopping | + | 14,008 sf | 1.55 | 21,712 | 5,369 | 8,322 | 8,639 | 13,390 | | 0 | | 0 |
| Subtotal Stairs, Miscellaneous | | 14,008 sf | 6.65 | 93,153 | 5,369 | 35,704 | 8,639 | 57,449 | 0 | 0 | 0 | 0 |
| Total A22 Upper Floor Structure | | 15,258 sf | 6.11 | 93,153 | 6.65 | 35,704 | 6.65 | 57,449 | 0.00 | 0 | #Num! | 0 |
| A23 Roof Structure | | | | | | | | | | | | |
| Roof Structure | | | | | | | | | | | | |
| metal roof deck 1.5" | + | 15,528 sf | 4.50 | 69,876 | 5,639 | 25,376 | 8,639 | 38,876 | 1,250 | 5,625 | | 0 |
| steel columns, beams, joists 7psf | | 56 tns | 5,550.00 | 310,800 | 20 | 111,000 | 31 | 172,050 | 5 | 27,750 | | 0 |
| steel extra at rail system 4 psf | | 18 tns | 5,550.00 | 99,900 | | 0 | 18 | 99,900 | | 0 | | 0 |
| rail system see equipment | | ls | 0.00 | 0 | | 0 | | 0 | | 0 | | 0 |
| Subtotal Roof Structure | | 15,528 sf | 30.95 | 480,576 | 5,639 | 136,376 | 8,639 | 310,826 | 1,250 | 33,375 | 0 | 0 |
| Total A23 Roof Structure | | 15,258 sf | 31.50 | 480,576 | 25.40 | 136,376 | 35.98 | 310,826 | 26.70 | 33,375 | #Num! | 0 |
| TOTAL A2 STRUCTURE | | | | 884,860 | | 278,922 | | 554,063 | | 51,875 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|--|-------|------------------|--------------|------------------|--------------|----------------|---------------|------------------|-------------|----------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| A3 ENCLOSURE | | | | | | | | | | | | |
| A32 Walls Above Grade | | | | | | | | | | | | |
| Cladding | | | | | | | | | | | | |
| metal insulated panel, 50% to learning | + | 14,275 sf | 58.80 | 839,370 | 1,275 | 74,970 | 13,000 | 764,400 | | | 0 | 0 |
| Subtotal Cladding | | 14,275 sf | 58.80 | 839,370 | 1,275 | 74,970 | 13,000 | 764,400 | 0 | 0 | 0 | 0 |
| Backup | | | | | | | | | | | | |
| metal stud | + | 14,275 sf | 10.00 | 142,750 | 1,275 | 12,750 | 13,000 | 130,000 | | | 0 | 0 |
| steel girts, details 2 psf | | 15 tns | 11,000.00 | 165,000 | 2 | 22,000 | 13 | 143,000 | | | 0 | 0 |
| sealing, misc | | 14,275 sf | 2.50 | 35,688 | 1,275 | 3,188 | 13,000 | 32,500 | | | 0 | 0 |
| gyp, stud/furring to learning | | 1,275 sf | 5.50 | 7,013 | 1,275 | 7,013 | | 0 | | | 0 | 0 |
| Subtotal Backup | | 14,275 sf | 24.55 | 350,450 | 1,275 | 44,950 | 13,000 | 305,500 | 0 | 0 | 0 | 0 |
| Total A32 Walls Above Grade | | 15,258 sf | 77.98 | 1,189,820 | 22.34 | 119,920 | 123.85 | 1,069,900 | 0.00 | 0 | #Num! | 0 |
| A33 Windows & Entrances | | | | | | | | | | | | |
| Windows | | | | | | | | | | | | |
| windows 50% to learning | + | 1,275 sf | 70.00 | 89,250 | 1,275 | 89,250 | | 0 | | | 0 | 0 |
| Subtotal Windows | | 1,275 sf | 70.00 | 89,250 | 1,275 | 89,250 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entrances | | | | | | | | | | | | |
| glazed | * | 4 no | 5,320.00 | 21,280 | 4 | 21,280 | | 0 | | | 0 | 0 |
| hollow metal | * | 4 no | 3,580.00 | 14,320 | | 0 | 4 | 14,320 | | | 0 | 0 |
| auto openers | | 4 no | 5,115.00 | 20,460 | 4 | 20,460 | | 0 | | | 0 | 0 |
| overhead doors | * | 4 no | 25,565.00 | 102,260 | | 0 | 4 | 102,260 | | | 0 | 0 |
| Subtotal Entrances | | 12 no | 13,193.33 | 158,320 | 4 | 41,740 | 8 | 116,580 | 0 | 0 | 0 | 0 |
| Total A33 Windows & Entrances | | 15,258 sf | 16.23 | 247,570 | 24.40 | 130,990 | 13.49 | 116,580 | 0.00 | 0 | #Num! | 0 |
| A34 Roof Covering | | | | | | | | | | | | |
| Roofing | | | | | | | | | | | | |
| metal standing seam | + | 8,639 sf | 40.90 | 353,335 | | 0 | 8,639 | 353,335 | | | 0 | 0 |
| metal corrugated panel | + | 1,250 sf | 25.55 | 31,938 | | 0 | | 0 | 1,250 | 31,938 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|--|-------|------------------|--------------|------------------|----------------|----------------|------------------|----------------|---------------|---------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| membrane | + | 5,369 sf | 25.55 | 137,178 | 5,369 | 137,178 | 0 | 0 | 0 | 0 | 0 | 0 |
| flashing, accessories | | 15,258 sf | 5.00 | 76,290 | 5,369 | 26,845 | 8,639 | 43,195 | 1,250 | 6,250 | | 0 |
| Subtotal Roofing | | 15,258 sf | 39.24 | 598,741 | 5,369 | 164,023 | 8,639 | 396,530 | 1,250 | 38,188 | 0 | 0 |
| Total A34 Roof Covering | | 15,258 sf | 39.24 | 598,741 | 30.55 | 164,023 | 45.90 | 396,530 | 30.55 | 38,188 | #Num! | 0 |
| A35 Projections | | | | | | | | | | | | |
| Projections - Area Based | | | | | | | | | | | | |
| canopies, soffits, screens | + | 150 sf | 1,000.00 | 150,000 | 150 | 150,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subtotal Projections - Area Based | | 150 sf | 1,000.00 | 150,000 | 150 | 150,000 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total A35 Projections | | 15,258 sf | 9.83 | 150,000 | 27.94 | 150,000 | 0.00 | 0 | 0.00 | 0 | #Num! | 0 |
| TOTAL A3 ENCLOSURE | | | | 2,186,131 | 564,933 | | 1,583,010 | | 38,188 | | 0 | |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|---|-------|------------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|---------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| B1 PARTITIONS & DOORS | | | | | | | | | | | | |
| B11 Partitions | | | | | | | | | | | | |
| Partitions | | | | | | | | | | | | |
| block to staging | + | 1,050 sf | 30.70 | 32,235 | | 0 | | 0 | 1,050 | 32,235 | | 0 |
| gyp assemblies to learning | + | 6,500 sf | 17.50 | 113,750 | 6,500 | 113,750 | | 0 | | 0 | | 0 |
| gyp insulated assemblies to processing | + | 8,700 sf | 35.00 | 304,500 | | 0 | 8,700 | 304,500 | | 0 | | 0 |
| glazing thermally broken 3 no | | 120 sf | 70.00 | 8,400 | 120 | 8,400 | | 0 | | 0 | | 0 |
| overhead doors 3 no | | 300 sf | 180.00 | 54,000 | | 0 | 300 | 54,000 | | 0 | | 0 |
| Subtotal Partitions | | 16,250 sf | 31.56 | 512,885 | 6,500 | 122,150 | 8,700 | 358,500 | 1,050 | 32,235 | 0 | 0 |
| Total B11 Partitions | | 15,258 sf | 33.61 | 512,885 | 22.75 | 122,150 | 41.50 | 358,500 | 25.79 | 32,235 | #Num! | 0 |
| B12 Doors | | | | | | | | | | | | |
| Doors, Frames, Hardware | | | | | | | | | | | | |
| stile rail/veneer to learning | * | 14 no | 3,070.00 | 42,980 | 14 | 42,980 | | 0 | | 0 | | 0 |
| metal insulated to processing | * | 13 no | 5,115.00 | 66,495 | | 0 | 13 | 66,495 | | 0 | | 0 |
| gates | * | 4 no | 1,500.00 | 6,000 | | 0 | | 0 | 4 | 6,000 | | 0 |
| Subtotal Doors, Frames, Hardware | | 31 no | 3,725.00 | 115,475 | 14 | 42,980 | 13 | 66,495 | 4 | 6,000 | 0 | 0 |
| Total B12 Doors | | 15,258 sf | 7.57 | 115,475 | 8.01 | 42,980 | 7.70 | 66,495 | 4.80 | 6,000 | #Num! | 0 |
| TOTAL B1 PARTITIONS & DOORS | | | | 628,360 | | 165,130 | | 424,995 | | 38,235 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|---|-------|------------------|--------------|----------------|---------------|----------------|---------------|----------------|--------------|---------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| B2 FINISHES | | | | | | | | | | | | |
| B21 Floor Finishes | | | | | | | | | | | | |
| Flooring | | | | | | | | | | | | |
| vinyl tile/polished concrete/tile to learning | + | 5,369 sf | 15.35 | 82,414 | 5,369 | 82,414 | | | 0 | | 0 | 0 |
| paint/sealing to processing | + | 8,639 sf | 7.65 | 66,088 | | | 8,639 | 66,088 | | | 0 | 0 |
| paint/sealing to staging | + | 1,250 sf | 7.65 | 9,563 | | | | | 1,250 | 9,563 | | 0 |
| Subtotal Flooring | | 15,258 sf | 10.36 | 158,065 | 5,369 | 82,414 | 8,639 | 66,088 | 1,250 | 9,563 | 0 | 0 |
| Base | | | | | | | | | | | | |
| metal/tile/rubber | + | 2,750 lf | 20.00 | 55,000 | 1,100 | 22,000 | 1,400 | 28,000 | 250 | 5,000 | | 0 |
| Subtotal Base | | 2,750 lf | 20.00 | 55,000 | 1,100 | 22,000 | 1,400 | 28,000 | 250 | 5,000 | 0 | 0 |
| Total B21 Floor Finishes | | 15,258 sf | 13.96 | 213,065 | 19.45 | 104,414 | 10.89 | 94,088 | 11.65 | 14,563 | #Num! | 0 |
| B22 Ceiling Finishes | | | | | | | | | | | | |
| Ceilings | | | | | | | | | | | | |
| gyp/acoustic tile to learning | + | 5,369 sf | 10.25 | 55,032 | 5,369 | 55,032 | | | 0 | | 0 | 0 |
| paint/exposed to processing, staging | + | 9,889 sf | 2.50 | 24,723 | | | 8,639 | 21,598 | 1,250 | 3,125 | | 0 |
| Subtotal Ceilings | | 15,258 sf | 5.23 | 79,755 | 5,369 | 55,032 | 8,639 | 21,598 | 1,250 | 3,125 | 0 | 0 |
| Total B22 Ceiling Finishes | | 15,258 sf | 5.23 | 79,755 | 10.25 | 55,032 | 2.50 | 21,598 | 2.50 | 3,125 | #Num! | 0 |
| B23 Wall Finishes | | | | | | | | | | | | |
| Wall Finishes | | | | | | | | | | | | |
| tile/panels/paint to learning | + | sf | 10.00 | 110,000 | 11,000 | 110,000 | | | 0 | | 0 | 0 |
| paint/wall guard to processing | + | 28,000 sf | 5.10 | 142,800 | | | 28,000 | 142,800 | | | 0 | 0 |
| none to staging | + | 1,250 sf | 0.00 | 0 | | | | | 1,250 | 0 | | 0 |
| Subtotal Wall Finishes | | 29,250 sf | 8.64 | 252,800 | 11,000 | 110,000 | 28,000 | 142,800 | 1,250 | 0 | 0 | 0 |
| Total B23 Wall Finishes | | 15,258 sf | 16.57 | 252,800 | 20.49 | 110,000 | 16.53 | 142,800 | 0.00 | 0 | #Num! | 0 |
| TOTAL B2 FINISHES | | | | 545,620 | | 269,446 | | 258,486 | | 17,688 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|---|-------|------------------|--------------|----------------|--------------|---------------|--------------|----------------|-------------|---------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| B3 FITTINGS & EQUIPMENT | | | | | | | | | | | | |
| B31 Fittings | | | | | | | | | | | | |
| Casework | | | | | | | | | | | | |
| cabinets, vanities, benches, etc | + | 50 lf | 537.00 | 26,850 | 50 | 26,850 | 0 | 0 | 0 | 0 | 0 | 0 |
| cabinets to processing | + | 25 lf | 715.00 | 17,875 | | 0 | 25 | 17,875 | 0 | 0 | 0 | 0 |
| Subtotal Casework | | 75 lf | 596.33 | 44,725 | 50 | 26,850 | 25 | 17,875 | 0 | 0 | 0 | 0 |
| Casework - Lab | | | | | | | | | | | | |
| lab casework | + | 100 lf | 820.00 | 82,000 | | 0 | 100 | 82,000 | 0 | 0 | 0 | 0 |
| Subtotal Casework - Lab | | 100 lf | 820.00 | 82,000 | 0 | 0 | 100 | 82,000 | 0 | 0 | 0 | 0 |
| Fittings - Misc | | | | | | | | | | | | |
| specialties, accessories, signage, misc | * | 31 no | 2,500.00 | 77,500 | 14 | 35,000 | 13 | 32,500 | 4 | 10,000 | | 0 |
| Subtotal Fittings - Misc | | 31 no | 2,500.00 | 77,500 | 14 | 35,000 | 13 | 32,500 | 4 | 10,000 | 0 | 0 |
| Total B31 Fittings | | 15,258 sf | 13.38 | 204,225 | 11.52 | 61,850 | 15.32 | 132,375 | 8.00 | 10,000 | #Num! | 0 |
| B32 Equipment | | | | | | | | | | | | |
| Equipment - Other | | | | | | | | | | | | |
| loading levelers, seals | | 1 no | 25,565.00 | 25,565 | | 0 | 0 | 0 | 1 | 25,565 | | 0 |
| a/v equipment by owner | | ls | 0.00 | 0 | | 0 | 0 | 0 | | 0 | | 0 |
| Subtotal Equipment - Other | | | | 25,565 | 0 | 0 | 0 | 0 | 0 | 25,565 | 0 | 0 |
| Equipment - Lab | | | | | | | | | | | | |
| lab area | + | 600 sf | | | | 0 | 600 | | | | | |
| fumehoods 2 per room | | 4 no | 15,340.00 | 61,360 | | 0 | 4 | 61,360 | | 0 | | 0 |
| other lab equipment by owner | | 600 sf | 0.00 | 0 | | 0 | 600 | 0 | | 0 | | 0 |
| Subtotal Equipment - Lab | | 600 sf | 102.27 | 61,360 | 0 | 0 | 600 | 61,360 | 0 | 0 | 0 | 0 |
| Equipment - Special | | | | | | | | | | | | |
| rail system steel | | 25,565 ls | 1.00 | 25,565 | | 0 | 25,565 | 25,565 | | 0 | | 0 |
| freezers/chilling rooms | | 1,360 sf | 205.00 | 278,800 | | 0 | 1,360 | 278,800 | | 0 | | 0 |
| cooling rooms | | 200 sf | 205.00 | 41,000 | | 0 | 200 | 41,000 | | 0 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|--|-------|-----------|-------|----------------|-------------|---------------|------------|----------------|----------|---------------|----------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| rail system | | 25,565 ls | 1.00 | 25,565 | | 0 | 25,565 | 25,565 | | 0 | | 0 |
| Subtotal Equipment - Special | | | | 370,930 | | 0 | 0 | 370,930 | | 0 | 0 | 0 |
| Total B32 Equipment | | 15,258 sf | 30.01 | 457,855 | 0.00 | 0 | 50.04 | 432,290 | 20.45 | 25,565 | #Num! | 0 |
| TOTAL B3 FITTINGS & EQUIPMENT | | | | 662,080 | | 61,850 | | 564,665 | | 35,565 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|--|-------|-----------|-----------|---------|----------|---------|------------|--------|----------|-------|----------|----|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| C1 MECHANICAL | | | | | | | | | | | | |
| C11 Plumbing & Drainage | | | | | | | | | | | | |
| Equipment | | | | | | | | | | | | |
| water service entrance, water meters, RPBBs, etc | | 31,000 ls | 1.00 | 31,000 | 31,000 | 31,000 | | 0 | | 0 | | 0 |
| water heater, gas | | 1 no | 46,000.00 | 46,000 | 1 | 46,000 | | 0 | | 0 | | 0 |
| recirculation pump | | 1 no | 3,970.00 | 3,970 | 1 | 3,970 | | 0 | | 0 | | 0 |
| hose down booster pump | | 1 no | 51,250.00 | 51,250 | 1 | 51,250 | | 0 | | 0 | | 0 |
| sewage ejector, storm ejector, grease traps, mixing valves, etc. | | 14,008 sf | 2.05 | 28,716 | 5,369 | 11,006 | 8,639 | 17,710 | | 0 | | 0 |
| testing, coordination, BIM | | 14,008 sf | 1.00 | 14,008 | 5,369 | 5,369 | 8,639 | 8,639 | | 0 | | 0 |
| allocate equipment to processing area | | ls | 1.00 | 0 | -62,938 | -62,938 | 62,938 | 62,938 | | 0 | | 0 |
| Subtotal Equipment | | | | 174,944 | 0 | 85,658 | 0 | 89,286 | 0 | 0 | 0 | 0 |
| Major Domestic Fixtures | | | | | | | | | | | | |
| major fixtures | + | 28 no | 2,135.00 | 59,780 | 11 | 23,485 | 17 | 36,295 | | 0 | | 0 |
| Subtotal Major Domestic Fixtures | | 28 no | 2,135.00 | 59,780 | 11 | 23,485 | 17 | 36,295 | 0 | 0 | 0 | 0 |
| Minor Domestic Fixtures | | | | | | | | | | | | |
| roof/overflow drains | + | 8 no | 975.00 | 7,800 | 3 | 2,925 | 5 | 4,875 | | 0 | | 0 |
| minor fixtures, learning space | | 5,369 sf | 1.00 | 5,369 | 5,369 | 5,369 | | 0 | | 0 | | 0 |
| minor fixtures, processing space : drains, hose bibs, hose stations, wall hydrants, etc. | | 8,639 sf | 3.10 | 26,781 | | 0 | 8,639 | 26,781 | | 0 | | 0 |
| minor fixtures, staging | | 1,250 sf | 0.50 | 625 | | 0 | | 0 | 1,250 | 625 | | 0 |
| Subtotal Minor Domestic Fixtures | | 8 no | 5,071.86 | 40,575 | 3 | 8,294 | 5 | 31,656 | 0 | 625 | 0 | 0 |
| Piping | | | | | | | | | | | | |
| piping, learning space | + | 5,369 sf | 33.80 | 181,472 | 5,369 | 181,472 | | 0 | | 0 | | 0 |
| piping, process space | + | 8,639 sf | 8.20 | 70,840 | | 0 | 8,639 | 70,840 | | 0 | | 0 |
| piping, staging | + | 1,250 sf | 2.50 | 3,125 | | 0 | | 0 | 1,250 | 3,125 | | 0 |
| Subtotal Piping | | 15,258 sf | 16.74 | 255,437 | 5,369 | 181,472 | 8,639 | 70,840 | 1,250 | 3,125 | 0 | 0 |
| Med/Lab Equipment | | | | | | | | | | | | |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|---|-------|------------------|--------------|----------------|--------------|----------------|---------------|----------------|-------------|--------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| lab equipment | | 600 sf | 25.60 | 15,360 | | 0 | 600 | 15,360 | | 0 | | 0 |
| Subtotal Med/Lab Equipment | | | | 15,360 | | 0 | 0 | 15,360 | | 0 | | 0 |
| Med/Lab Fixtures | | | | | | | | | | | | |
| lab sinks, fumehoods, incubators, miscellaneous connections | | 600 sf | 8.20 | 4,920 | | 0 | 600 | 4,920 | | 0 | | 0 |
| Subtotal Med/Lab Fixtures | | | | 4,920 | | 0 | 0 | 4,920 | | 0 | | 0 |
| Med/Lab Piping | | | | | | | | | | | | |
| lab piping | | 600 sf | 30.75 | 18,450 | | 0 | 600 | 18,450 | | 0 | | 0 |
| Subtotal Med/Lab Piping | | | | 18,450 | | 0 | 0 | 18,450 | | 0 | | 0 |
| Total C11 Plumbing & Drainage | | 15,258 sf | 37.32 | 569,466 | 55.67 | 298,909 | 30.88 | 266,807 | 3.00 | 3,750 | #Num! | 0 |
| C12 Fire Protection | | | | | | | | | | | | |
| Sprinklers | | | | | | | | | | | | |
| fire pump, assume not required | | no | 0.00 | 0 | | 0 | | 0 | | 0 | | 0 |
| sprinkler coverage, learning space | | 5,369 sf | 5.65 | 30,335 | 5,369 | 30,335 | | 0 | | 0 | | 0 |
| sprinkler coverage, process space | | 8,639 sf | 5.65 | 48,810 | | 0 | 8,639 | 48,810 | | 0 | | 0 |
| sprinkler coverage, staging | | 1,250 sf | 3.00 | 3,750 | | 0 | | 0 | 1,250 | 3,750 | | 0 |
| Subtotal Sprinklers | | | | 82,895 | | 0 | 30,335 | 0 | 48,810 | 0 | 3,750 | 0 |
| Total C12 Fire Protection | | 15,258 sf | 5.43 | 82,895 | 5.65 | 30,335 | 5.65 | 48,810 | 3.00 | 3,750 | #Num! | 0 |
| C13 HVAC | | | | | | | | | | | | |
| Air Handling Units | | | | | | | | | | | | |
| DOAS units | + | 5,500 cfm | 15.00 | 82,500 | 5,500 | 82,500 | | 0 | | 0 | | 0 |
| DOAS units | + | 17,500 cfm | 10.00 | 175,000 | | 0 | 17,500 | 175,000 | | 0 | | 0 |
| Subtotal Air Handling Units | | 23,000 cf | 11.20 | 257,500 | 5,500 | 82,500 | 17,500 | 175,000 | 0 | 0 | 0 | 0 |
| Fans | | | | | | | | | | | | |
| general supply/exhaust | | 14,008 sf | 1.00 | 14,008 | 5,369 | 5,369 | 8,639 | 8,639 | | 0 | | 0 |
| fume hood exhaust fan | | 1 no | 15,375.00 | 15,375 | | 0 | 1 | 15,375 | | 0 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|---|-------|------------|----------|---------|----------|---------|------------|---------|----------|----|----------|----|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| Subtotal Fans | | | | 29,383 | 0 | 5,369 | 0 | 24,014 | 0 | 0 | 0 | 0 |
| Heating Plant | | | | | | | | | | | | |
| VRF air-source outside unit heat pumps | | 62 tns | 1,600.00 | 99,200 | 24 | 38,400 | 38 | 60,800 | | 0 | | 0 |
| balance of plant | | 17,100 ls | 1.00 | 17,100 | 6,600 | 6,600 | 10,500 | 10,500 | | 0 | | 0 |
| Subtotal Heating Plant | | | | 116,300 | 0 | 45,000 | 0 | 71,300 | 0 | 0 | 0 | 0 |
| Air Distribution | | | | | | | | | | | | |
| ductwork, learning space | + | 4,660 lbs | 14.85 | 69,201 | 4,660 | 69,201 | | 0 | | 0 | | 0 |
| ductwork, process space | + | 17,300 lbs | 14.85 | 256,905 | | 0 | 17,300 | 256,905 | | 0 | | 0 |
| stainless steel ductwork | + | 225 lbs | 30.75 | 6,919 | | 0 | 225 | 6,919 | | 0 | | 0 |
| insulation | | 12,080 sf | 5.75 | 69,460 | 2,565 | 14,749 | 9,515 | 54,711 | | 0 | | 0 |
| air distribution | | 14,008 sf | 2.60 | 36,421 | 5,369 | 13,959 | 8,639 | 22,461 | | 0 | | 0 |
| Subtotal Air Distribution | | 22,185 lbs | 19.78 | 438,906 | 4,660 | 97,909 | 17,525 | 340,996 | 0 | 0 | 0 | 0 |
| Terminal Units | | | | | | | | | | | | |
| VRF indoor units, branch circuit controllers, misc terminal units | | 14,008 sf | 11.00 | 154,088 | 5,369 | 59,059 | 8,639 | 95,029 | | 0 | | 0 |
| underfloor heating for cooler room | | 15,375 ls | 1.00 | 15,375 | | 0 | 15,375 | 15,375 | | 0 | | 0 |
| Subtotal Terminal Units | | | | 169,463 | 0 | 59,059 | 0 | 110,404 | 0 | 0 | 0 | 0 |
| Piping | | | | | | | | | | | | |
| piping | | 14,008 sf | 20.50 | 287,164 | 5,369 | 110,065 | 8,639 | 177,100 | | 0 | | 0 |
| Subtotal Piping | | | | 287,164 | 0 | 110,065 | 0 | 177,100 | 0 | 0 | 0 | 0 |
| Miscellaneous | | | | | | | | | | | | |
| emergency generator accessories | | 300 kw | 140.00 | 42,000 | 300 | 42,000 | | 0 | | 0 | | 0 |
| allocate generator accessories cost | | ls | 1.00 | 0 | -21,000 | -21,000 | 21,000 | 21,000 | | 0 | | 0 |
| testing, balancing, BIM, coordination, as-builts & 3rd party assist commissioning | | 14,008 sf | 3.10 | 43,425 | 5,369 | 16,644 | 8,639 | 26,781 | | 0 | | 0 |
| Subtotal Miscellaneous | | | | 85,425 | 0 | 37,644 | 0 | 47,781 | 0 | 0 | 0 | 0 |



ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|----------------------------|-------|------------------|--------------|------------------|--------------|----------------|---------------|------------------|-------------|--------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| Total C13 HVAC | | 15,258 sf | 90.72 | 1,384,140 | 81.49 | 437,546 | 109.57 | 946,595 | 0.00 | 0 | #Num! | 0 |
| C14 Controls | | | | | | | | | | | | |
| Controls | | | | | | | | | | | | |
| controls | | 14,008 sf | 10.00 | 140,080 | 5,369 | 53,690 | 8,639 | 86,390 | | 0 | | 0 |
| Subtotal Controls | | | | 140,080 | 0 | 53,690 | 0 | 86,390 | 0 | 0 | 0 | 0 |
| Total C14 Controls | | 15,258 sf | 9.18 | 140,080 | 10.00 | 53,690 | 10.00 | 86,390 | 0.00 | 0 | #Num! | 0 |
| TOTAL C1 MECHANICAL | | | | 2,176,582 | | 820,480 | | 1,348,602 | | 7,500 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|--|-------|-----------|--------|---------|----------|---------|------------|---------|----------|--------|----------|----|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| C2 ELECTRICAL | | | | | | | | | | | | |
| C21 Service & Distribution | | | | | | | | | | | | |
| Normal Service & Distribution | | | | | | | | | | | | |
| distribution equipment & feeders | + | 1,770 A | 175.00 | 309,750 | 535 | 93,625 | 1,235 | 216,125 | | | 0 | 0 |
| solat panels, see alternates | | ls | 0.00 | 0 | | 0 | | 0 | | | 0 | 0 |
| Subtotal Normal Service & Distribution | | 1,770 A | 175.00 | 309,750 | 535 | 93,625 | 1,235 | 216,125 | 0 | 0 | 0 | 0 |
| Emergency Service & Distribution | | | | | | | | | | | | |
| emergency generator | + | 300 kw | 565.00 | 169,500 | 300 | 169,500 | | 0 | | | 0 | 0 |
| allocate generator cost | | ls | 1.00 | 0 | -84,750 | -84,750 | 84,750 | 84,750 | | | 0 | 0 |
| Subtotal Emergency Service & Distribution | | 300 kw | 565.00 | 169,500 | 300 | 84,750 | 0 | 84,750 | 0 | 0 | 0 | 0 |
| Motor Wiring & Control | | | | | | | | | | | | |
| motor wiring | | 14,008 sf | 3.10 | 43,425 | 5,369 | 16,644 | 8,639 | 26,781 | | | 0 | 0 |
| Subtotal Motor Wiring & Control | | | | 43,425 | 0 | 16,644 | 0 | 26,781 | 0 | 0 | 0 | 0 |
| Total C21 Service & Distribution | | 15,258 sf | 34.26 | 522,675 | 36.32 | 195,019 | 37.93 | 327,656 | 0.00 | 0 | #Num! | 0 |
| C22 Lighting & Devices | | | | | | | | | | | | |
| Lighting | | | | | | | | | | | | |
| lighting, learning space | + | 5,369 sf | 15.90 | 85,367 | 5,369 | 85,367 | | 0 | | | 0 | 0 |
| lighting, process space | + | 8,639 sf | 10.00 | 86,390 | | 0 | 8,639 | 86,390 | | | 0 | 0 |
| lighting, staging space | + | 1,250 sf | 8.00 | 10,000 | | 0 | | 0 | 1,250 | 10,000 | | 0 |
| lighting controls | | 15,258 sf | 1.25 | 19,073 | 5,369 | 6,711 | 8,639 | 10,799 | 1,250 | 1,563 | | 0 |
| Subtotal Lighting | | 15,258 sf | 13.16 | 200,830 | 5,369 | 92,078 | 8,639 | 97,189 | 1,250 | 11,563 | 0 | 0 |
| Devices | | | | | | | | | | | | |
| devices, learning space | + | 5,369 sf | 8.20 | 44,026 | 5,369 | 44,026 | | 0 | | | 0 | 0 |
| devices, process space | + | 8,639 sf | 5.50 | 47,515 | | 0 | 8,639 | 47,515 | | | 0 | 0 |
| devices, staging space | + | 1,250 sf | 2.05 | 2,563 | | 0 | | 0 | 1,250 | 2,563 | | 0 |
| Subtotal Devices | | 15,258 sf | 6.17 | 94,103 | 5,369 | 44,026 | 8,639 | 47,515 | 1,250 | 2,563 | 0 | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|---|-------|------------------|--------------|----------------|--------------|----------------|--------------|----------------|--------------|---------------|--------------|----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| Total C22 Lighting & Devices | | 15,258 sf | 19.33 | 294,932 | 25.35 | 136,104 | 16.75 | 144,703 | 11.30 | 14,125 | #Num! | 0 |
| C23 Systems | | | | | | | | | | | | |
| Fire Alarm | | | | | | | | | | | | |
| fire alarm system | + | 14,008 sf | 3.10 | 43,425 | 5,369 | 16,644 | 8,639 | 26,781 | | 0 | | 0 |
| Subtotal Fire Alarm | | 14,008 sf | 3.10 | 43,425 | 5,369 | 16,644 | 8,639 | 26,781 | 0 | 0 | 0 | 0 |
| Tel/Data | | | | | | | | | | | | |
| tel/data outlets, empty | + | 14,008 sf | 1.50 | 21,012 | 5,369 | 8,054 | 8,639 | 12,959 | | 0 | | 0 |
| Subtotal Tel/Data | | 14,008 sf | 1.50 | 21,012 | 5,369 | 8,054 | 8,639 | 12,959 | 0 | 0 | 0 | 0 |
| Security Systems | | | | | | | | | | | | |
| security, empty | + | 14,008 sf | 0.56 | 7,844 | 5,369 | 3,007 | 8,639 | 4,838 | | 0 | | 0 |
| Subtotal Security Systems | | 14,008 sf | 0.56 | 7,844 | 5,369 | 3,007 | 8,639 | 4,838 | 0 | 0 | 0 | 0 |
| Other Systems | | | | | | | | | | | | |
| AV, conduit only | | 14,008 sf | 0.77 | 10,786 | 5,369 | 4,134 | 8,639 | 6,652 | | 0 | | 0 |
| lightning protection | | 15,258 sf | 0.56 | 8,544 | 5,369 | 3,007 | 8,639 | 4,838 | 1,250 | 700 | | 0 |
| temp lighting & power | | 15,258 sf | 0.77 | 11,749 | 5,369 | 4,134 | 8,639 | 6,652 | 1,250 | 963 | | 0 |
| misc electrical, BIM coordination | + | 15,258 sf | 1.60 | 24,413 | 5,369 | 8,590 | 8,639 | 13,822 | 1,250 | 2,000 | | 0 |
| Subtotal Other Systems | | 15,258 sf | 3.64 | 55,492 | 5,369 | 19,865 | 8,639 | 31,964 | 1,250 | 3,663 | 0 | 0 |
| Total C23 Systems | | 15,258 sf | 8.37 | 127,773 | 8.86 | 47,569 | 8.86 | 76,542 | 2.93 | 3,663 | #Num! | 0 |
| TOTAL C2 ELECTRICAL | | | | 945,381 | | 378,692 | | 548,901 | | 17,788 | | 0 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | Processing | Staging | Site | \$ | |
|--|-------|------------------|--------------|----------------|-------------|------------|-------------|----------|-------------|------------------------|
| | | | | | Quantity | Quantity | Quantity | Quantity | | |
| D1 SITE WORK | | | | | | | | | | |
| D11 Site Development | | | | | | | | | | |
| Site Preparation | | | | | | | | | | |
| strip & prepare | + | 69,000 sf | 1.02 | 70,380 | 0 | 0 | 0 | 0 | 69,000 | 70,380 |
| strip & prepare minimal | | 95,000 | 0.20 | 19,000 | 0 | 0 | 0 | 0 | 95,000 | 19,000 |
| grading | | 53,742 sf | 1.50 | 80,613 | 0 | 0 | 0 | 0 | 53,742 | 80,613 |
| erosion control | | 69,000 sf | 0.26 | 17,940 | 0 | 0 | 0 | 0 | 69,000 | 17,940 |
| Subtotal Site Preparation | | 69,000 sf | 2.72 | 187,933 | 0 | 0 | 0 | 0 | 69,000 | 187,933 |
| Paving & Structure | | | | | | | | | | |
| asphalt road way 800 lf at 10' wide | + | 8,000 sf | 10.25 | 82,000 | 0 | 0 | 0 | 0 | 8,000 | 82,000 |
| asphalt parking 60 spots | + | 20,000 sf | 8.20 | 164,000 | 0 | 0 | 0 | 0 | 20,000 | 164,000 |
| road rework - allow | | 51,125 ls | 1.00 | 51,125 | 0 | 0 | 0 | 0 | 51,125 | 51,125 |
| Subtotal Paving & Structure | | 28,000 sf | 10.61 | 297,125 | 0 | 0 | 0 | 0 | 28,000 | 297,125 |
| Improvements | | | | | | | | | | |
| fencing by owner | | lf | 205.00 | 0 | 0 | 0 | 0 | 0 | | 0 |
| retaining, signage, misc | | 50,000 ls | 1.00 | 50,000 | 0 | 0 | 0 | 0 | 50,000 | 50,000 |
| Subtotal Improvements | | | | 50,000 | 0 | 0 | 0 | 0 | 0 | 50,000 |
| Planting | | | | | | | | | | |
| planting/sod/seed | + | 13,742 sf | 5.10 | 70,084 | 0 | 0 | 0 | 0 | 13,742 | 70,084 |
| detention pond allow 556 cy | | 50,000 ls | 1.00 | 50,000 | 0 | 0 | 0 | 0 | 50,000 | 50,000 |
| Subtotal Planting | | 13,742 sf | 8.74 | 120,084 | 0 | 0 | 0 | 0 | 13,742 | 120,084 |
| Total D11 Site Development | | 15,258 sf | 42.94 | 655,142 | 0.00 | 0 | 0.00 | 0 | 0.00 | #Div/0! 655,142 |
| D12 Mechanical Site Services | | | | | | | | | | |
| Building Services | | | | | | | | | | |
| water | + | 800 lf | 112.75 | 90,200 | 0 | 0 | 0 | 0 | 800 | 90,200 |
| water, connect to existing | | 1 no | 7,125.00 | 7,125 | 0 | 0 | 0 | 0 | 1 | 7,125 |
| sanitary | + | 800 lf | 87.00 | 69,600 | 0 | 0 | 0 | 0 | 800 | 69,600 |
| sanitary, connect to existing | | 1 no | 7,125.00 | 7,125 | 0 | 0 | 0 | 0 | 1 | 7,125 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | Processing | Staging | Site | \$ | |
|--|-------|------------|----------|------------------|----------|------------|----------|----------|------------------|---------|
| | | | | | Quantity | Quantity | Quantity | Quantity | | |
| gas service | + | 800 lf | 153.75 | 123,000 | 0 | 0 | 0 | 800 | 123,000 | |
| gas, connect to existing | | 1 no | 7,125.00 | 7,125 | 0 | 0 | 0 | 1 | 7,125 | |
| miscellaneous site strucutres | | 25,000 ls | 1.00 | 25,000 | 0 | 0 | 0 | 25,000 | 25,000 | |
| Subtotal Building Services | | 2,400 lf | 137.16 | 329,175 | 0 | 0 | 0 | 2,400 | 329,175 | |
| Site Drainage & Services | | | | | | | | | | |
| storm | | 100,000 ls | 1.00 | 100,000 | 0 | 0 | 0 | 100,000 | 100,000 | |
| Subtotal Site Drainage & Services | | | | 100,000 | 0 | 0 | 0 | 0 | 100,000 | |
| Total D12 Mechanical Site Services | | 15,258 sf | 28.13 | 429,175 | 0.00 | 0 | 0.00 | 0 | #Div/0! | 429,175 |
| D13 Electrical Site Services | | | | | | | | | | |
| Building Services | | | | | | | | | | |
| electrical ductbank, primary | + | 800 lf | 322.90 | 258,320 | 0 | 0 | 0 | 800 | 258,320 | |
| electrical, connect to existing | | 1 no | 7,125.00 | 7,125 | 0 | 0 | 0 | 1 | 7,125 | |
| telecom ductbank | + | 800 lf | 292.00 | 233,600 | 0 | 0 | 0 | 800 | 233,600 | |
| telecom, connect to existing | | 1 no | 7,125.00 | 7,125 | 0 | 0 | 0 | 1 | 7,125 | |
| miscellaneous site strucutres | | 25,000 ls | 1.00 | 25,000 | 0 | 0 | 0 | 25,000 | 25,000 | |
| Subtotal Building Services | | 1,600 lf | 331.98 | 531,170 | 0 | 0 | 0 | 1,600 | 531,170 | |
| Site Lighting & Services | | | | | | | | | | |
| site lighting | | 150,000 ls | 1.00 | 150,000 | 0 | 0 | 0 | 150,000 | 150,000 | |
| Subtotal Site Lighting & Services | | | | 150,000 | 0 | 0 | 0 | 0 | 150,000 | |
| Total D13 Electrical Site Services | | 15,258 sf | 44.64 | 681,170 | 0.00 | 0 | 0.00 | 0 | #Div/0! | 681,170 |
| TOTAL D1 SITE WORK | | | | 1,765,487 | 0 | 0 | 0 | | 1,765,487 | |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|---------------------------------------|-------|-----------|------|-------------------|----------|-----------|------------|-----------|----------|---------|----------|-----------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| DIRECT CONSTRUCTION COST | | | | 10,159,276 | | 2,629,880 | | 5,535,221 | | 228,688 | | 1,765,487 |
| Z1 GENERAL REQUIREMENTS | | | | | | | | | | | | |
| Z11 General Requirements | | | | | | | | | | | | |
| General Conditions | | | | | | | | | | | | |
| General Conditions | + | 10.0% Is | | 1,015,928 | 10.0% | 262,988 | 10.0% | 553,522 | 10.0% | 22,869 | 10.0% | 176,549 |
| Subtotal General Conditions | | 0 Is | | 1,015,928 | 0 | 262,988 | 0 | 553,522 | 0 | 22,869 | 0 | 176,549 |
| General Requirements | | | | | | | | | | | | |
| General Requirements | + | .0% Is | | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 |
| Subtotal General Requirements | | Is | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Insurance | | | | | | | | | | | | |
| Insurance | + | .0% Is | | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 |
| Subtotal Insurance | | Is | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Subcontractor Bonding | | | | | | | | | | | | |
| Subcontractor Bonding | + | .0% Is | | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 |
| Subtotal Subcontractor Bonding | | Is | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Building Permit | | | | | | | | | | | | |
| Building Permit | + | .0% Is | | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 |
| Subtotal Building Permit | | Is | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Z11 General Requirements | | 15,258 sf | | 1,015,928 | 48.98 | 262,988 | 64.07 | 553,522 | 18.30 | 22,869 | #Div/0! | 176,549 |
| Z12 Fee | | | | | | | | | | | | |
| Profit/Fee/Risk | | | | | | | | | | | | |
| Profit/Fee/Risk | + | 3.0% Is | | 304,778 | 3.0% | 78,896 | 3.0% | 166,057 | 3.0% | 6,861 | 3.0% | 52,965 |
| Subtotal Profit/Fee/Risk | | 0 Is | | 304,778 | 0 | 78,896 | 0 | 166,057 | 0 | 6,861 | 0 | 52,965 |
| Total Z12 Fee | | 15,258 sf | | 304,778 | 14.69 | 78,896 | 19.22 | 166,057 | 5.49 | 6,861 | #Div/0! | 52,965 |



23440 Version 05
Program

The UTIA Protein Innovation Center
Scheme 3

Estimate Date: 2023-03-14
Printed: 16:18 2023-08-02 E.19

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | Learning | | Processing | | Staging | | Site | | |
|-------------------------------|-------|----------|------|-----------|----|------------|----|----------|----|----------|----|---------|
| | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ | |
| TOTAL Z1 GENERAL REQUIREMENTS | | | | 1,320,706 | | 341,884 | | 719,579 | | 29,729 | | 229,513 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | | Processing | | Staging | | Site | |
|--|-------|----------|------|-----------|----------|---------|------------|---------|----------|--------|----------|---------|
| | | | | | Quantity | \$ | Quantity | \$ | Quantity | \$ | Quantity | \$ |
| Z2 CONTINGENCIES | | | | | | | | | | | | |
| Z21 Design Contingency | | | | | | | | | | | | |
| Design Stage Contingency | | | | | | | | | | | | |
| Design Stage Contingency | + | 10.0% | ls | 1,015,928 | 10.0% | 262,988 | 10.0% | 553,522 | 10.0% | 22,869 | 10.0% | 176,549 |
| Subtotal Design Stage Contingency | | 0 | ls | 1,015,928 | 0 | 262,988 | 0 | 553,522 | 0 | 22,869 | 0 | 176,549 |
| Total Z21 Design Contingency | | 15,258 | sf | 1,015,928 | 48.98 | 262,988 | 64.07 | 553,522 | 18.30 | 22,869 | #Div/0! | 176,549 |
| Z22 Escalation Contingency | | | | | | | | | | | | |
| Escalation Contingency - 2026 Q3 - not inc | | | | | | | | | | | | |
| Escalation Contingency - 2026 Q3 - not inc | + | .0% | ls | 0 | .0% | 0 | .0% | 0 | .0% | 0 | .0% | 0 |
| Subtotal Escalation Contingency - 2026 Q3 - not inc | | 0 | ls | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bidding Contingency | | | | | | | | | | | | |
| Bidding Contingency | + | 5.0% | ls | 507,964 | 5.0% | 131,494 | 5.0% | 276,761 | 5.0% | 11,434 | 5.0% | 88,274 |
| Subtotal Bidding Contingency | | 0 | ls | 507,964 | 0 | 131,494 | 0 | 276,761 | 0 | 11,434 | 0 | 88,274 |
| Total Z22 Escalation Contingency | | 15,258 | sf | 507,964 | 24.49 | 131,494 | 32.04 | 276,761 | 9.15 | 11,434 | #Div/0! | 88,274 |
| Z23 Construction Contingency | | | | | | | | | | | | |
| Construction Contingency | | | | | | | | | | | | |
| Construction Contingency | + | 3.0% | ls | 304,778 | 3.0% | 78,896 | 3.0% | 166,057 | 3.0% | 6,861 | 3.0% | 52,965 |
| Subtotal Construction Contingency | | 0 | ls | 304,778 | 0 | 78,896 | 0 | 166,057 | 0 | 6,861 | 0 | 52,965 |
| Total Z23 Construction Contingency | | 15,258 | sf | 304,778 | 14.69 | 78,896 | 19.22 | 166,057 | 5.49 | 6,861 | #Div/0! | 52,965 |
| TOTAL Z2 CONTINGENCIES | | | | 1,828,670 | | 473,378 | | 996,340 | | 41,164 | | 317,788 |

ELEMENTAL ESTIMATE

| Description | Trade | Quantity | Rate | \$ | Learning | Processing | Staging | Site |
|-----------------------------------|-------|----------|------|-------------------|------------------|------------------|----------------|------------------|
| | | | | | Quantity | \$ | Quantity | \$ |
| INDIRECT CONSTRUCTION COST | | | | 3,149,376 | 815,263 | 1,715,919 | 70,893 | 547,301 |
| TOTAL COSTS | | | | 13,308,651 | 3,445,142 | 7,251,140 | 299,581 | 2,312,788 |

