



# GANADO HIGH SCHOOL CAREER TECHNICAL EDUCATION FACILITY



# CREDITS

The information in this proposal is intended as guidance for Ganado High School in their design of a new Career Technical Education (CTE) facility. The research, design process, and recommendations were made based on the best knowledge and judgment of the students along with their studio coordinator and are subject to verification by the Ganado High School CTE committee or other parties prior to implementation of any action. All photos, renderings, drawings, charts, or other content were taken or generated by students, instructors or Ganado High School representatives unless otherwise noted.

## GANADO HIGH SCHOOL CTE COMMITTEE MEMBERS

Doris Nelson, Ganado HS CTE Director

Leander Thomas, CTE Agriculture Instructor

## RII NATIVE PEOPLES TECHNICAL ASSISTANCE OFFICE

Claudia Nelson, Director

## TRIBAL EXTENSION PROGRAMS UNIVERSITY OF ARIZONA

Trent Teegerstrom, Associate Director

## UNIVERSITY OF ARIZONA

Laura Carr, Studio Coordinator

Rudy Chon

Nurlan Herburger

Crystal McCloyn

Athena Myers

Nahal Entezam Nia

Zoe Sadorf

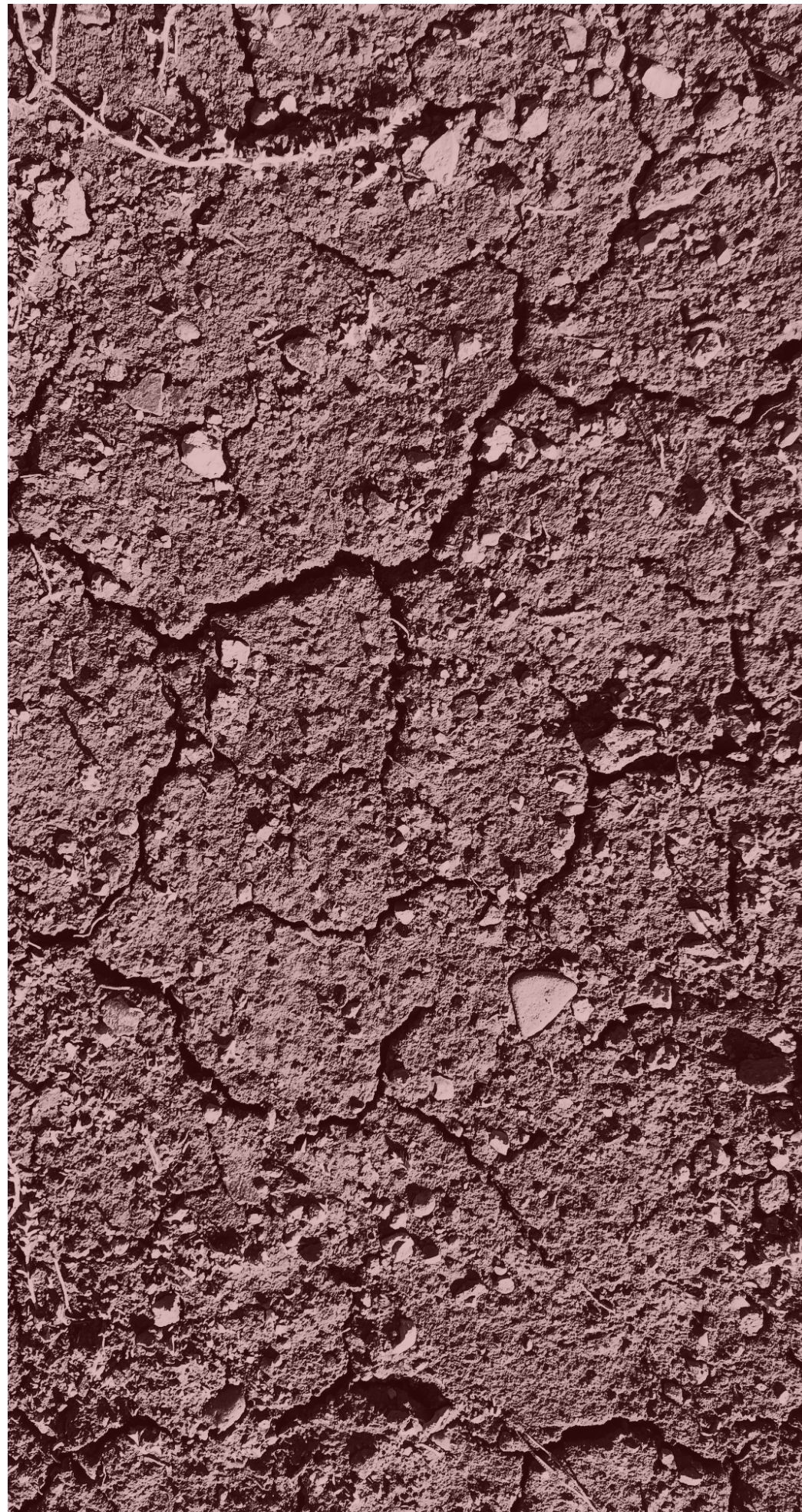
Pawel Sapiecha

Morgan Scott

## COVER IMAGES:

Ganado High School CTE + FFA Students | Provided by Leander Thomas

June 2020



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## STAKEHOLDERS



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**CLAUDIA NELSON**  
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Technical Assistance Office,  
University of Arizona



**TRENT TEEGERSTROM**  
Associate Director for Tribal Extension  
Programs, Acting Associate Director  
for Ag and Natural Resources and  
Ag Economics Extension Specialist,  
University of Arizona

## ARCHITECTURAL REVIEWERS

RICHARD BEGAY | AIA, Associate, SPS+  
ERIC DESCHEENIE | Chinle Resident  
DENNIS DOXTATER | Professor Emeritus SOA  
LAURA HOLLENGREEN | Associate Professor / Associate Director SOA  
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DAN MAHER | Lecturer, SOA  
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Architects, Professor of Practice, SOA  
MARIA SALENGER | AIA, Senior Associate, Jones Studio  
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BETSY GREENE, PHD | Extension Equine Specialist,  
University of Arizona  
CLYDE MCBRIDE | Agriculture teacher and CTE Director  
at Kayenta Unified School District  
ROB THOMPSON | Principal Mechanical Engineer, Smith  
Group

## ARC510E STUDIO

LAURA CARR | Lecturer, SOA, Studio Coordinator

### MASTER OF ARCHITECTURE STUDENTS:

Rudy Chon  
Nurlan Herburger  
Crystal McCloyn  
Athena Myers  
Nahal Entezam Nia  
Zoe Sadorf  
Pawel Sapiecha  
Morgan Scott

# STAKEHOLDERS | STATEMENTS

## GANADO HIGH SCHOOL CAREER TECHNICAL EDUCATION (CTE) PROGRAM

As an innovative public-private partnership between stakeholders, this new facility will be focused on helping area students develop academic proficiency, technical skills and industry certifications for the high wage and high demand careers in the veterinary, meat processing and animal husbandry professions as well as the “soft skills” needed to assure success in careers and/or college.

Agriculture and livestock have always been key to the health of Navajo society and economy. As drought and food safety become critical issues, it becomes essential for students to have opportunities to learn how to sustainably produce food and fiber for private use and for sale in the local community. Food biosecurity is critical and proper husbandry methods and food handling need to be taught in a state-of-the-art facility. The socio-economic conditions on the Navajo Nation are highlighted by limited employment opportunities; the current unemployment rate is 48.5 percent, and average household income is \$8,240, well below the federal poverty guidelines. These factors indicate a need for implementation of agricultural education programs, policies, regulations, and conservation programs to revitalize our rural economy for self-sufficiency. By exposing youth to hands-on career pathways, providing links to industry certifications and college credit and motivating students to stay in school and get their diploma before entering the workforce or going on to college, the Veterinary/livestock husbandry and Meat Processing programs strengthen our community which includes local Navajo Nation Chapters and reaches the University of Arizona with advisors and potential partnerships.

Additional CTE program areas are being identified by student interest, labor market analysis industry support, and state educational and economic priorities. Research indicates local industry and educational institutions have identified a critical unmet need for skilled workers to care for and raise food and fodder on the Navajo Nation. About 85% Ganado area students clearly need educational opportunities that inspire them to create a positive future for themselves and area industry needs a trained workforce. The closest facilities providing training of the proposed caliber are located some distance away in Kayenta, Arizona (MVHS AG Facility) and Crownpoint, New Mexico (Navajo Technical University). The proposed facility would provide an additional access point closer to the I-40 Corridor. A range of factors has inspired the Ganado stakeholders to dream BIG, inspired by the successes of the Kayenta Monument Valley High School Veterinary Science Facility and the New Navajo Technical College Veterinary Technician Program. Several consulting visits have been made by committee members to University of Arizona Veterinary School, Navajo Technical University, and Navajo Nation Veterinarians to ascertain the need for this project. The Ganado Unified School District Veterinary Technical Sciences Facility will allow our students to be self-sufficient in producing their own food and fiber for economic security.

Ganado High School CTE Committee Members  
Doris Nelson, Ganado High School CTE Director  
Leander Thomas, Ganado High School Agriculture Instructor



# STAKEHOLDERS | STATEMENTS

## UNIVERSITY OF ARIZONA CAPLA

### Architectural Education and the Community

The School of Architecture and the College of Architecture, Planning and Landscape Architecture at the University of Arizona have long been dedicated to engagement with the communities of the state of Arizona and the region of the Southwest. Not only is our community outreach important as a way to support local communities and to bring them design services to which they might otherwise not have access, it is also critical to the formation of our students. They learn to observe different peoples and ways of life in ways that build empathy and good citizenship while also honing their design skills in contexts that give them real purpose. In the end, we want our students to be both professionals and good neighbors—protectors of the land that we inhabit together and stewards of our other precious resources.

We were excited to learn that Laura Carr’s master’s level Advanced Design Studio in Spring 2020 would focus on Ganado High School and expansion of facilities for its Career Technical Education program. In the UA School of Architecture, we have long taken pride in the Native American students who have studied with us: names like Begay, Yazzie, Tsosie and Johns are well-known and respected. The beauty of this studio is that it introduced master’s students not only from Arizona—and in some cases not from the US—to the challenges and opportunities of work with Native American clients. That direct encounter is priceless. I witnessed the seriousness with which the students explained what they had learned about the land, climate, and culture of the Navajo Nation and the inventiveness and integrity with which they sought to solve the problems of the design brief. I think you will be intrigued by their work and inspired to ponder further possible interactions.

Laura Hollengreen

Associate Director, School of Architecture

Associate Dean for Academic Affairs,

College of Architecture, Planning and Landscape Architecture



THE UNIVERSITY OF ARIZONA

College of Architecture, Planning  
& Landscape Architecture

# STAKEHOLDERS | STATEMENTS

## NATIVE PEOPLES TECHNICAL ASSISTANCE OFFICE

The Native Peoples Technical Assistance Office is the key research and resource liaison to Arizona’s Indian Country on behalf of the Office of Research, Innovation & Impact and the Senior VP for Research. For almost 30 years, director Claudia Nelson has facilitated an array of projects and programs in partnerships with Native communities, calling upon the expertise of a diverse cadre of faculty, students and academic professionals.

The Ganado Career Technical Education Program Facilities Expansion Masterplan project represents a collaborative community-focused effort between the Ganado School District with Mr. Leander Thomas and Ms. Doris Nelson serving as project leaders and cultural advisors, and UArizona’s College of Architecture, Landscape Architecture & Planning (CAPLA) ARC510E Advance Design Studio led by Professor Laura Carr, and the College of Agriculture & Life Science (CALS) Tribal Cooperative Extension director Trent Teegerstrom. This design project provided an unparalleled opportunity for our students to gain direct field experience collaborating with the Ganado community, and we are grateful to the Ganado School District for entrusting us with this important assignment. This workbook is presented to the Ganado community with sincere appreciation for this collaboration.

Claudia Nelson  
Director of the RII Native Peoples  
Technical Assistance Office,  
University of Arizona



# STAKEHOLDERS | STATEMENTS

## TRIBAL EXTENSION PROGRAMS UNIVERSITY OF ARIZONA

The University of Arizona Tribal Extension Program is the conduit between 1862 land grant institutions and Tribes involving collaboration, leadership, and development of programs and mutual trust between all involved entities. Through the Federally Recognized Tribal Extension Program (FRTEP), we have had a direct presence on Navajo Nation with four agents who identify and strive to meet the dynamic needs of tribal communities by developing and implementing culturally- appropriate, science-based programs that improve the lives of individuals, families, and communities throughout Native American land. As the UArizona Associate Director of Tribal Extension Programs and Extension Specialist, Trent Teegerstrom has worked with a variety of agricultural enterprises across the northeast, mountain west and southwest. Over the past 30+ years, he has provided extension services to tribal communities across the Nation assisting with agricultural production and economic development issues.

The Ganado Career Technical Education Program Facilities Expansion Masterplan project represents one example of tribal extension commitment to serve the needs of the community. The collaboration between Ganado High School, UArizona College of Architecture, Landscape Architecture & Planning (CAPLA) ARC510E Advance Design Studio, UArizona Native Peoples Technical Assistance Office and the College of Agriculture & Life Sciences (CALS) Tribal Cooperative Extension Program is an example of our core mission to serve tribal communities and bring UArizona resources to the Navajo Nation.

### Trent Teegerstrom

Associate Director for Tribal Extension Programs, Acting Associate Director for Ag and Natural Resources and Ag Economics Extension Specialist, University of Arizona





## PROJECT OVERVIEW

The proposed expansion of the Ganado CTE facility was initiated by Mr. Allen Blacksheep, on behalf of the Ganado High School CTE Program. The design underwent several iterations before being directed to the College of Architecture, Planning, and Landscape Architecture at the University of Arizona. The joint effort reflected in this book was facilitated by Ms. Doris Nelson (Director of CTE Programs, Ganado High School); Mr. Leander Thomas (Instructor of AG/Vet Science, Ganado High School); Mr. Trent Teegerstrom (Associate Director for Tribal Extension Programs at the University of Arizona [CALs]), and Ms. Claudia Nelson (Director of the RII Native Peoples Technical Assistance Office [NPTAO] at the University of Arizona). In December of 2019, NPTAO provided funding to send Laura Carr, Lecturer with the School of Architecture at the University of Arizona and acting coordinator for the ARC 510E MArch studio, to meet with Mr. Allen Blacksheep and Ms. Doris Nelson at Ganado High School and review the previous plans, share examples of student work and tour the project site.

In January 2020, CALs, NPTAO and the Ganado team worked together to design a plan for quickly bringing the students up-to-speed in terms of the knowledge required for a facility design of this complexity, and to provide proper introduction to the people, place and culture surrounding Ganado. Over the course of four days, the students toured the University of Arizona Meat Processing Facility with facility manager Samuel Garcia and facility architect Bill Carnell; attended a lecture with biosecurity expert Betsy Greene; traveled across the Navajo Nation to visit cultural sites such as Monument Valley and Canyon De Chelly; visited the historic Hubble Trading Post; and toured Chinle, Monument Valley and Ganado High School's CTE programs with the instructors and students.

Back in the architecture studio, students gathered together what they learned to create a base program. Many students drew inspiration from the interactions in Ganado, particularly from the weavings displayed and discussed at Hubble Trading post. The students began their analyses, and from that, overlaid topics of demographics, food sovereignty, landscape and climate to their work. The studio also began to organize this thinking within the context of the book *Diné, A History of the Navajos*, by Dr. Peter Iverson. Dr. Iverson lived among the Navajo at Many Farms, teaching at Diné College and gathering stories, and today is Regents Professor of History (Emeritus) at Arizona State University with focused scholarly work in American Indian History. To contextualize the central foundations of the Diné, Dr. Iverson identifies four characteristics of the Navajo briefly summarized here:

**DEFENSE AND SURVIVAL**, which establishes the necessity of understanding that the people, the animals and the land must be defended in order for the Diné to survive.

**ADAPTATION AND INCORPORATION**, namely, the intentional act of incorporating new ideas, new people and new elements into Navajo culture and tradition. For example, basketball and rodeo are viewed as traditional pastimes; the Native American Church combines traditional and Christian beliefs; Asian patterns have been incorporated into weavings; clan systems include groups who were born Navajo and who chose to come live with the Navajo; and livestock acquired by the Spanish have become staples for Navajo families.

**EXPANSION AND PROSPERITY**, which is the belief that for society and culture to prosper, they must expand in a number of different ways. This happens in part by an expansion of territory, but it also happens in terms of services and systems provided for the people.

**IDENTITY AND CONTINUATION**, namely, to be Navajo means to respect the old ways and to find the means to continue in a new day. Changing Woman provides continued inspiration and reaffirmation, and while many situations have caused reasons to despair, the Navajo continue to celebrate the continuation of their people in this place.

# STUDIO OVERVIEW

To translate these ideas into an architectural work, University of Arizona Professor Emeritus Dennis Doxtater joined the studio as a guest lecture exploring the question of “what is meant by designing culturally relevant architecture?” The students concluded that creating meaningful architectural work in this context is defined by work that communicates Navajo attributes over iconography. Professor Doxtater demonstrated to the students the ways in which he has translated these principles into his own work by establishing axes that connect geographical points of cultural significance as opposed to the more hierarchal alignments related to status seen in contemporary architecture.

With this foundation, projects began to take form, and technical criteria was introduced into the work - a resolve of the structural system, integration of mechanical, plumbing and electrical systems (MPE), designing for thermal comfort, and energy and water consideration. Lecturer Dan Maher supported the studio’s development of sustainable and energy conscious design and provided technical specifications for the building envelopes. Landscape Architecture Professor Bo Yang assisted in the landscape architecture design, assisting with proper design of bioswales, site circulation and locations for public space. The students had 1-1 sessions with Director Teegerstrom, who reviewed site plans and provided feedback on issues of biosecurity and the circulation of animals on site. To everyone’s surprise, our fast pace came to an abrupt end when the spread of COVID-19 forced the University of Arizona and Ganado High School to close their facilities on March 15th. From that date, it took approximately two weeks to get the studio functioning again as an online course, and our communication with Ganado High School was disrupted significantly while they also transitioned to online instruction. Insofar as our timeline was concerned, this was an obvious setback, but more significant was the loss of the collective momentum gained by sharing the same physical space and interacting creatively on a regular basis. We also lost the opportunity to revisit Ganado and obtain public feedback on the designs. In light of these circumstances, it is a strong testament to the integrity of the students and their commitment to Ganado that their projects were completed to the level achieved by the end of the semester. No one would have chosen the path we traveled post COVID-19, but in doing so, we had the opportunity to exercise in our work some of the values we learned from our brief exposure to the Navajo way. Everyone ended the semester a better designer, and most importantly, with a broader world view that will serve a lifetime.

## U OF A STUDENTS VISITING GANADO + MONUMENT VALLEY HIGH SCHOOLS



# PROJECT GOALS + OBJECTIVES

The project presented by the 510E studio is for a master plan and design of facilities at Ganado High School to house the Career Technical Education (CTE) Program. The master plan includes new facilities for programs in Nursing, Graphic and Architectural Design, Meat Processing, Veterinary Care and Culinary Arts. Advanced career training at the high school level provides students the opportunity to enter trades directly out of high school or to be competitively placed into advanced degree programs. Providing career training at Ganado High School protects the cultural, agricultural and economic health of the greater Ganado area, and continues the traditions and skills that have been cultivated for generations.

**GHS/CTE MISSION STATEMENT:** Our mission is to develop student empowerment through cultural values and workplace employability skills for a promising future, bringing their vision to life.

**GHS/CTE VISION STATEMENT:** Our vision is to provide focused, high quality educational pathways for students to succeed by developing community partnerships which will help inspire lifelong learning, a passion for success, and the confidence to move forward and thrive in a diverse society.

# GANADO HIGH SCHOOL STUDENTS



Ganado High School CTE Students + Leander Thomas | <https://navajotimes.com/sports/rodeo/2010/1010/100710thomas.php>



Ganado High School CTE+ FFA Students | Image provided by Leander Thomas



Ganado High School CTE+ FFA Students | Image provided by Leander Thomas



Ganado High School CTE+ FFA Students | Image provided by Leander Thomas

## PROGRAM

The focus of this proposal is the CTE Master Plan of a parcel located on the high school campus, as well as design development of the Meat Processing, Veterinary Care and Culinary Arts buildings. The program for these spaces was compiled by the students from data gathered from previous designs done for this facility, and from a precedent study done at the UofA Campus Farms, Monument Valley High School's Veterinary Tech School and Chinle High School's Meat Fabrication Facility (not currently in use). This data is recorded in the program tabulations contained in this proposal. Interview sessions with Ms. Doris Nelson, Director of the CTE program at Ganado High School and Mr. Leander Thomas, CTE Instructor in the Agriculture Program at Ganado High School, were done to establish project goals and document the CTE's vision for the new facility. Total building area varies by design, with a range between 30,000 and 40,000 sqft. While each student has modified the square footage allocated to each function and additional program spaces based on their own design, all projects have the following areas in common:

### MEAT FABRICATION ~ 3,200 SF (EXCLUDING CIRCULATION)

- Kill floor
- Meat processing and packaging
- Future USDA office
- Classrooms
- Service: offal, lockers, showers, restrooms, laundry, storage, mechanical/plumbing/electrical (MPE) spaces
- Public functions: market for selling meat products

### CULINARY ARTS SCHOOL ~8,000 SF (EXCLUDING CIRCULATION)

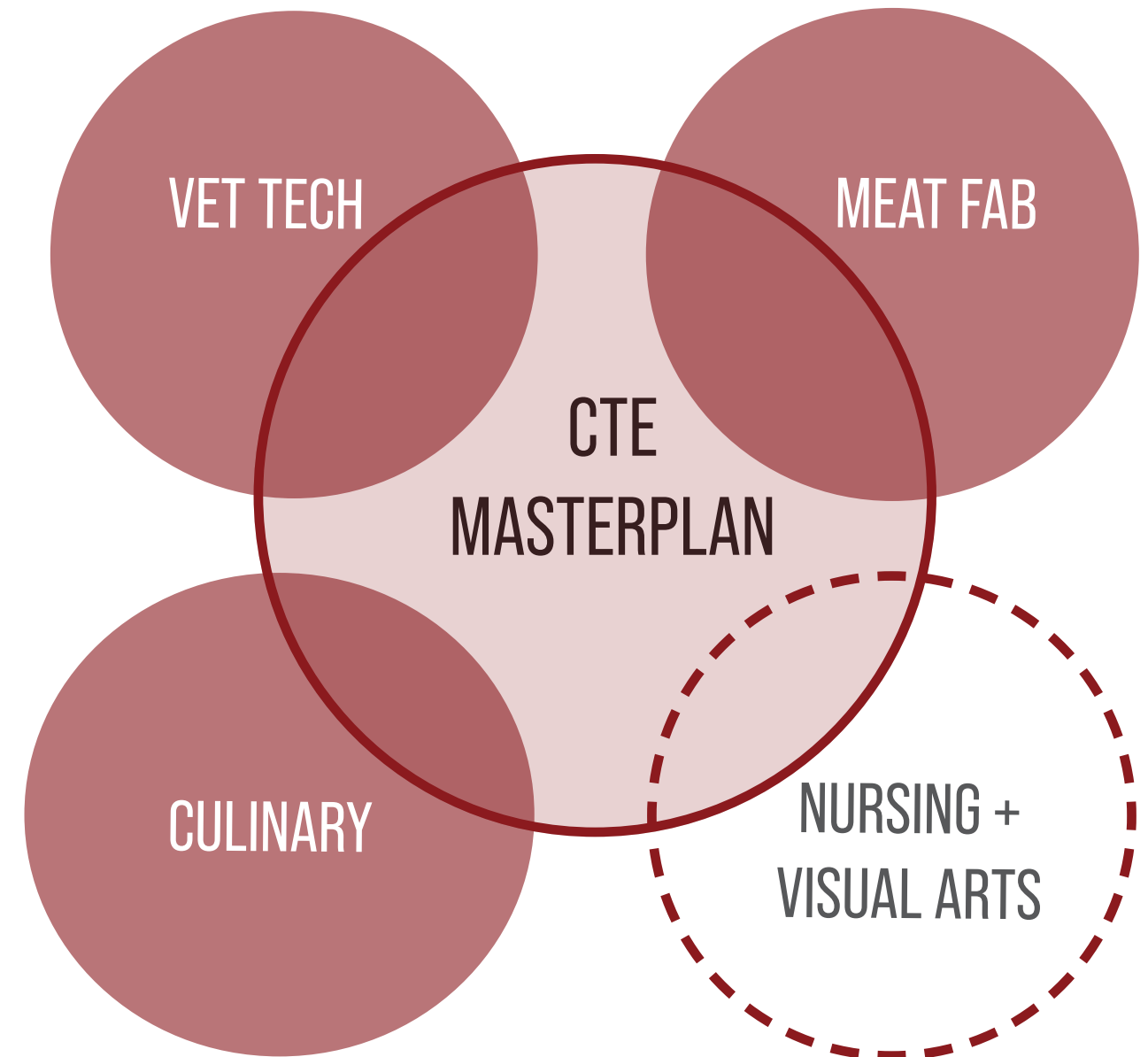
- Teaching kitchen
- Classrooms
- Service: lockers, restrooms, storage, MPE spaces
- Public functions: banquet hall for 300, cafe, community kitchen

### VETERINARY TECH SCHOOL ~3,100 SF (EXCLUDING CIRCULATION)

- Large and small animal exam
- Small animal surgery
- Indoor arena
- Classrooms
- Computer lab
- Vet office
- Service: lockers, showers, restrooms, laundry, storage, secure storage, MPE spaces
- Public functions: animal care for small and large animals

### NURSING AND GRAPHIC ARTS

- Space allocated for future expansion in these areas



# BIOSECURITY

According to the USDA, biosecurity refers to everything that's done to keep diseases and the pathogens that carry them – viruses, bacteria, fungi, parasites and other microorganisms – away from birds, property, and people. This includes:

**STRUCTURAL BIOSECURITY:** Measures used in the physical construction and maintenance of coops, pens, poultry houses, family farms, commercial farms, and other facilities.

**OPERATIONAL BIOSECURITY:** Practices, procedures, policies that are consistently followed by people.

## GUIDELINES



BETSY GREENE, PHD | Extension Equine Specialist,  
University of Arizona

### STRUCTURAL GUIDELINES

- Controlled entry
- Clearly marked, central entrance/exit controls traffic flow
- Keep a record of visitation
- Signs
- Make sure off-limits areas are clearly marked and enforced
- Maintain parking area away from manure and feed lanes
- Hand/Boot washing located near entrances and exits
- Staff present and available for questions
- Disallow or have strict guidelines for dogs



Cow at Monument Valley High School | Image provided by Laura Carr

### RISK LEVEL

**LOW RISK:** Do not own horses and rarely visit farms

ex: school field trip

**MEDIUM RISK:** Make regular visits to farms but don't have contact with horses

ex: feed delivery personnel, repairmen

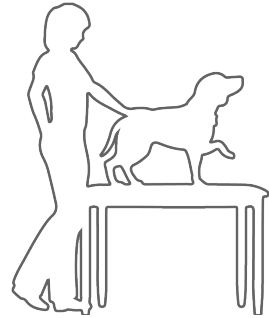
**HIGH RISK:** Make regular trips to horse farms and have close contact with animals

ex: vets, farriers, inseminators, trainers, international visitors

### OPERATIONAL GUIDELINES

- Establish sanitation standards
- Who handles horses and in what order
- Track and control the use of tools and equipment
- Quarantine new animals a minimum of three weeks; treat any animal from outside or that has been exposed to outside events as if it could be sick
- Know the history of each animal, and have it checked by a vet at the first sign of illness
- Scrub and disinfect water tanks, feed tubs and supplement buckets on a regular basis
- Eliminate standing water and change water every 24 hours
- Protect your water source from contaminants
- Keep storage areas clean
- Discourage birds, rodents and pests

# USERS + IMPACT



## VET TECH STUDENT

Students in the veterinary technician program spend 1-2 periods of their school day at the facility. Typical tasks would be working at the reception desk, treating small and large animals, tending to the animals in outdoor pens, learning in a classroom or testing for workplace certifications. Skills that students gain from this program are the ability to schedule and treat animals, quality animal husbandry practices, credits towards dual enrollment and certifications that improve their chances of employment and admission to veterinary schools.



## CULINARY STUDENT

Students in the culinary program spend 1-2 periods of their school day at the facility. Typical tasks would be working within the cafe, learning recipes and techniques in the kitchen, learning in a classroom and testing for workplace certifications. Skills that students gain from this program are industry standard training, knowledge of how to run a restaurant, the ability to prepare and serve large banquet or catering events and certifications that improve their chances of employment.



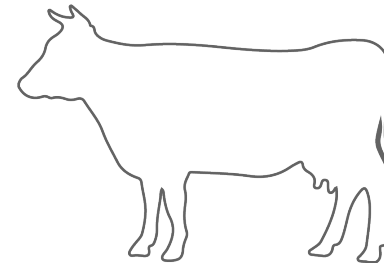
## MEAT FAB STUDENT

Students in the meat fabrication program spend 1-2 periods of their school day at the facility. Typical tasks would be working within the meat market, working on the kill floor, tending to the animal pens, learning fabrication techniques, learning in a classroom and testing for workplace certifications. Skills that students gain from this program are industry standard training, knowledge of how to butcher and fabricate large animals and certifications that improve their chances of employment.



## PUBLIC

Integration of the public into the CTE program operations is vital to achieving economic sovereignty. Animal examination fees, meat product sales and cafe goods represent revenue-generating opportunities for each CTE program. Events, workshops and public access to the CTE commercial kitchen encourage entrepreneurship, provide resources and skills to the community and reinvestment in the Navajo Nation.



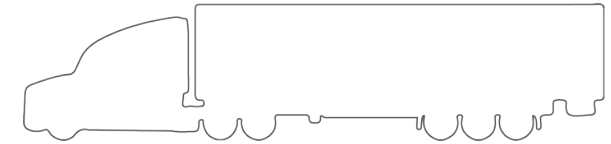
## LARGE ANIMALS

Large animals such as cows, sheep, pigs and horses are able to be treated and maintained through the vet tech program or be processed through the meat processing program. There is an immediate need for large animal processing equipment at Ganado as many families keep cattle as an investment but are forced to sell to outsiders as there is no way to capitalize on the processing of these animals. Animal husbandry is a cornerstone of the Diné way of life and there needs to be convenient and quality access to services and resources in Ganado.



## SMALL ANIMALS

On the Navajo Nation there are many small animals such as dogs and cats that roam the landscape. Many households have numerous pets and look after many more that they do not directly own. There exists an urgent need for a facility to provide affordable, reliable veterinary care for these animals.



## SERVICE + MAINTENANCE

All of the CTE programs are heavily resource dependent. Tools and equipment, food products, cleaning supplies, etc. are key to the success of the facilities. Adequate space needs to be allocated to receive them, including capacity for large animals and associated equipment. If the revenue generating programs expand and potentially include distribution, space and infrastructure will need to be put into place in anticipation.

The new CTE facility is projected to enroll **125** students in the Vet Tech program and over **400** students in other CTE courses



**90%** of CTE students will earn at least 8 college credits

**95%** or better CTE student attendance will be demonstrated

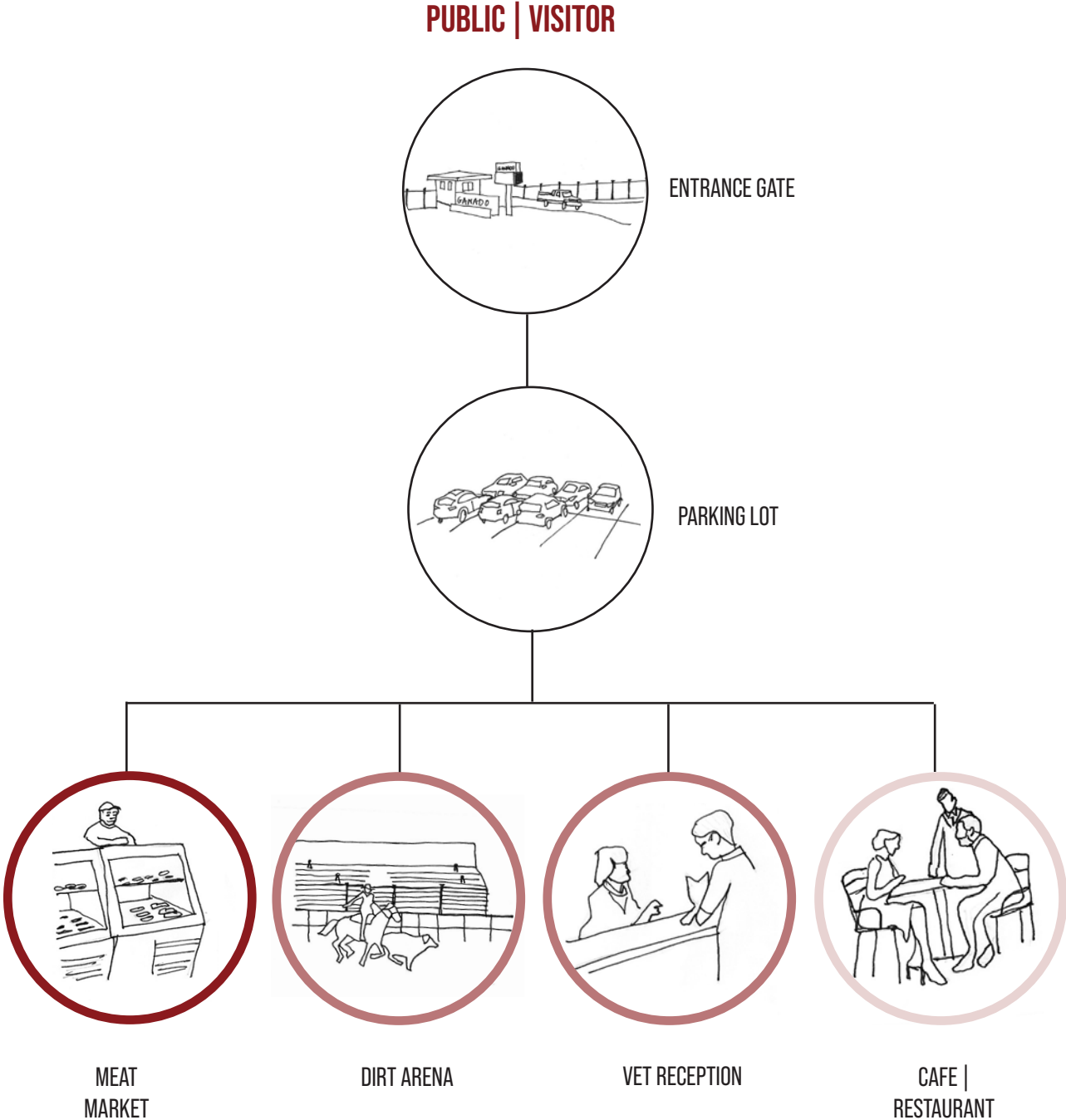
**90%** of CTE students will graduate high school

**90%** of CTE GUSD students will earn 2 or more industry-required certifications

**90%** of GUSD CTE students will participate in 1 or more of the following career exploration activities: mentor program, job shadow experience, paid/unpaid internships

**100%** of GUSD CTE students will develop employability skills, such as career searches, resume writing, mock interviews, public speaking, that are documented in a work portfolio

# USER SEQUENCING



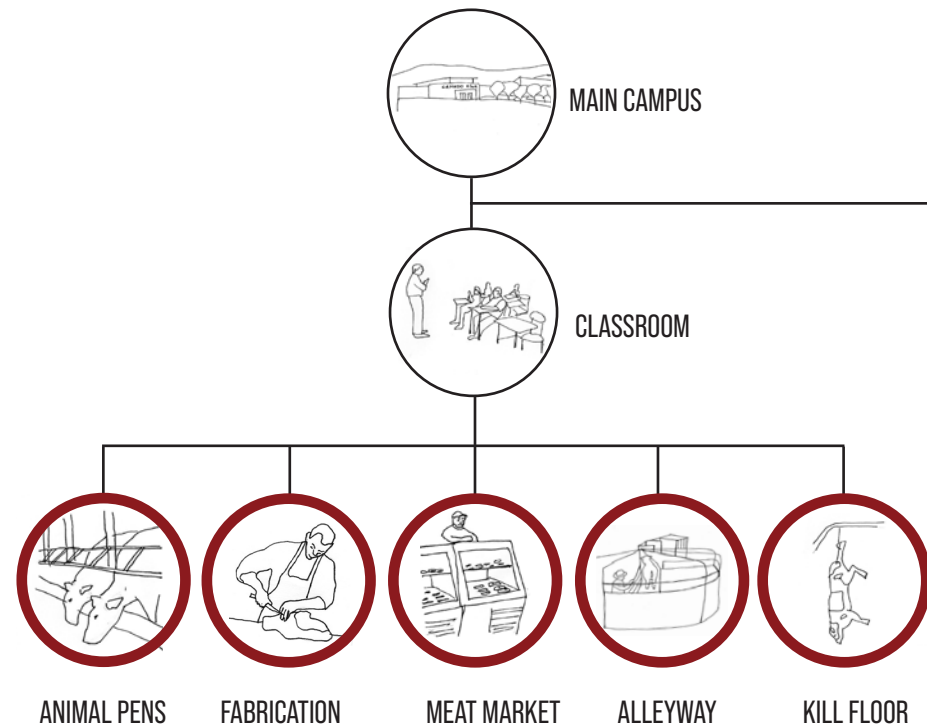
1. ENTER SCHOOL GROUNDS THROUGH MAIN ENTRANCE GATE

2. PARK IN PARKING LOT

3. DIRECT ACCESS TO MEAT MARKET, CAFE, VET RECEPTION OR OUTDOOR ARENA

# USER SEQUENCING

## MEAT PROCESSING STUDENT



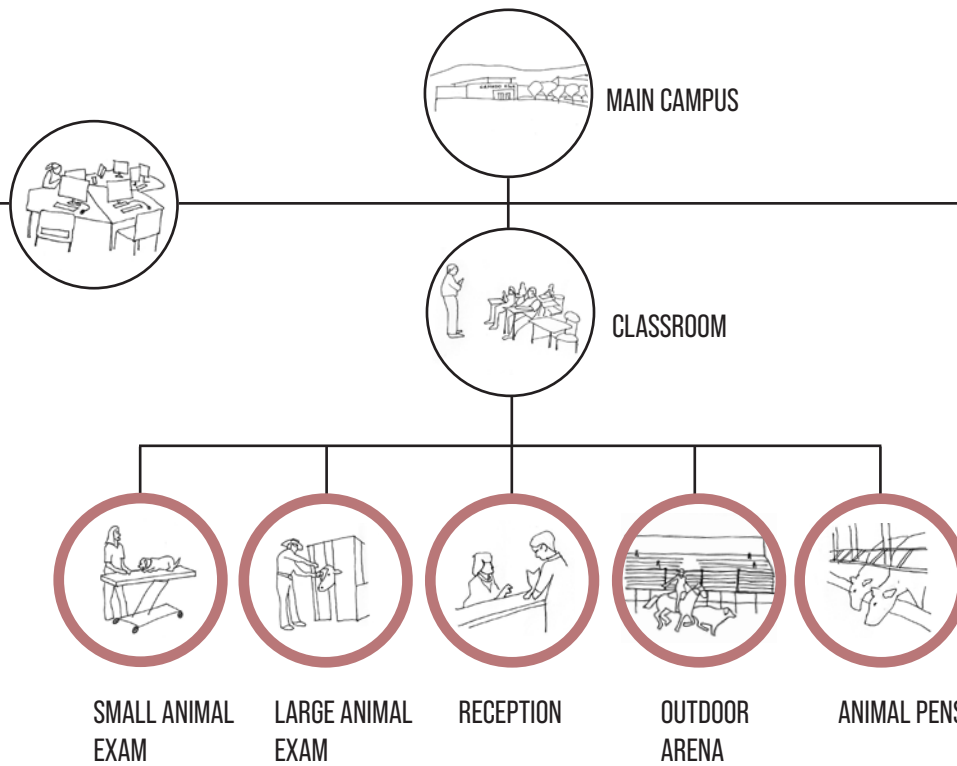
1. LEAVE MAIN CAMPUS FOR CTE CLASS PERIOD

2. ENTER THROUGH A CLASSROOM OR CHECK IN AREA

3. CIRCULATE TO ASSIGNED ZONE KILL FLOOR, PENS, FABRICATION, MEAT MARKET OR CATTLE ALLEYWAY

3A. -OR- CIRCULATE TO COMPUTER LAB FOR LESSON OR TESTING

## VET TECH STUDENT



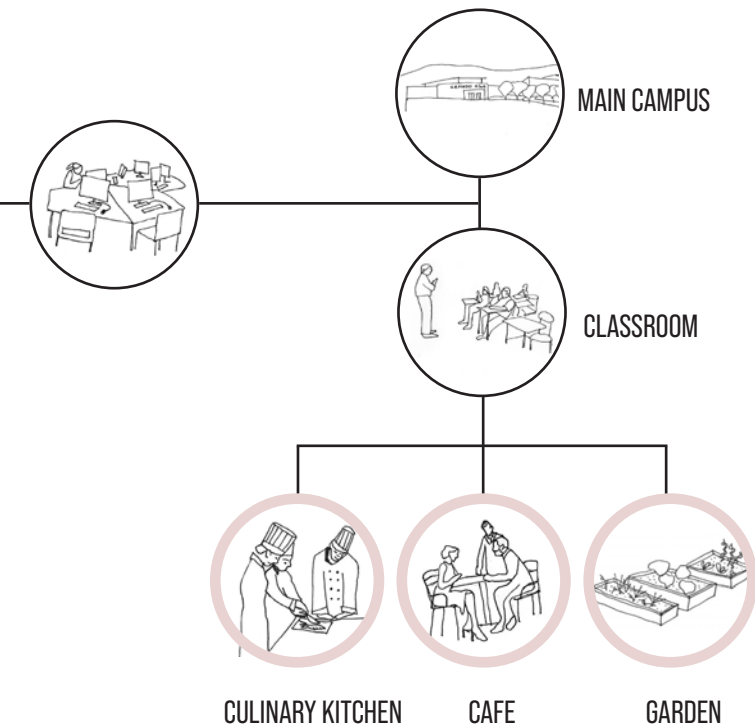
1. LEAVE MAIN CAMPUS FOR CTE CLASS PERIOD

2. ENTER THROUGH A CLASSROOM OR CHECK IN AREA

3. CIRCULATE TO ASSIGNED ZONE SMALL ANIMAL EXAM ROOM, LARGE ANIMAL EXAM ROOM, VET RECEPTION, OUTDOOR ARENA OR PENS

3A. -OR- CIRCULATE TO COMPUTER LAB FOR LESSON OR TESTING

## CULINARY STUDENT



1. LEAVE MAIN CAMPUS FOR CTE CLASS PERIOD

2. ENTER THROUGH A CLASSROOM OR CHECK IN AREA

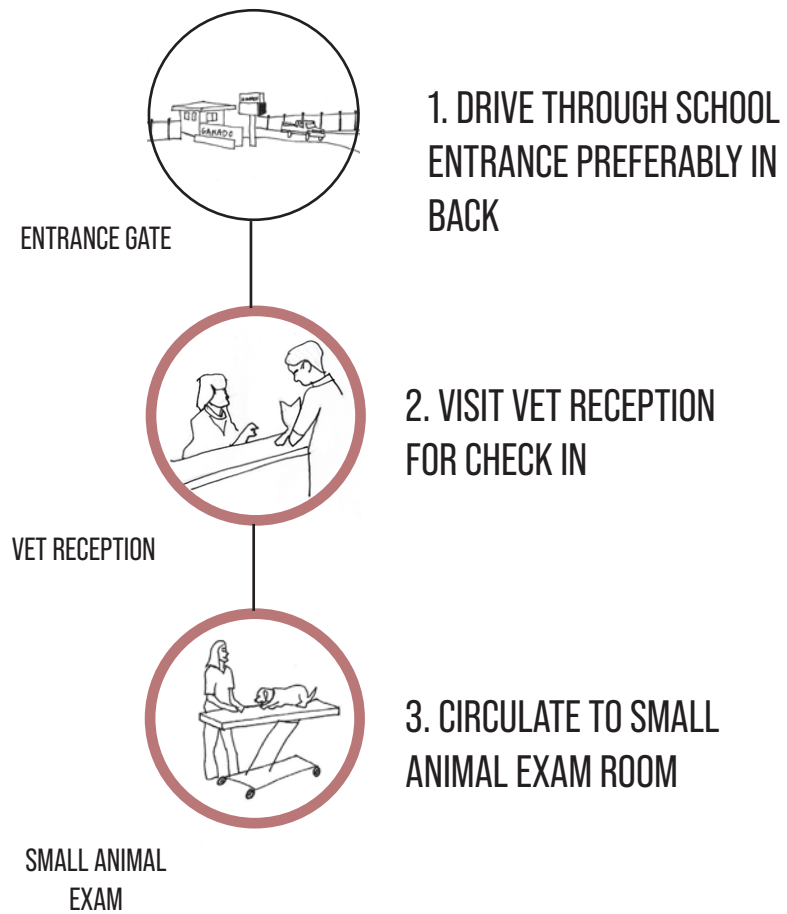
3. CIRCULATE TO ASSIGNED ZONE SMALL ANIMAL EXAM ROOM, LARGE ANIMAL EXAM ROOM, VET RECEPTION, OUTDOOR ARENA OR PENS

3A. -OR- CIRCULATE TO COMPUTER LAB FOR LESSON OR TESTING

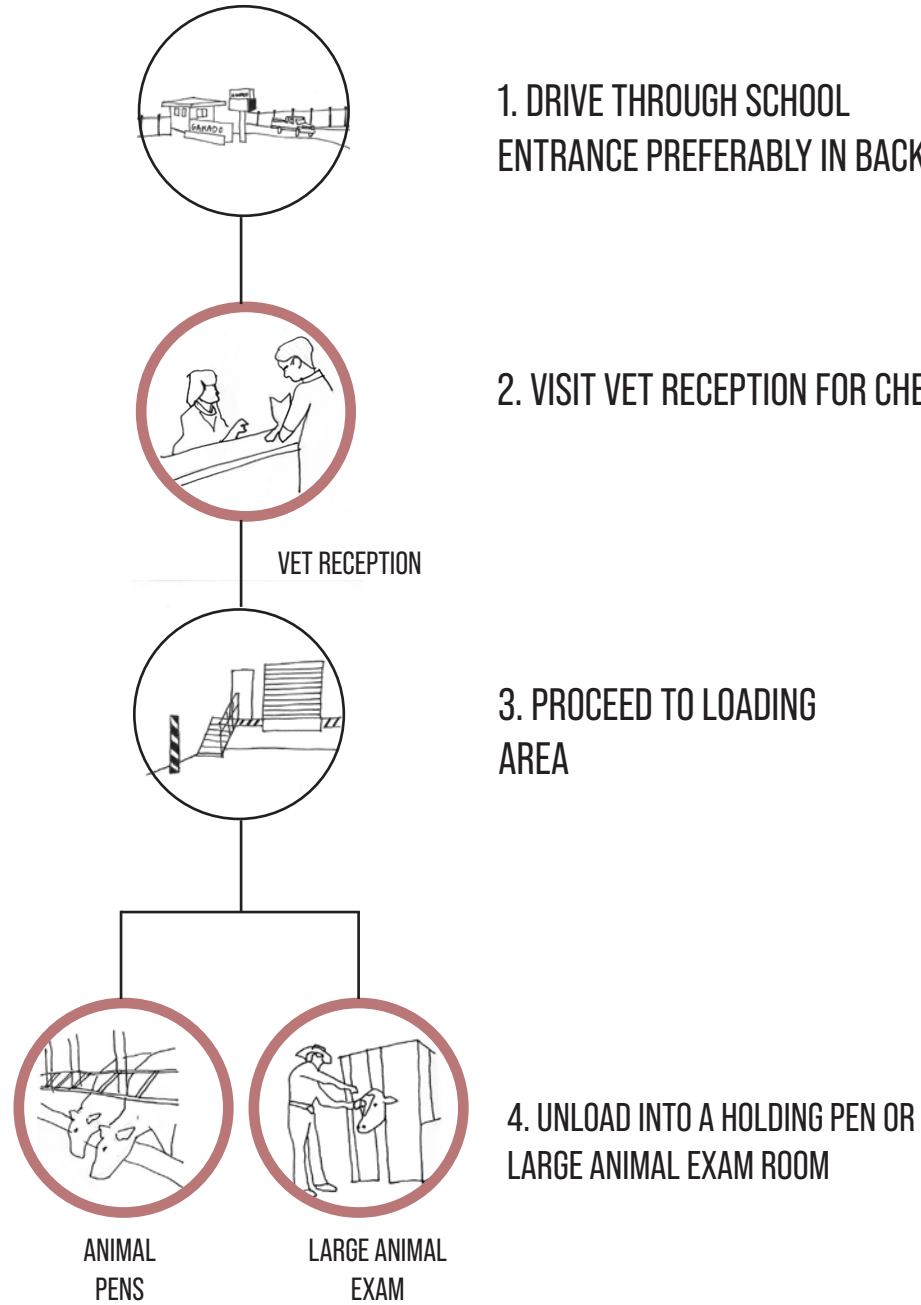


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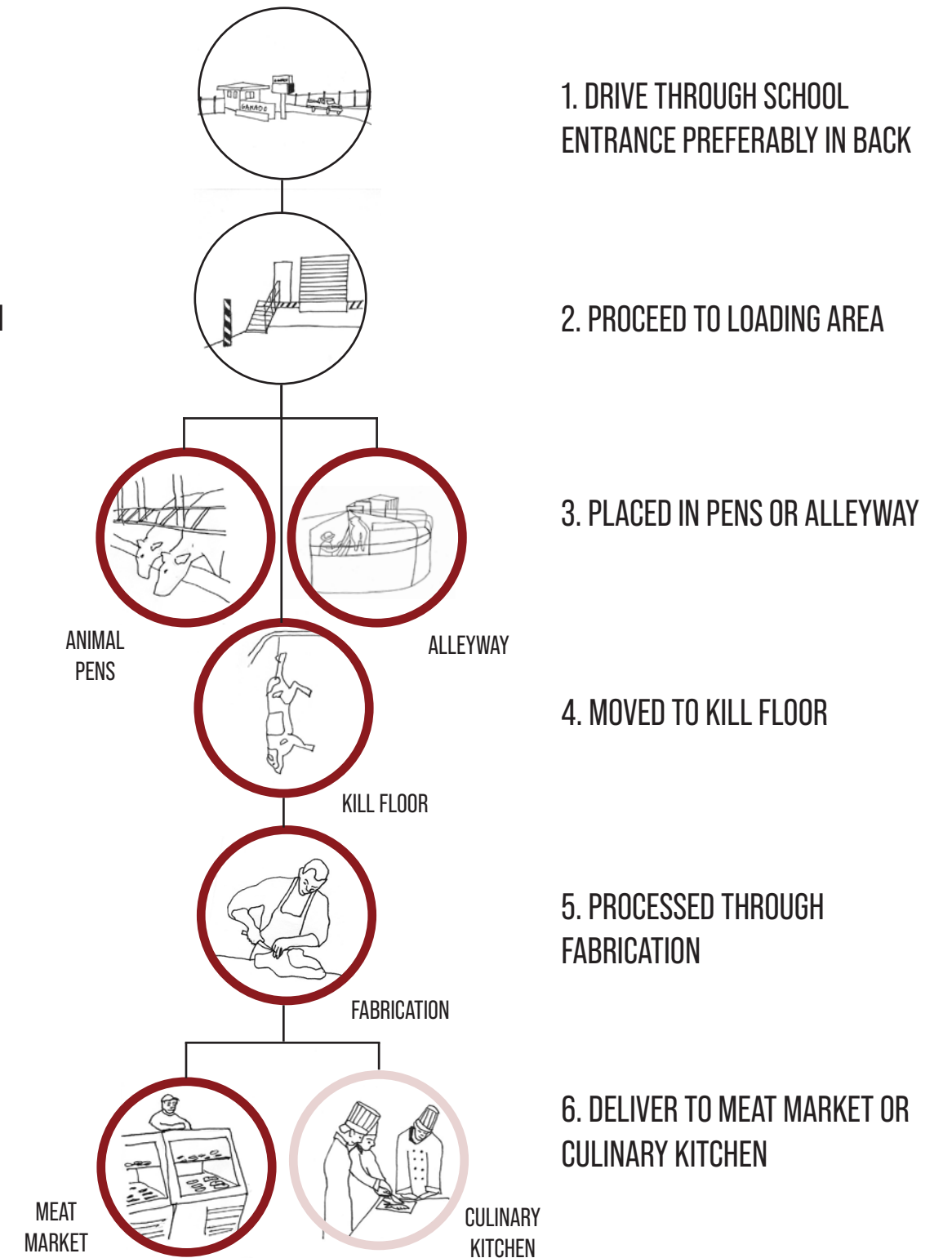
## SMALL ANIMAL VET



## LARGE ANIMAL VET



## ANIMAL FOR PROCESSING



# PROGRAM | VET TECH

Room Name	Square Footage	Equipment	Important Adjacencies	Other Notes / Requirements
Reception	450	Seating- x4-5 Scale- DRE 400 Vet Scale 37.4"L x 19.7"W x 3"H Desk Storage	File Room	Enough room for owner and pets Area for weighing scale Separate entrances or waiting areas for sick and healthy animals
File Room	120	Filing Cabinets- Storage	Reception	Secure lock/Private files
Small Animal Exam	300	Examination table- 46"W x 38"H x 18.65"D Wash table- VSSI (stainless steel wet prep) 60"L x 24"W x 36"H or 48"L x 24"W x 36"H Holding cages- VSSI (stainless steel x5) X-Ray Machines	Sterilization room	Floor slope- drainage* Floor outlets Places for oxygen tanks to be stored externally Easy to clean surfaces
Small Animal Surgery	250	Surgery table- 44L x 22W...(x2-4) Storage- casework Surgery/ Operation Lights Veterinary Vital Sign Monitors	Sterilization room Viewing area	Floor slope- drainage* Floor outlets Places for oxygen tanks to be stored externally Easy to clean surfaces
Sterilization Room		Examination table- 46"W x 38"H x 18.65"D Storage- Casework	Small Animal Exam Room Small Animal Surgery Room Larger Animal Exam Room	Floor slope- drainage* Lighting is important Easy clean surfaces Places for oxygen tanks to be stored externally
Large Animal Exam / Processing	268	Hydraulic squeeze Horse Stall Floor Scale- 78.75" L x 39.37" W x 3.93" H		Overhead hanging outlets
Outdoor Animal Holding	160	Holding Stalls (x3 or x4)		
Dirt Arena (Indoor)				
Arena (Outdoor)	1,400	stands/bleachers		dances 4H showings farms market from culinary arts
Laundry Room	124	Washer Dryer	Locker Room	Based off Emc design
Men's Locker Room	300	Lockers Restrooms Showers	Laundry Room	
Womens Locker Room	300	Lockers Restrooms Showers	Laundry Room	
Vet's Office	160	Desk Storage	Reception Classroom	
Classroom	630	Desk (x20) Whiteboard Projector		
Storage	60	(x2 or x3)		



Horse exam at Monument Valley High School Vet Tech Program | Image provided by Leander Thomas



Students in Monument Valley High School Vet Tech Program | Image provided by Laura Carr

# PROGRAM | MEAT FABRICATION

Room Name	Square Footage	Equipment	Important Adjacencies	Other Notes / Requirements
Holding Pens	180sf per pen x 6 + 12.5' corridor= 1530sf	Paneling, Gates, Water , Lights , Roof structure	Truck Unload, Alleyway, Chute	Only holding 10-20 animals at once
Alleyway	~1500	Panels + Siding, Catwalk, Shading, Etched concrete/Rubber Flooring	Cripple Entrance, Kill Floor, Holding Pens	
Kill Floor	60 sf draining 200 sf skinning	Chute, Cripple Tool, Lift, Working Rail, Table, Knife Sanitation, Work Sink, Drainage, Hanging Scale, Cleaning Tools (Hoses, Solutions, Brushes)	Hot Box, Holding Cooler, Classroom,	Size based off Chinle
Hot Box	60 sf	Working Rail, Refridgeration, Drainage	Holding Cooler, Kill Floor	
Holding Cooler	~225 sf	Working Rail, Rail Splitter, Refridgeration, Drainage, Lighting	Hot Box, Classroom	Chinle 75 sf - Leeander estimated triple the space for desired storage of 20 carcasses Rails should allow for easy FIFO and specific selection, i.e. rails "loop" at front and back
Freezer Storage	~130 sf	Storage Racks,	Holding Cooler, Fabrication + Packaging	
Offal	30sf		Waste Pickup (Exterior)	U of A Meat Labs Offal Storage is 240sf
Fabrication + Packaging	~450 ~160 for mixing/ stuffing ~275 for processing	Grinder/Mixer, Vacuum Packing , Band Saw, Utility Tables, Digital Scales, 2 compartment sink	Holding Cooler, Storage Freezer + Cooler, Transportation Market	U of A Meat Labs is ~1500
Classroom	650 sf	Working Rail, 30 stations, Whiteboard, Projection, Working Table (cutting table), Drainage	Kill Floor,	based on NYU article of (17 sf per station x 30 students) + ~150 sf for englarged instruction area for livestock
Shower + Restroom + Locker	150 sf Locker Room 72 sf Restrooms 4'0" x 4'8" Shower	Lockers, Showers, Benches, Laundry shoot	Laundry	3'0" x 4'8" Changing Rooms Showers open to 4'0" side Laundry Passthrough
Laundry + Storage	120 sf for laundry	Washer + Dryer, folding table, sink	Locker Rooms, Mechanical Rooms	
Lab/ Quality Control	405 sf	Spectrometer, refractometers, titrators, moisture analyzers, alcohol analyzers, refridgerator, sink,		Based on U of A Required tests for Commodity or Retail USDA *Food Microbiology Analysis (Lactobacillus, Salmonella, Listeria, E. Coli, Staphylococcus)
Electrical/Mech	~130sf			
Office	130 sf per office 75sf UDSA Office	USDA offices require Shower, Dressing - Locker/Storage, Safe, Lock provided by USDA	Kill Floor	USDA office not including shower, locker room, etc.
Market	250 sf	Coolers, Displays, Register, Drainage, Dry Storage	Packaging/Processing More Public Entrance	
Pit Roast + Gathering	Outside	Seating, Roasting Pit	Away from Kill area	
Break Room	~150sf	Fridge, Tables, Chairs, Microwave	Locker Rooms, Laundry	
Tannery	Outside	Stretching Table		



Tucson Foodie | Jackie Tran | <https://tucsonfoodie.com/2018/07/18/local-meat-lab>



Arizona Daily Star | Mike Christy | <https://tucson.com/lifestyles/food-and-cooking/tucson-lab-studies-the-science-of-meat-from-pasture-to-table>

# PROGRAM | CULINARY

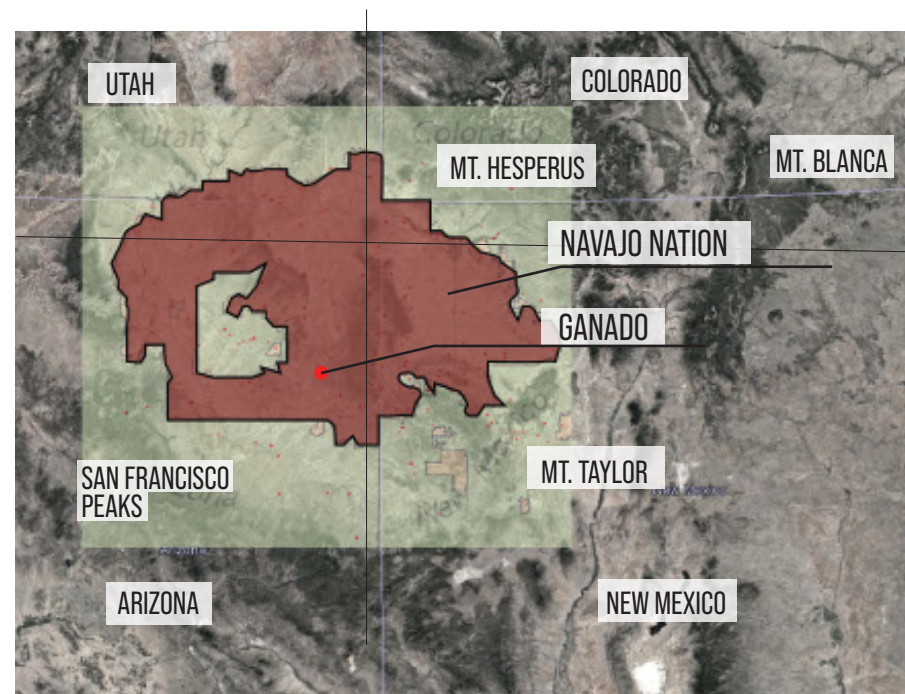
Banquet Space	3000-3600 sf	Tables, Chairs	Table Storage, Culinary Arts	
Lobby	944 sf		Reception, office	
Reception	109sf	Desk, Storage	Lobby	
Office			Lobby, Reception	
Culinary Arts	2,141 sf	Working Stations, stove tops, ovens, microwaves, refrigerators, prep sinks, tables, chairs, shelving and tray racks, cabinets for storage, dishwasher	Banquet, Receiving, Cooler, Freezer, Boiler, storage	Stainless steel
Laundry	124 sf	Washer, Dryer	Locker Rooms	
Mens Locker Room		Lockers, Restrooms, Showers	Laundry Room	
Womens Locker Room		Lockers, Restrooms, Showers	Laundry Room	
Storage			Banquet, Receiving, Culinary Arts	
Receiving	76 sf		Storage, Banquet, Culinary Arts	
Table Storage	439 sf		Banquet	
Cooler	107 sf	Shelving/Storage Racks	Culinary Arts	
Freezer	92sf	Shelving/Storage Racks	Culinary Arts	
Boiler	123 sf		Culinary Arts	
Classroom		Computers(30-35)		



Toasted Sister Podcast Navajo Tech University Students | Brian Tatsukawa | <https://toastedsisterpodcast.com/2019/02/12/e48-culinary-arts-at-navajo-technical-university>



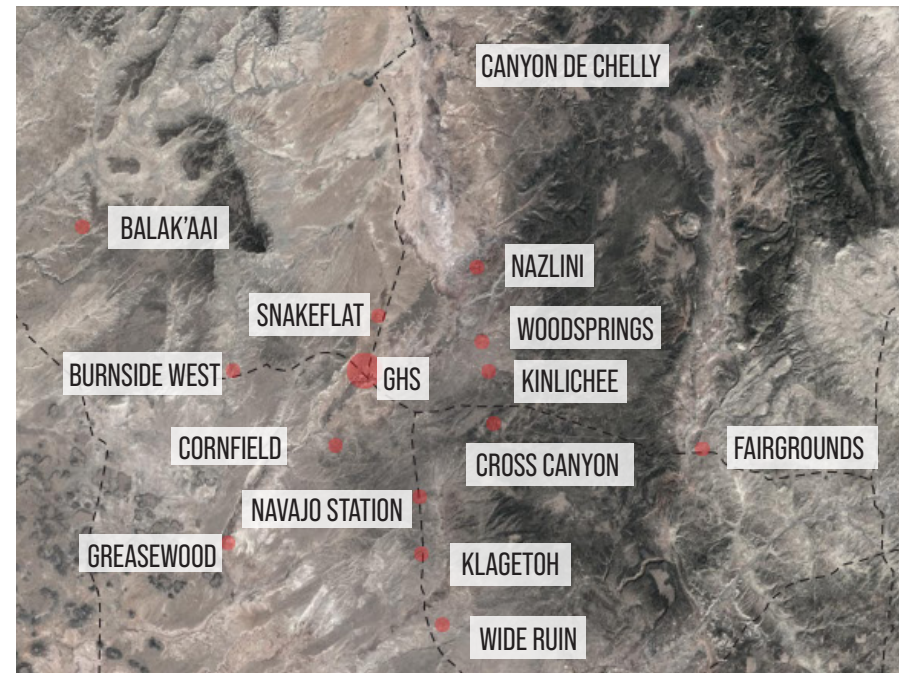
# SITE CONTEXT



200 mi.

## NAVAJO NATION

They are called the Navajo, but call themselves the Diné. The Navajo Nation is the largest American Indian reservation in North America encompassing over 25,000 square miles, overlapping Arizona, New Mexico, and Utah. Diné Bikéyah, the Navajo's country, however is much larger and spans much greater distances than these boundaries. It lies within the four sacred mountains; Mt. Blanca to the east, Mt. Taylor to the south, the San Francisco Peaks to the west and Mt. Hesperus to the north. It is here where the Navajo believe they belong and know they will stay.



20 mi.

## GANADO, ARIZONA

Ganado is part of the Navajo Nation, located about halfway between Holbrook and Chinle at an elevation of 6,400 ft. Located north of Ganado is Canyon De Chelly, occupied today as it has been for more than 5,000 years by Navajo families raising livestock and farming the land. Ganado is the home of the famous Hubble Trading Post, established in 1868. Today, the Ganado community holds many agricultural parcels managed by a local board of Farming Advocates, and is surrounded by ranches that provide organic beef and mutton.



.5 mi.

## GANADO HIGH SCHOOL + CTE PROGRAM

CTE prepares students for entering fields in agriculture, veterinary science and food science. High school students involved in CTE are more engaged, perform better and graduate at higher rates.

- Taking one CTE class for every two academic classes minimizes the risk of students dropping out of high school.
- The average high school graduation rate for students concentrating in CTE programs is 93 percent, compared to an average national freshman graduation rate of 80 percent.
- 91% of high school graduates who earned 2-3 CTE credits enrolled in college.

# SITE | CONTEXT



1 VIEW OF PAVILION FROM SITE



2 VIEW OF RESIDENTIAL ZONE FROM SITE



3 VIEW OF PLATEAU FROM SITE



# SITE CONTEXT | CLIMATE

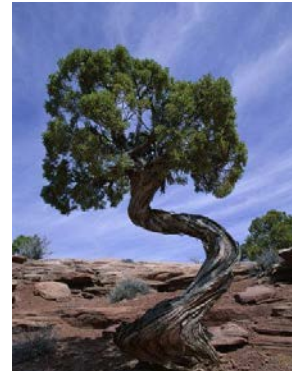
Ganado is located within the Colorado Plateau region of Northern Arizona and has an average elevation around 6,200 feet above sea level. The region is characterized by very cold winters and moderate summers. The area has vegetation represented in both the Pinyon Juniper biome as well as the Semi Desert Grassland / Shrub Steppe biome. High elevation deserts with these classifications typically include low bushy trees like junipers, and large expanses of grass lands. Some of the typical vegetation types are shown below. The Ganado area gets an average of 11" of precipitation a year. This generally happens most during monsoon season spanning July to September, and in the winter months as snow.



ARIZONA CYPRUS



PINYON PINE



JUNIPER



SAGEBRUSH



BLUE GRAMA GRASS



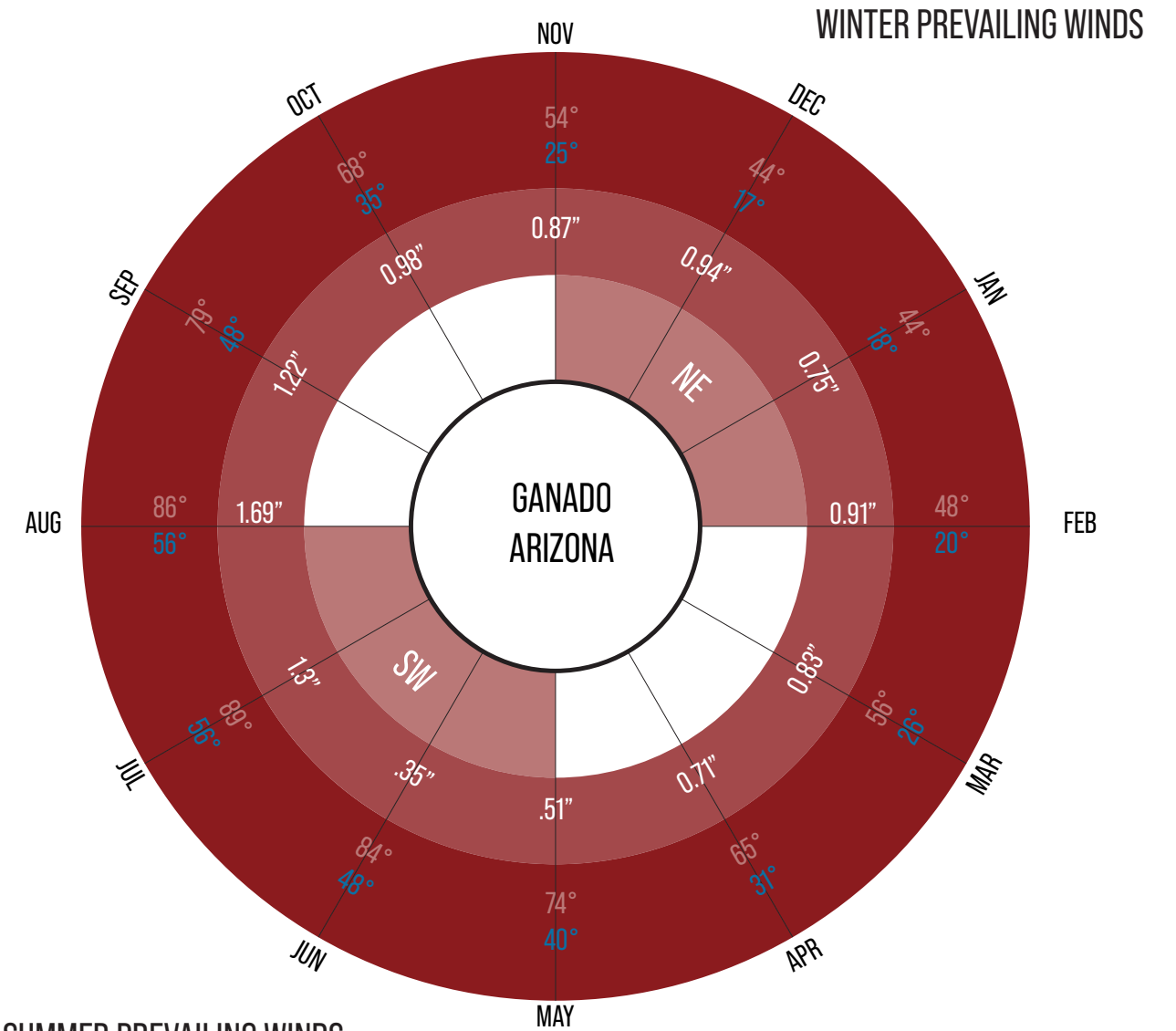
NEEDLE + THREAD GRASS



RUBBER RABBITBRUSH



MOUNTAIN MAHOGANY



- AVG TEMP. HIGH & LOW
- AVG PRECIPITATION
- PREVAILING WIND

# SITE CONTEXT | FORCES



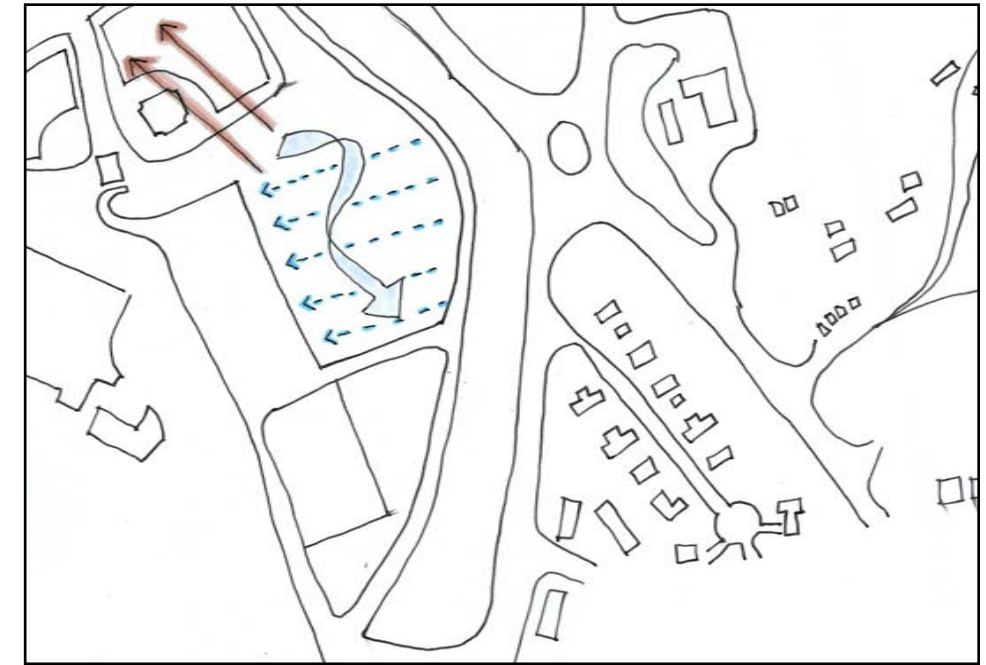
LAND USE

- RESIDENTIAL
- COMMERCIAL
- ACADEMIC



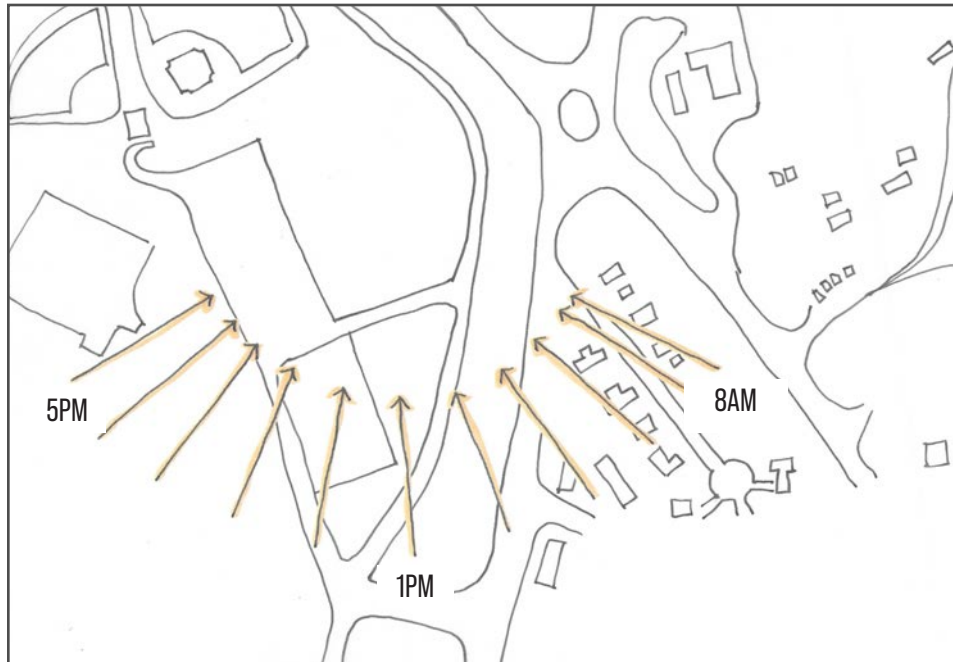
VEHICULAR CIRCULATION

- MAIN ENTRANCE
- INTERIOR CIRCULATION
- PARKING LOTS
- HIGHWAY + INTERSTATE

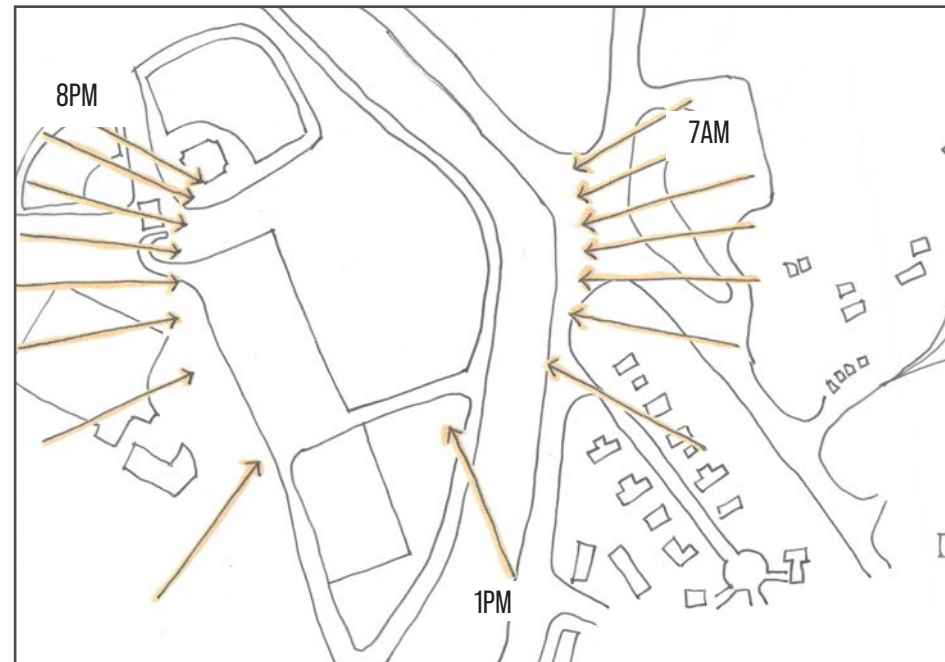


WIND + WATER + VIEWS

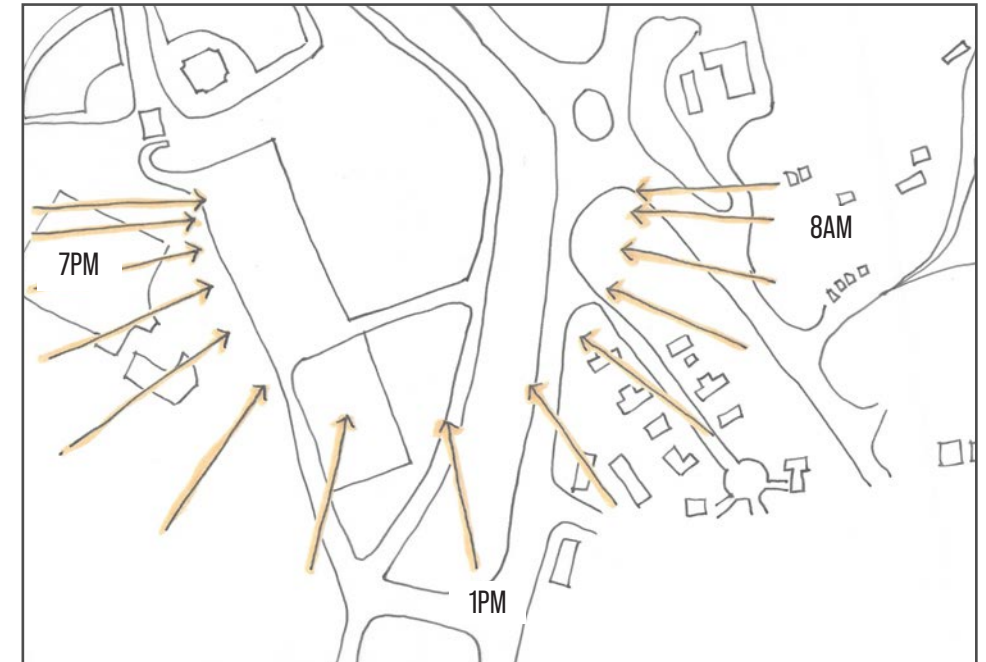
- WATER
- MOUNTAIN VIEWS
- WIND



WINTER SOLSTICE



SUMMER SOLSTICE



EQUINOX



## STUDENT PROPOSALS

This semester's work has focused on the CTE Master Plan of a parcel located on the high school campus, as well as design development of the Meat Processing, Veterinary Care and Culinary Arts buildings. The program for these spaces was compiled by the students from data gathered from previous designs done for this facility, and from a precedent study done at the UofA Campus Farms, Monument Valley High School's Veterinary Tech School, and Chinle High School's Meat Processing Facility (not currently in use). Interview sessions with Ms. Doris Nelson, Director of the CTE program at Ganado High School and Mr. Leander Thomas, CTE Instructor in the Agriculture Program at Ganado High School, were done to establish project goals and document the CTE's vision for the new facility. Students conducted site visits, interviews, and background research of the Diné and Ganado on topics of history, culture, population, climate, art, and agriculture. The master of architecture students worked towards combining public and school functions on the same site. Some of the issues explored by student proposals include:

- Privacy, accessibility and security
- Facilities derived from commercial prototypes refocused for educational applications
- Transporting, holding, moving and handling animals
- Maintaining biosecurity boundaries between the healthy and sick animals
- Designing culturally relevant architecture as an outsider, being sensitive to information shared and unknown.
- Responding to site and community in a rural context

## U OF A STUDENTS VISITING CHINLE



Students at Canyon de Chelly | Image provided by Laura Carr



Students at Chinle High School | Image provided by Laura Carr

**RESILIENCE | RUDY CHON** HEREFORD, AZ

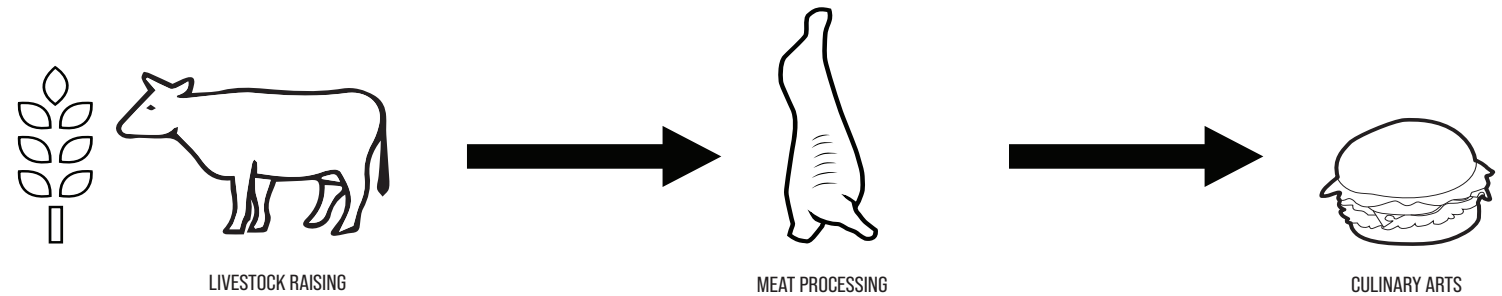
In commenting on the COVID outbreak happening in the Navajo Nation, President Nez stated, “we are not going to feel sorry for ourselves, we have overcome past waves of disease and oppression, we are resilient!” Resilience and the beauty of endurance inspired the design of the Ganado Career Technical Education Center. Beginning as a single form, the building is split, shifted, and eroded in order to create linkages between the educational and public realms, to allow for air and light to activate space and to define space in the voids left behind. By using established construction methods, a climatically appropriate form, and durable materials the building is designed to last, to be resilient and serve the Navajo people for future generations to come.



# GOALS + OBJECTIVES

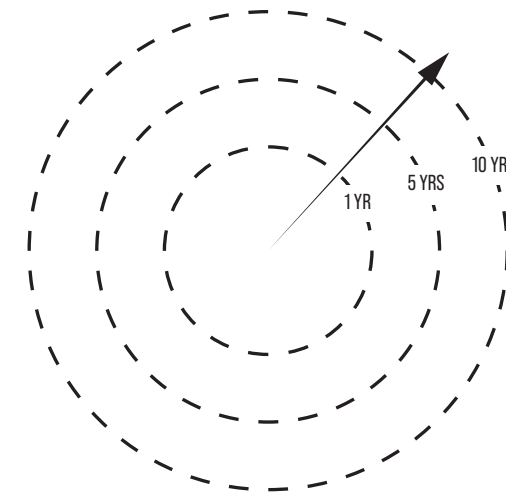
## PROCESS ORIENTED

This proposal aims to build an educational center that facilitates teaching animal husbandry, spanning well-being, processing and food preparation.



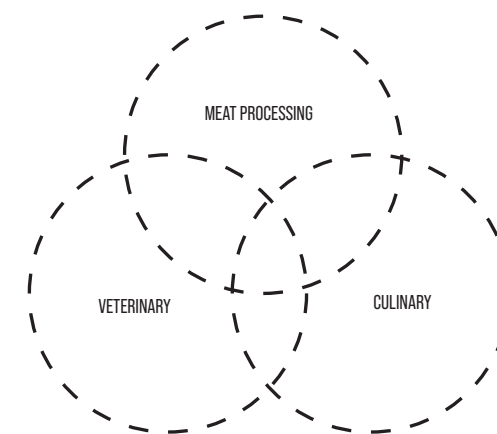
## FUTURE-FACING

The building should be designed to primarily provide a safe and fulfilling technical education for students, as closely resembling real working environments as possible. Facilities should be designed to accommodate future growth and continued service to the community (Veterinary services, Meat Processing, Catering)



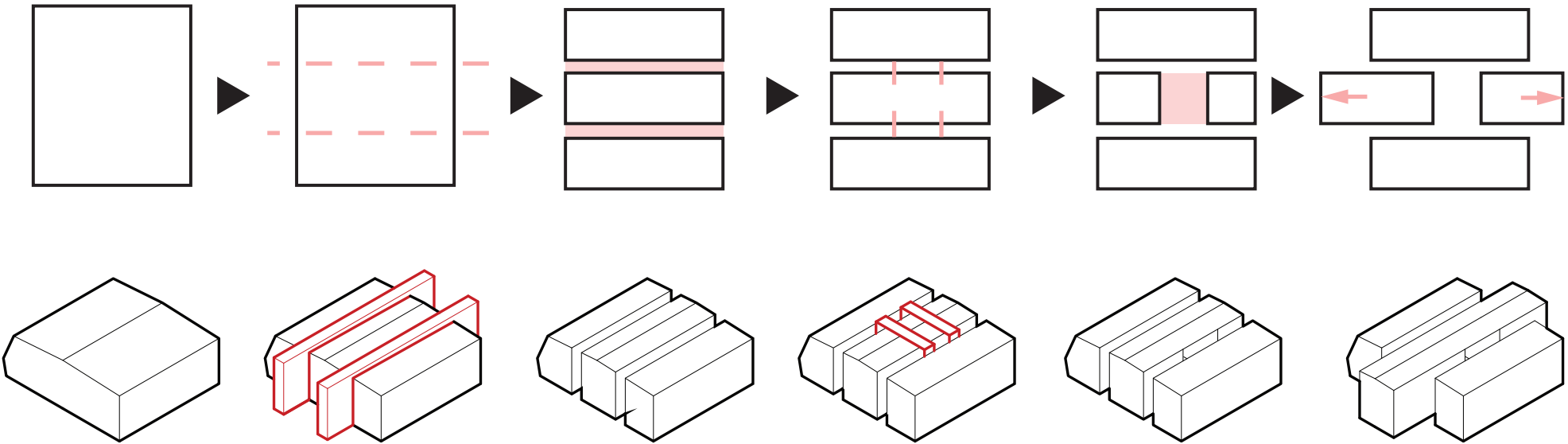
## INTERDISCIPLINARY

Technical education spaces should be oversized to accommodate up to 30 students at one time, to allow for as many hands-on learning experiences as possible, including in linkage spaces to facilitate interdisciplinary experiences similarly resembling real life interaction.

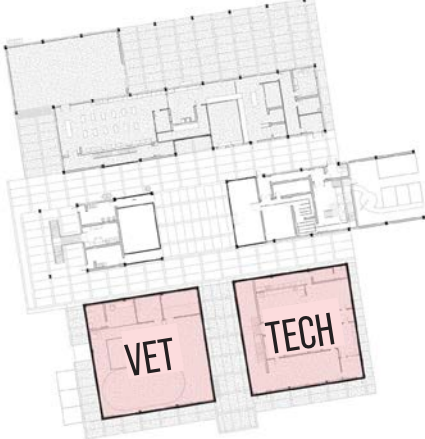
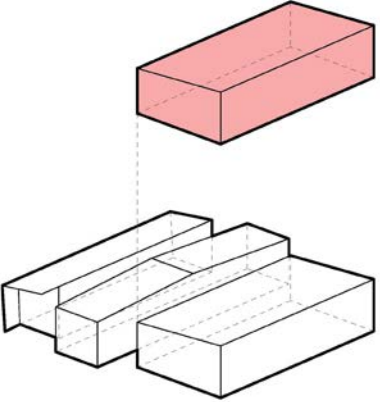
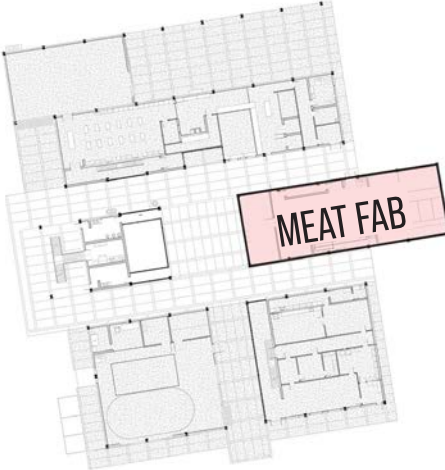
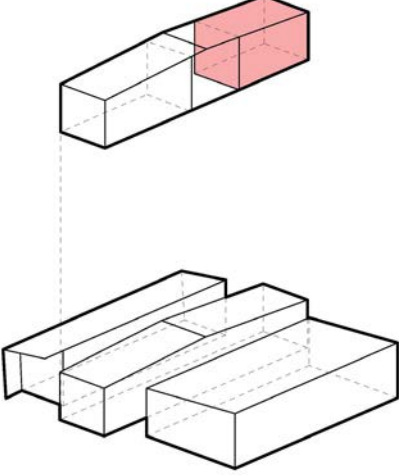
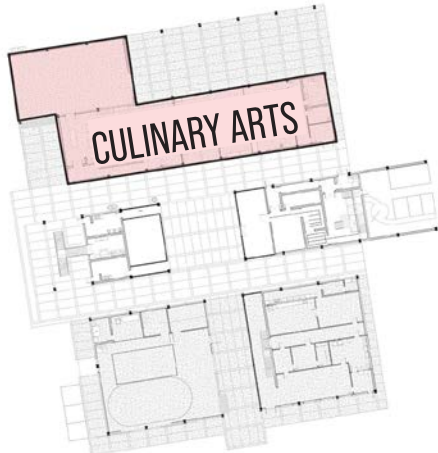
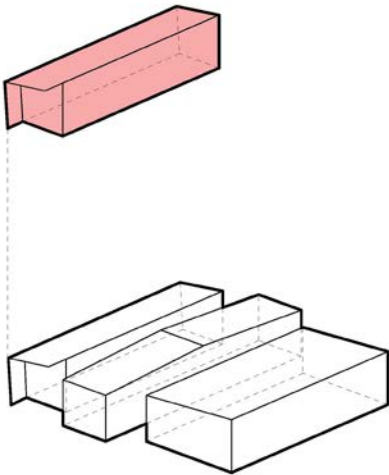
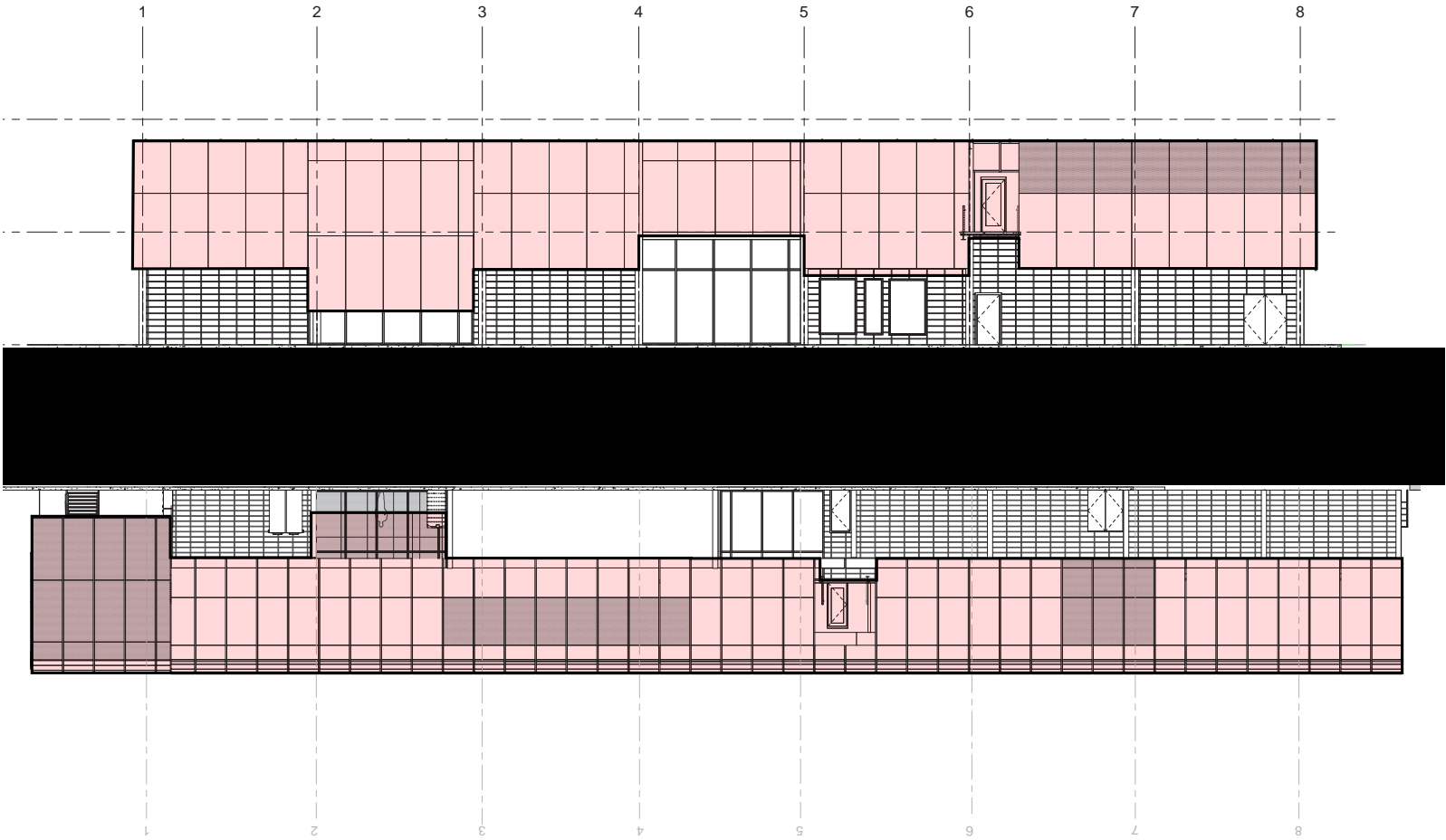


# CONCEPT

Architecture requires light, air, and social engagement. To achieve this, the structural frame is pulled apart; air and light allowed to enter, and the activities inside revealed. Outdoor linkage spaces are created, and in some instances implied, to accommodate the need for certain functions to overlap and connect.

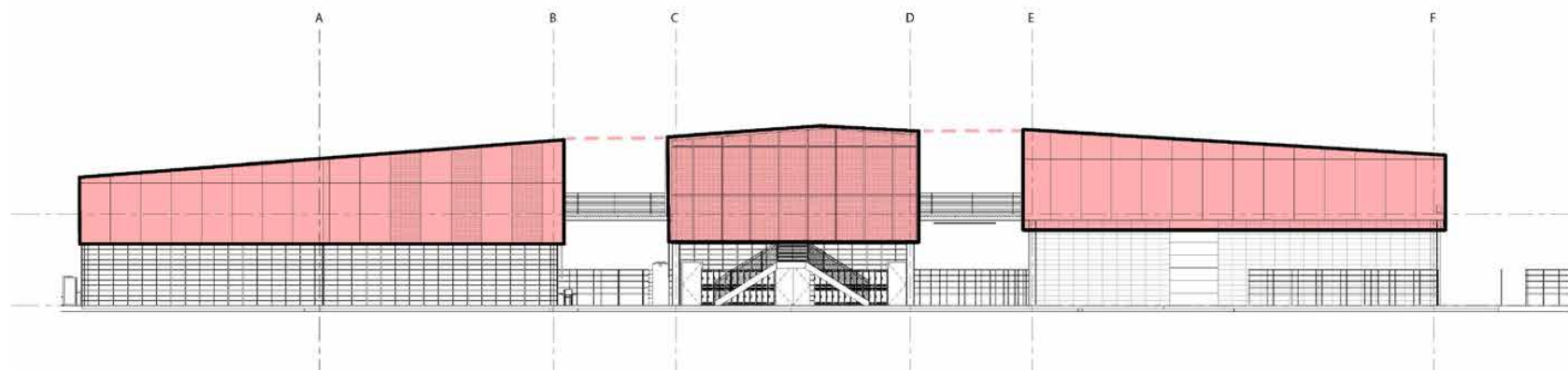


# CONCEPT | ORGANIZATION



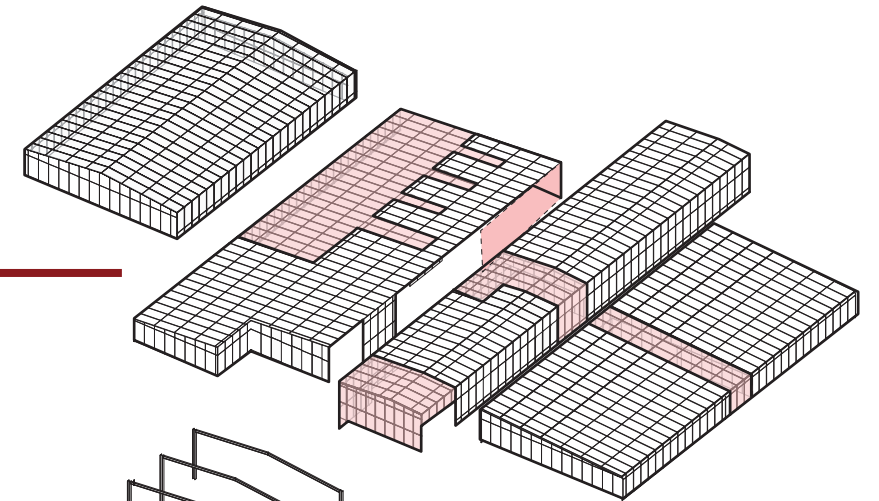
# CONCEPT | STRUCTURAL LOGIC

The portal frame is an efficient structural design capable of long spans with minimal material excess. Most commonly, these structures are seen in agricultural settings such as spanning open arenas, because they satisfy the functional needs of the space. Because of their minimal use of material and simple construction, they satisfy the economic constraints of the ranchers and farmers that erect them. These shared attributes between a structural system engineered for efficiency, and the functional and resilient nature of the agricultural industry, became a source of inspiration in the CTE facility design.

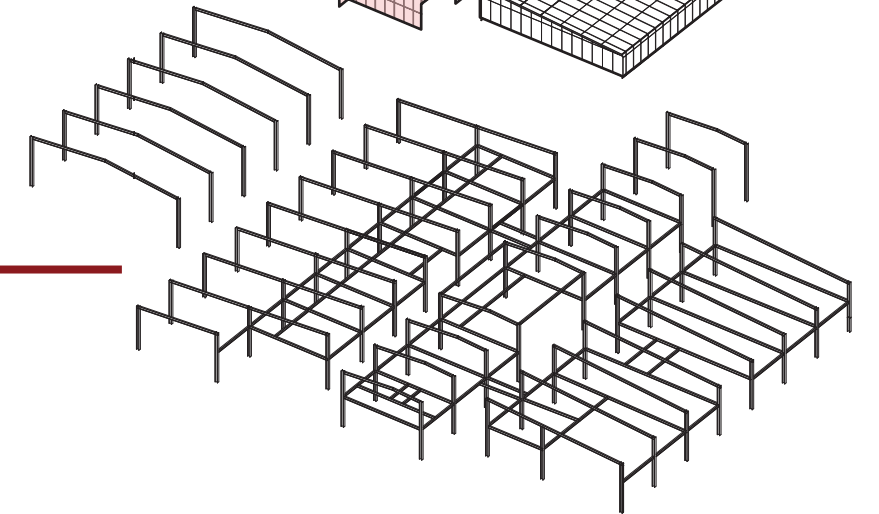


FACILITY ELEVATION

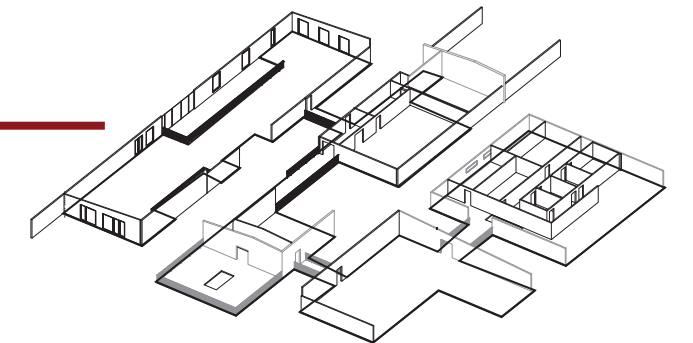
ROOF PANEL SYSTEM



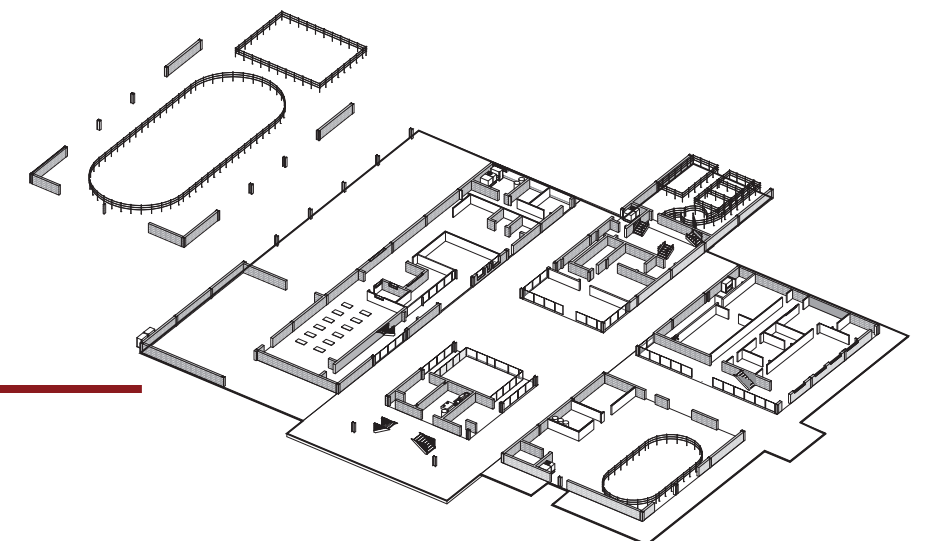
STEEL PORTAL FRAMING



LOAD BEARING WALLS

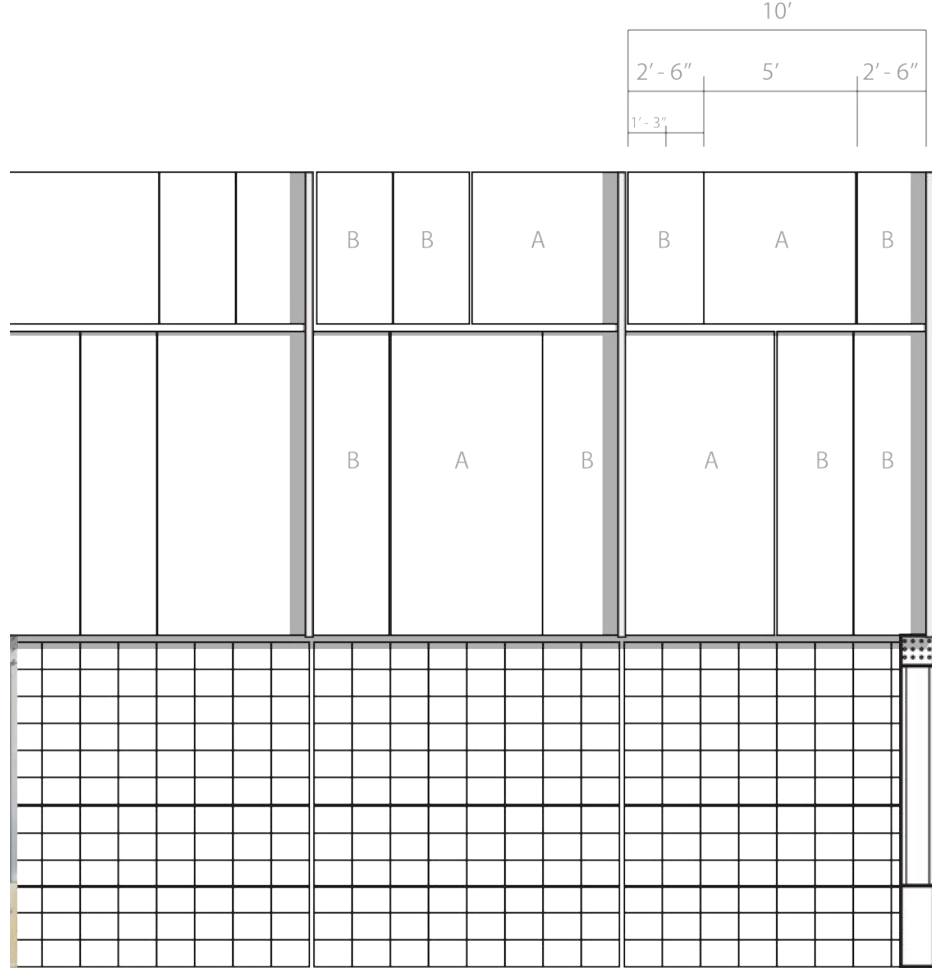
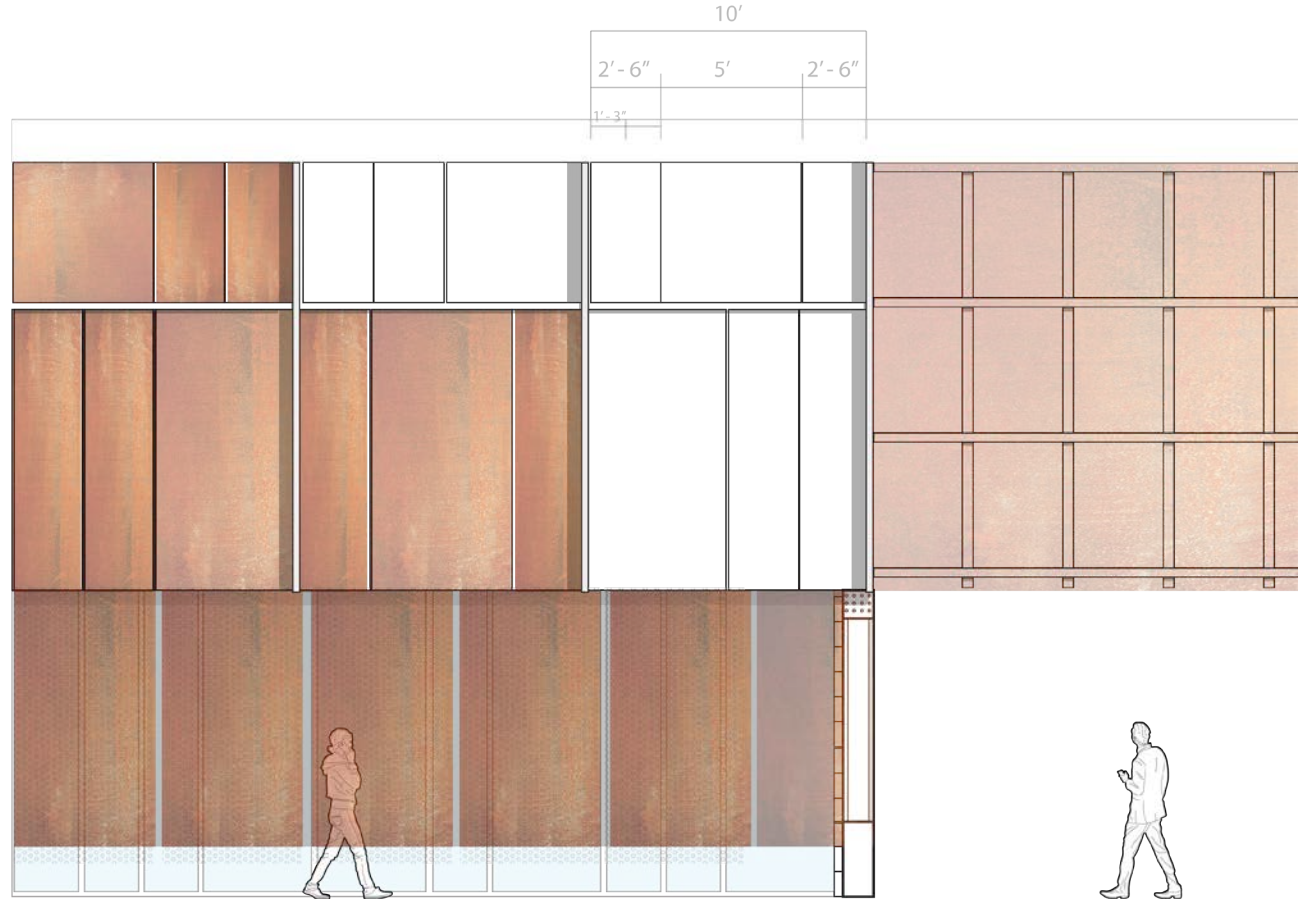
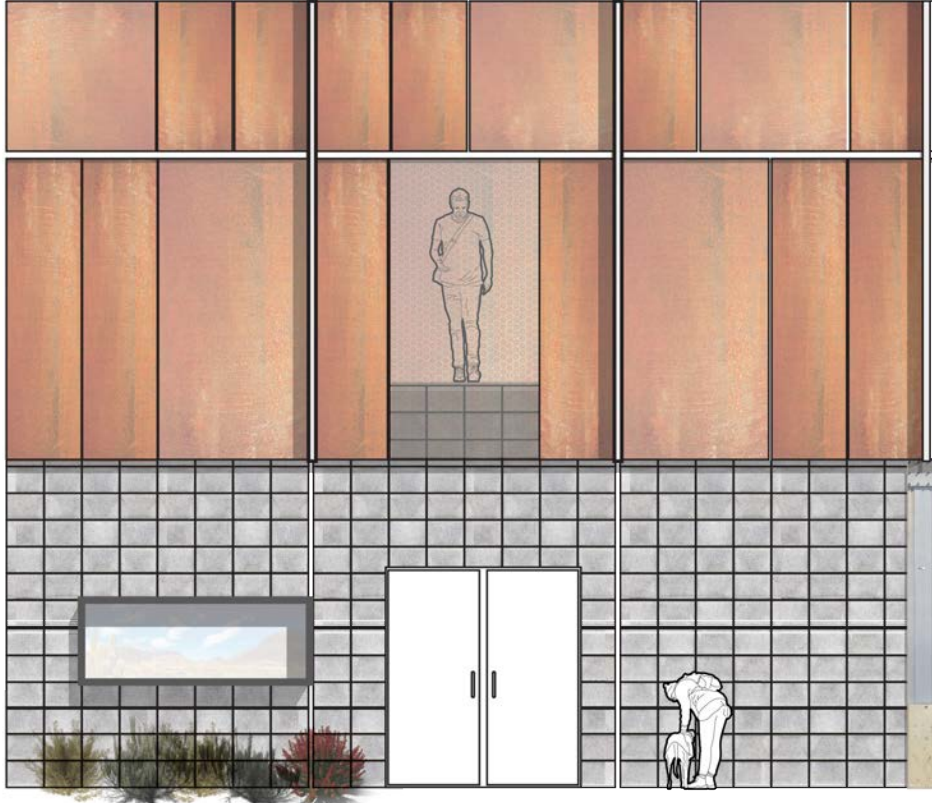


INTERIOR PARTITIONS + PEN PANELING



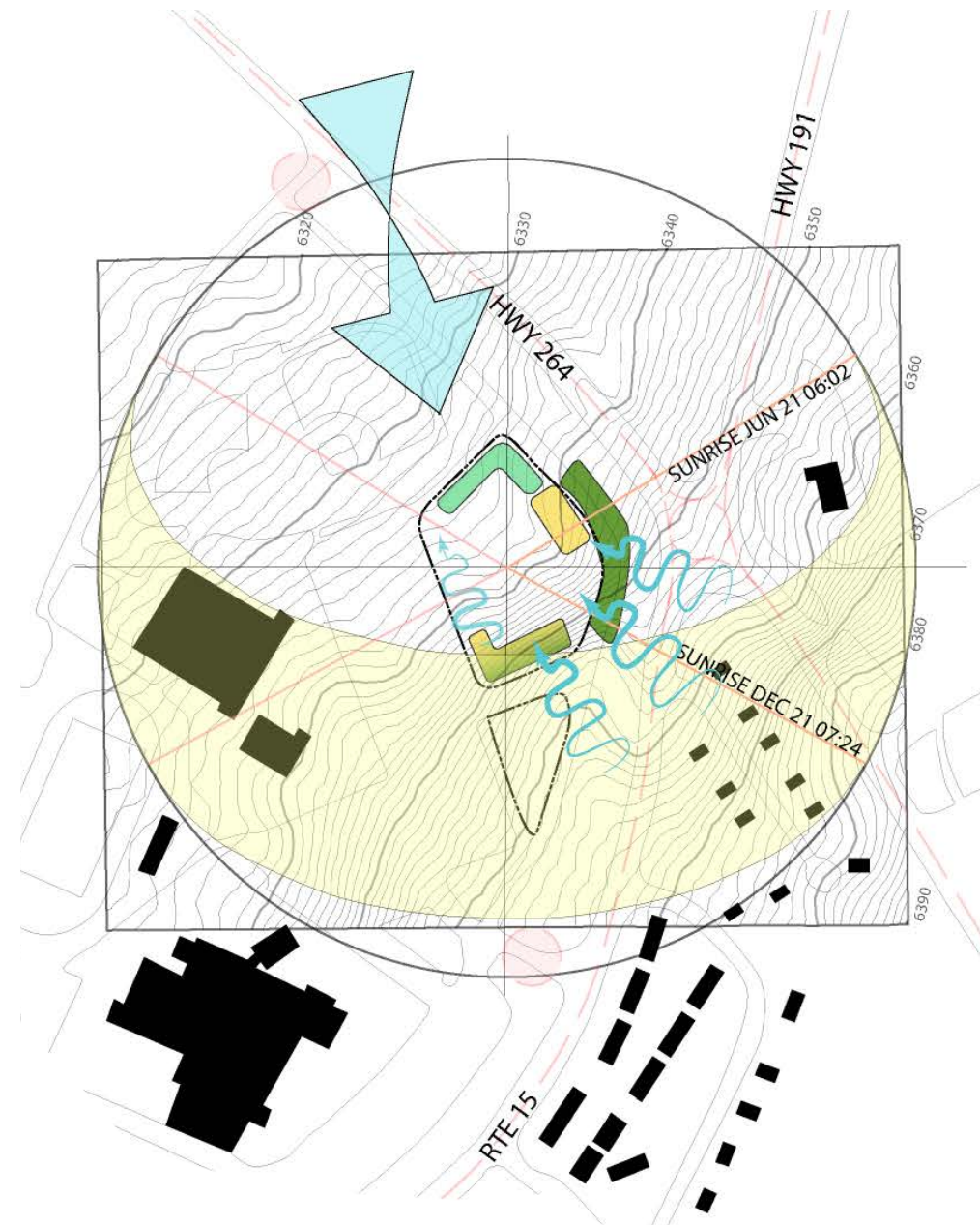
# CONCEPT | ELEVATIONS

Architecturally, the shifting becomes evident in the facade design. Like a canyon revealing its geological evolution in its walls, the facade maintains the trace of the 'shift' with offset panels and varied patinas. The facade also maintains enough presence to keep the original portal frame design reading as a single structure, and connect the building to the low-lying landscape beyond.

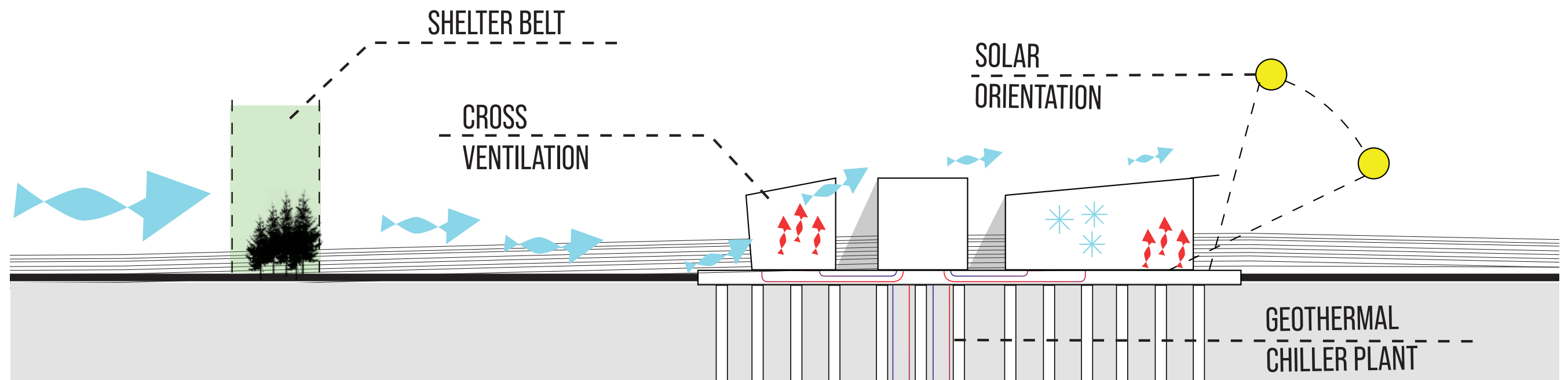


# PASSIVE STRATEGIES

This proposal hopes to utilize a site-wide passive strategy plan in order to create one cohesive working site. A shelter belt of vegetation to the northern edge of the site buffers the strong prevailing northern wind. The culinary arts building, primarily in a cooling condition, makes use of the controlled northern wind for cross ventilation to reduce cooling loads. The placement of the veterinary building to the south, with a solar collector in the floor, wall, or both, to reduce morning heating loads by the release of stored heat. To help maintain the soil integrity of the site, different local plant species would be placed to create a stronger more rootbound soil, such as cordgrass or sacaton. These areas could also be planted alongside species that help filter pollutants from entering groundwater supplies, such as wheatgrass or wild rose.



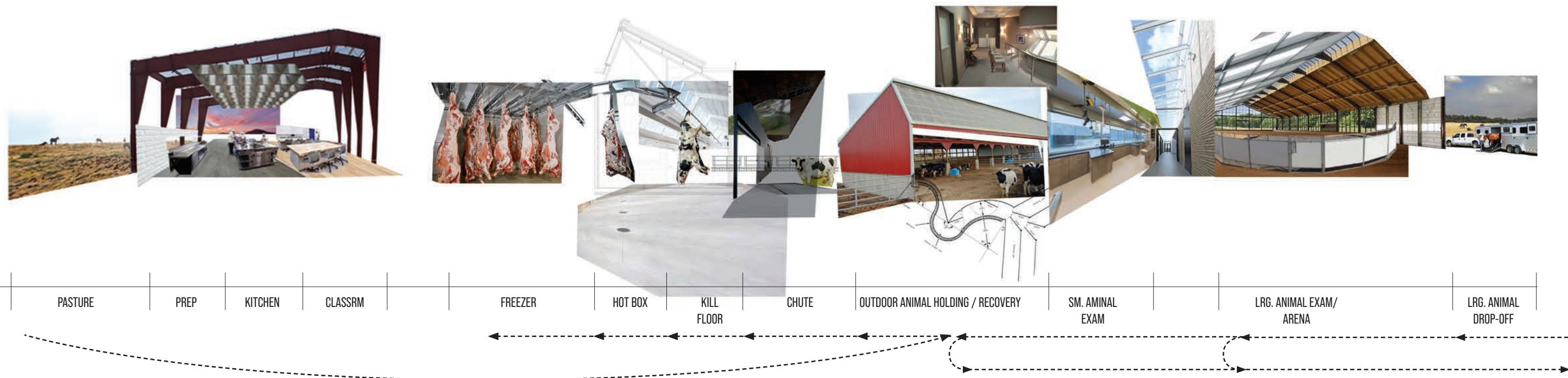
- SHELTERBELT**  
WIND BLOCKING FOLIAGE; MIX OF TREE + HARDY GRASS COLORADO PINON
- RANGE FOLIAGE**  
SMALL PREFERABLY EDIBLE SHRUBS + GRASSES  
CORDGRASS, COYOTE WILLOW, CLIFFROSE, DANDILIONS
- WATER MANAGEMENT FOLIAGE**  
GRASSES + SHRUBS THAT FILTER WATER + PREVENT EROSION  
CORDGRASS, WHEATGRASS, MUHLY, SACATON, WILD ROSE



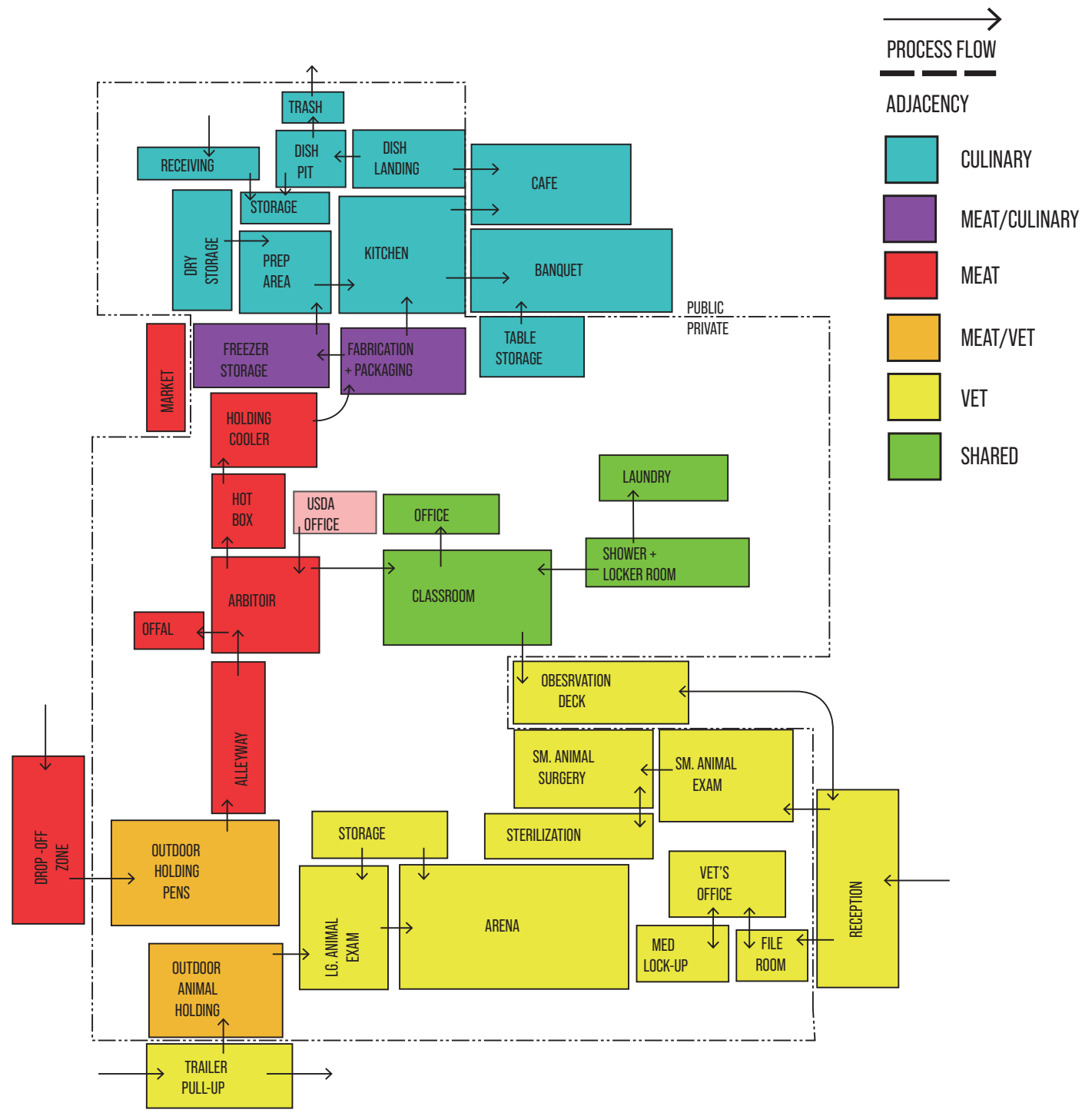


# SITE | ORGANIZATION

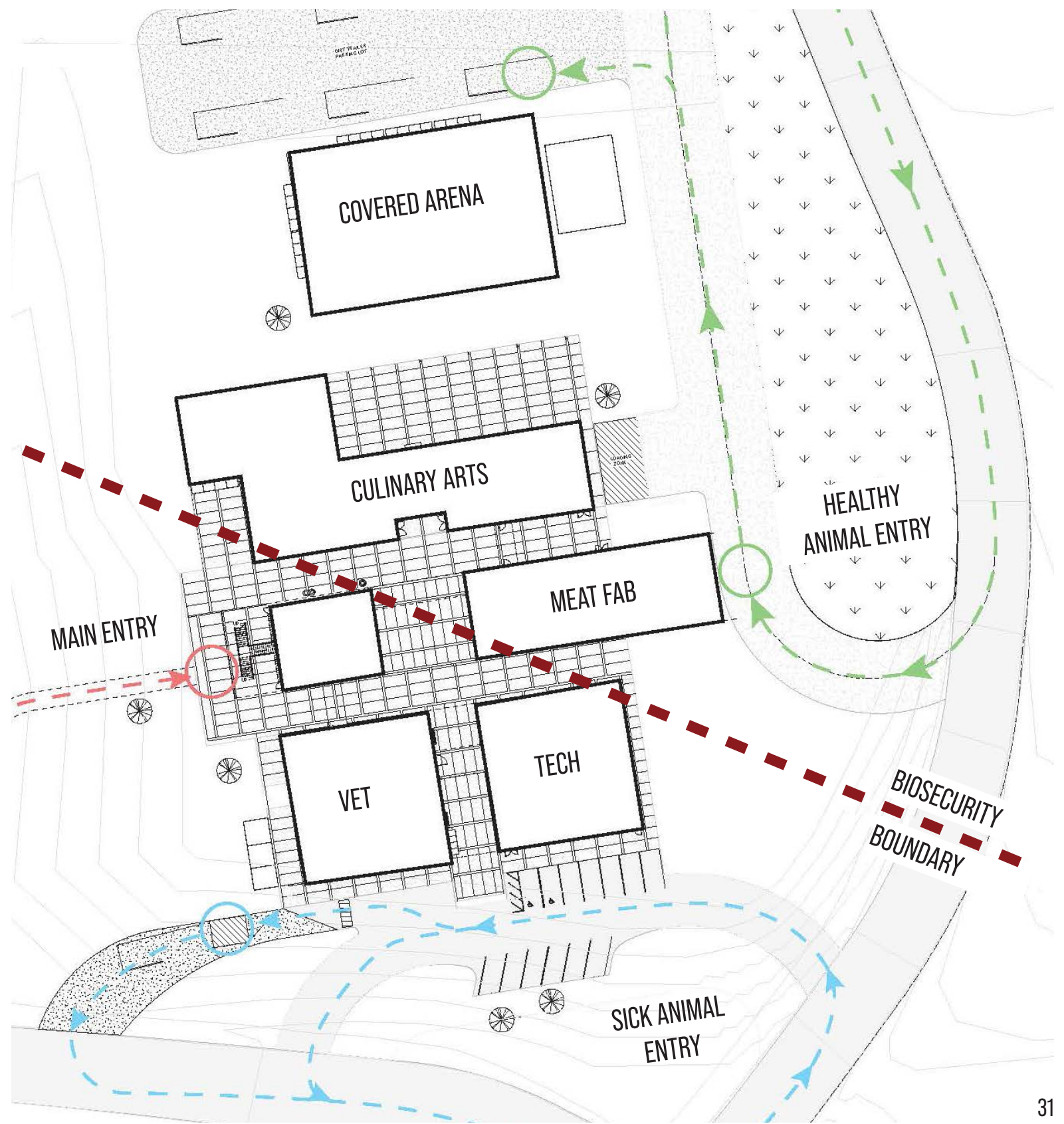
Through investigation of program and their necessary spaces it became apparent that all programs had overlapping requirements, from classrooms and offices to secure trash locations and locker rooms. An organizational method was employed to make the overall expansion as efficient as possible by locating these shared programmatic elements into a single building [or space] that would then link to each individual program. As much as possible the utility building should be thought of as an entry filter, gathering all students at the beginning of each period, preparing them for their classes, and then releasing them to their individual programs. This flow will help to reinforce student interaction, and therefore programmatic interaction.



# SITE | ORGANIZATION

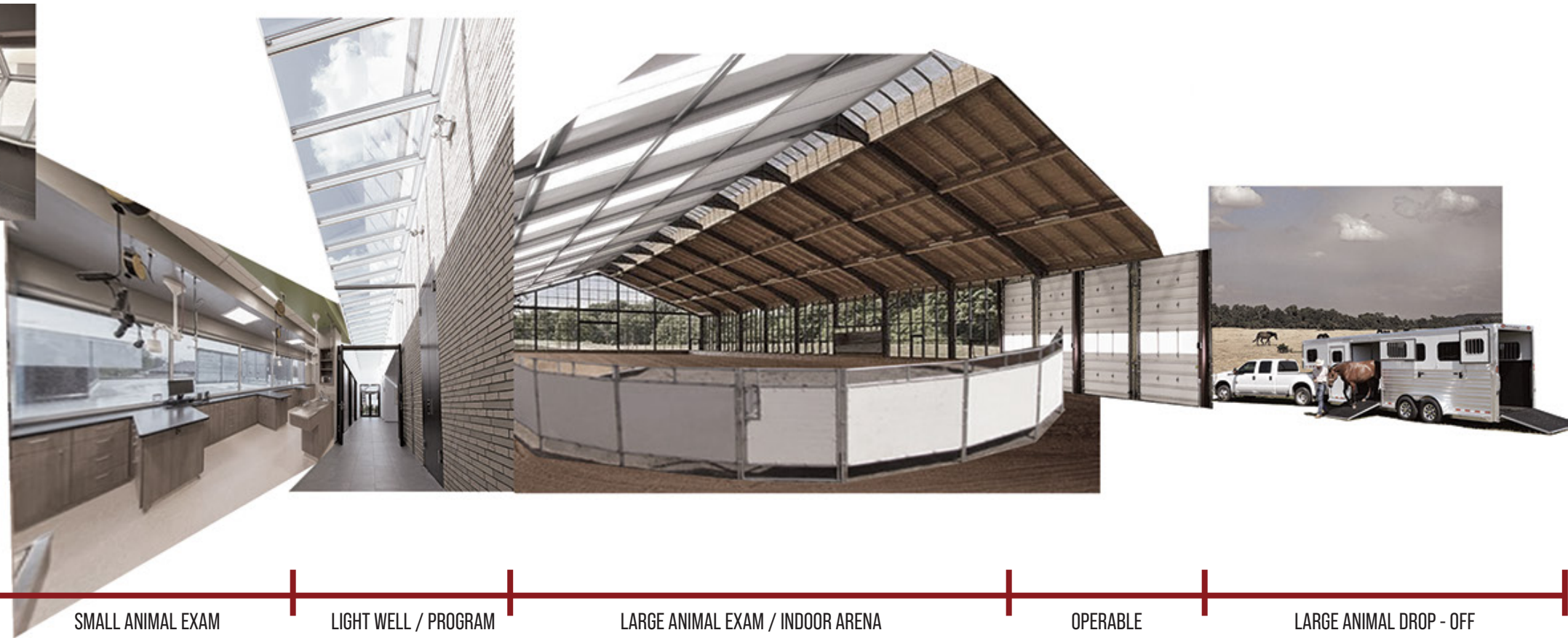
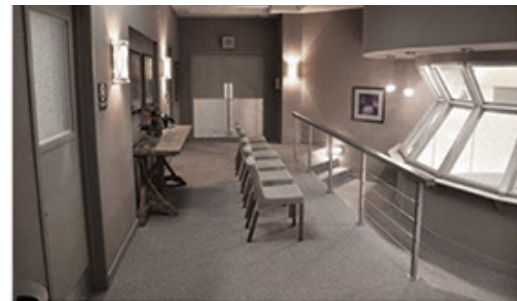
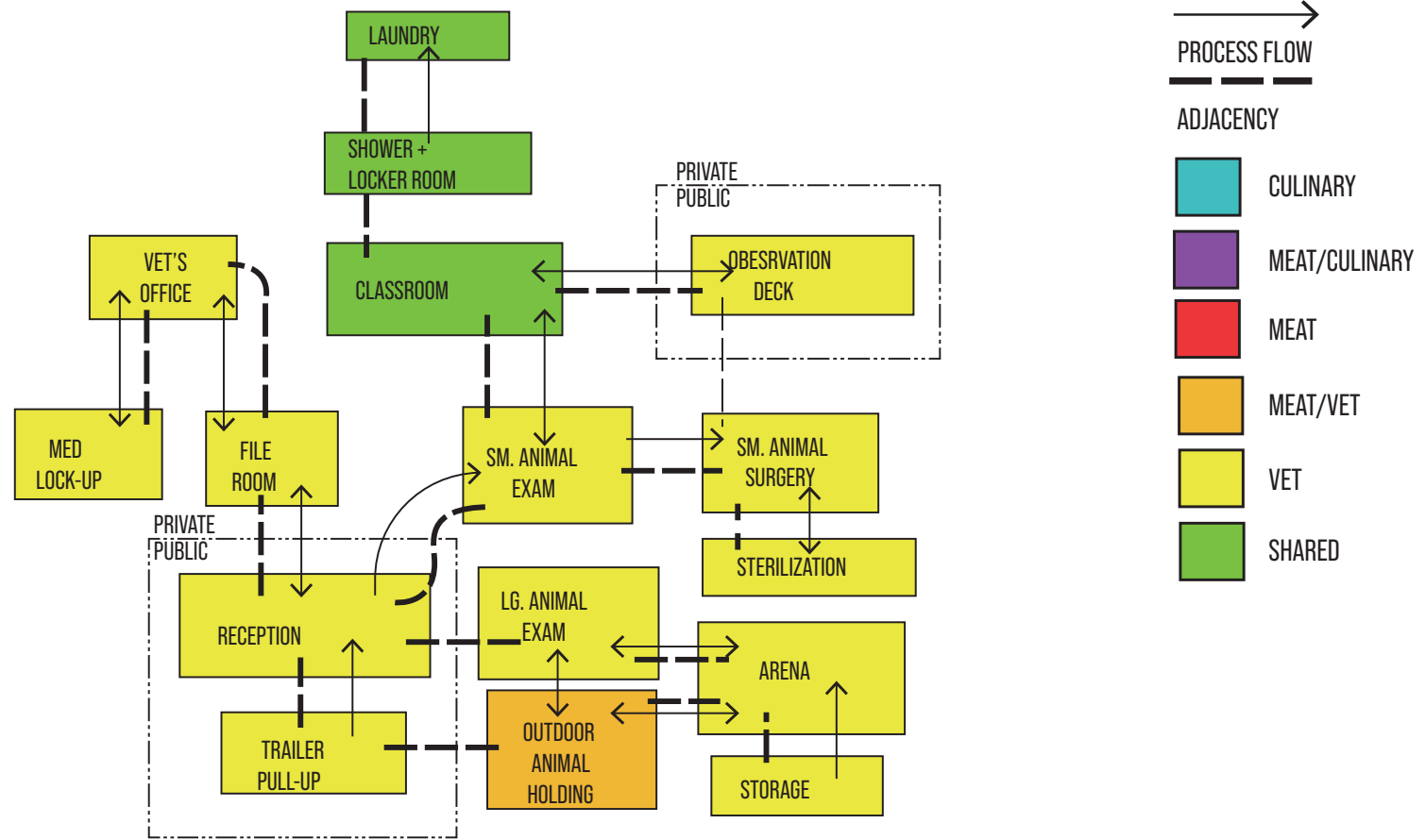


# SITE | PLAN



# VET TECH | ORGANIZATION

The key elements articulated in the concept collage are the programmatic split between the large and small animal exam areas and the large operable openings between the large animal exam / indoor arena and the large animal drop off. The split between the veterinary programs is to help ensure biosecurity between small and large animals, safety of clients and students, and conceptually reinforce the programmatic differences between the spaces via interior finishes and arrangements (e.g. The small animal facility will be finished similar to a vet clinic, while the large animal facility will be finished similar to a working barn).



SURGERY OBSERVATION

SMALL ANIMAL EXAM

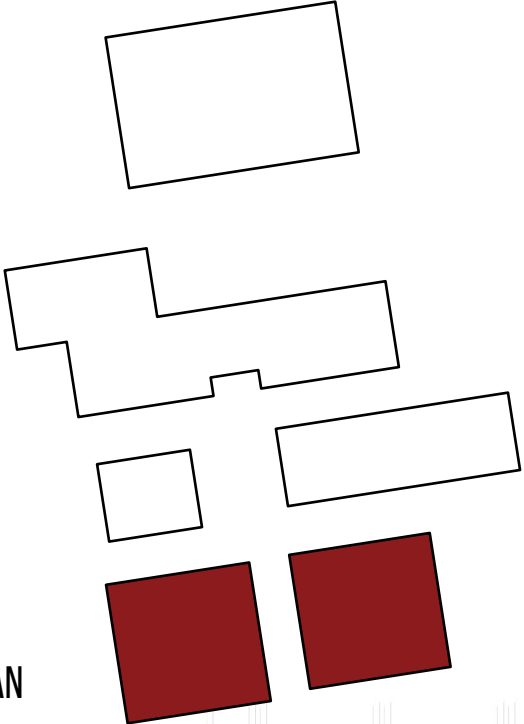
LIGHT WELL / PROGRAM SPLIT

LARGE ANIMAL EXAM / INDOOR ARENA

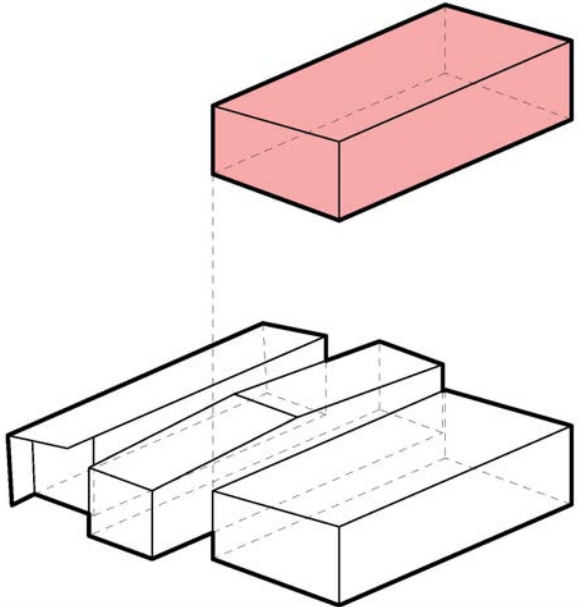
OPERABLE WALL/WINDOW

LARGE ANIMAL DROP - OFF

# VET TECH | PLAN + EXPERIENCE

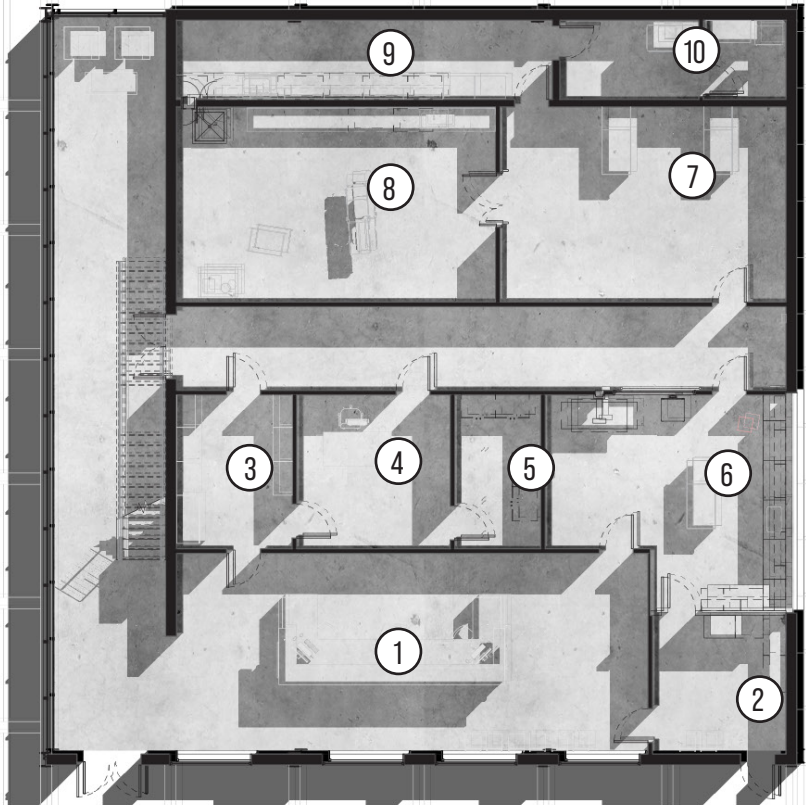


KEY PLAN



**KEY**

- 1. RECEPTION
- 2. BIOSECURE ENTRY
- 3. FILE ROOM
- 4. VET OFFICE
- 5. MED LOCK-UP
- 6. PRE-EXAM ROOM
- 7. EXAM ROOM
- 8. OPERATING ROOM
- 9. STERILIZATION ROOM
- 10. MECHANICAL
- 11. OUTDOOR ARENA
- 12. LARGE ANIMAL EXAM
- 13. STORAGE
- 14. TACK ROOM
- 15. WORKSHOP

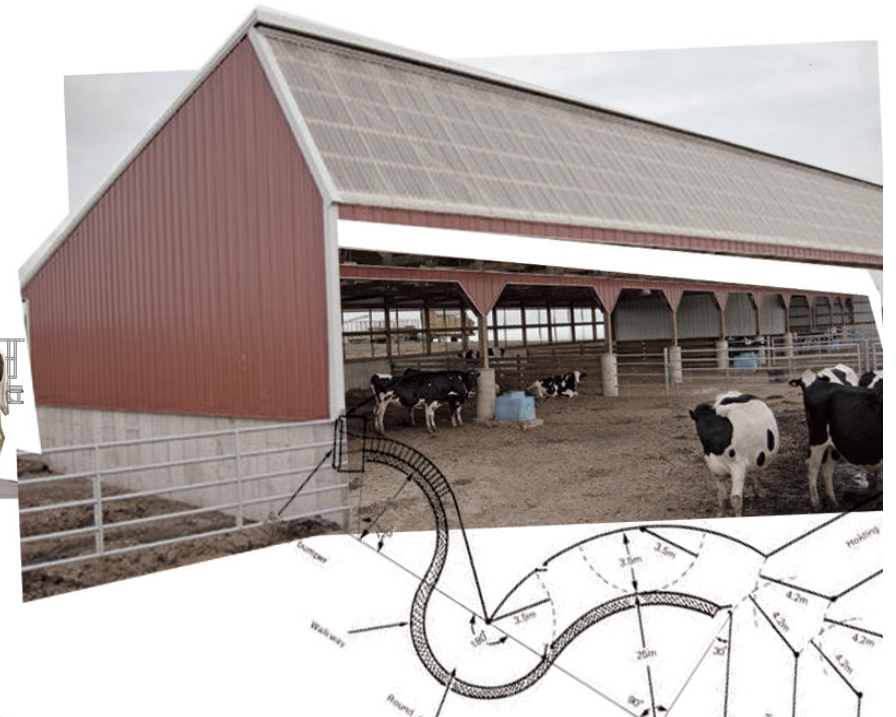
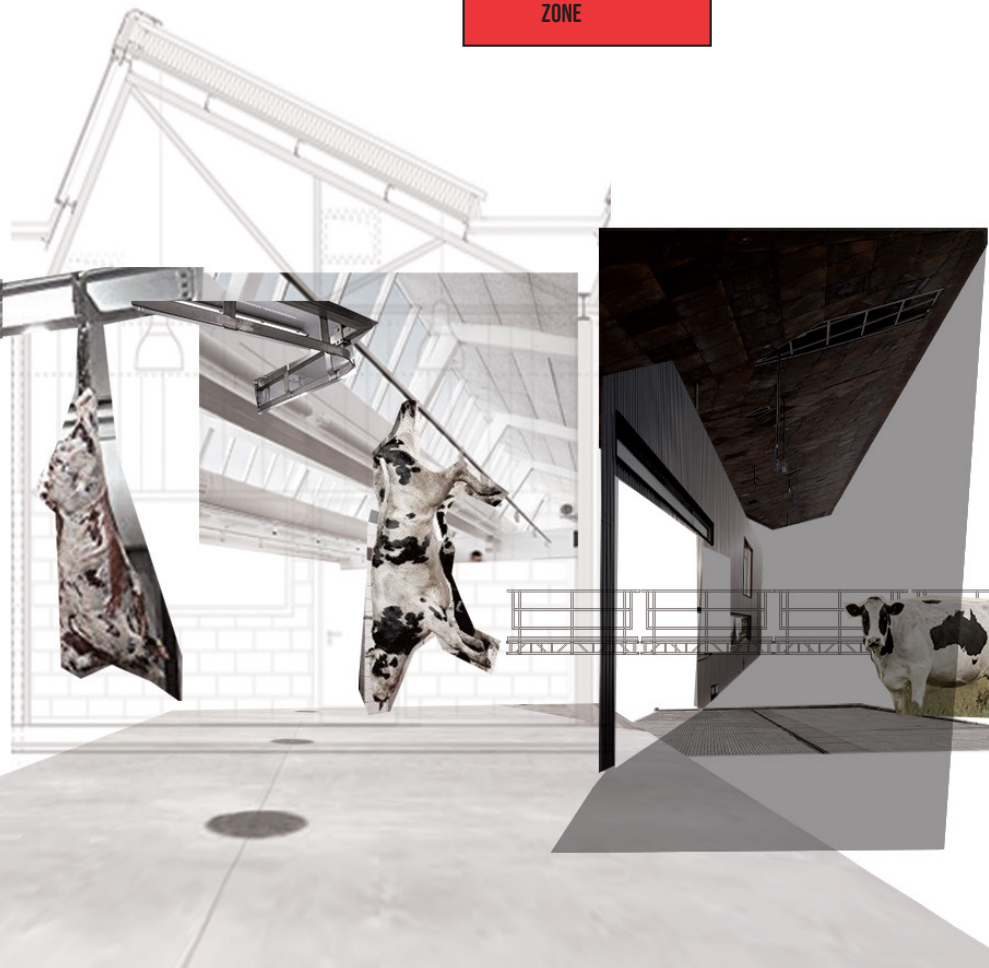
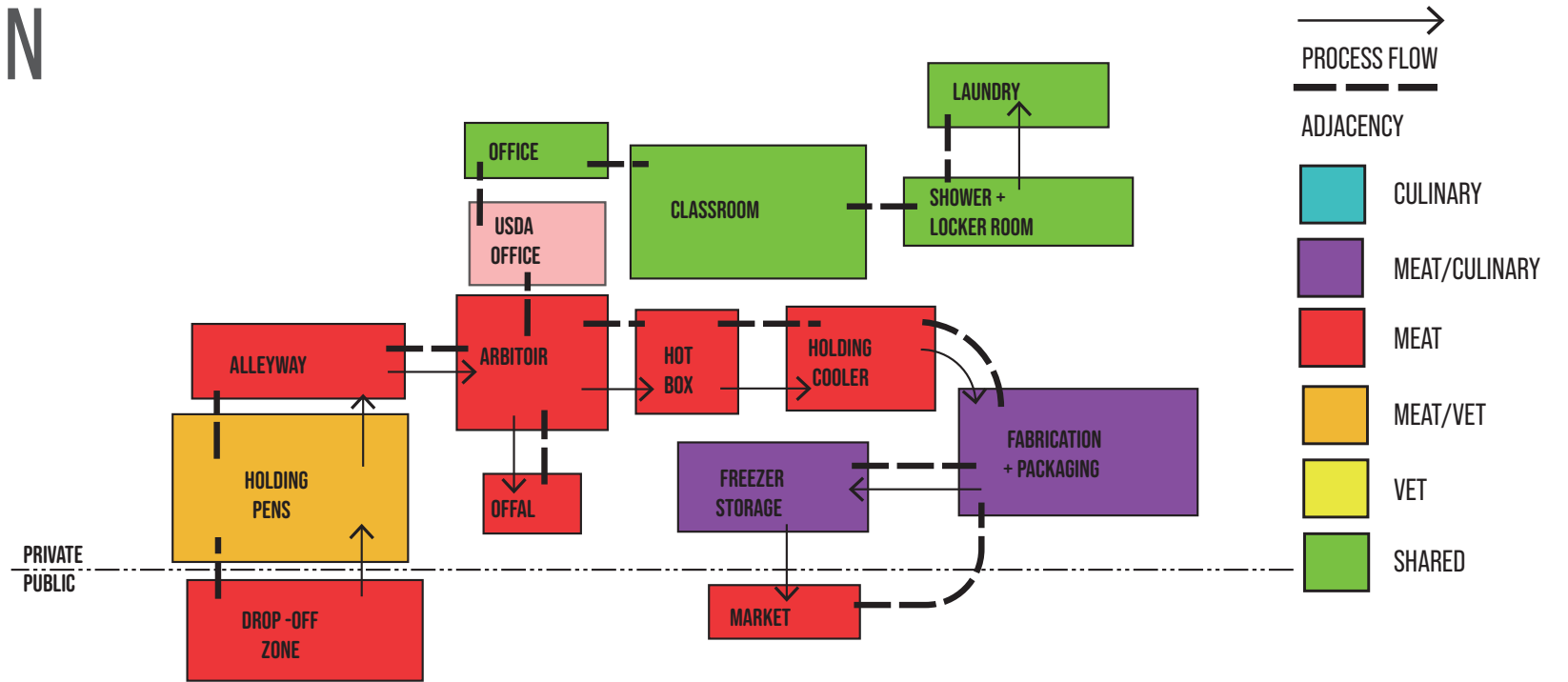


# VET TECH | OUTDOOR ARENA RENDERING



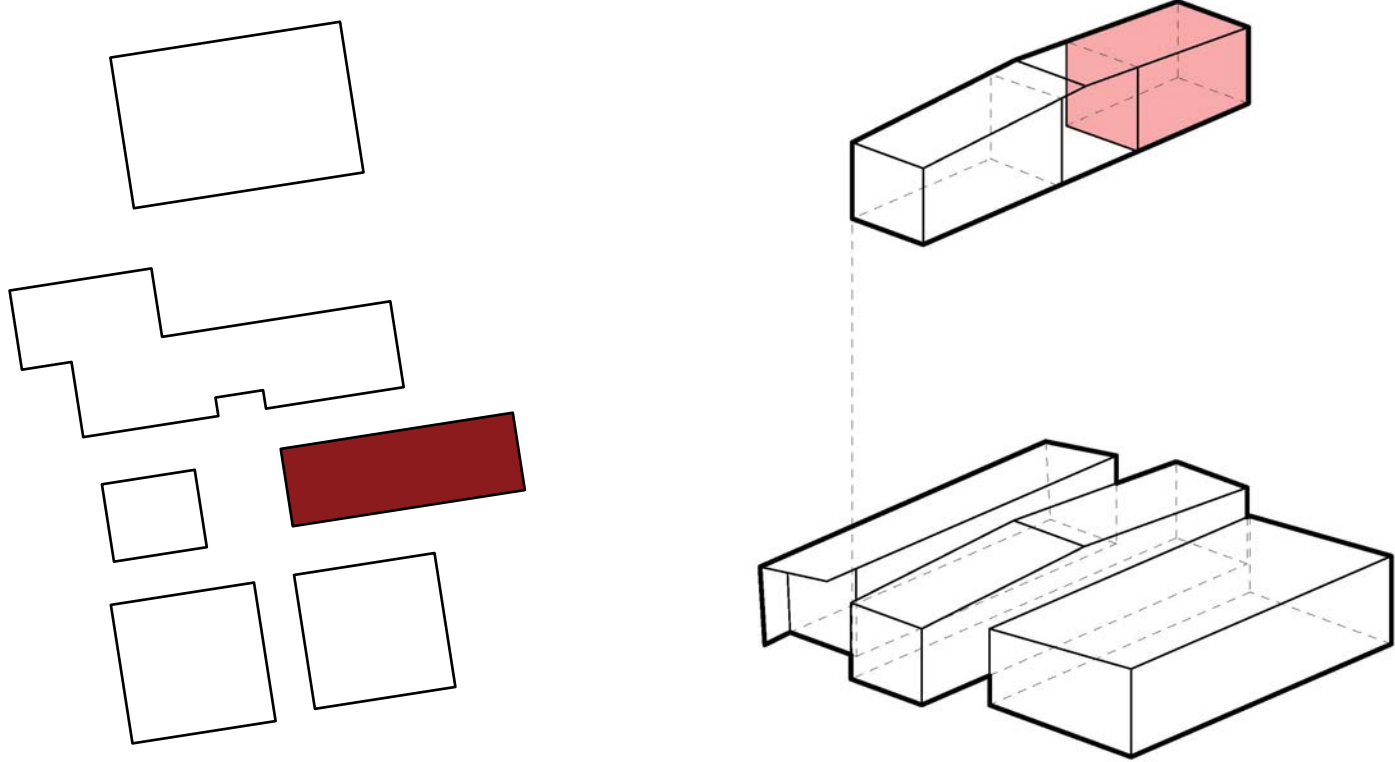
# MEAT FABRICATION | ORGANIZATION

Key components of the conceptual collage were the influences of Temple Grandon, both in the organization and flow of unloading and transporting livestock from trailers or pens. Temple Grandon's influence can also be seen in the intentional shading of the processing chutes, and the arboitir flooded with natural light. This relationship of quality of light, moving from dark to light creates a natural desire for animals to flow in that direction, creating the most humane animal harvesting process possible.



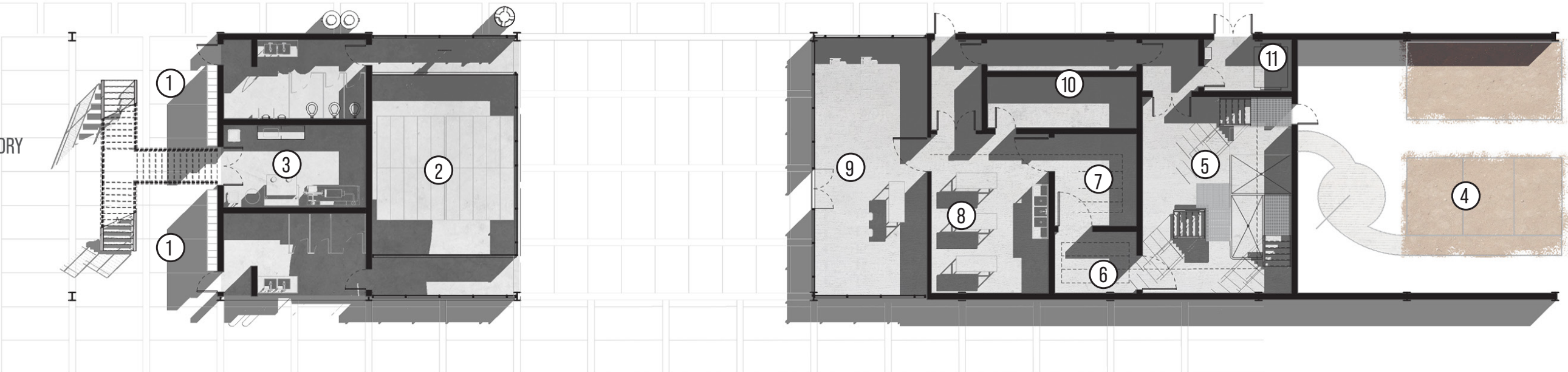
# MEAT FABRICATION | PLAN + EXPERIENCE

KEY PLAN



**KEY**

- 1. LOCKER ROOM
- 2. COMMUNITY ROOM
- 3. MECHANICAL / LAUNDRY
- 4. HOLDING PENS
- 5. ARBITOIR
- 6. STORAGE FREEZER
- 7. AGING FREEZER
- 8. HARVESTING ROOM
- 9. CLASSROOM
- 10. STORAGE FREEZER
- 11. OFFAL



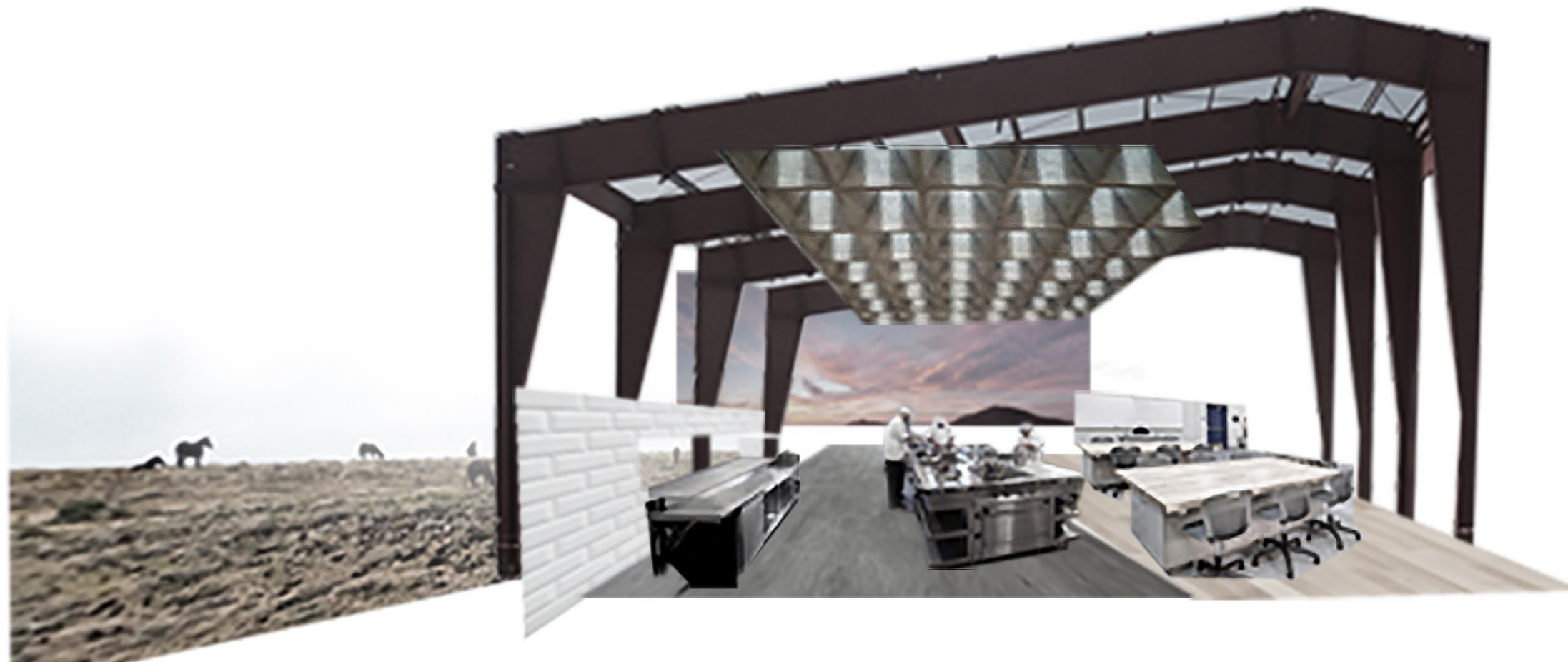
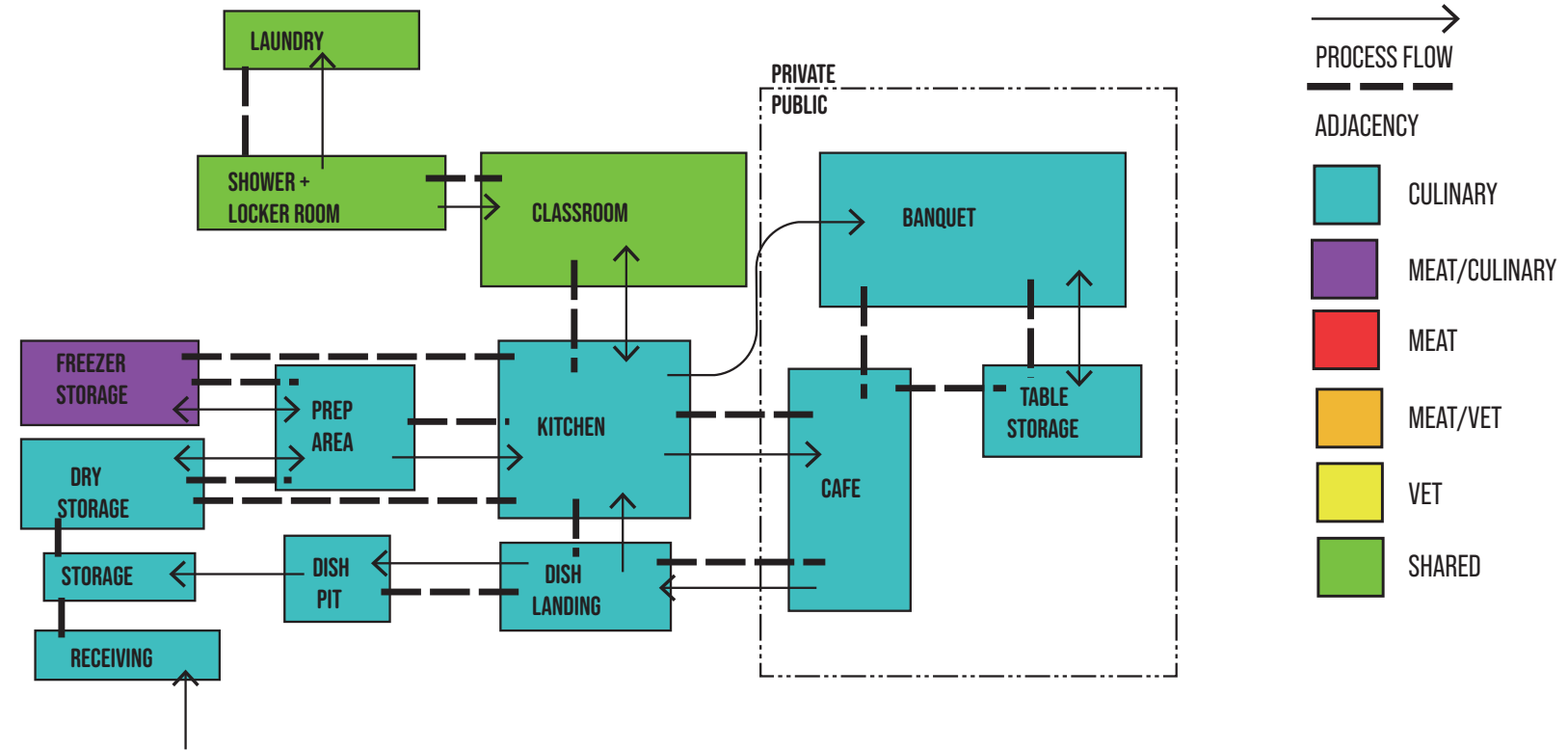
# MEAT FABRICATION | EXTERIOR LINKAGE RENDERING





# CULINARY | ORGANIZATION

Conceptually, the organization of the culinary arts facility was around the flow and use of heat. Taking advantage of the large internal loads and excess heat produced allowed for the interior heating needs for the building to be offset during the cold months. The kitchen was located so that it could serve both the banquet and the cafe which extends out into a large outdoor seating area for eating and gathering.



PASTURE

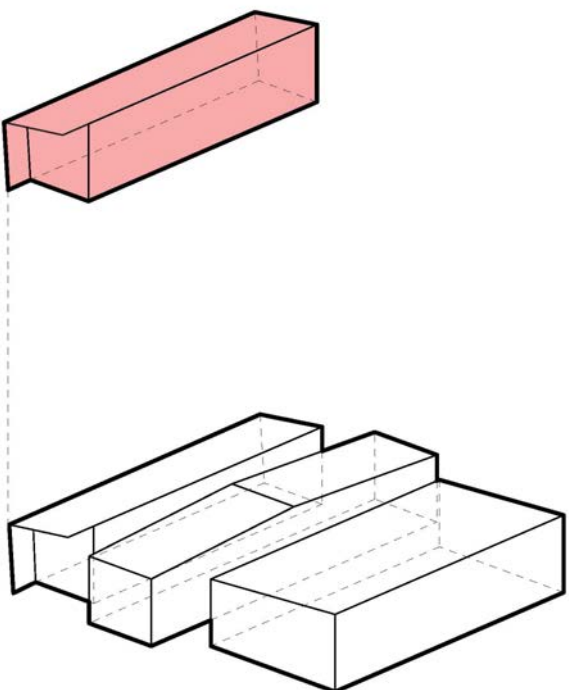
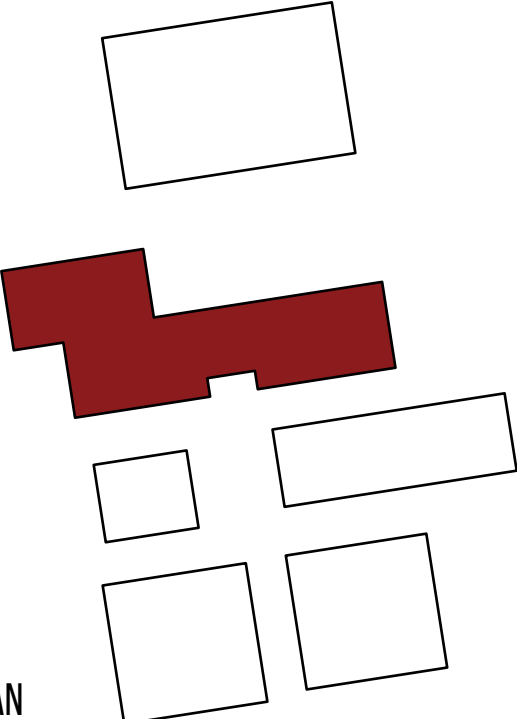
PREP

KITCHEN

CLASSROOM

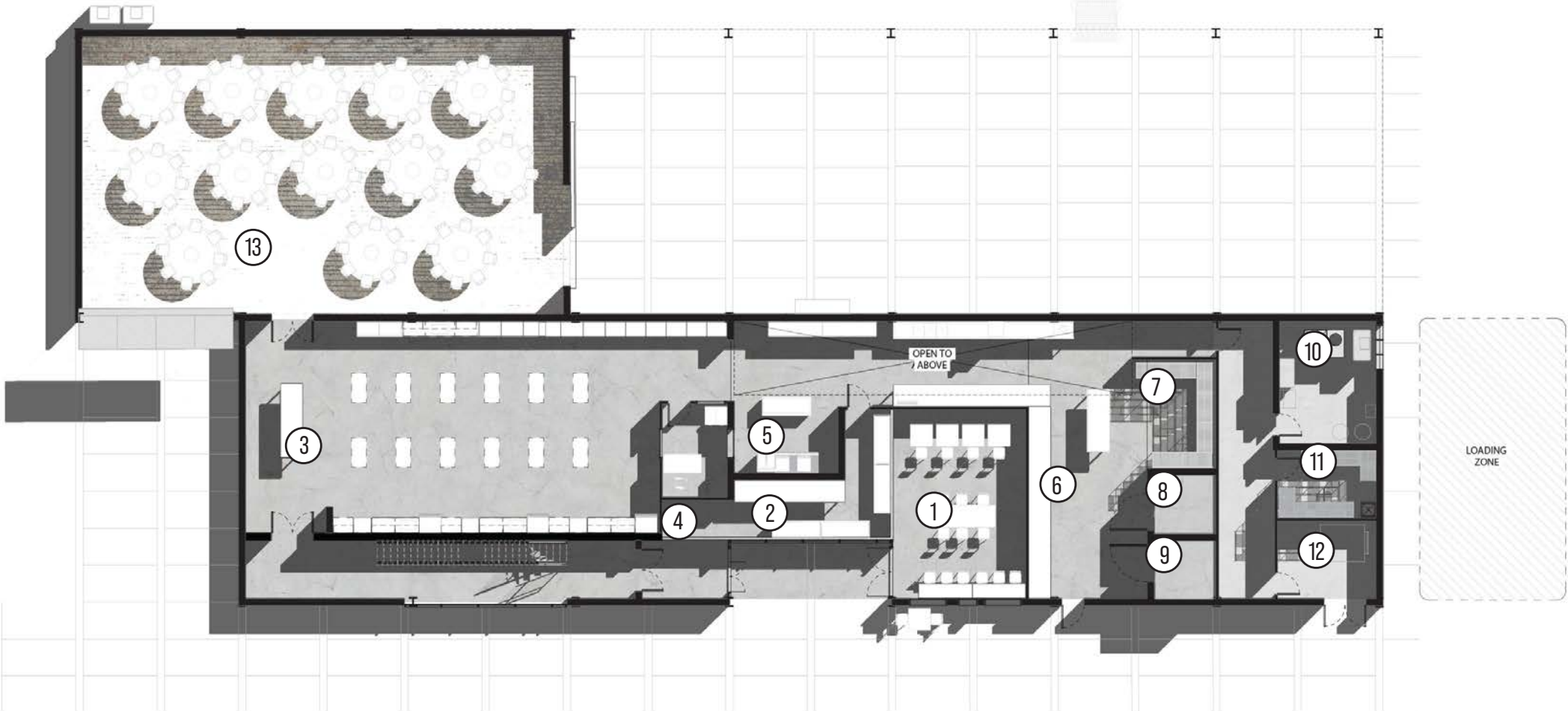
# CULINARY | PLAN + EXPERIENCE

KEY PLAN



**KEY**

- 1. CAFE
- 2. WORKING KITCHEN
- 3. TEACHING KITCHEN
- 4. OFFICE
- 5. CONCESSIONS
- 6. PREP AREA
- 7. PANTRY
- 8. REFRIGERATOR
- 9. FREEZER
- 10. MECHANICAL
- 11. STORAGE
- 12. TRASH
- 13. BANQUET



# CULINARY | CONCESSIONS RENDERING



# FACILITY | ENTRY RENDERING + SECTION





The CTE facility will serve as a hub or central point for the Ganado community. The skill development, resources and entrepreneurial opportunities it provides will radiate into the community. At the core of this facility is the arena, which symbolizes animals and their importance to the Diné culture. Animals represent the ever-present connection of the people to the land, as well as a major economic opportunity. The form of the CTE buildings reflects this by creating a rotational circulation pattern focused on the arena.



# GOALS + OBJECTIVES

## ANIMAL HUSBANDRY

“Livestock ownership and agriculture are timeless symbols of resourcefulness, prosperity and social status. Central to Diné philosophy of Nizhonigo ‘lina (beauty way of life). The adherence to this philosophy, identity and cultural uniqueness is maintained among the Diné people, and is recognized as the core foundation of our sovereignty.”

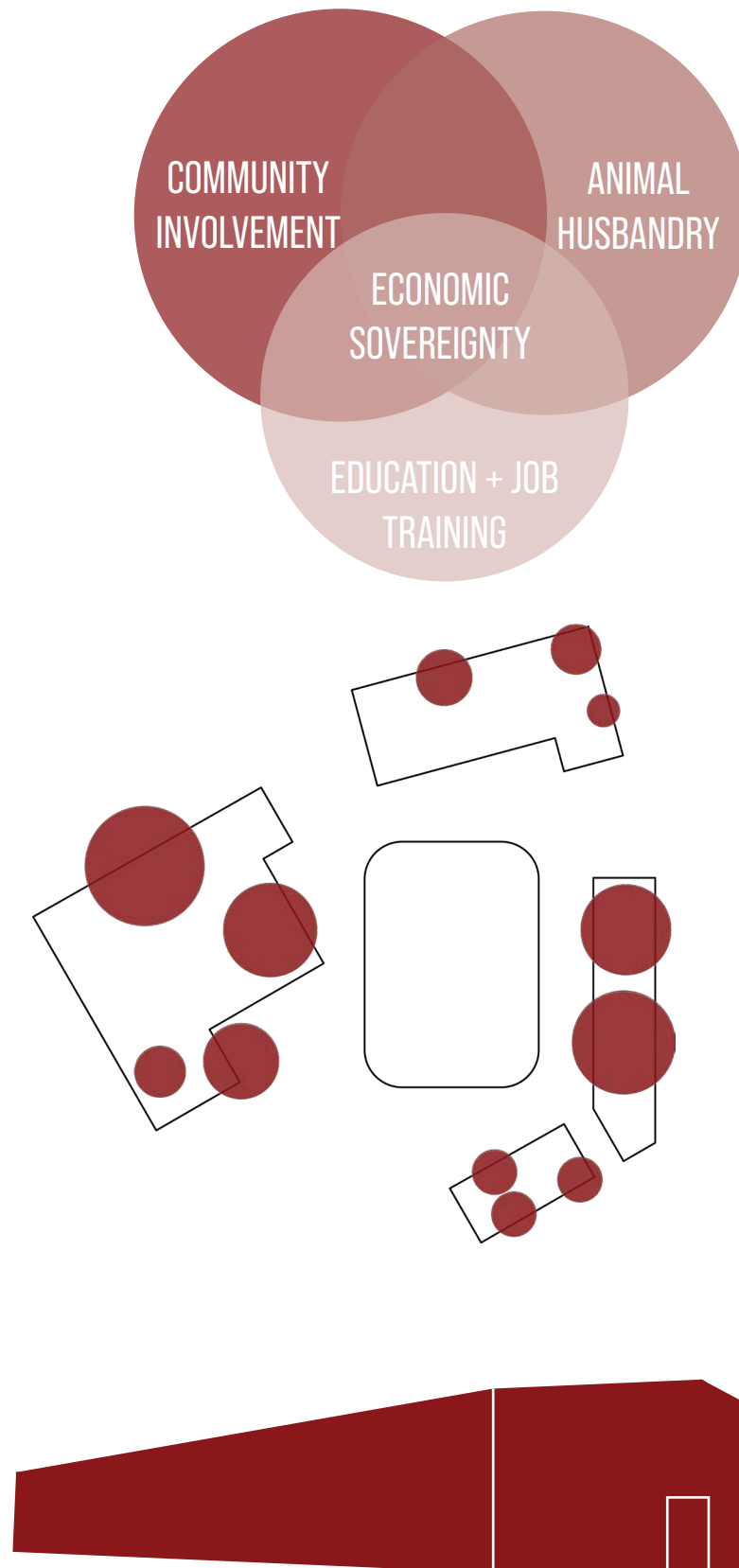
-Navajo Nation Department of Agriculture

## PUBLIC ENGAGEMENT

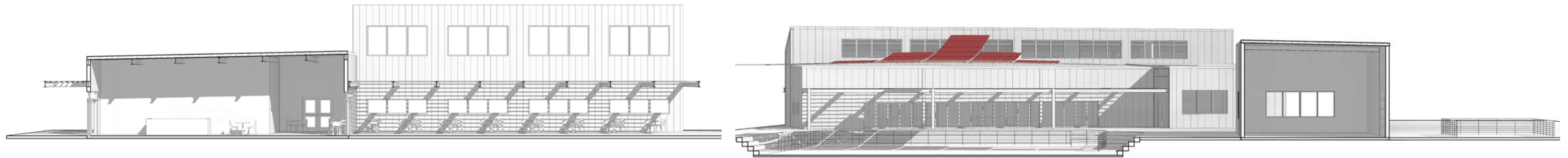
Another key element in the effort to create economic sovereignty is buy-in and participation from the Ganado community. The services provided by the school benefit the public and in return, the public contributes to the school. This proposal seeks to prioritize those areas within the site that facilitate public engagement by providing clear and direct access points.

## RESPOND TO PLACE

The building typologies present in the region, namely pre fabricated warehouses, were used as inspiration for design of this facility. These typologies were altered in order to demonstrate better environmental performance and were elevated by way of material selection and site organization.



# SITE | SECTION PERSPECTIVE + COLLAGE



CULINARY BUILDING

OUTDOOR CAFE

CENTRAL ARENA + MEAT FABRICATION BEYOND

VET TECH BUILDING

ANIMAL PENS

SECTION PERSPECTIVE



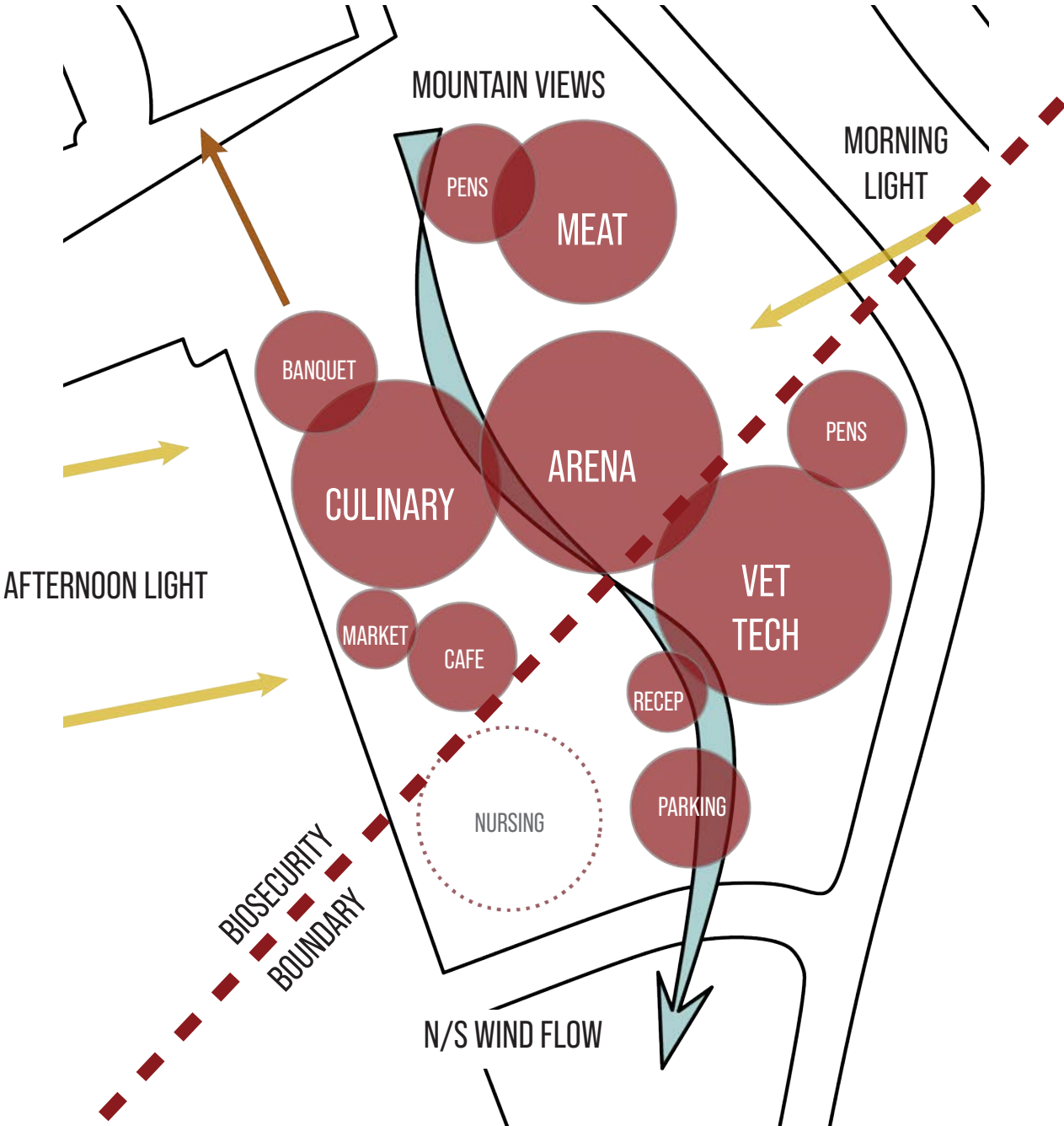
CULINARY BUILDING

OUTDOOR CAFE

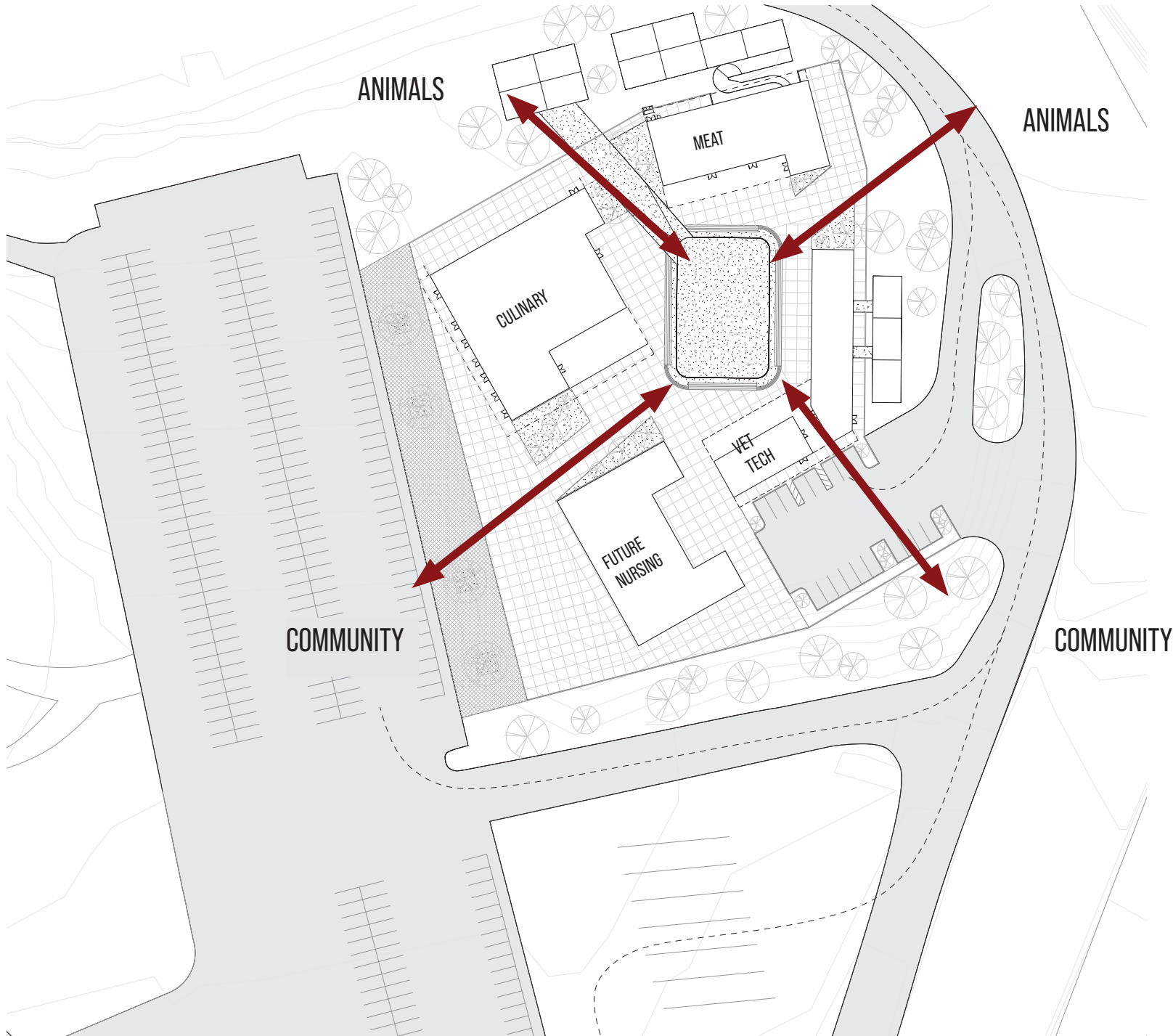
CENTRAL ARENA + MEAT FABRICATION BEYOND

SITE COLLAGE

# SITE | ORGANIZATION



# SITE | PLAN

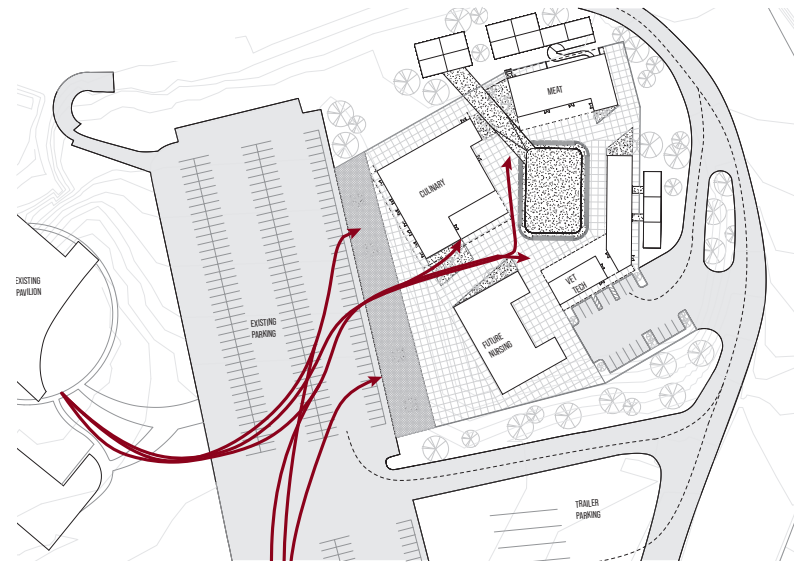




# SITE | ACCESS

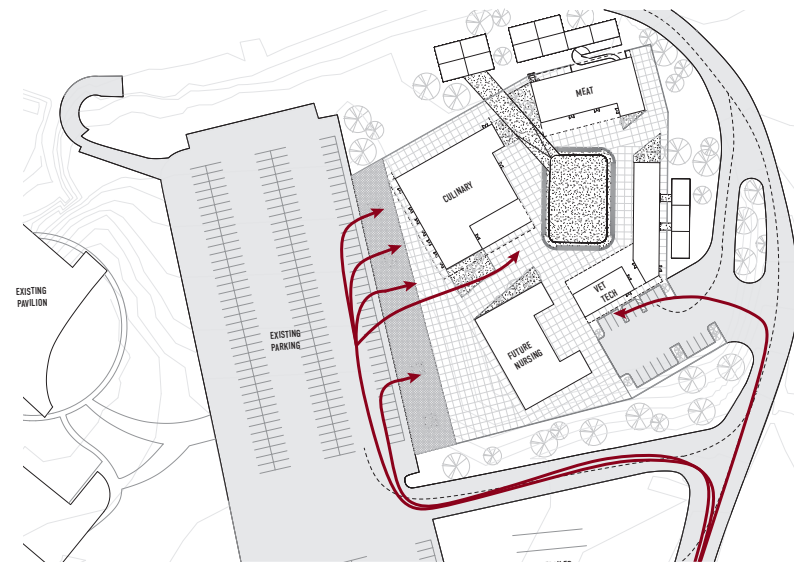
## STUDENT ACCESS

The majority of student traffic will be coming from either the existing campus or parking lot along the west or the main school entrance located south of the site. From the main western facility entrance, students can circulate around the outdoor arena in order to get to their respective CTE building.



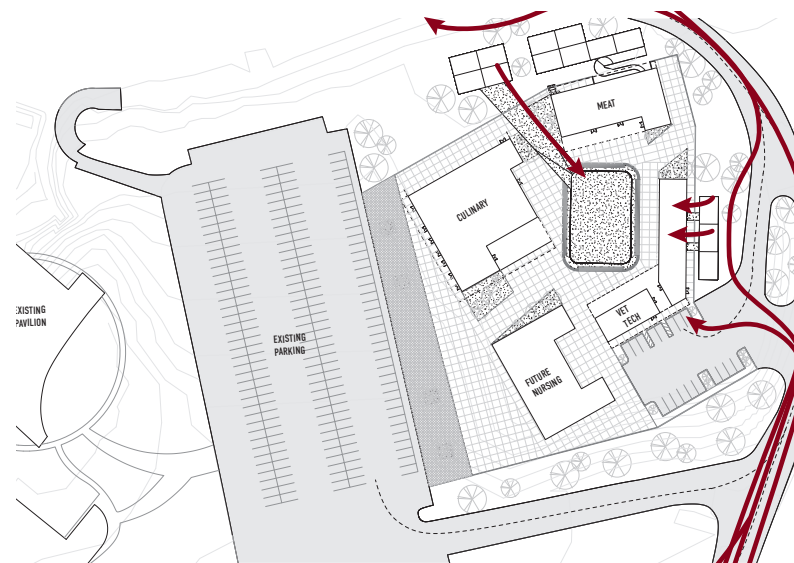
## PUBLIC ACCESS

The existing parking lot and additional parking lot along the southeast side of the vet tech building serve as the main access points for the public. Quick access to the cafe, meat market and banquet space are provided on the west, while direct access to the vet reception area is provided on the southeast.



## ANIMAL ACCESS

It is important that sick and healthy animals be separated for biosecurity reasons. Because of this, all healthy animal holding areas are located on the north side of the site while the sick animals are housed on the east.



# PRECEDENT

The prefabricated warehouse typology was apparent on the Navajo Nation from the CTE facilities we visited, to a general observation of buildings in the landscape. This is primarily due to the remote location of the reservation along with the low cost, low maintenance nature of their construction. These structures are easily modified to accommodate a range of programmatic needs and can grow over time. This proposal seeks to elevate this typology through choice of materials, siting and detailing for better thermal performance.



PRE FABRICATED WAREHOUSE



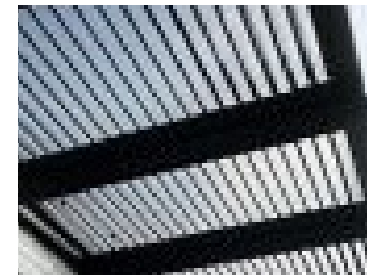
MONUMENT VALLEY AGRI SCIENCE



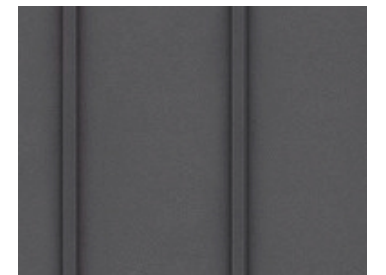
CHINLE CTE BUILDING



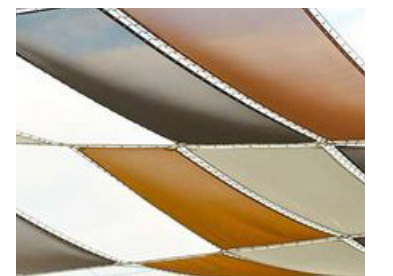
DARK GRAY STRUCTURAL STEEL FRAME



STEEL PIPE AND BEAM PAINTED BLACK



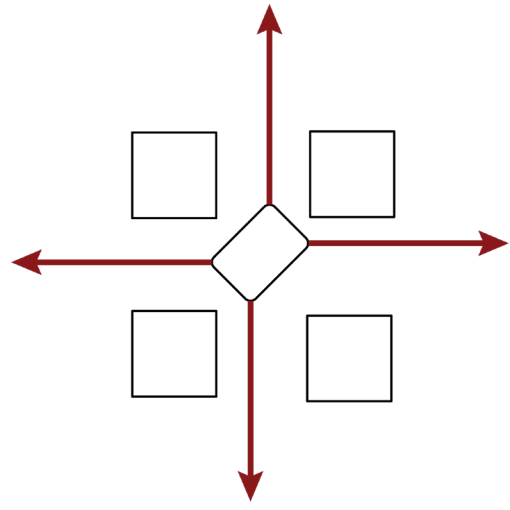
GRAY STANDING SEAM METAL CLADDING



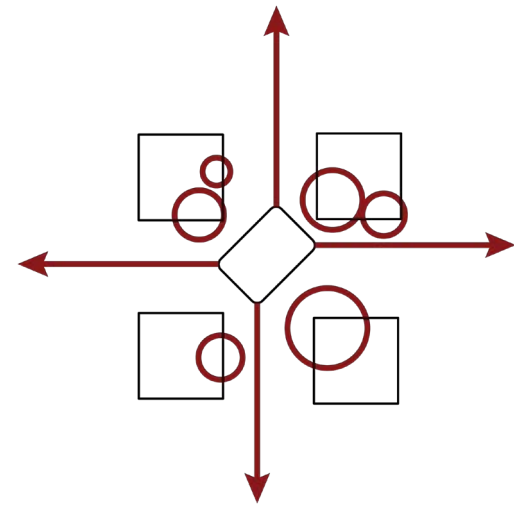
UV FABRIC PANELS + CABLE STRUCTURE

PROJECT MATERIALS

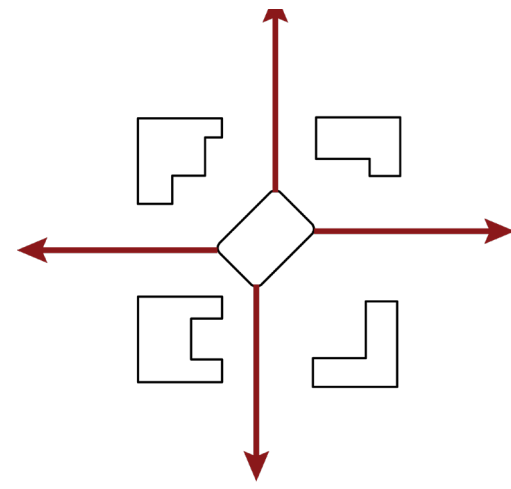
# CONCEPT



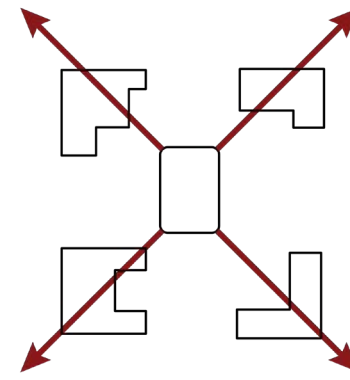
4 BUILDINGS CENTERED ON ARENA



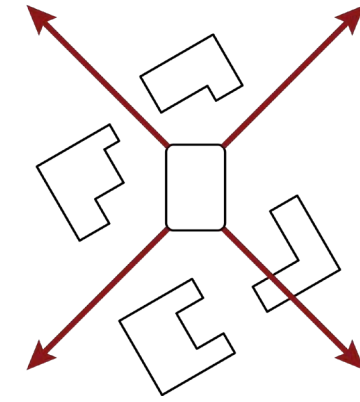
AREAS IDENTIFIED FOR SEATING + GATHERING



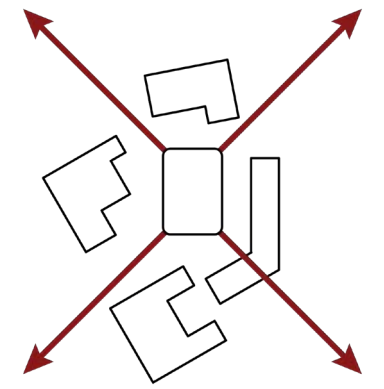
GATHERING AREAS SUBTRACTED



ARENA + VECTORS ROTATED



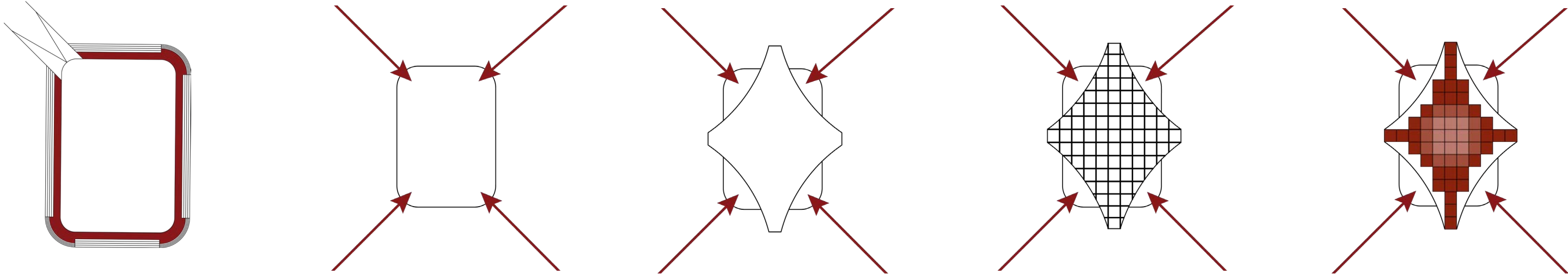
BUILDINGS ROTATED + ADJUSTED TO CIRCULATE ARENA



VET BUILDING EXTENDED

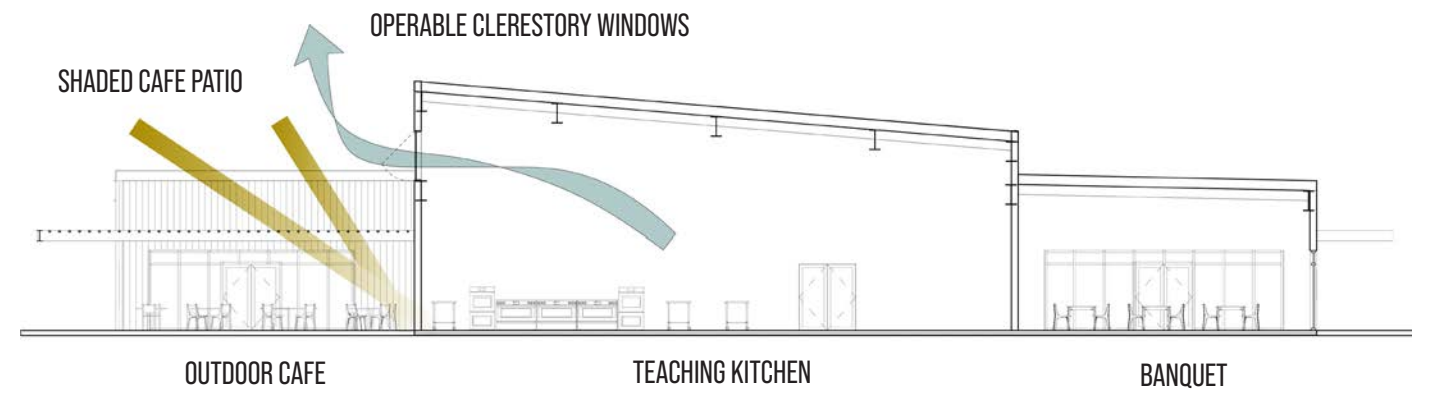
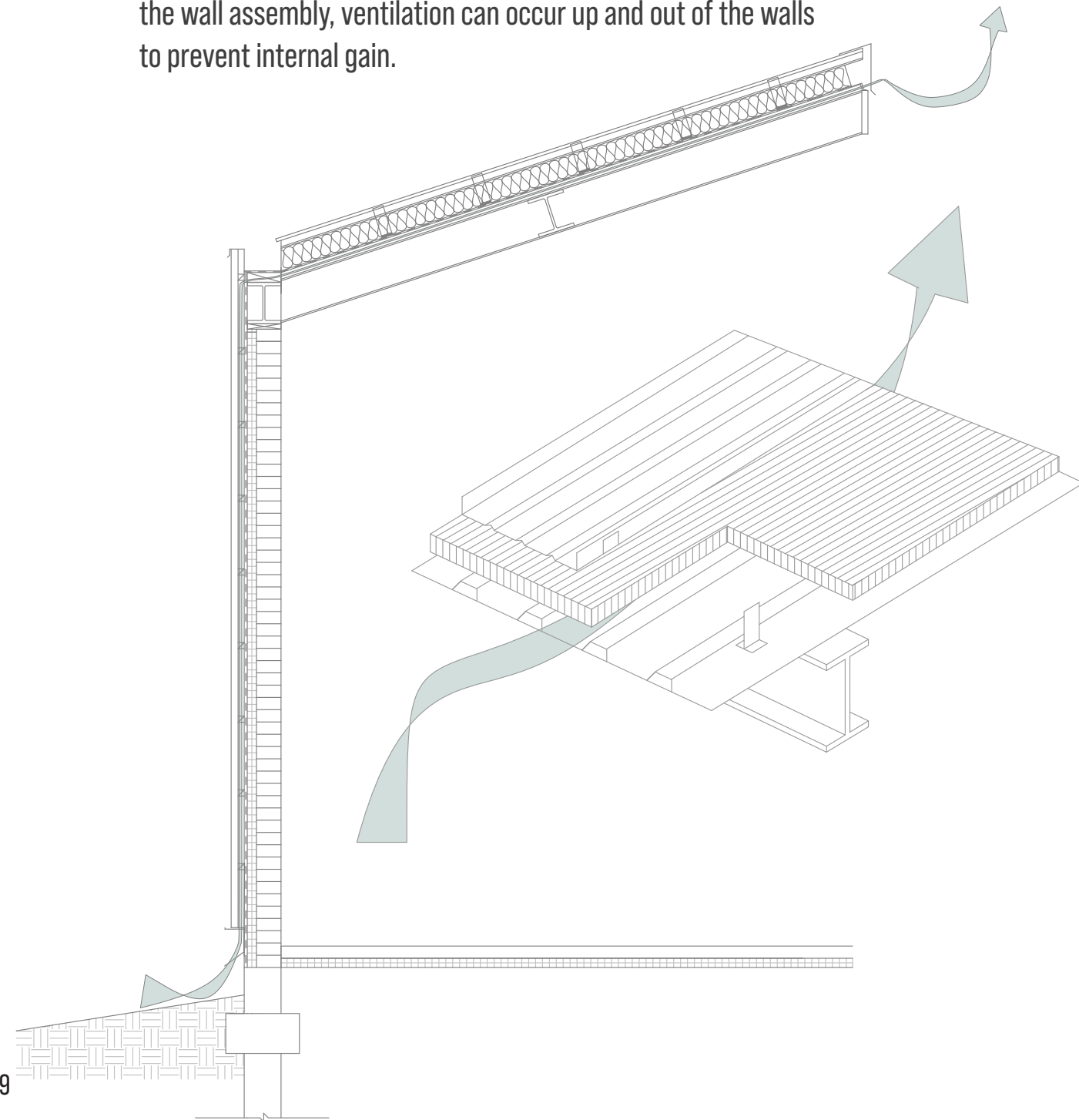


# SHADE STRUCTURE | LOGIC + RENDERING

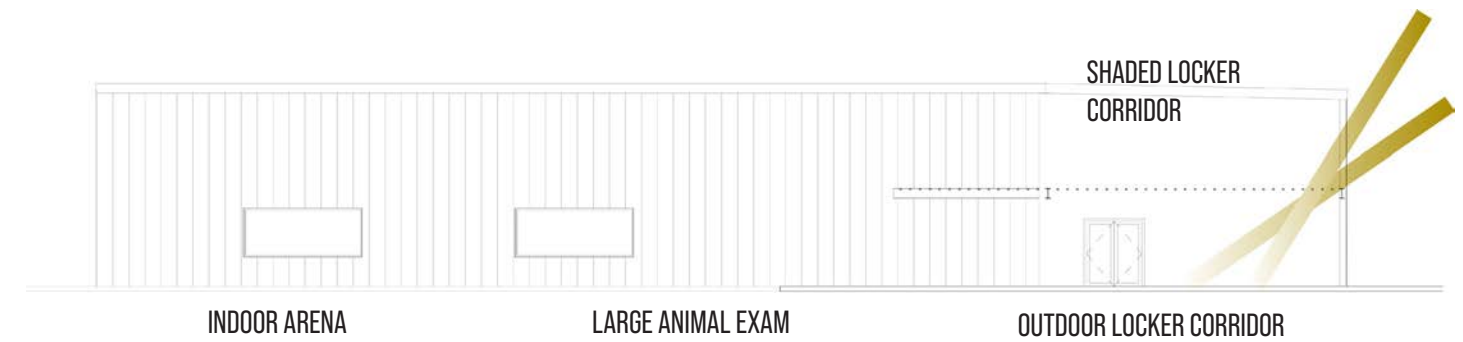


# PASSIVE STRATEGIES

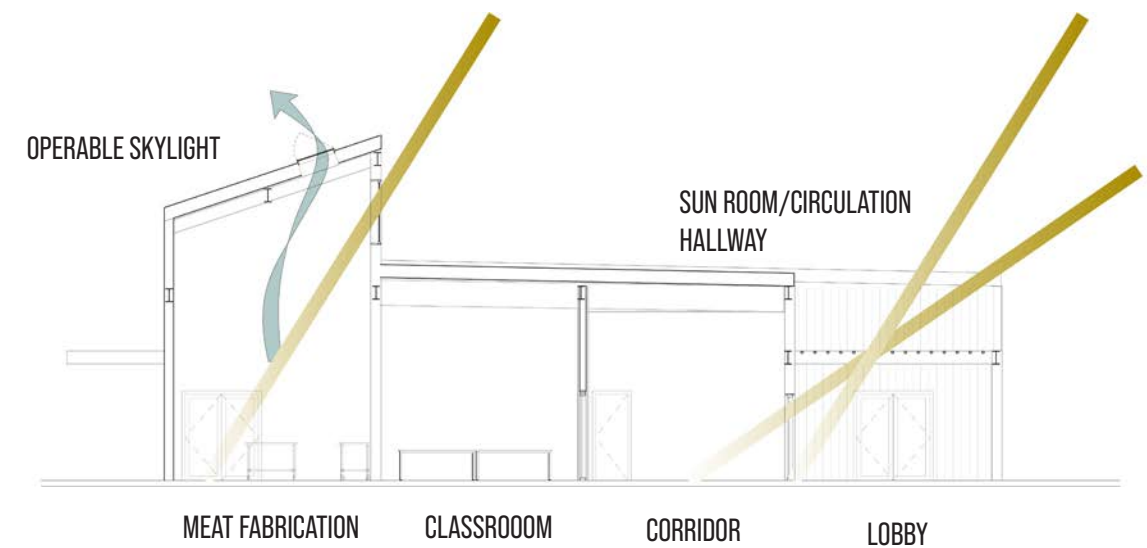
Given the heating needs of this facility, the primary goal of the passive strategies is to maximize daylight. Given excess heat, ventilation serves as a second priority. Operable windows and skylights vent hot air via stack effect in interior spaces. Within the wall assembly, ventilation can occur up and out of the walls to prevent internal gain.



CULINARY BUILDING

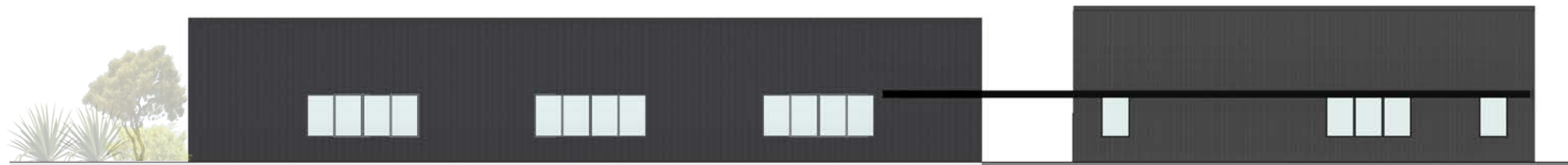


VET TECH BUILDING



MEAT FABRICATION BUILDING

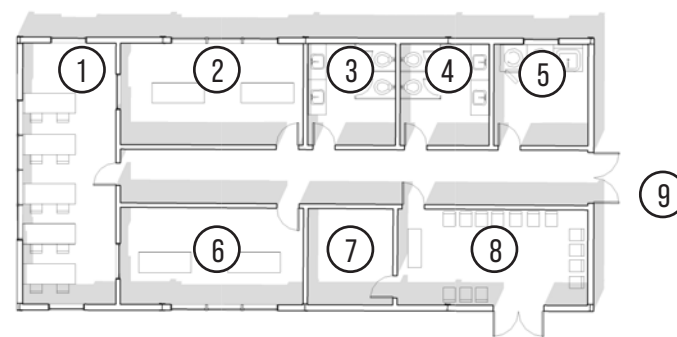
# VET TECH | ELEVATION + PLAN



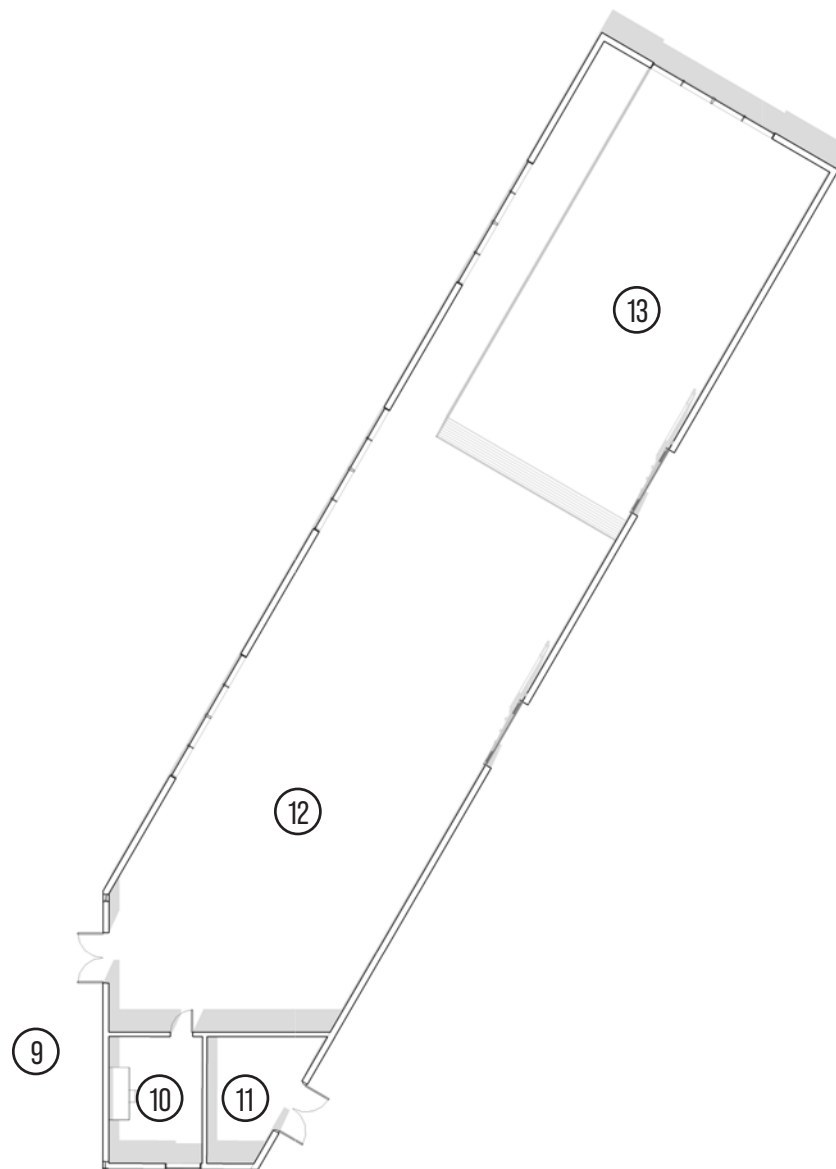
NORTH ELEVATION

**KEY**

- 1. VET CLASS + OBSERVATION
- 2. SMALL ANIMAL SURGERY
- 3. RESTROOM
- 4. RESTROOM
- 5. LAUNDRY
- 6. SMALL ANIMAL EXAM
- 7. FILE
- 8. RECEPTION
- 9. LOCKERS
- 10. OFFICE
- 11. MECHANICAL
- 12. LARGE ANIMAL EXAM
- 13. INDOOR ARENA



PLAN



# VET TECH | COLLAGE

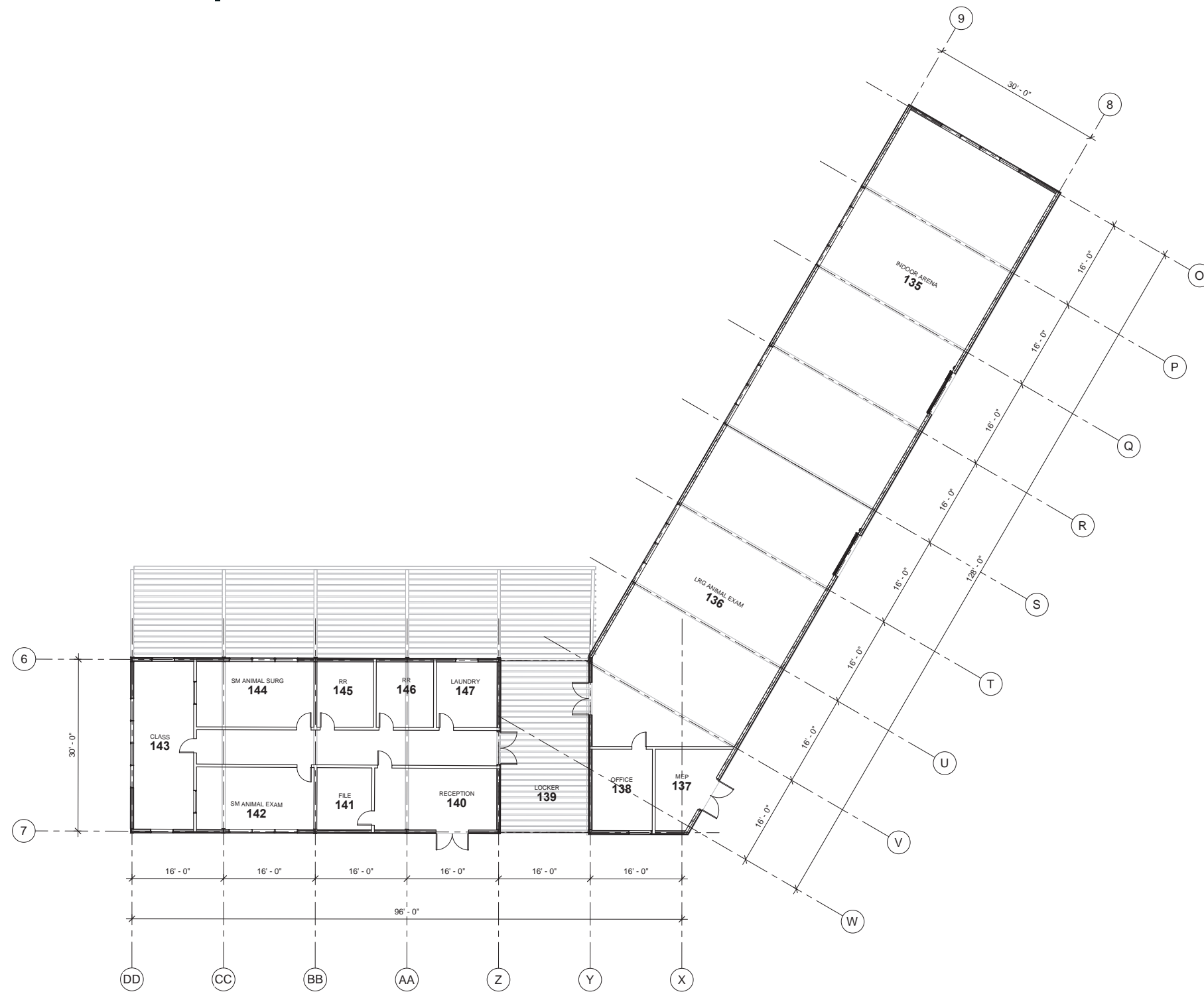


VET TECH CLASSROOM

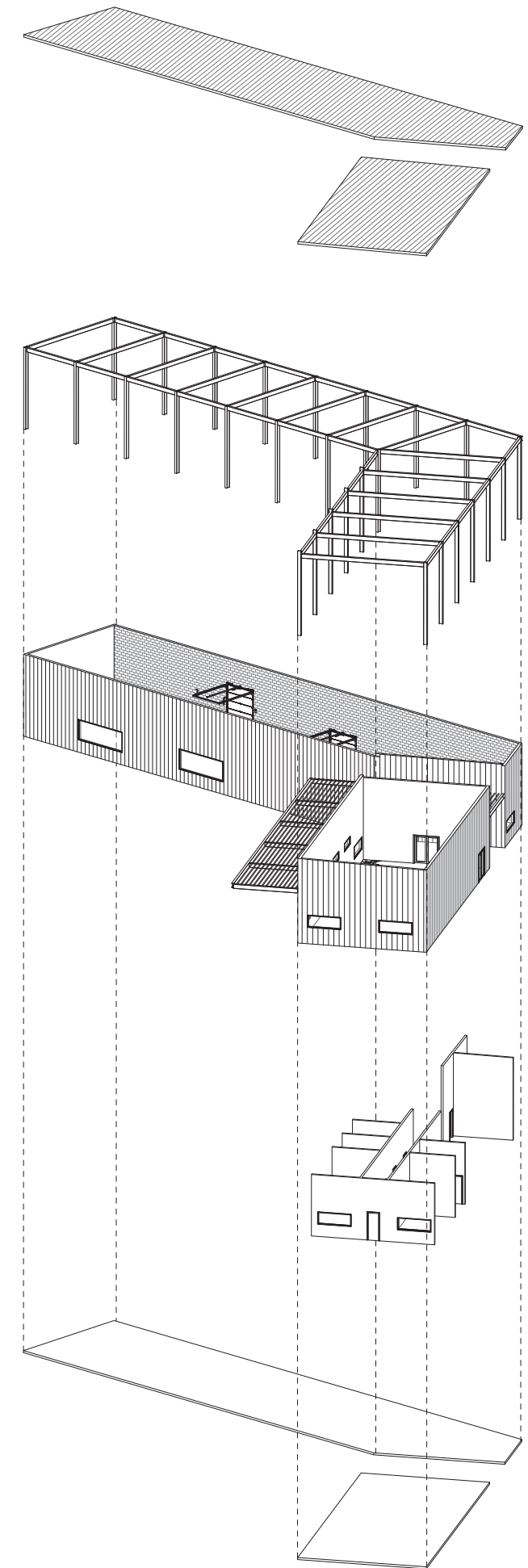


VET TECH INDOOR ARENA + LARGE ANIMAL EXAM

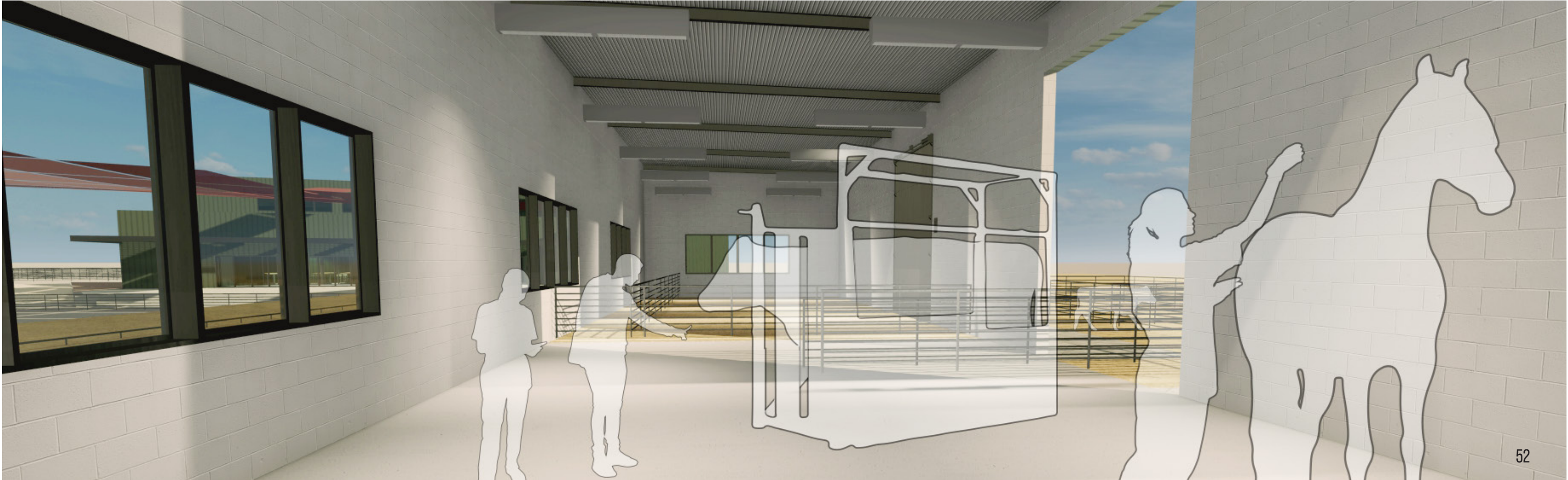
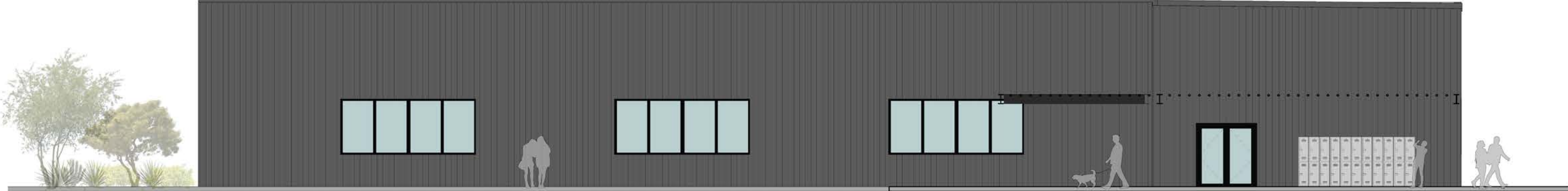
# VET TECH | STRUCTURAL LOGIC



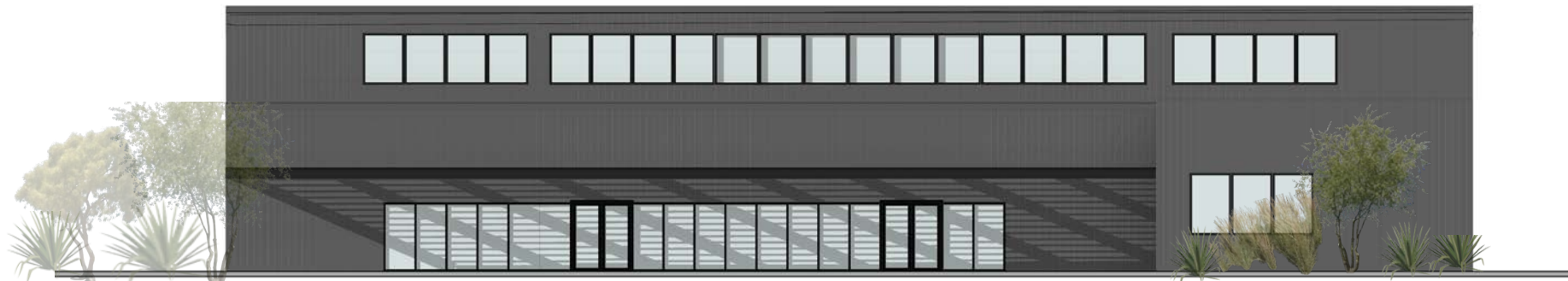
PLAN 



# VET TECH | SECTION + RENDERING



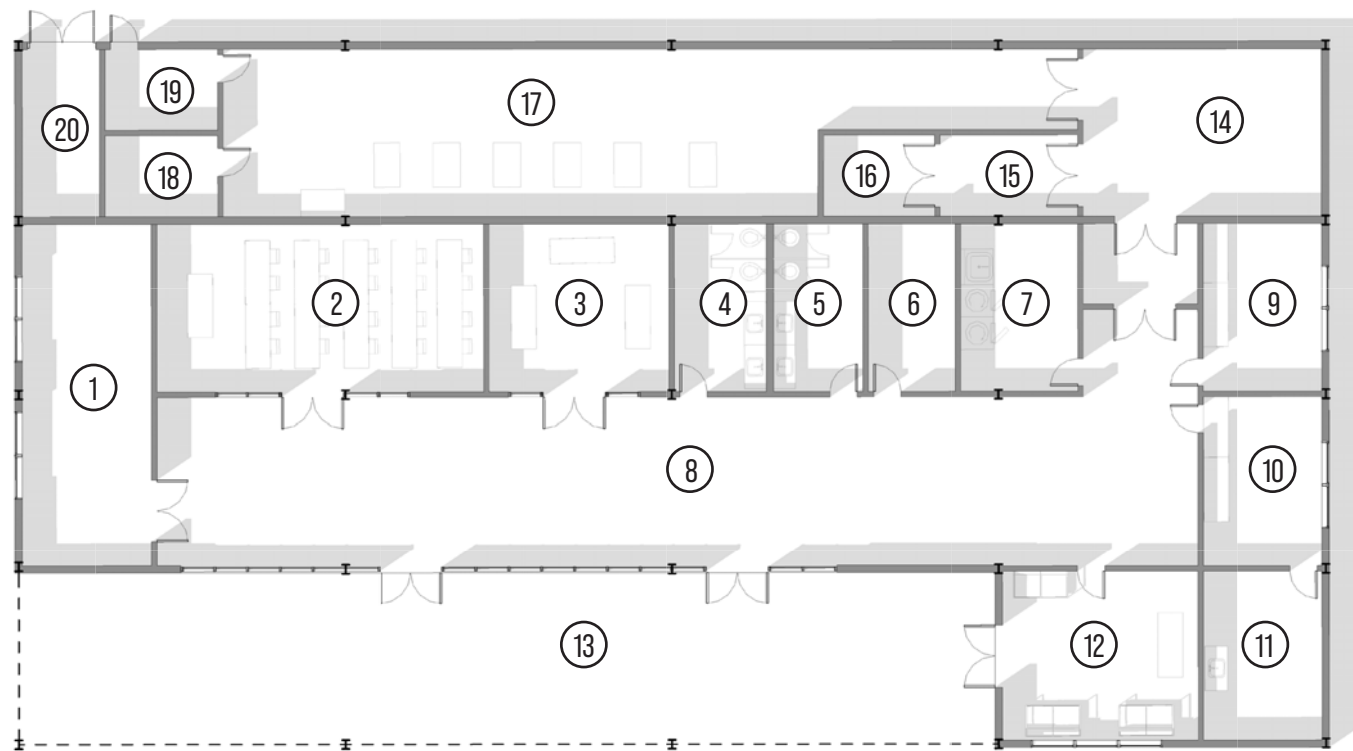
# MEAT FAB | ELEVATION + PLAN



WEST ELEVATION

## KEY

- 1. LAB
- 2. CLASSROOM
- 3. BREAK
- 4. RESTROOM
- 5. RESTROOM
- 6. LAUNDRY
- 7. BREAK ROOM
- 8. HALL/SUN ROOM
- 9. OFFICE
- 10. USDA OFFICE
- 11. USDA RESTROOM
- 12. LOBBY
- 13. OUTDOOR SEATING
- 14. KILL FLOOR
- 15. HOT BOX
- 16. HOLDING COOLER
- 17. FABRICATION/PACKAGING
- 18. STORAGE
- 19. FREEZER
- 20. MECHANICAL



PLAN 

# MEAT FAB | COLLAGE



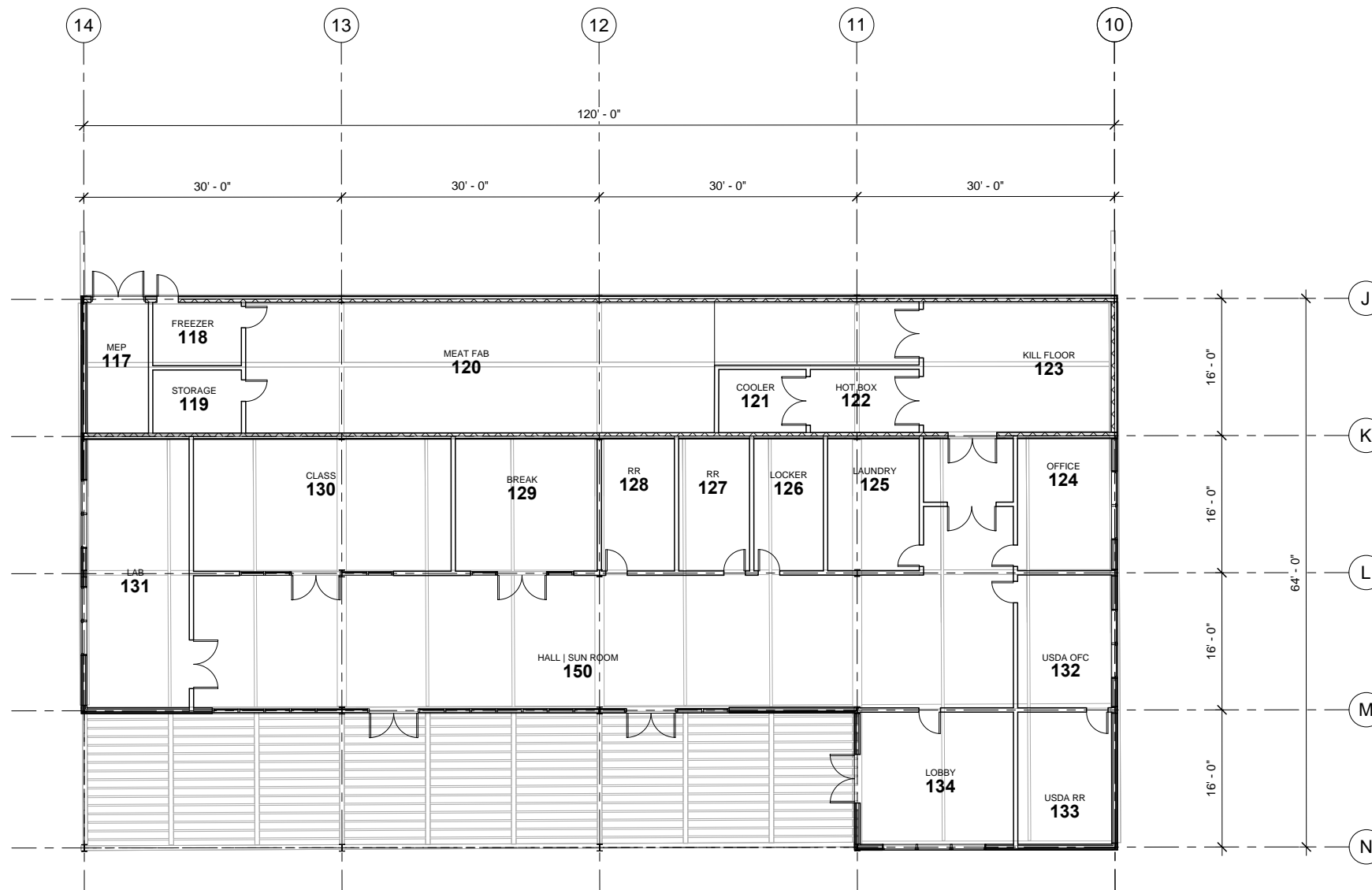
MEAT FABRICATION



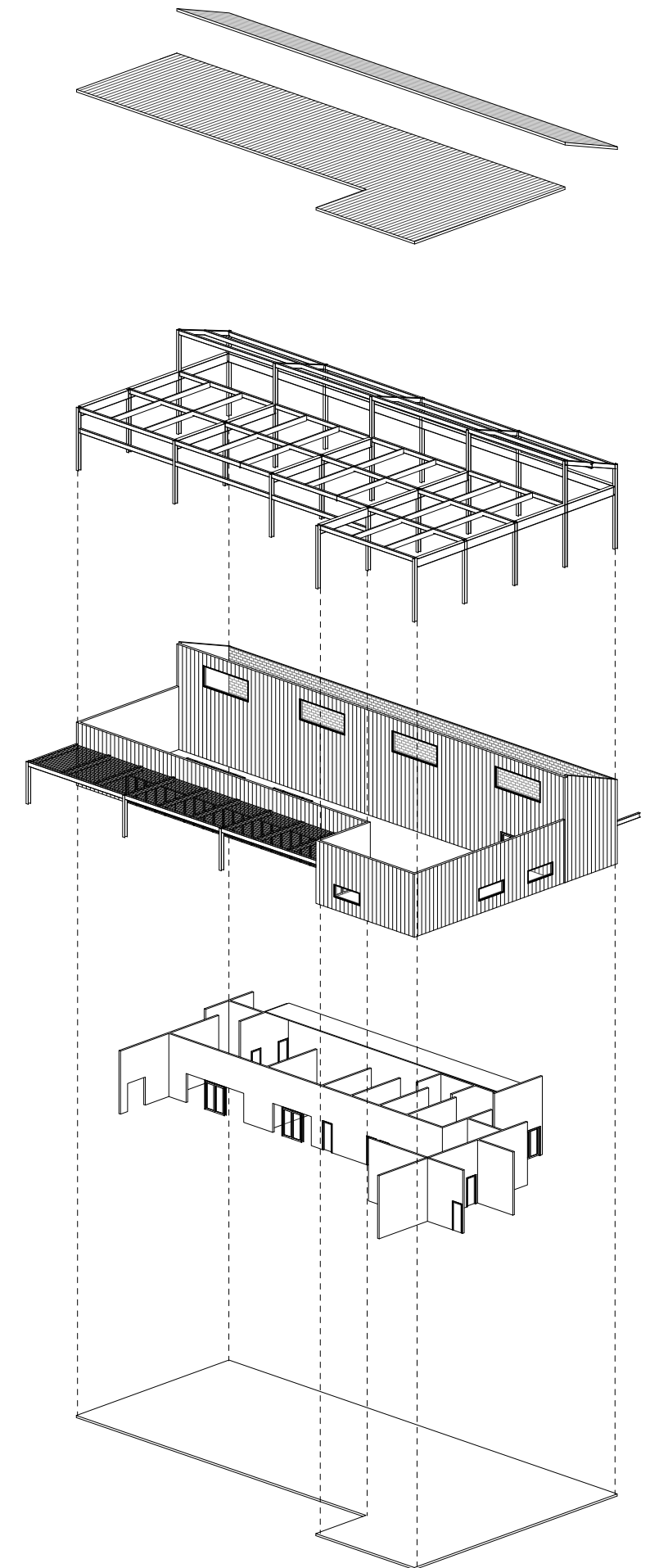
MEAT CLASSROOM



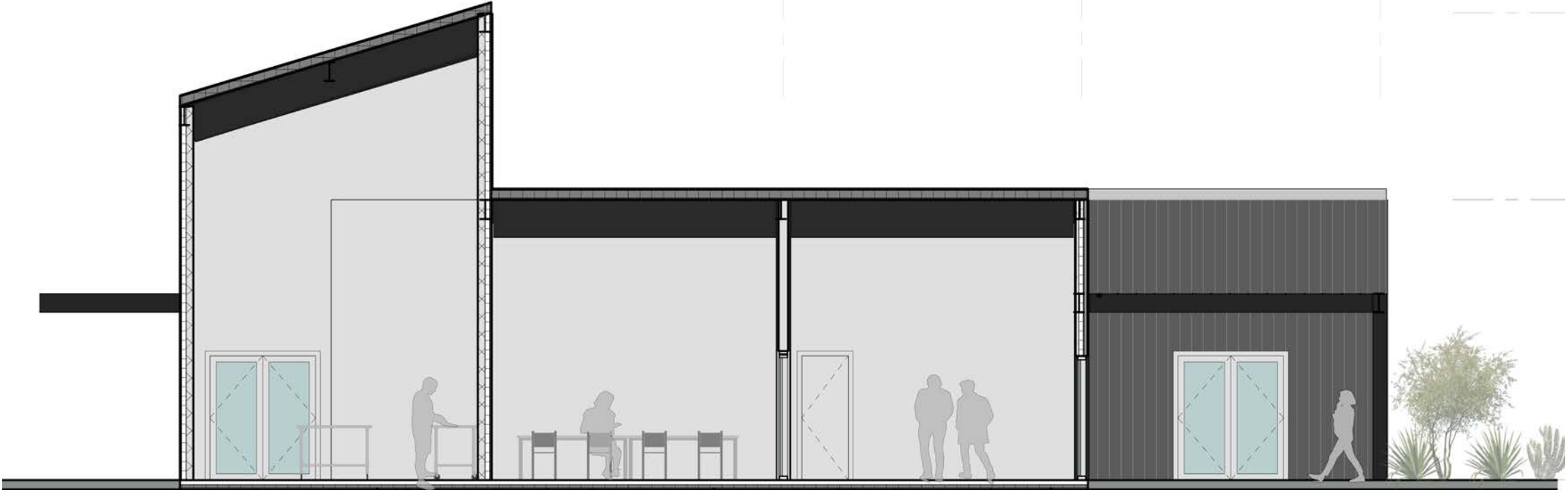
# MEAT FAB | STRUCTURAL LOGIC



PLAN ①



# MEAT FAB | SECTION + RENDERING

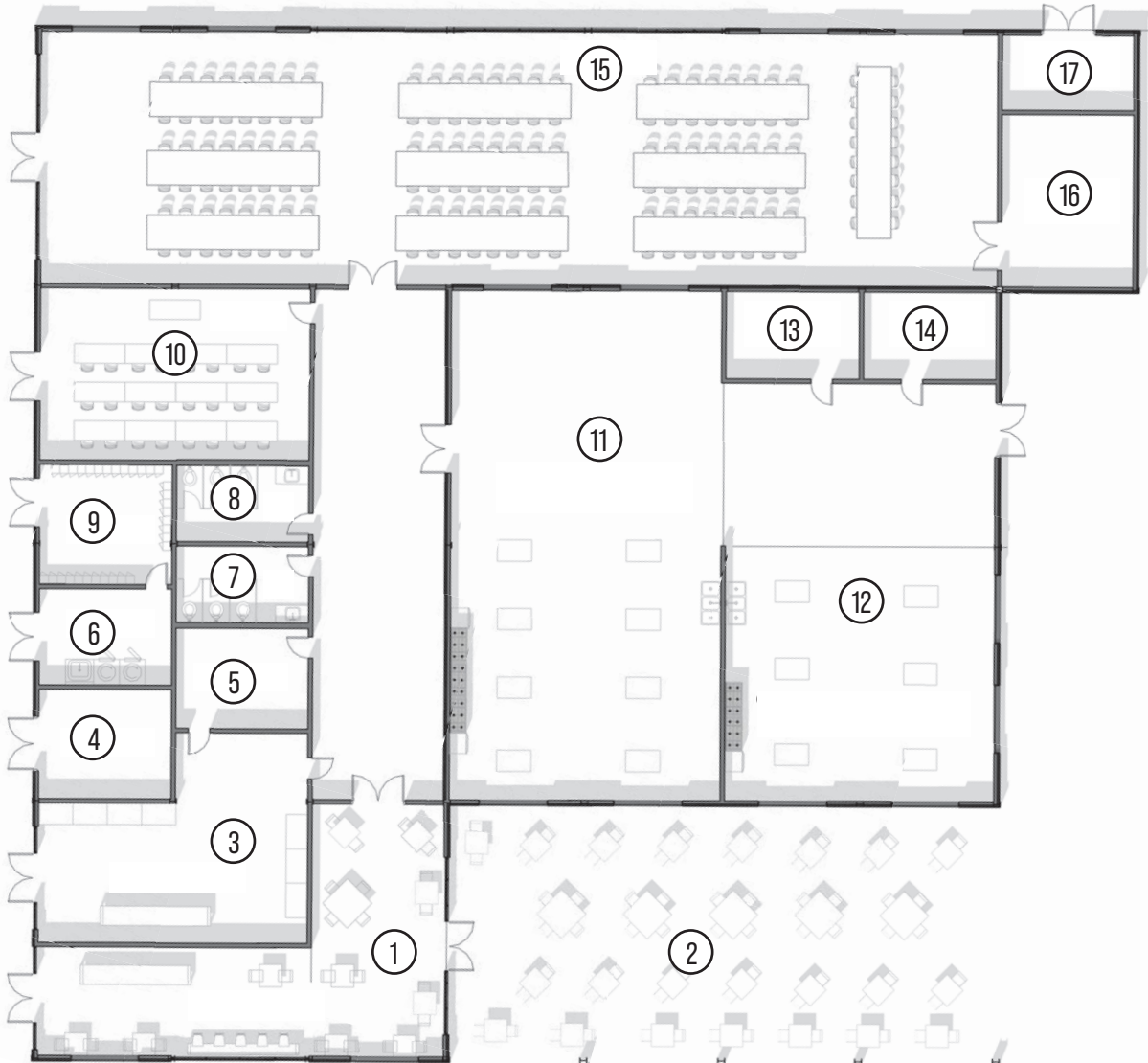


# CULINARY | ELEVATION + PLAN



CULINARY BUILDING WEST ELEVATION

- KEY**
- 1. CAFE
  - 2. OUTDOOR CAFE SEATING
  - 3. MEAT MARKET
  - 4. MECHANICAL
  - 5. STORAGE
  - 6. LAUNDRY
  - 7. RESTROOM
  - 8. RESTROOM
  - 9. LOCKERS
  - 10. CLASSROOM
  - 11. TEACHING KITCHEN
  - 12. COMMERCIAL KITCHEN
  - 13. FREEZER
  - 14. COOLER
  - 15. BANQUET
  - 16. TABLE STORAGE
  - 17. MECHANICAL



PLAN

# CULINARY | COLLAGE

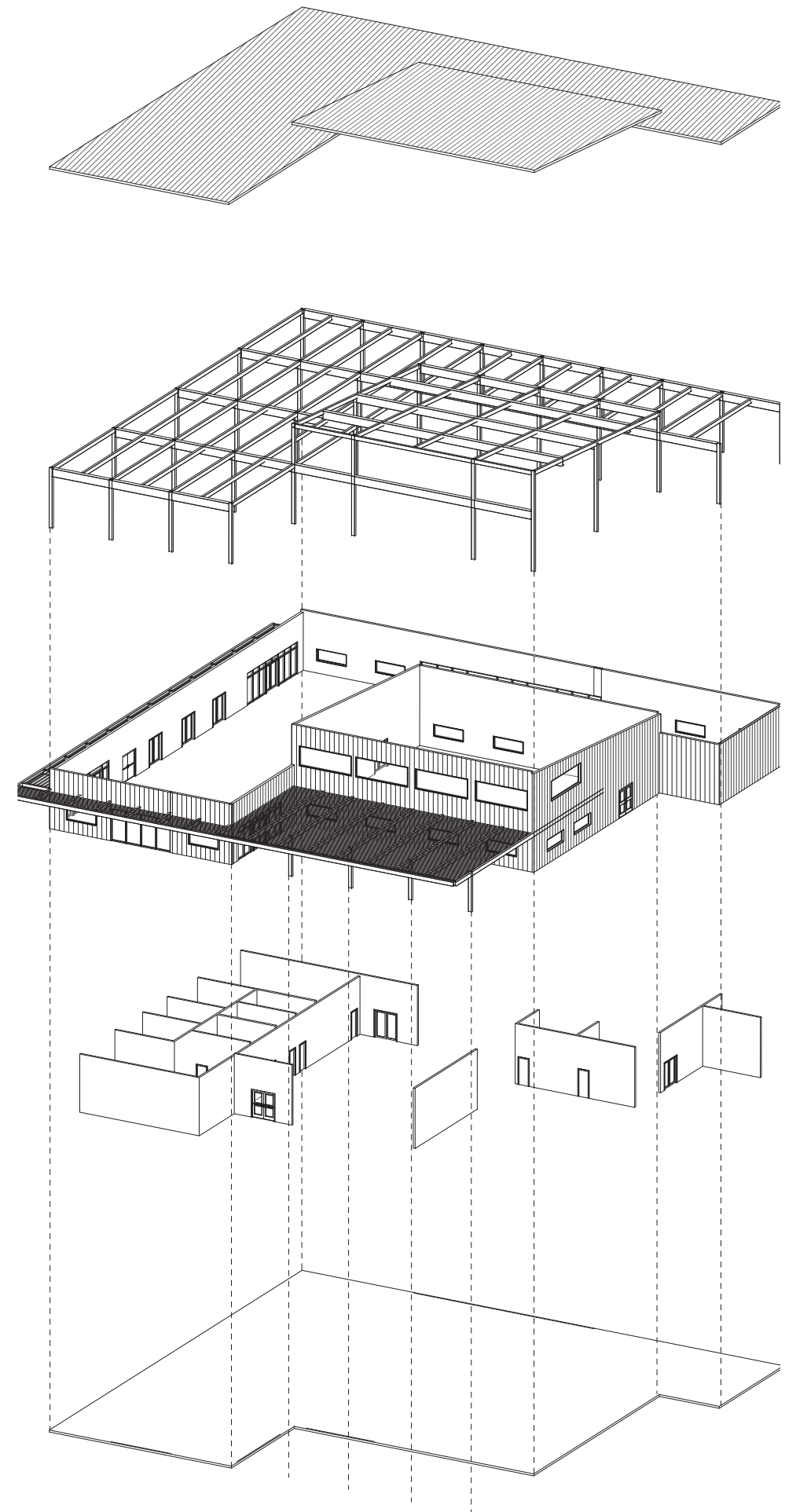
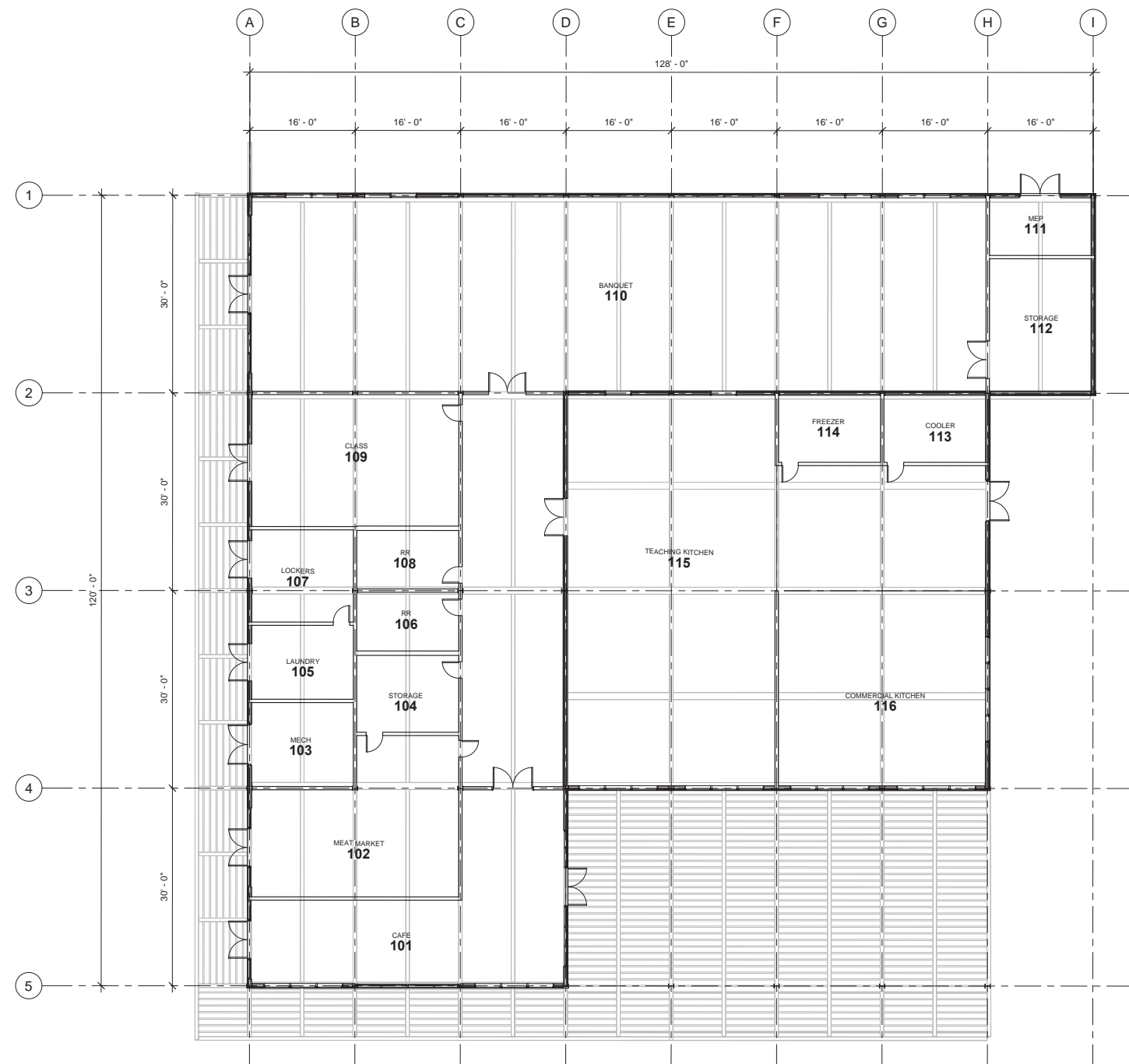


TEACHING KITCHEN



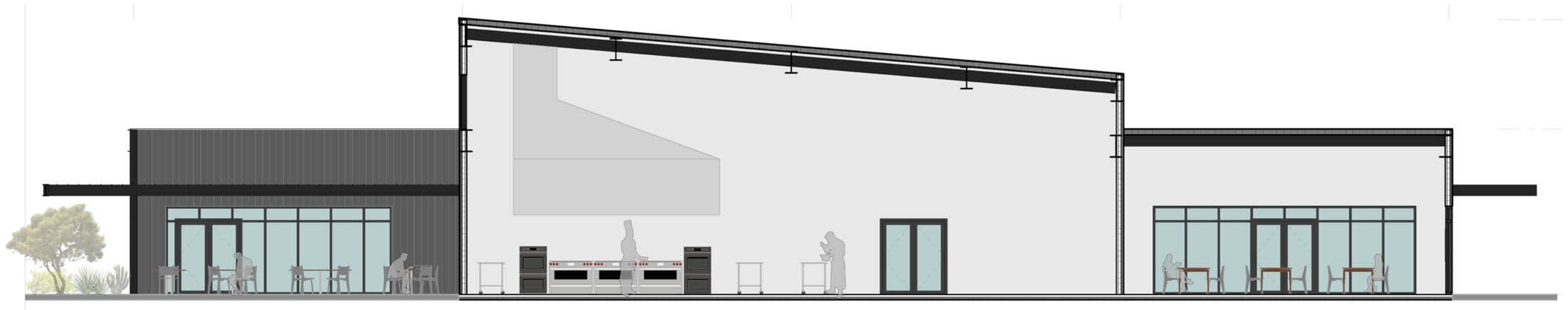
CAFE

# CULINARY | STRUCTURAL LOGIC



PLAN 

# CULINARY | SECTION + RENDERING





Hózhó is a belief central to Diné philosophy that nature is not perfect or symmetrical, but dynamic and balanced. The CTE proposal aims to delicately strike such a balance between the built and natural environment, and celebrate perfect imperfection. Rhythms which are regular and expected are broken by a dynamic and varied form adapted to accommodate the program spaces within and respond to the site.



# GOALS + OUTCOMES

## CONNECTION TO NATURE

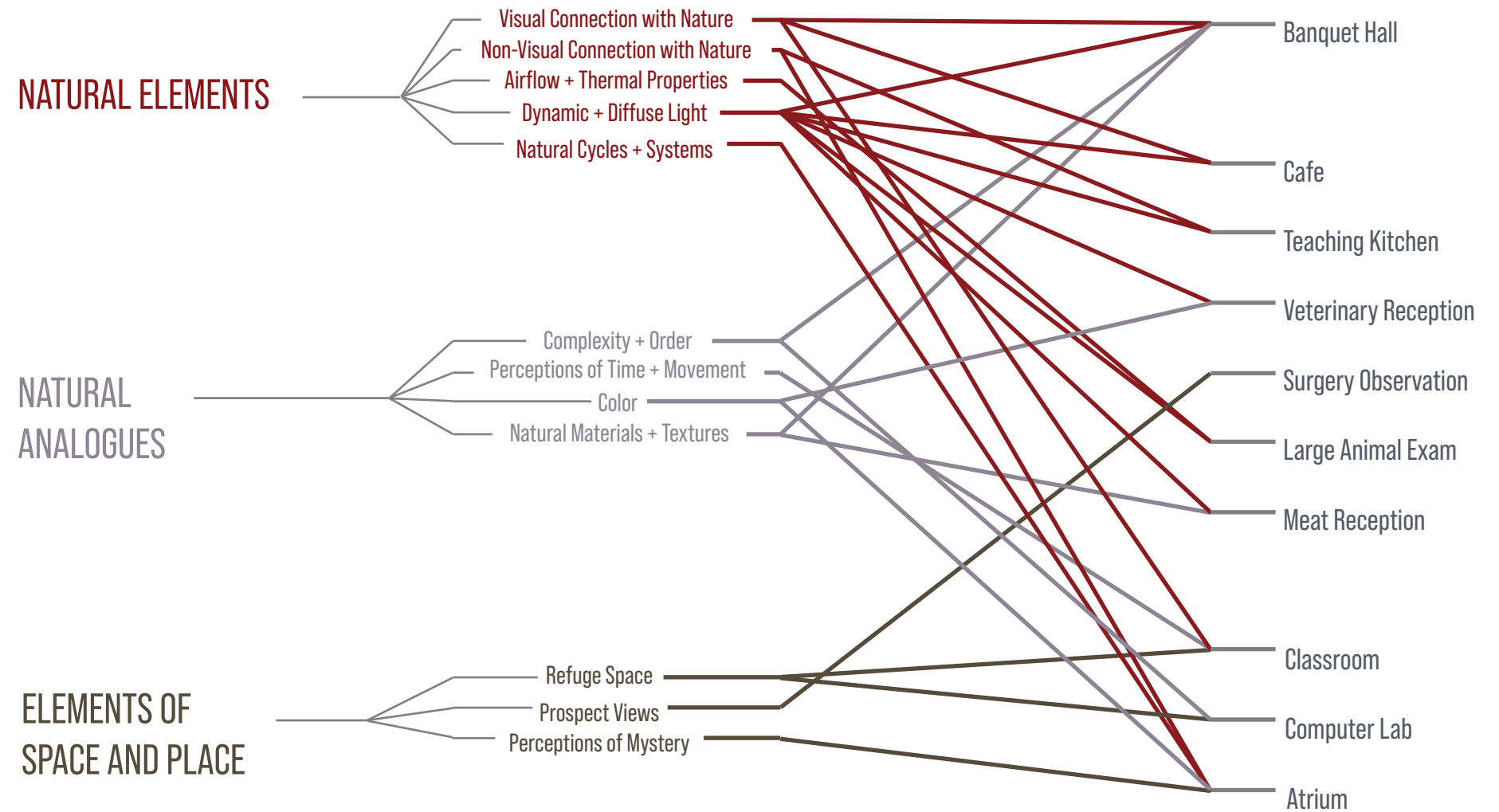
Infusing elements of biophilic design and cultural values to emphasize the importance of nature to the facility and community.

## CROSS POLLINATION

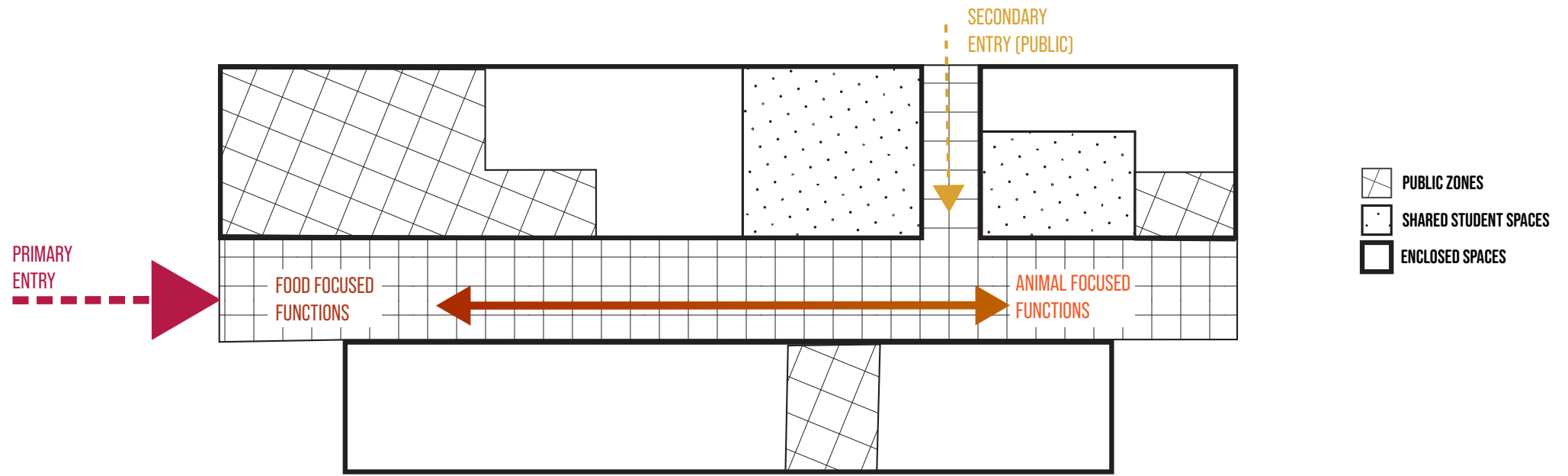
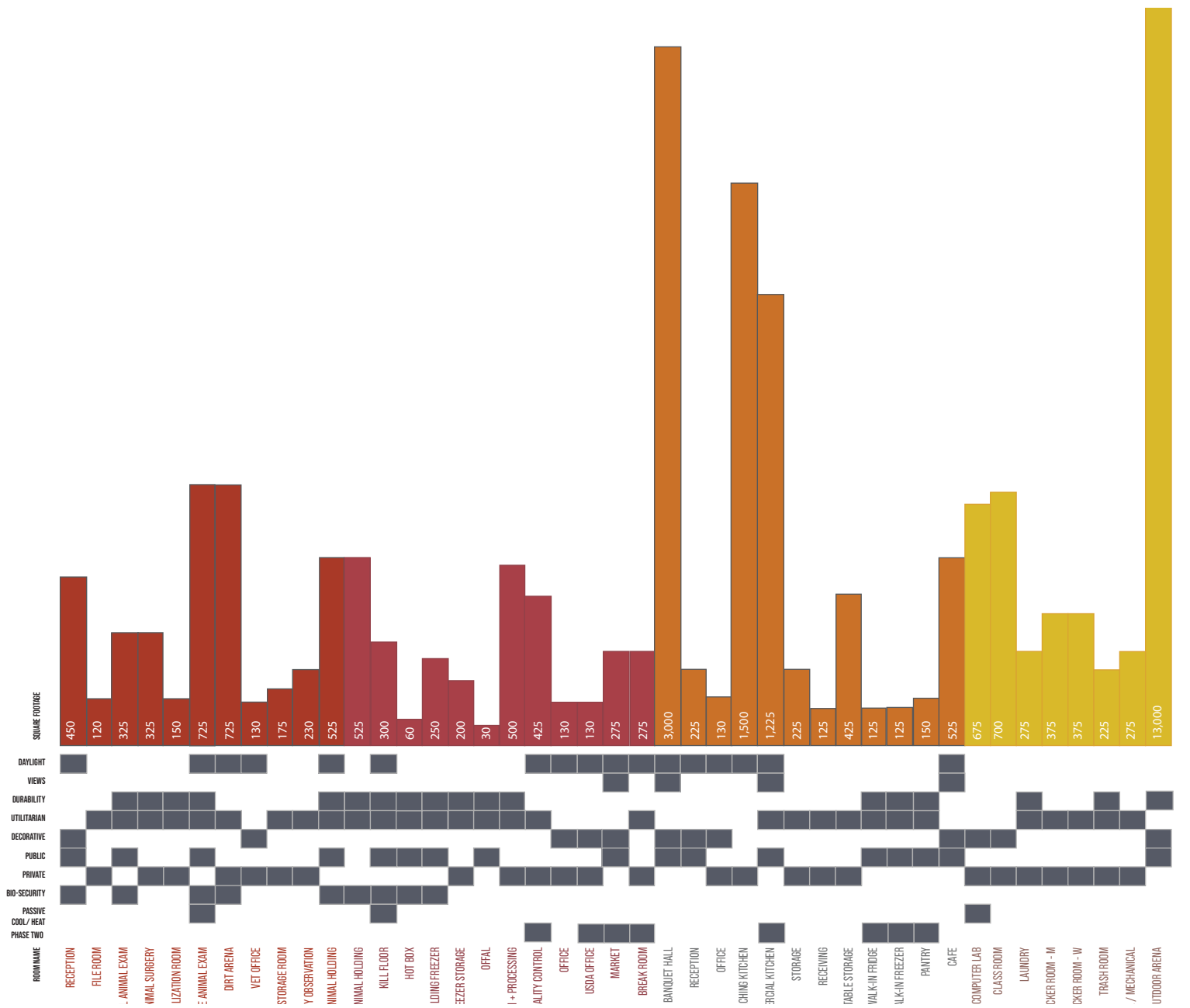
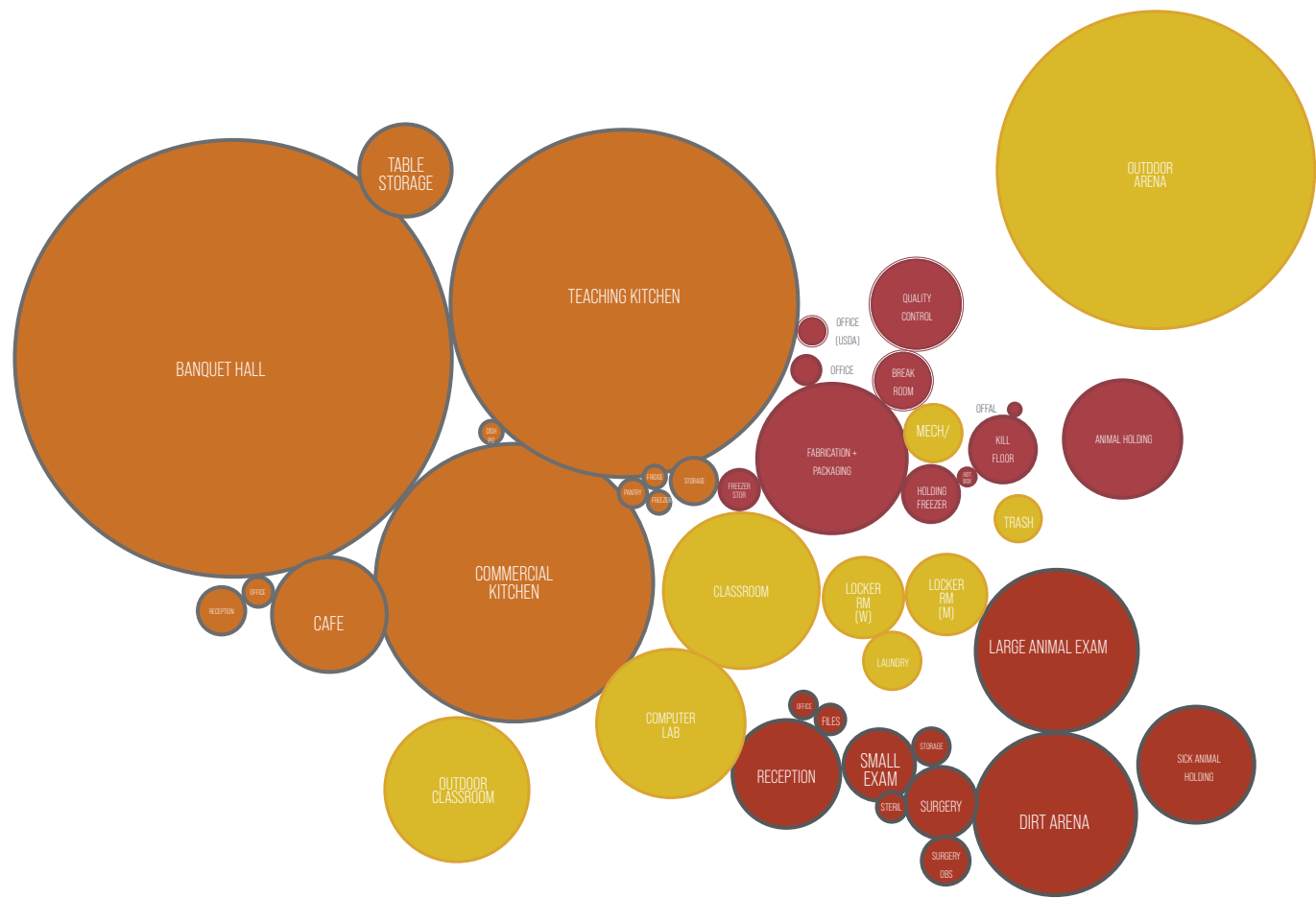
Create connections between programs to ensure students gain a holistic understanding and a sense of community is fostered

## RESPOND TO SITE

Employ specific strategies that respond to site-specific conditions and environment in a way that enhances energy efficiency within the building.



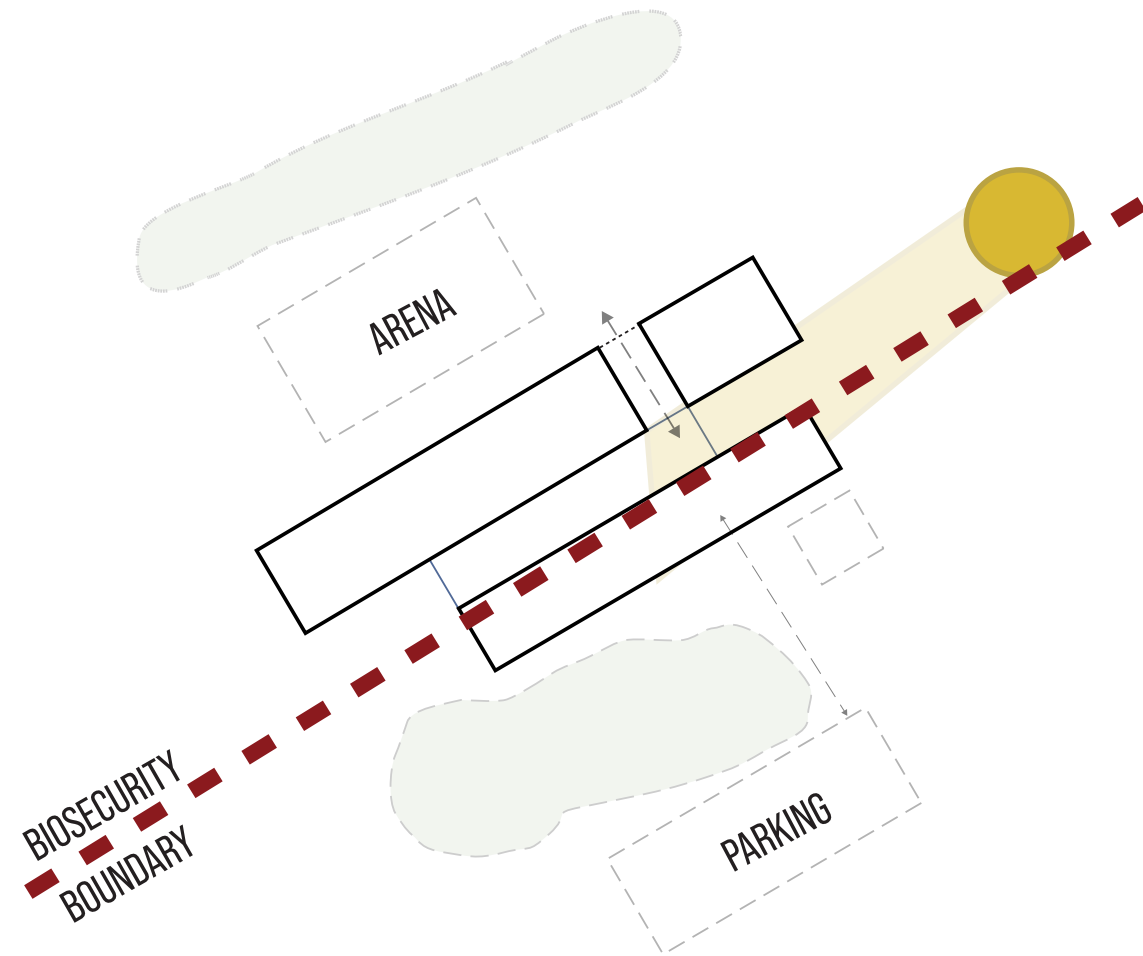
# PROGRAM | ORGANIZATION



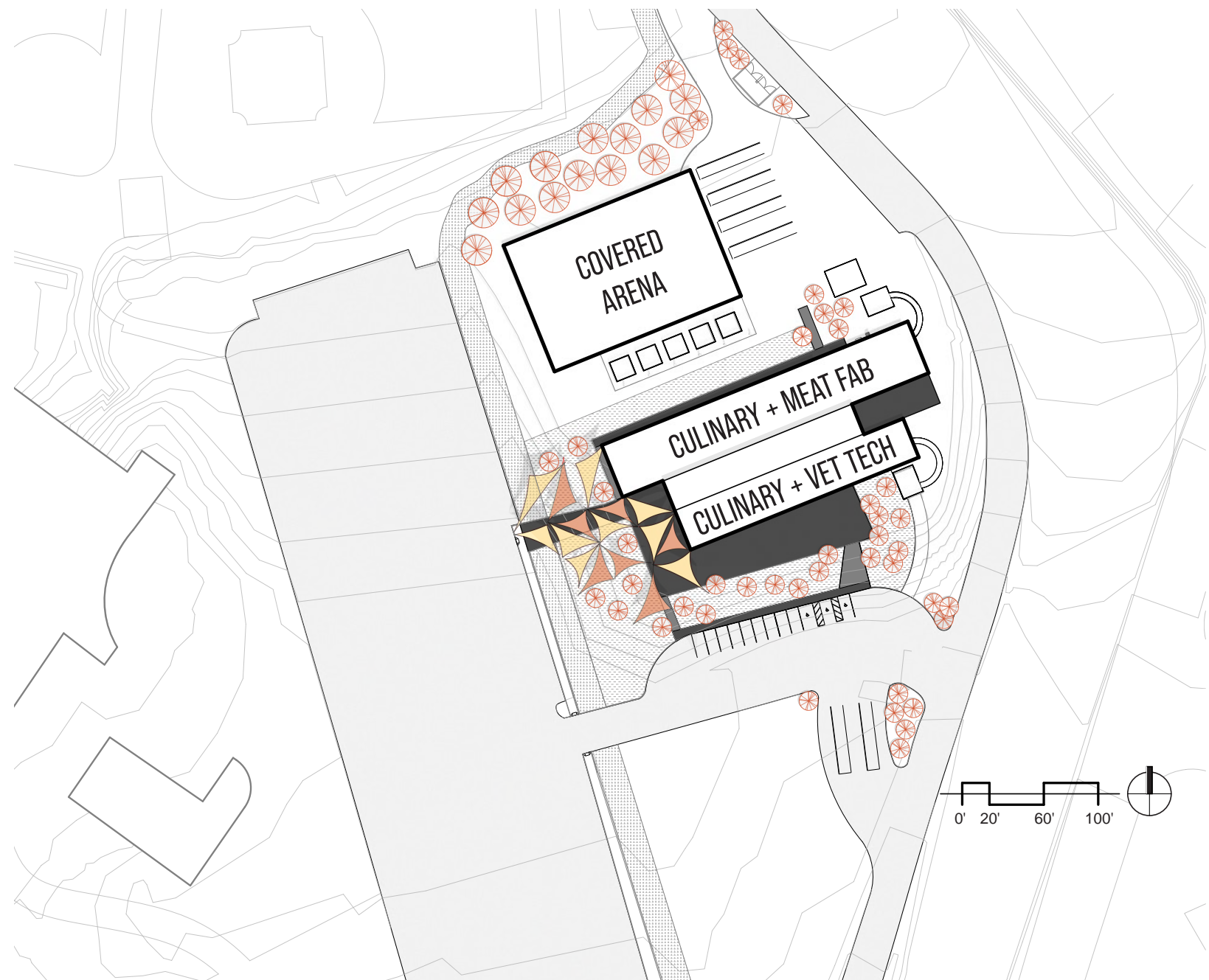


# SITE | ORGANIZATION

Simple linear building massing broken into two pieces with the building to the south shading the building to the north. The complex is oriented to the east to honor the Navajo tradition. Programs like culinary and meat processing are to the north to avoid heat gain.

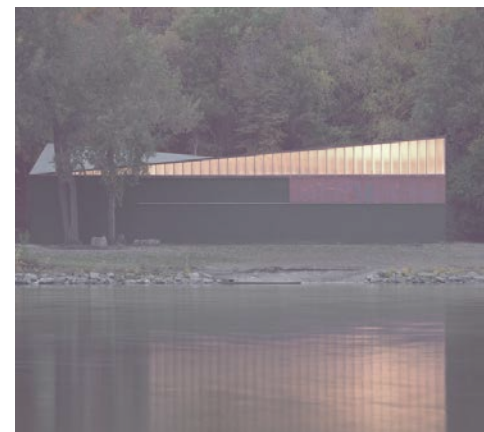
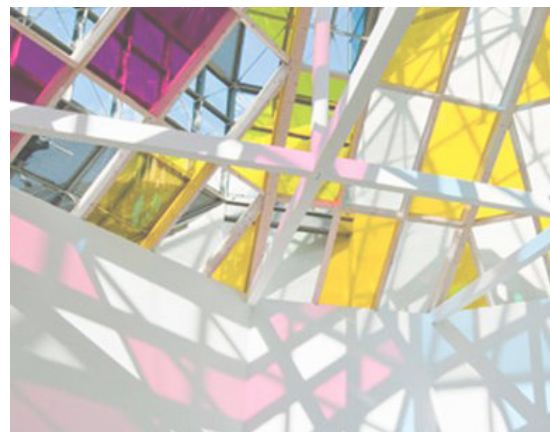
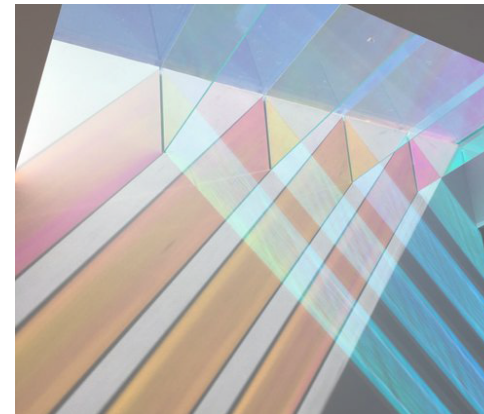
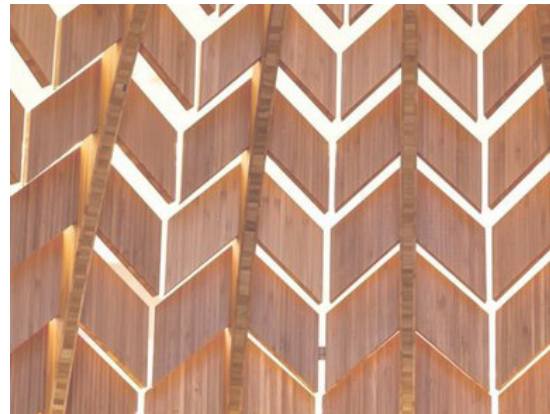
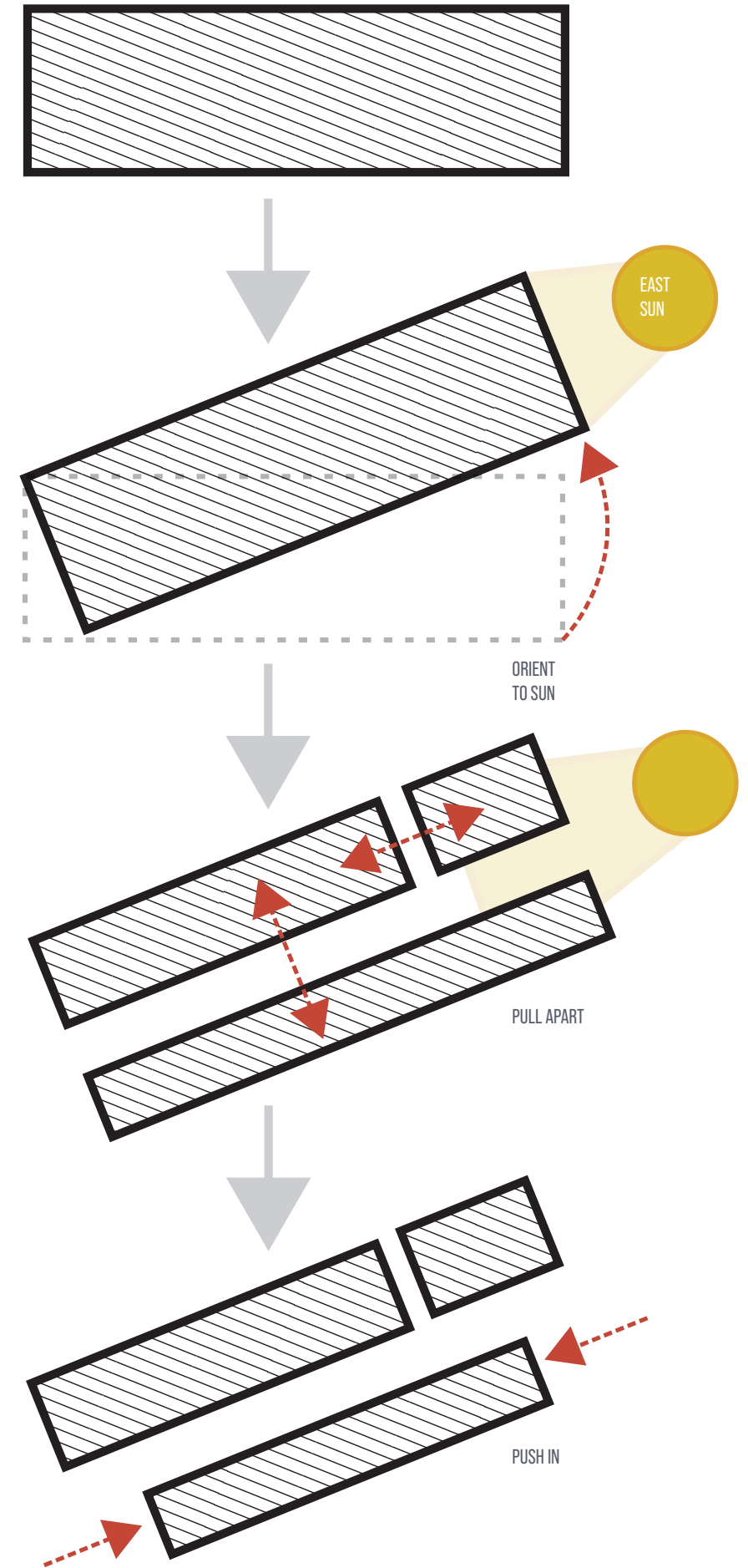
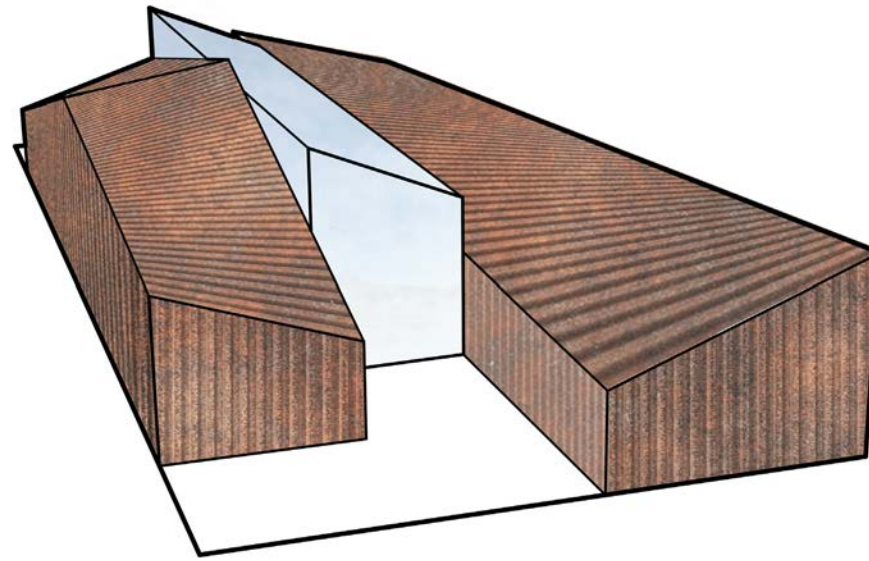


# SITE | PLAN + SECTION

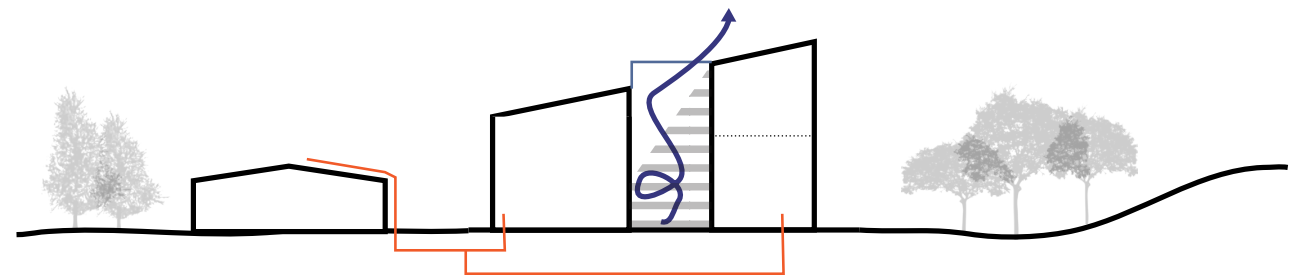
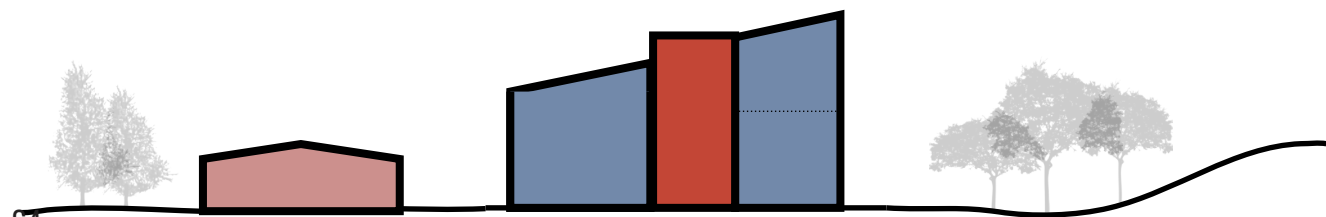
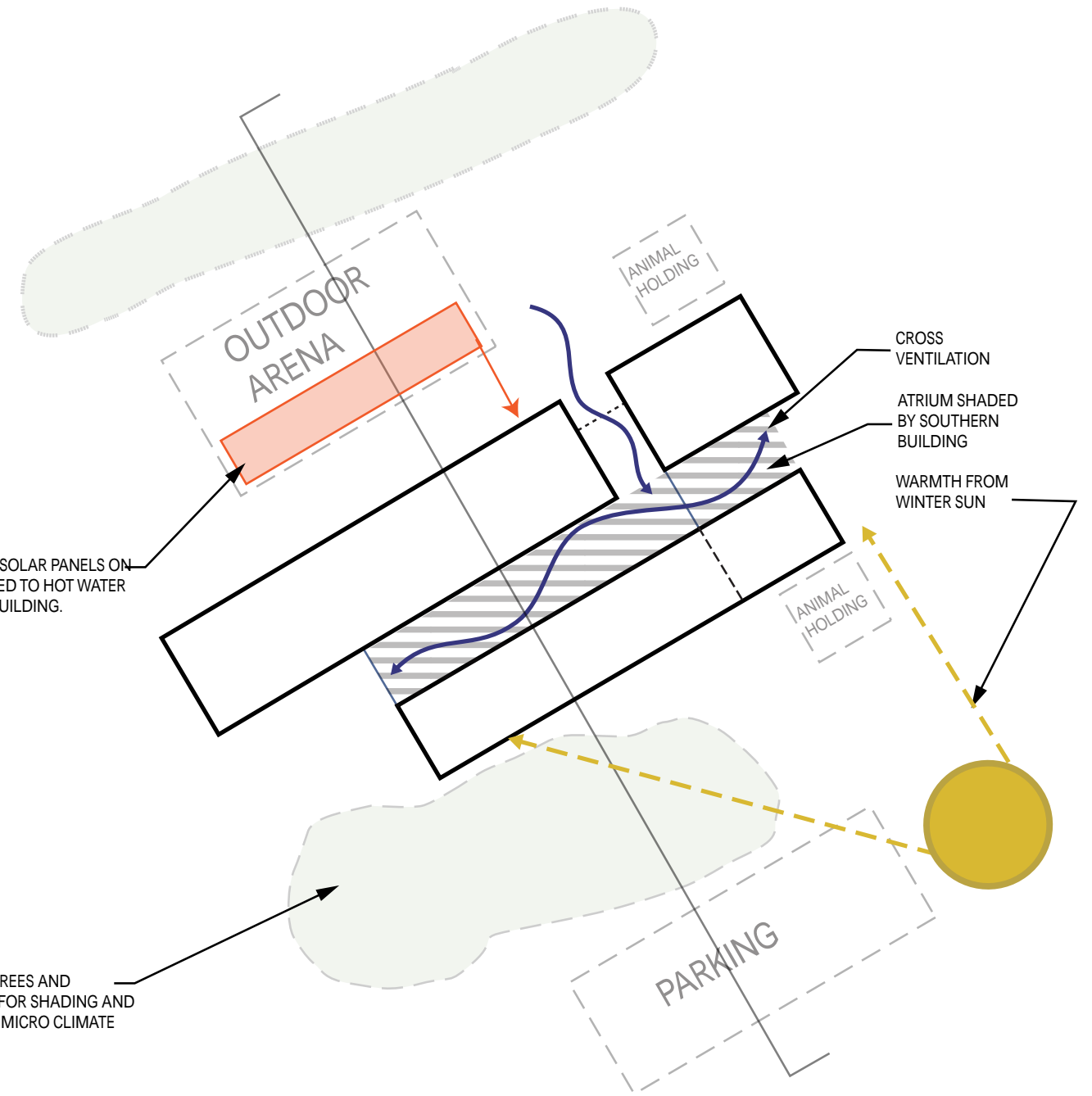
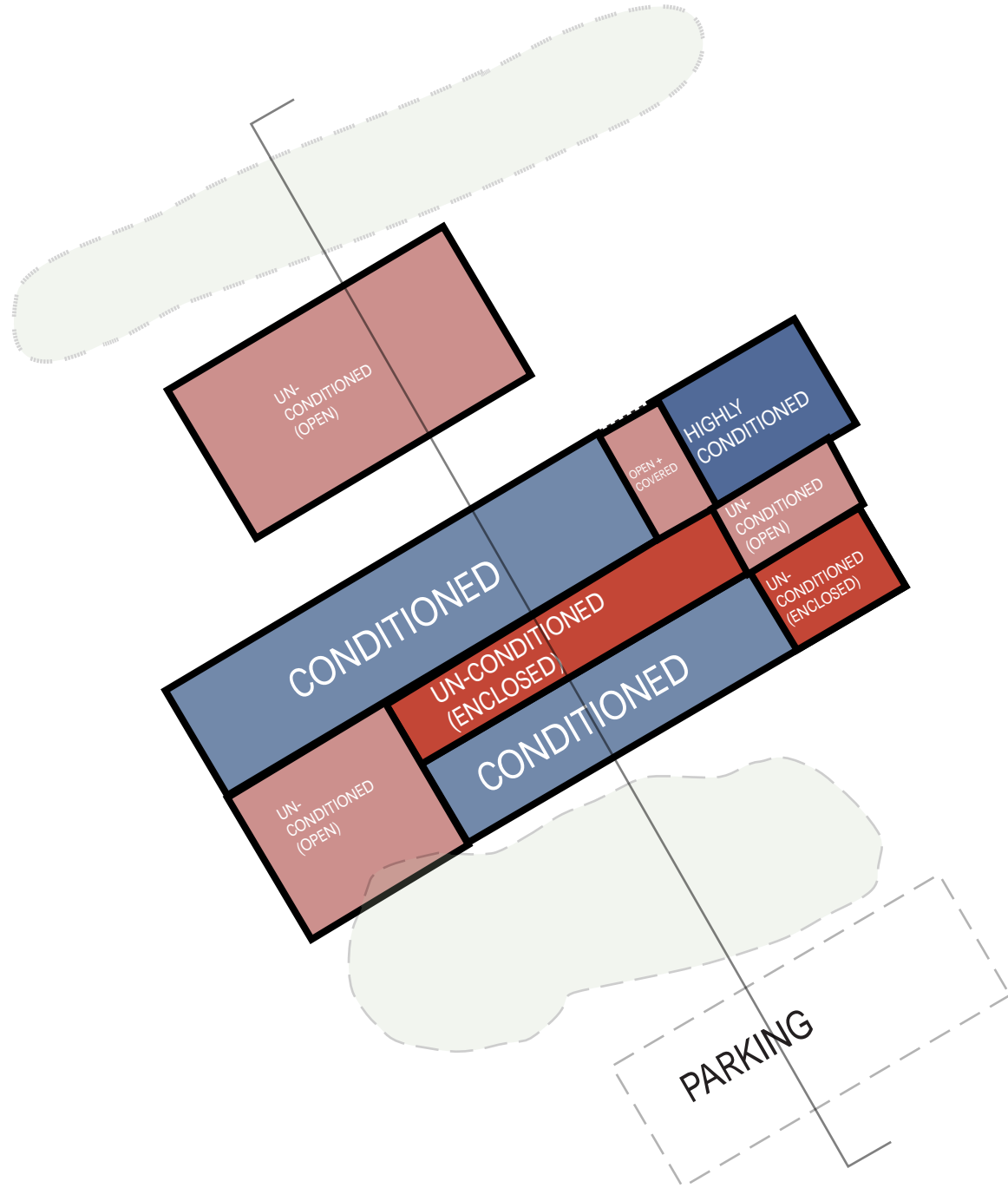


# CONCEPT

There is not one word in English for Hózhó, but it is a combination of beauty, order, balance and harmony. Hózhó does not try to strike a 'perfect' balance, but more of a balance in the way the natural world does. It is the type of balance that the cycle of the seasons have. There is a recognition that the natural world is full of movement, cycles, change and dynamism. This proposal aims to create a rhythm which is regular and expected, yet at the same time dynamic and varied and celebrates the idea of perfect imperfection.



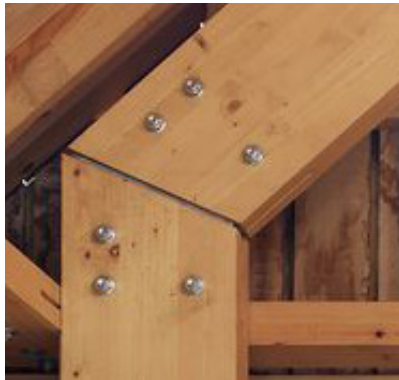
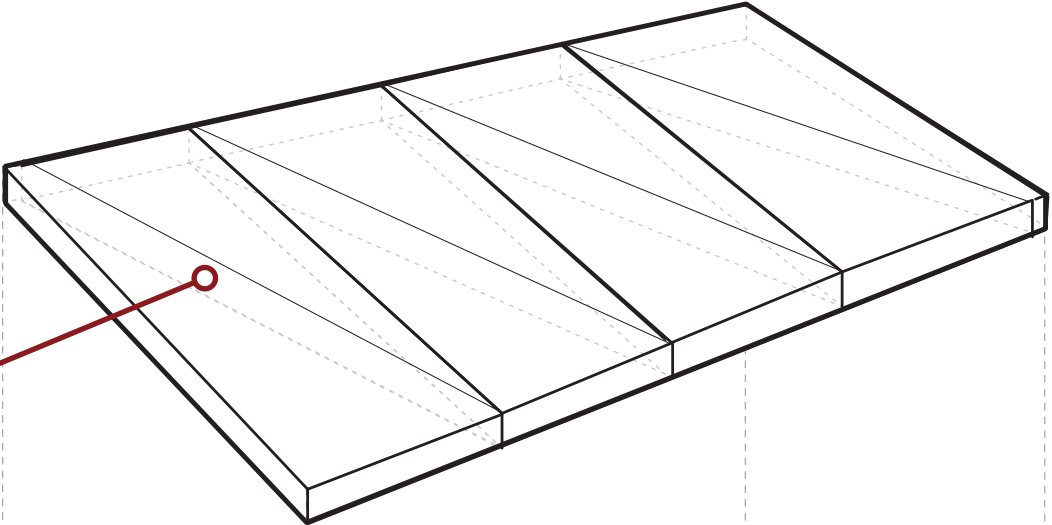
# PASSIVE STRATEGIES



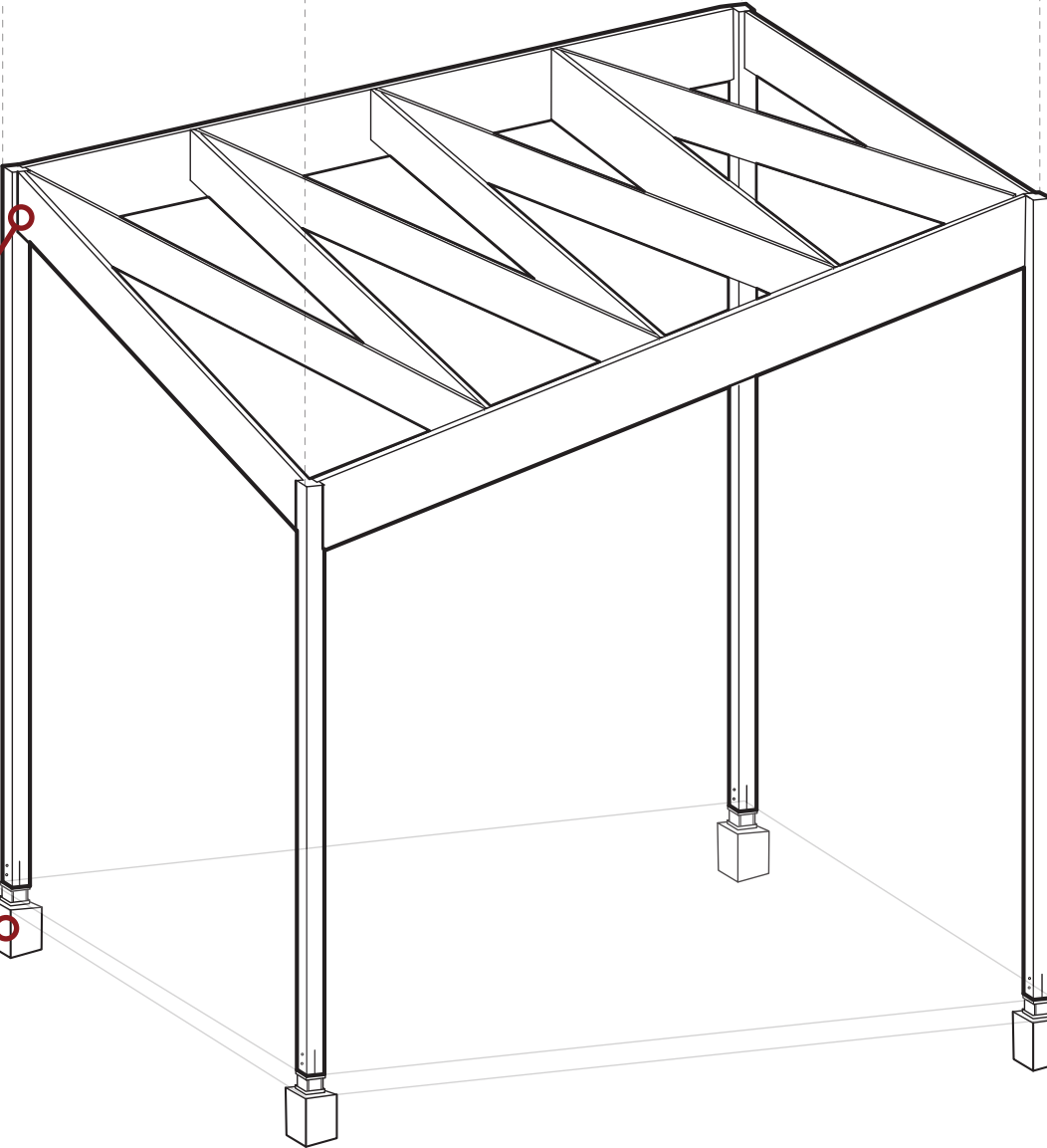
# BUILDING | STRUCTURE



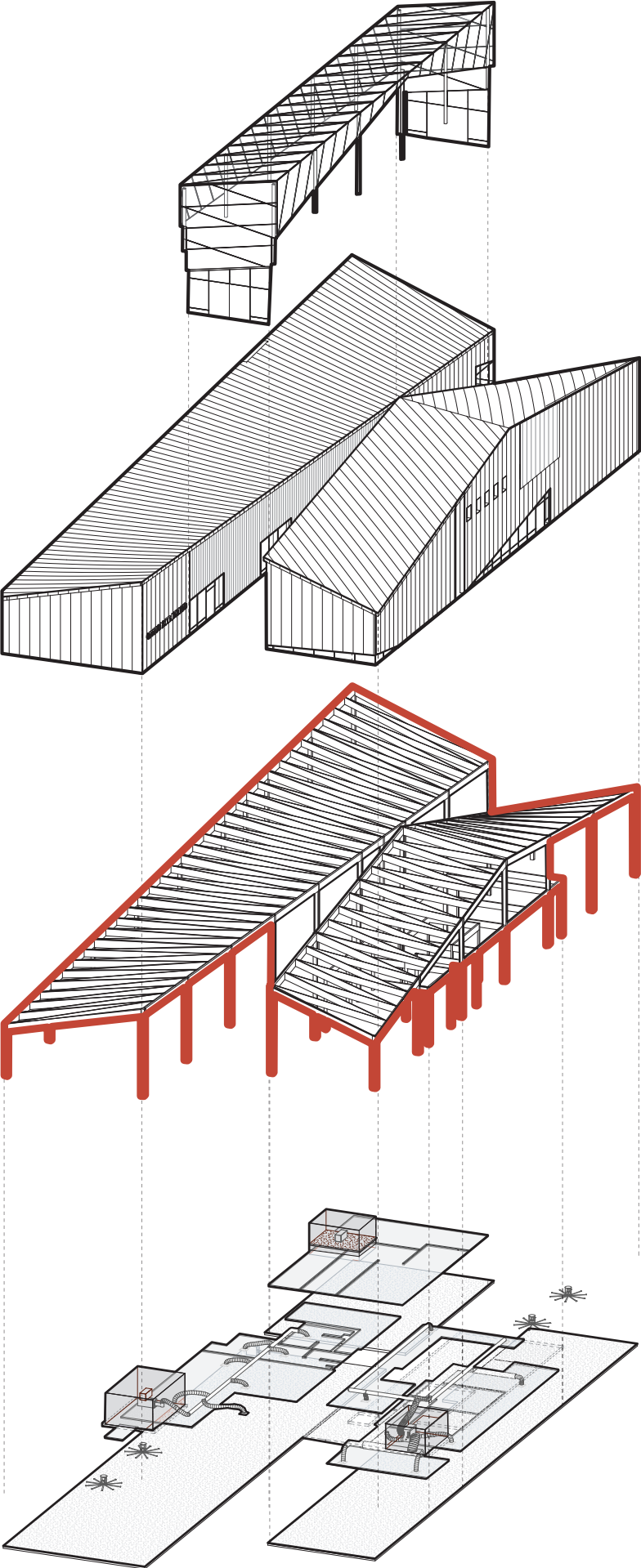
CLT ROOF PANELS



STRUCTURAL BEAM CONNECTIONS



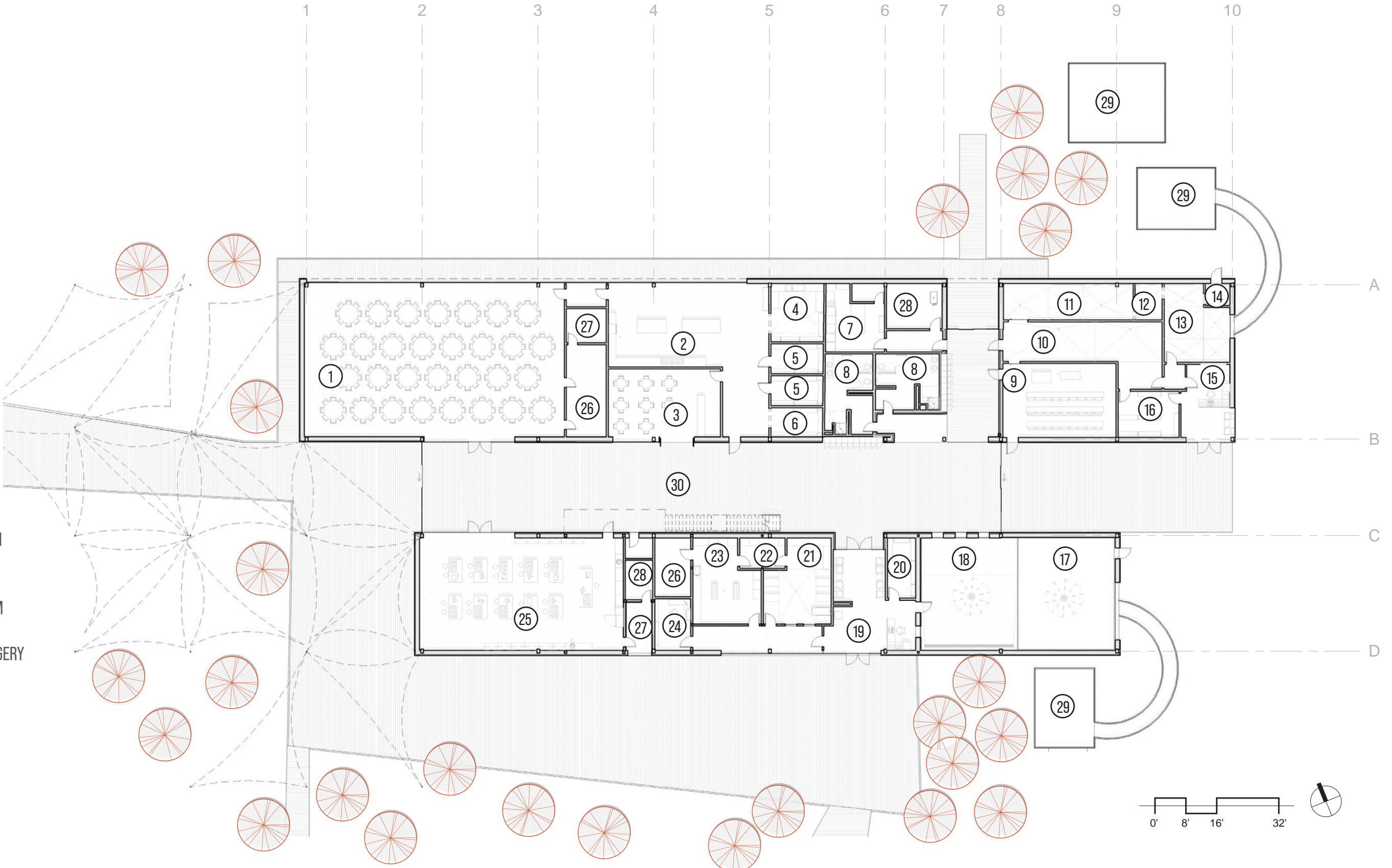
COLUMN CONNECTION



# BUILDING | PLAN LEVEL 1

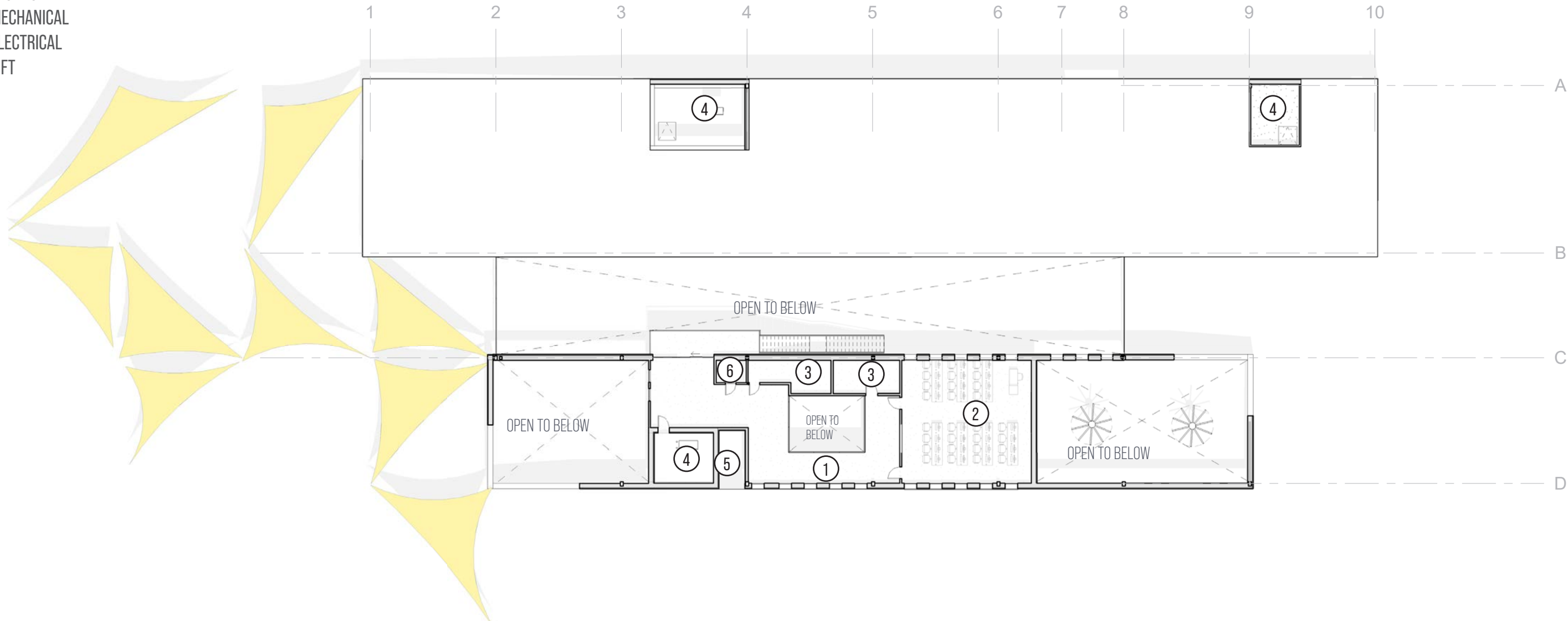
## KEY

- 1. BANQUET HALL
- 2. CULINARY KITCHEN
- 3. CAFE
- 4. DISH PIT
- 5. WALK-IN
- 6. PANTRY
- 7. LAUNDY
- 8. LOCKER
- 9. CLASSROOM
- 10. PROCESSING
- 11. HOLDING FREEZER
- 12. HOT BOX
- 13. KILL FLOOR
- 14. OFFAL
- 15. RECEPTION + SALES
- 16. FREEZER STORAGE
- 17. INDOOR ARENA
- 18. LARGE ANIMAL EXAM
- 19. VET RECEPTION
- 20. FILES
- 21. SMALL ANIMAL EXAM
- 22. STERILIZATION
- 23. SMALL ANIMAL SURGERY
- 24. VET OFFICE
- 25. TECHING KITCHEN
- 26. STORAGE
- 27. ELECTRICAL
- 28. BOILER ROOM
- 29. ANIMAL HOLDING
- 30. ATRIUM



# BUILDING | PLAN LEVEL 2

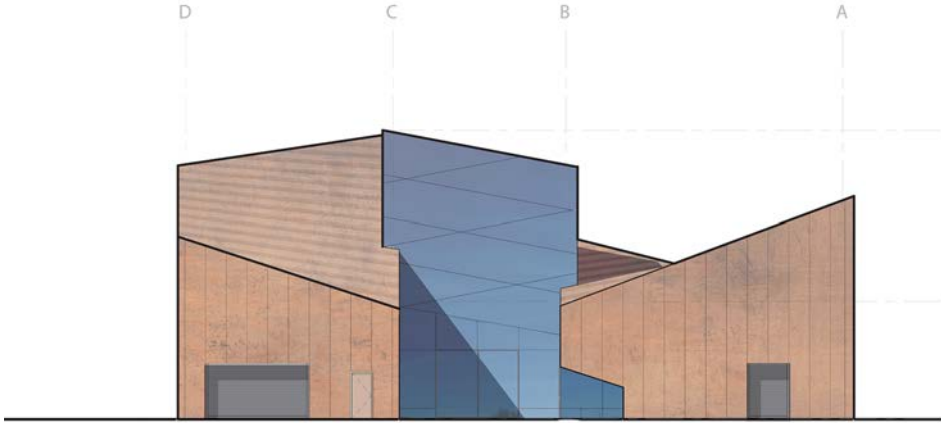
- KEY**
- 1. SURGERY OBSERVATION
  - 2. COMPUTER LAB
  - 3. STORAGE
  - 4. MECHANICAL
  - 5. ELECTRICAL
  - 6. LIFT



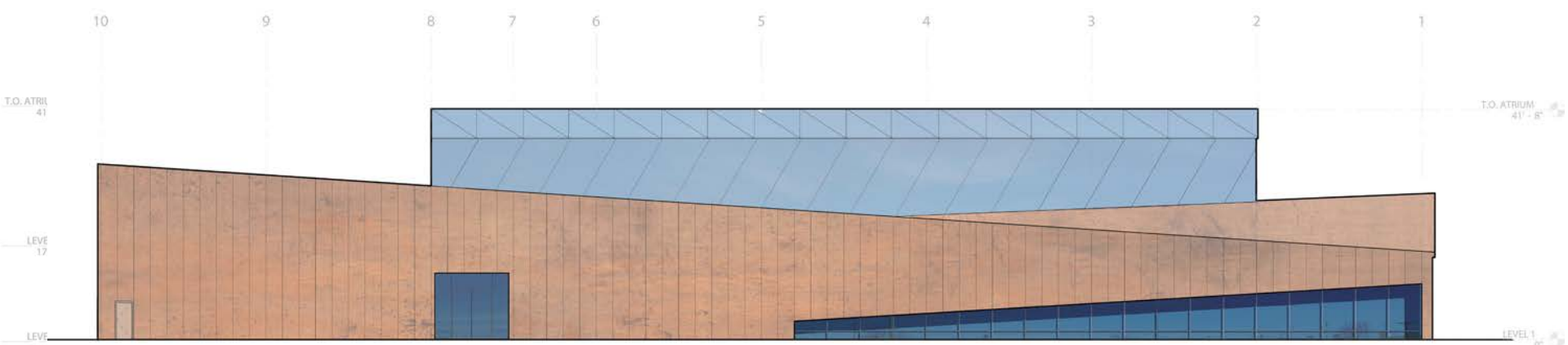
# CULINARY | KITCHEN RENDERING



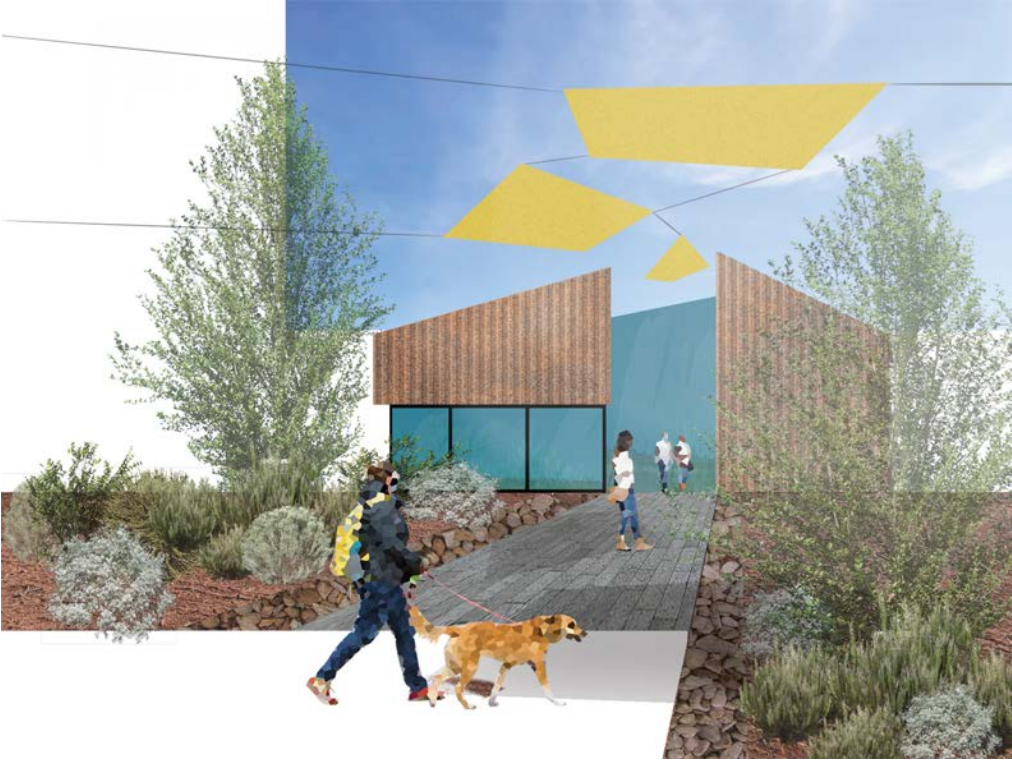
# BUILDING | ELEVATIONS + COLLAGES



WEST ELEVATION



SOUTH ELEVATION



ENTRY



CLASSROOM



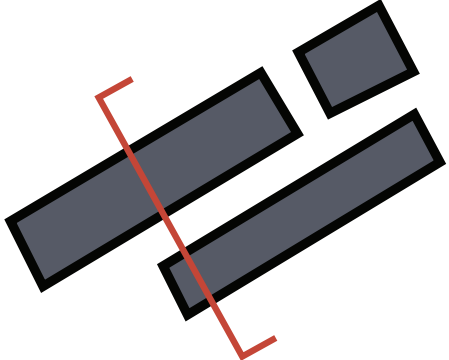
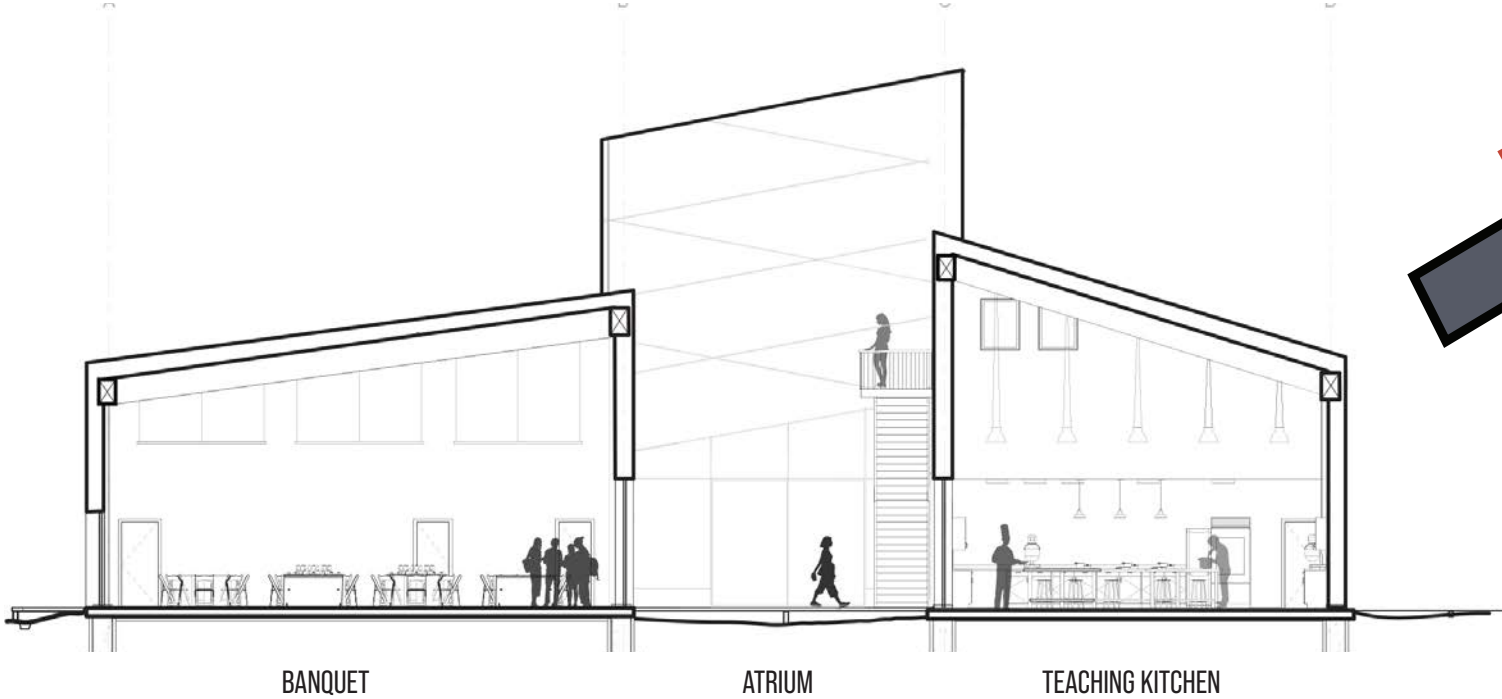
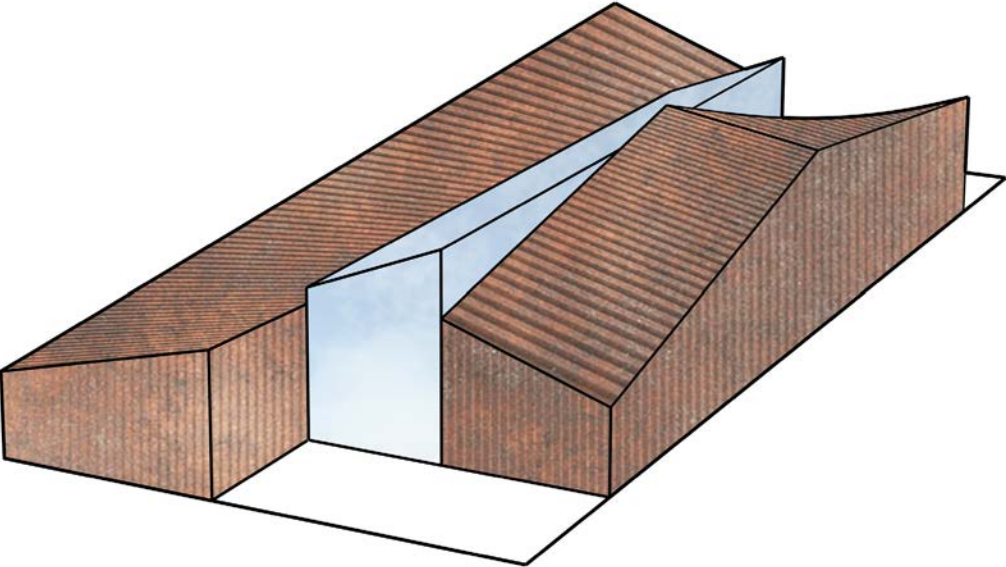
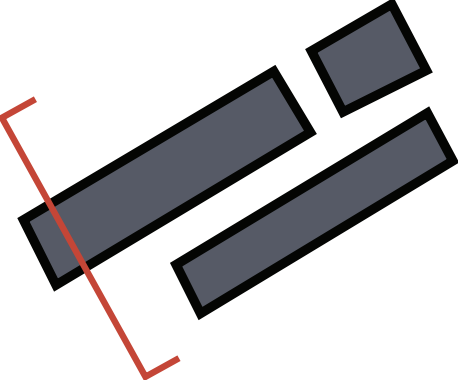
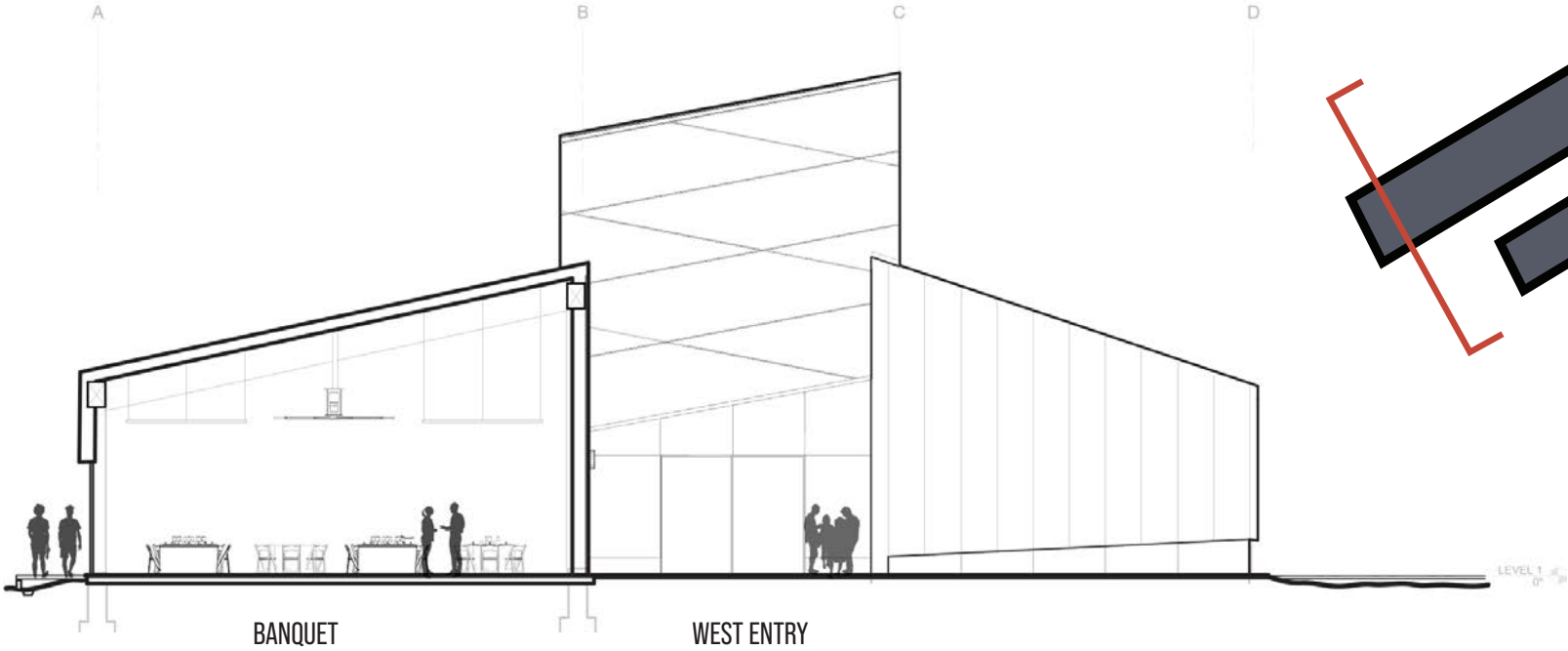
CENTRAL ATRIUM



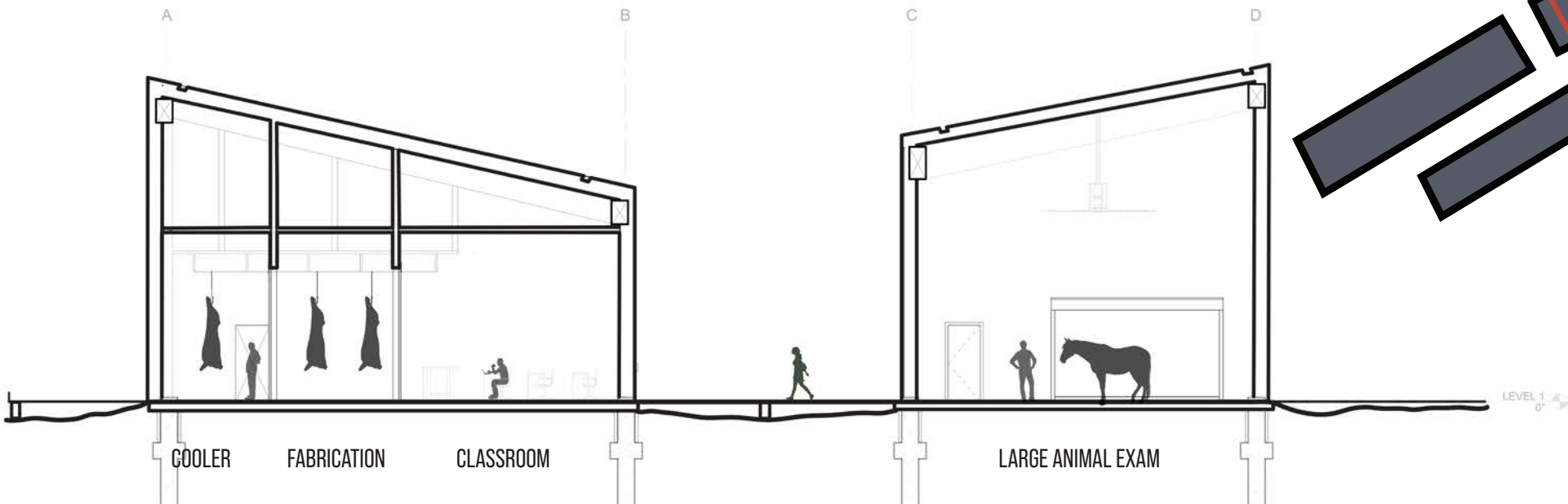
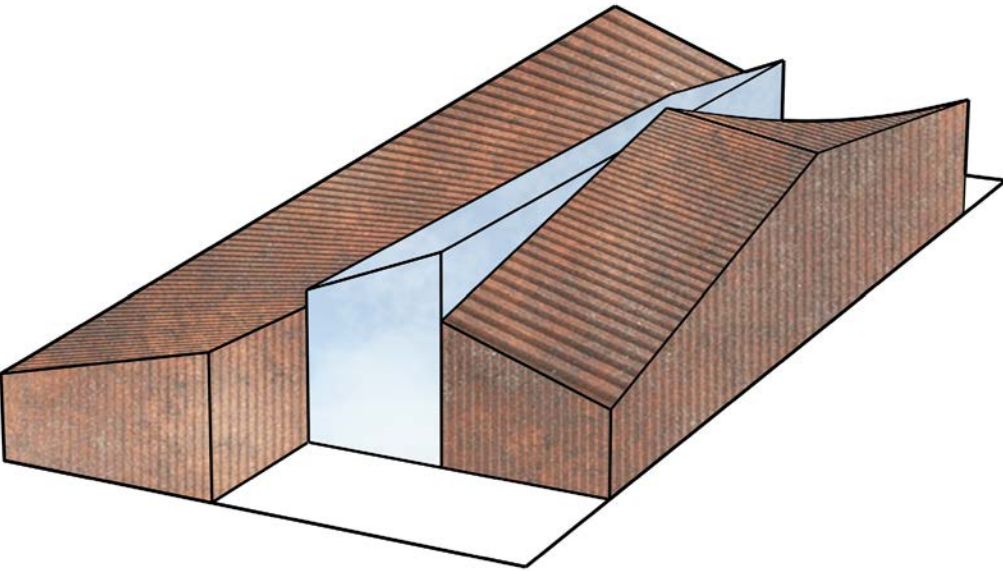
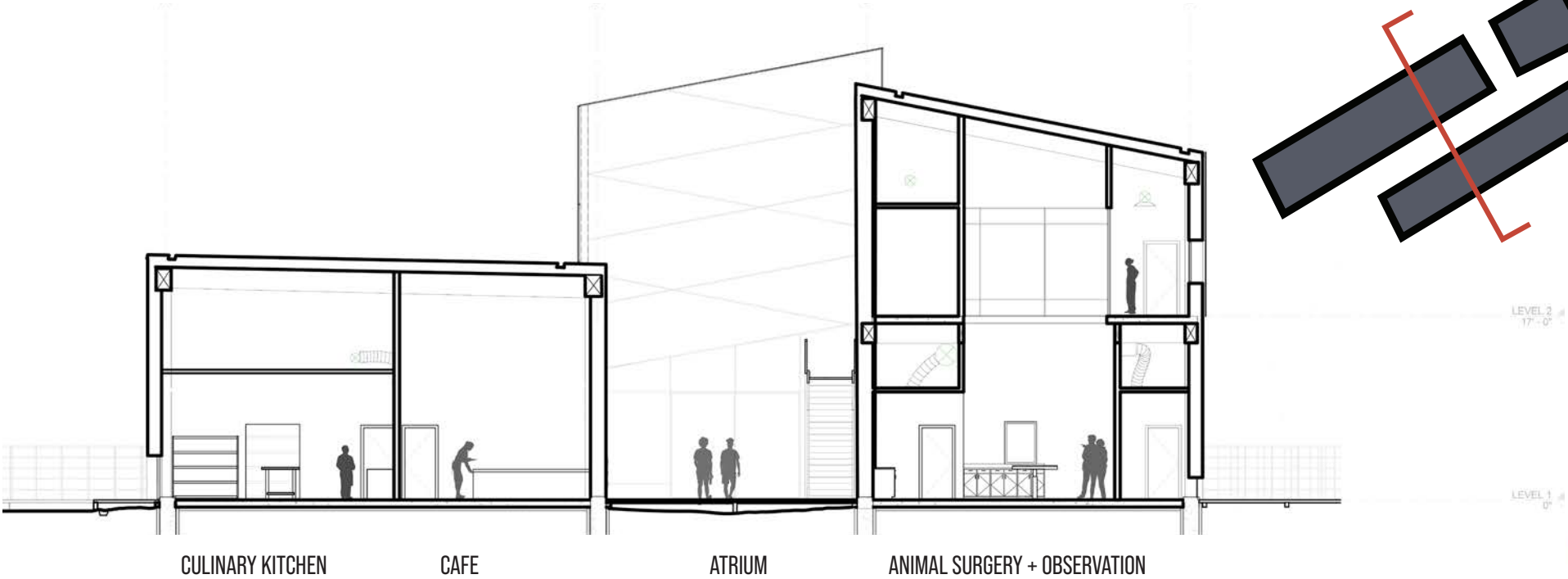
# ATRIUM | RENDERING



# BUILDING | SECTIONS



# BUILDING | SECTIONS



ENTRY | RENDERING

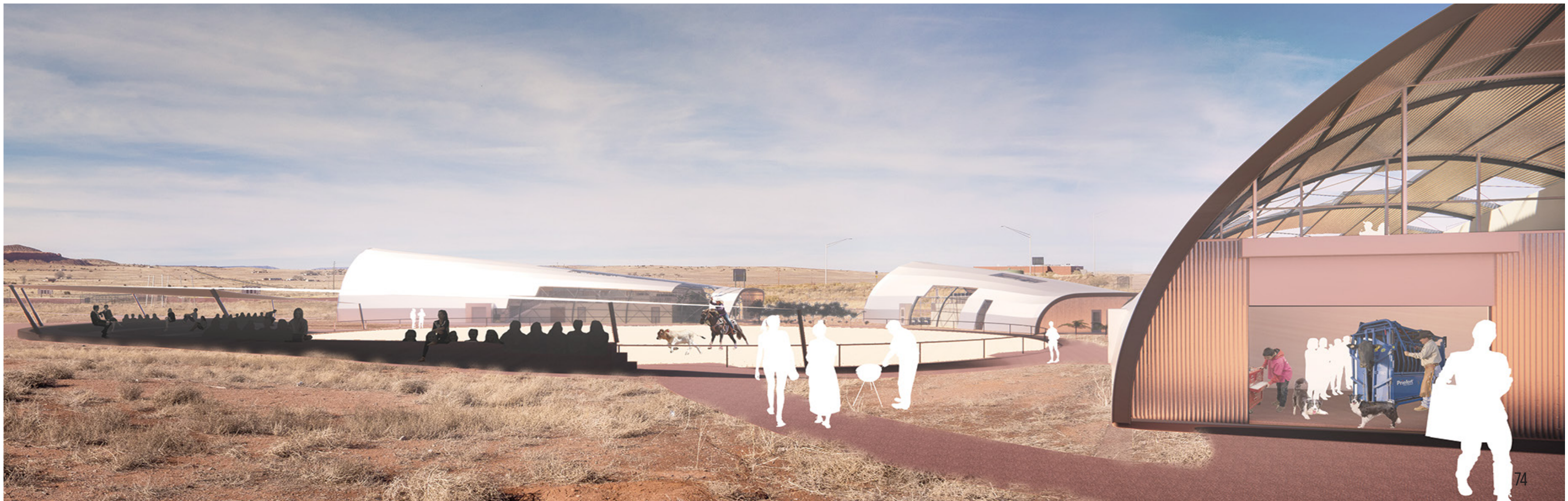


09

# HIGH-TECH QUONSET | PAWEL SAPIECHA WARSAW, POLAND



The form of the buildings is inspired by traditional Quonset, but it is modified and optimized to take advantage of modern building technologies and to meet progressive sustainability requirements. This summarizes the CTE concept; namely applying high-tech design to a low-tech typology as a way of responding to the past and creating a gateway to the future. In this way, the architecture captures the innovative and adaptive nature of the Diné people and becomes a symbol of possibility for the Ganado community.



# GOALS + OUTCOMES

## RESOURCEFUL APPROACH

In his book, *Diné, History of the Navajos*, author Peter Iverson identifies 4 central foundation themes to the Navajo, one of which is the notion of adaptation and incorporation. In the author's view, the Navajo are unique in their practice of bringing in new ideas, new people and new elements and making these things Navajo. Examples cited include:

- Basketball and rodeo which are viewed as traditional pastimes
- Practices of traditional and Christian belief synthesized in the Native American Church
- Asian patterns incorporated into weavings
- Clan systems that include outside groups who chose to come live with the Navajo
- Livestock acquired by the Spanish now part of the staple livestock belonging to a Navajo family



## ADAPTING TO LOCAL CONTEXT

The quonset is a form that already exists in Ganado vernacular architecture. Since its invention, it has represented a form of utilitarianism and efficiency. This proposal aims to present a high-tech interpretation of a quonset.



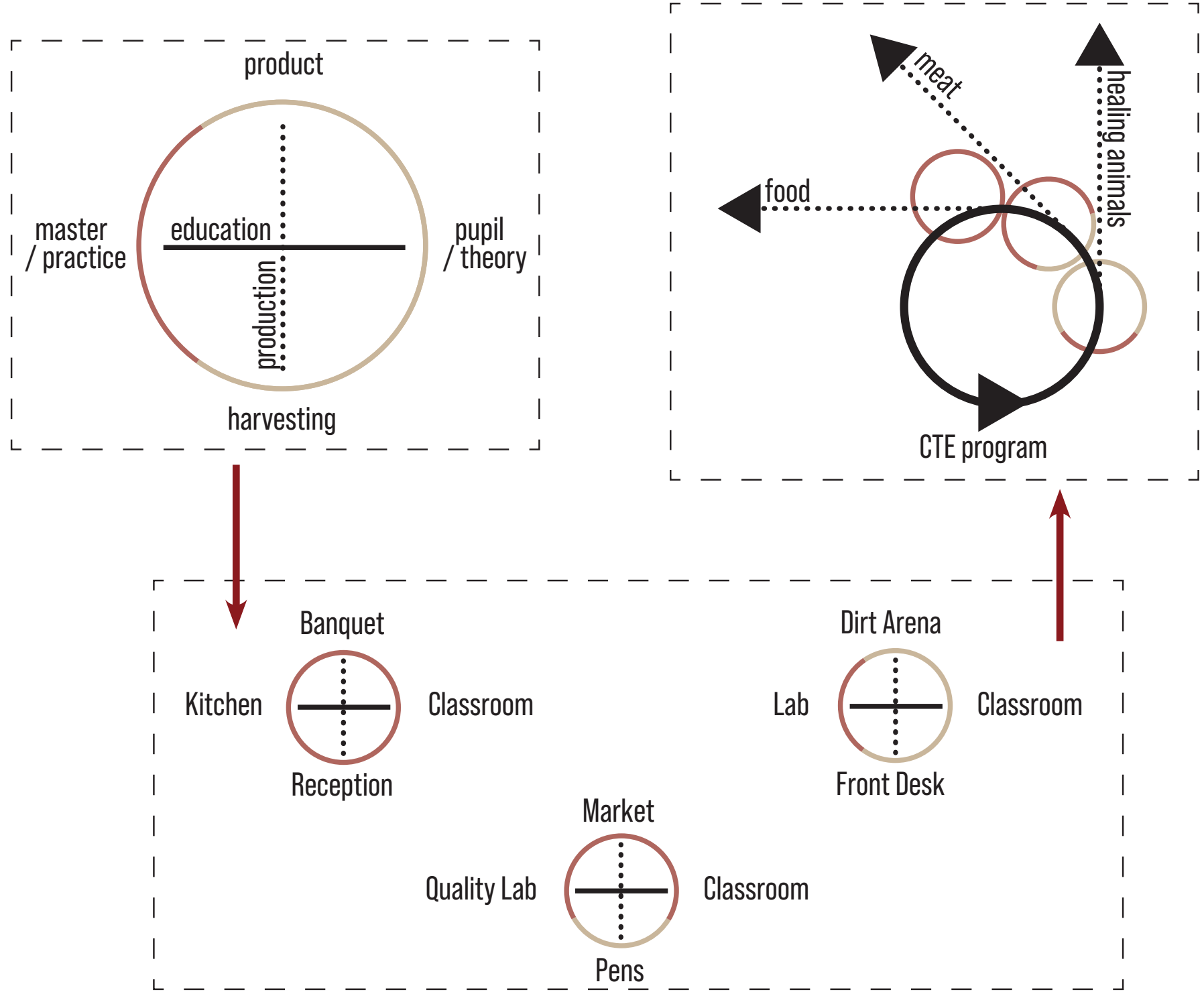
## SEQUENCE OF PRODUCTION

Within the different programs of the facility there exists a process that leads to a product. For example, in meat fabrication, an animal is processed and the product is food. In this proposal, the buildings visually represent this process-to-product sequence, with the product portion being celebrated in architecture.

PRODUCT ← PROCESS

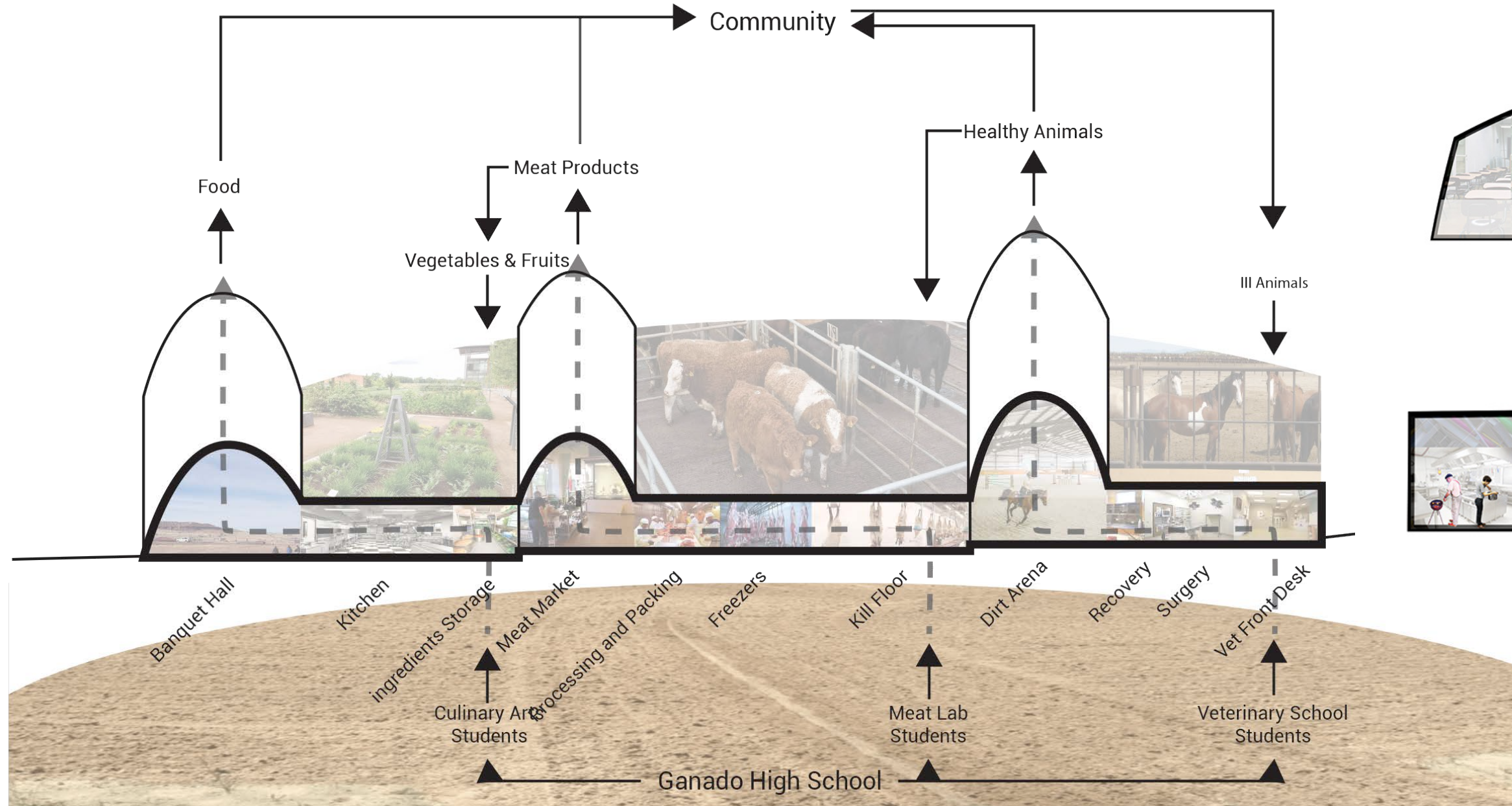
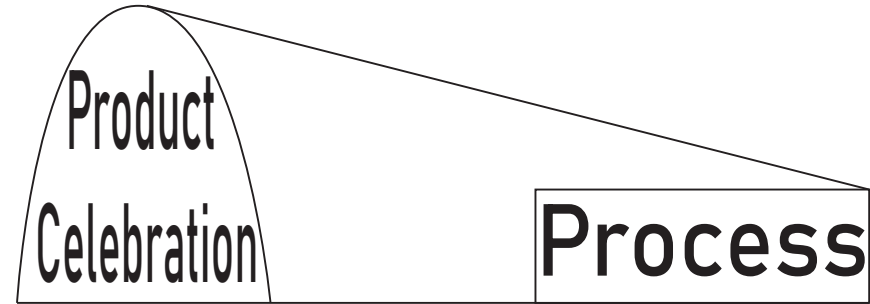
# CONCEPT

In the paper *Meaning of the Workplace; Using Ideas of Ritual Space in Design*, author Dennis Doxtater explains his theory that it is possible to find the axis of meaning within the organization of a building's spaces and that this is a more powerful means of communicating the values of an organization than using iconic representation such as symbols. A classic example of this is a large library space prominently positioned within an educational facility; or designating large window office spaces for the high-level managers of a business. In the case of Ganado CTE, there are two important axes to consider. The first is process, namely the technical and uniquely cultural act of harvesting meat for the provision of food and sustenance. The second axis is product, which results from the transfer of knowledge from master to pupil, manifesting in a celebrated commodity or experience. For this reason, rather than evoking symbols, the buildings organize to communicate the importance of both process and product, co-existing for the greater good. The process, where things begin, is located on one end of the axis in the shallower section of the structure and the product locates opposite in the taller, more celebrated section of the space. This also works in terms of energy and material conservation, keeping the highest concentration of energy-intensive use in the more controlled volume and allowing for more sporadic use such as a banquet or indoor arena to take advantage of the open and exposed volume.



# CONCEPT

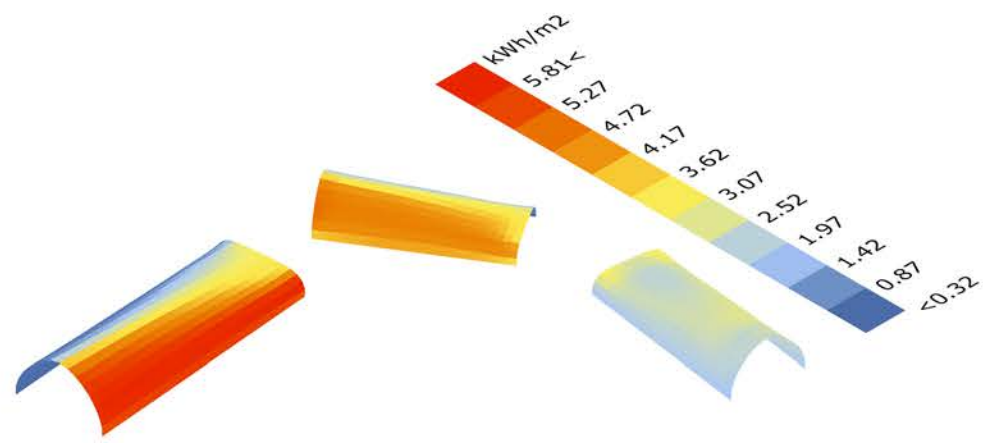
Each building houses a process that generates a product. Therefore the form of the buildings reflects this as a rectangular building that morphes into a dome. The rectangular portion represents the process and the dome celebrates the product.



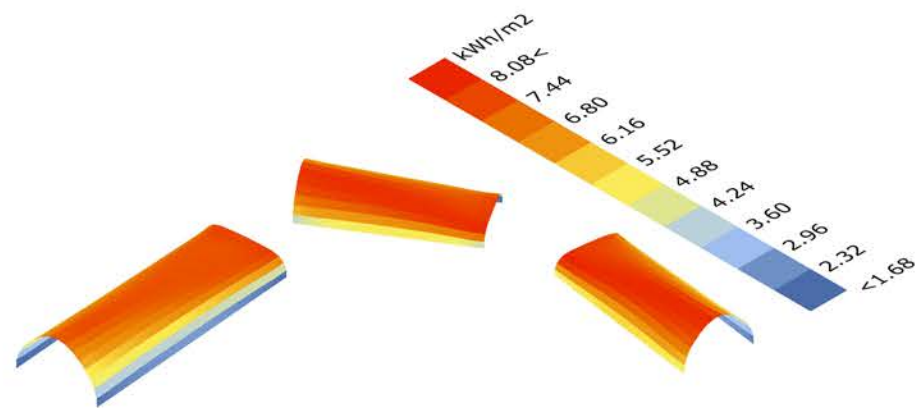


# PASSIVE STRATEGIES

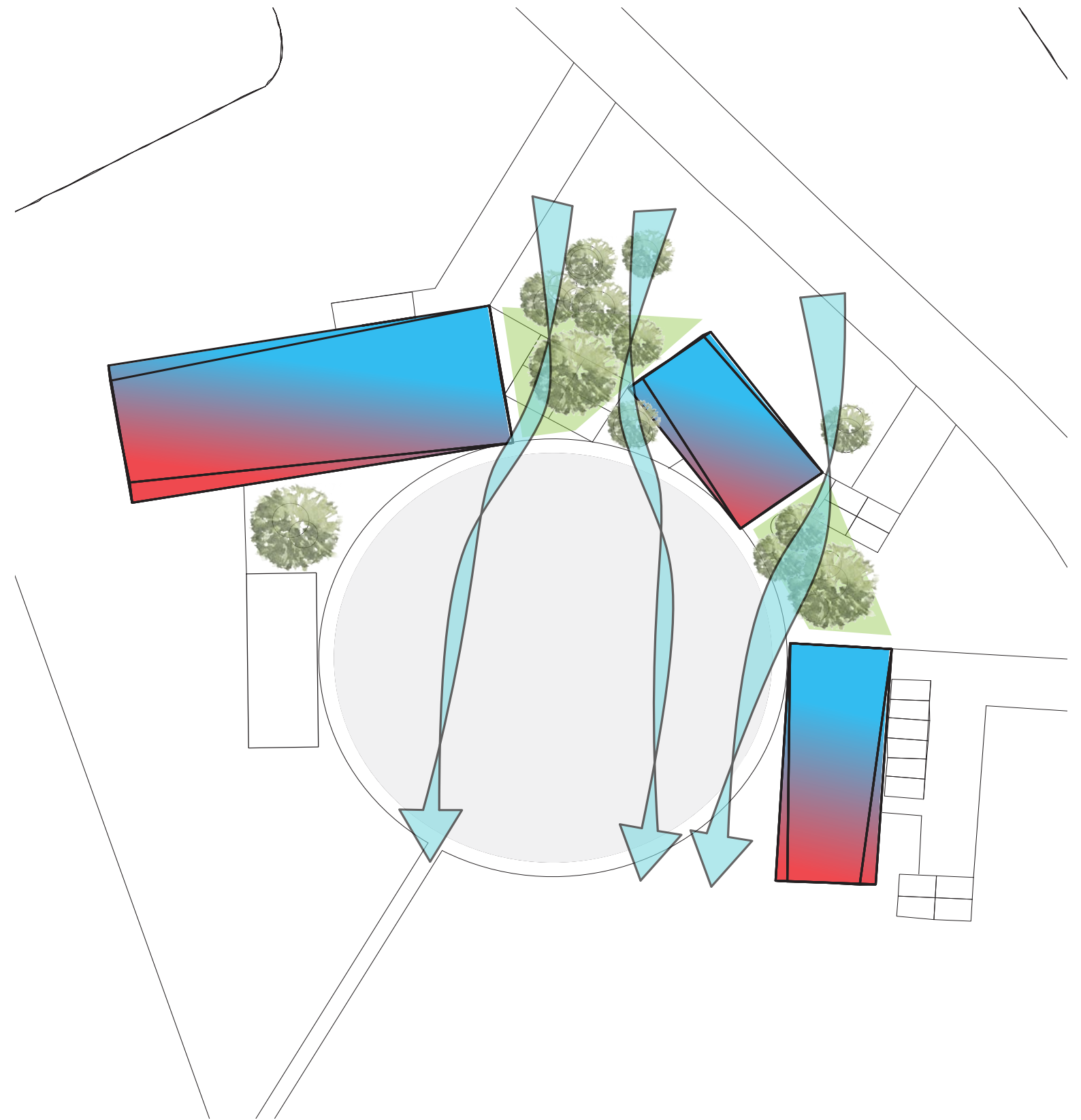
Parts of the program that required cooler temperatures were placed in more opaque parts of the building, while opportunities for passive heat gain were treated with more glazing. The geometry and organization of overhangs and glazed panels directly follows environmental conditions on the site. Corridors are heavily glazed in order to warm interior spaces during winter but are shaded in summer. Wind direction was also used on site to filter air through vegetation corridors before passing through the facility.



RADIATION ANALYSIS WINTER

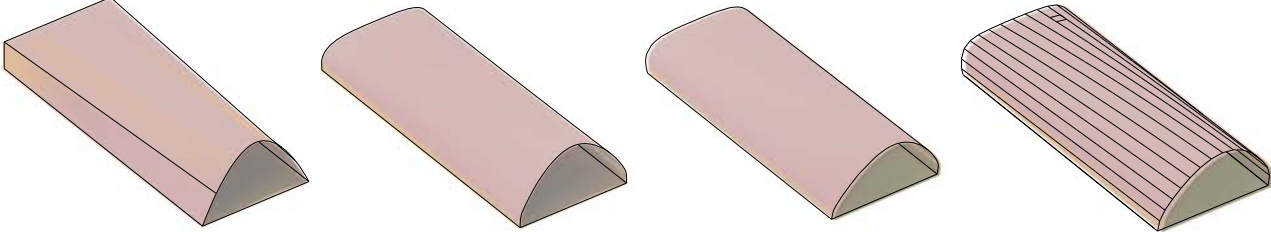


RADIATION ANALYSIS SUMMER

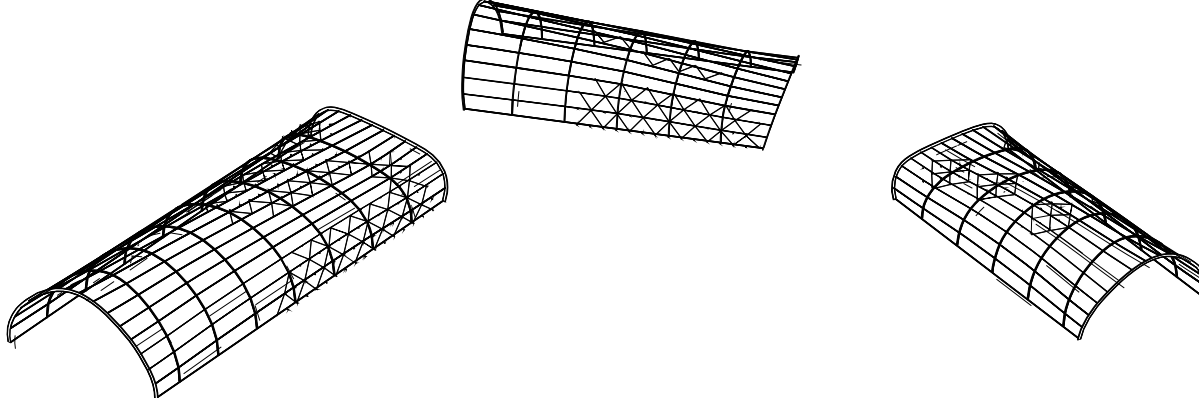


WINDFLOW + TEMPERATURE PLAN

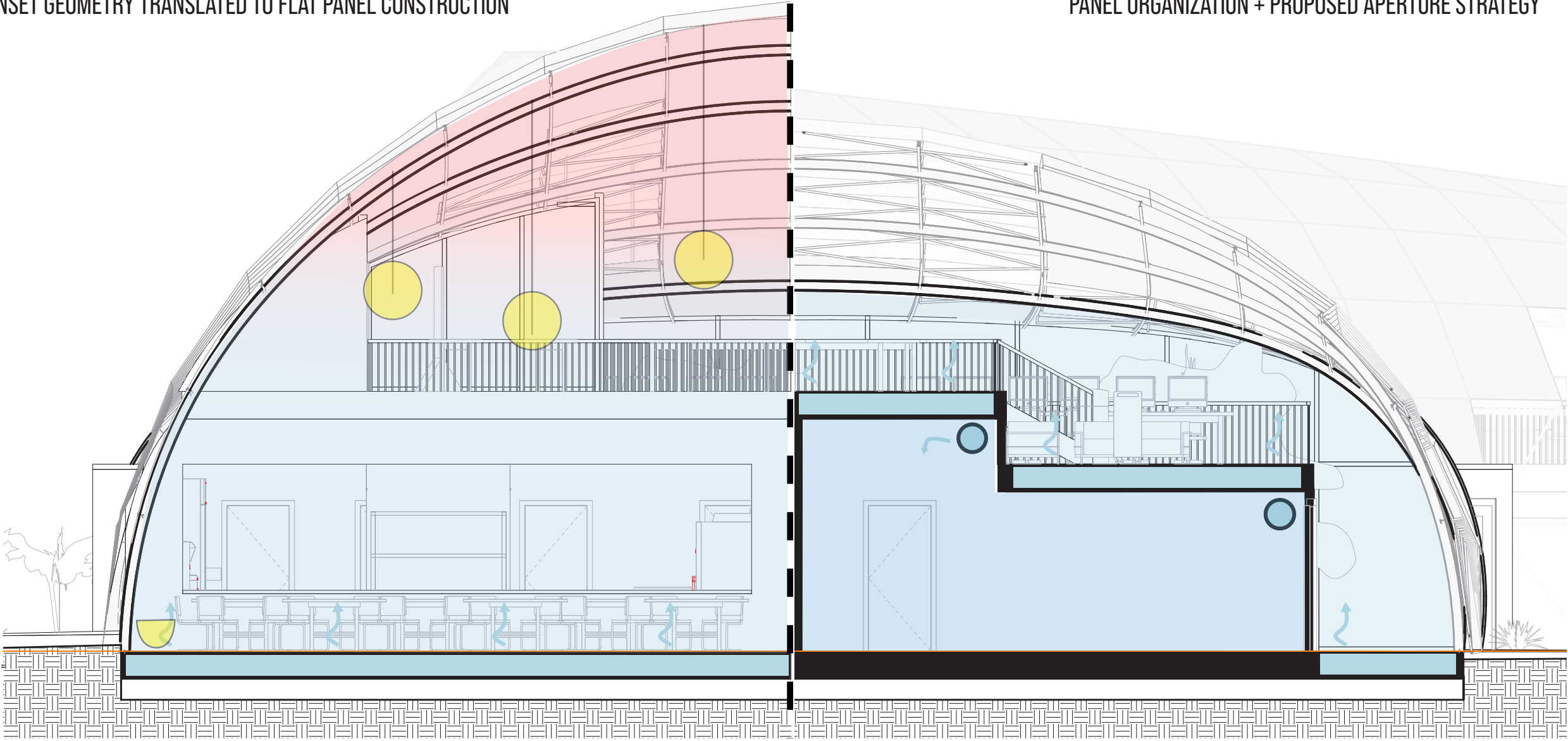
# STRUCTURAL LOGIC



MODIFIED QUONSET GEOMETRY TRANSLATED TO FLAT PANEL CONSTRUCTION



PANEL ORGANIZATION + PROPOSED APERTURE STRATEGY

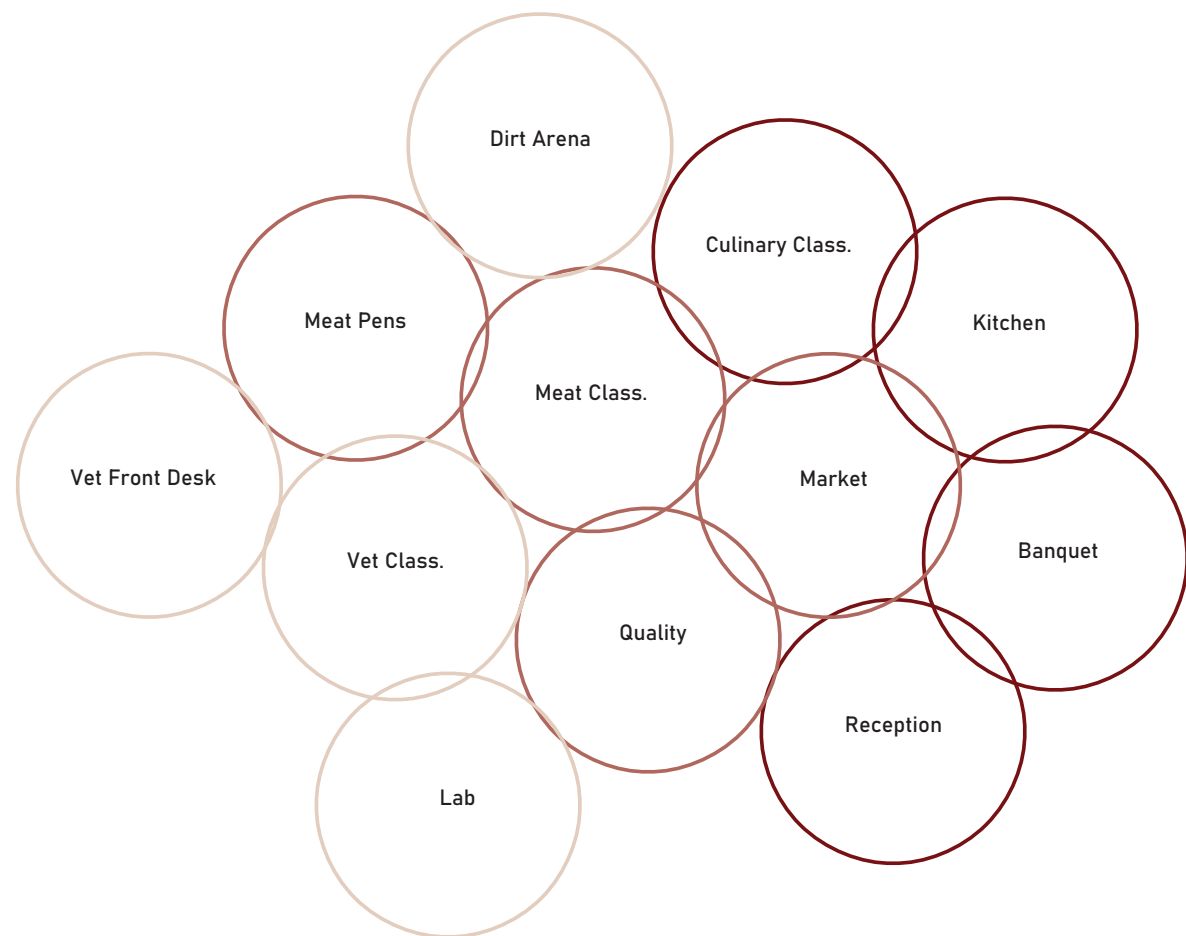


BANQUET SECTION

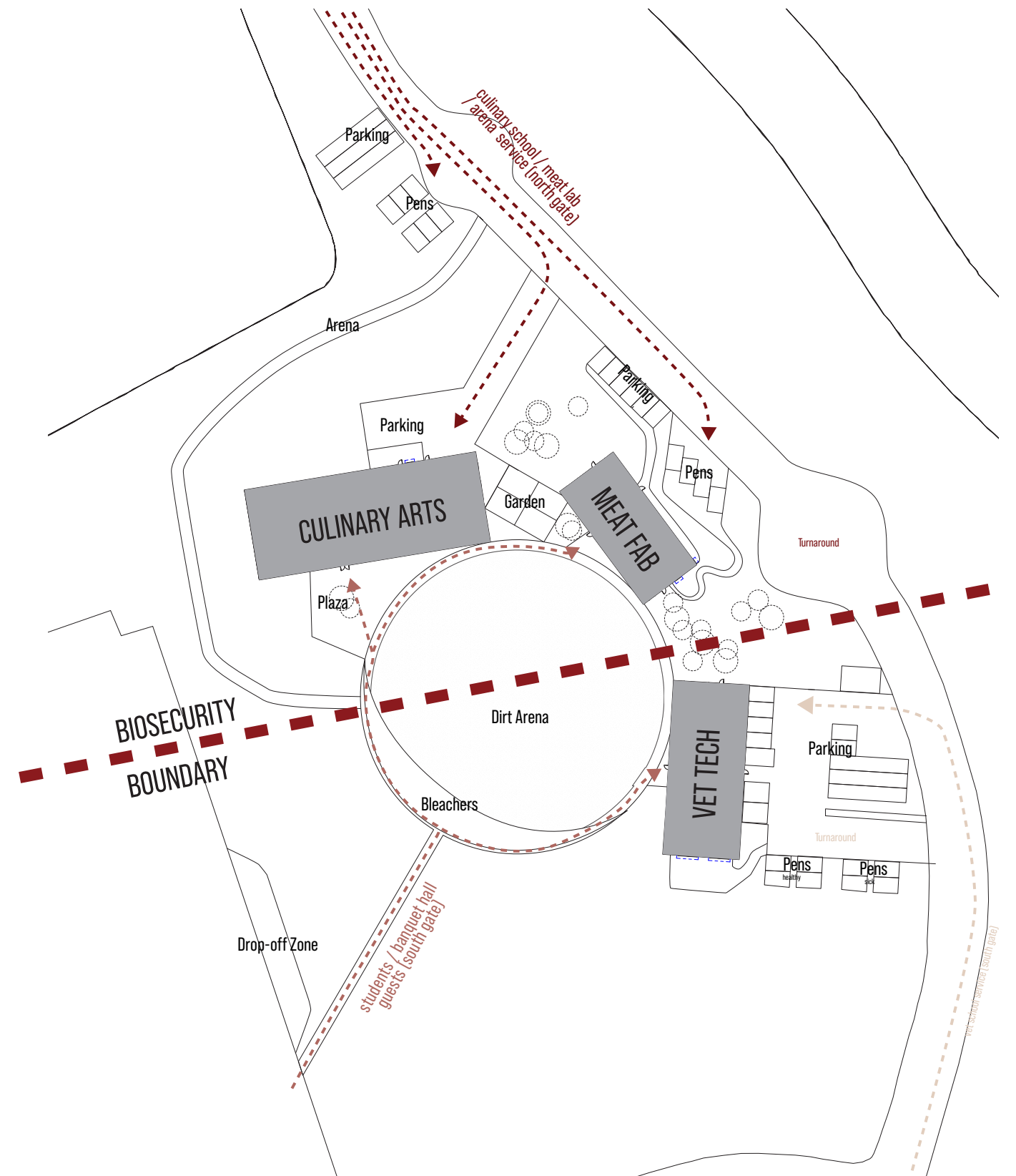
PROCESSING SECTION

# SITE | ORGANIZATION

NODES	Banquet	Reception	Kitchen	Culinary Class.	Meat Pens	Market	Quality	Meat Class.	Vet Front Desk	Dirt Arena	Vet Class.	Lab
Banquet		1	1	2	4	1	3	2	4	4	4	4
Reception	1		2	2	4	3	3	4	3	4	4	4
Kitchen	1	2		1	3	1	2	2	4	3	3	4
Culinary Class.	2	2	1		2	1	2	2	4	3	3	4
Meat Pens	4	4	3	2		3	2	2	2	2	1	3
Market	1	3	1	1	3		1	2	4	4	4	4
Quality	3	3	2	2	2	1		2	4	4	3	2
Meat Class.	2	4	2	2	2	2	2		4	2	2	3
Vet Front Desk	4	3	4	4	2	4	4	4		3	2	3
Dirt Arena	4	4	3	3	2	4	4	2	3		3	4
Vet Class.	4	4	3	3	1	4	3	2	2	3		1
Lab	4	4	4	4	3	4	2	3	3	4	1	



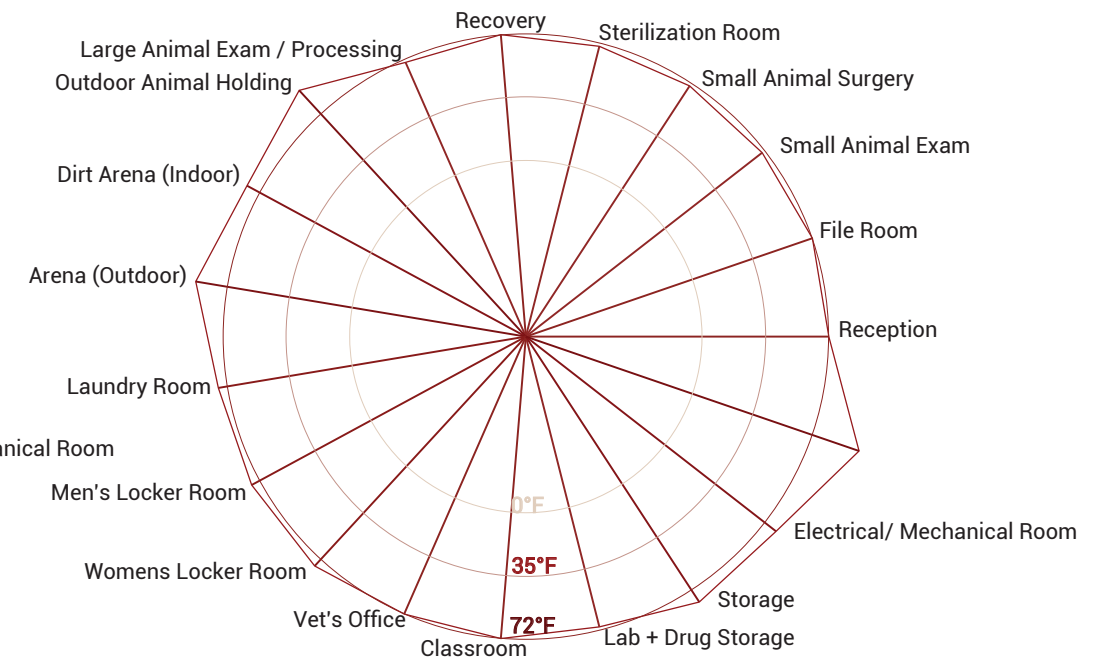
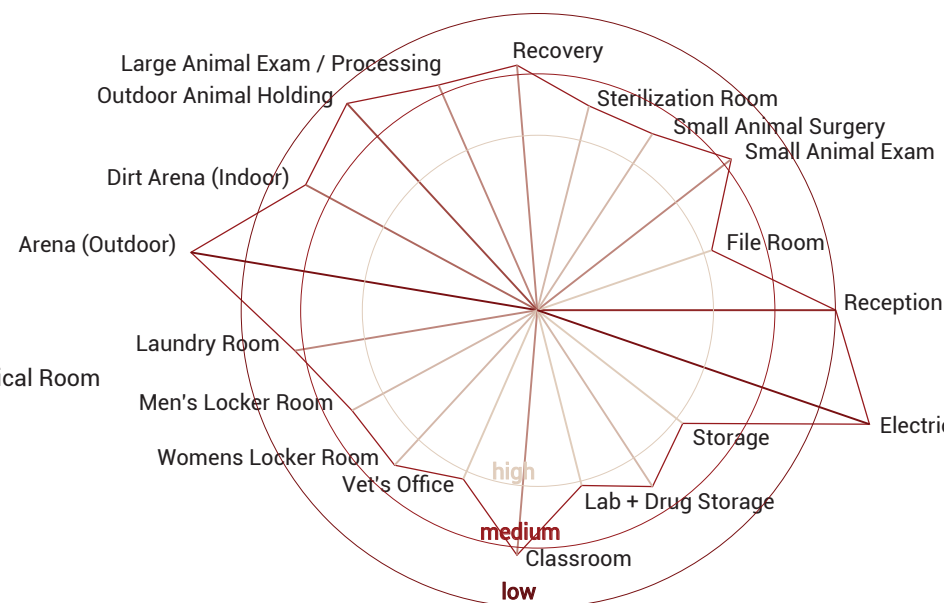
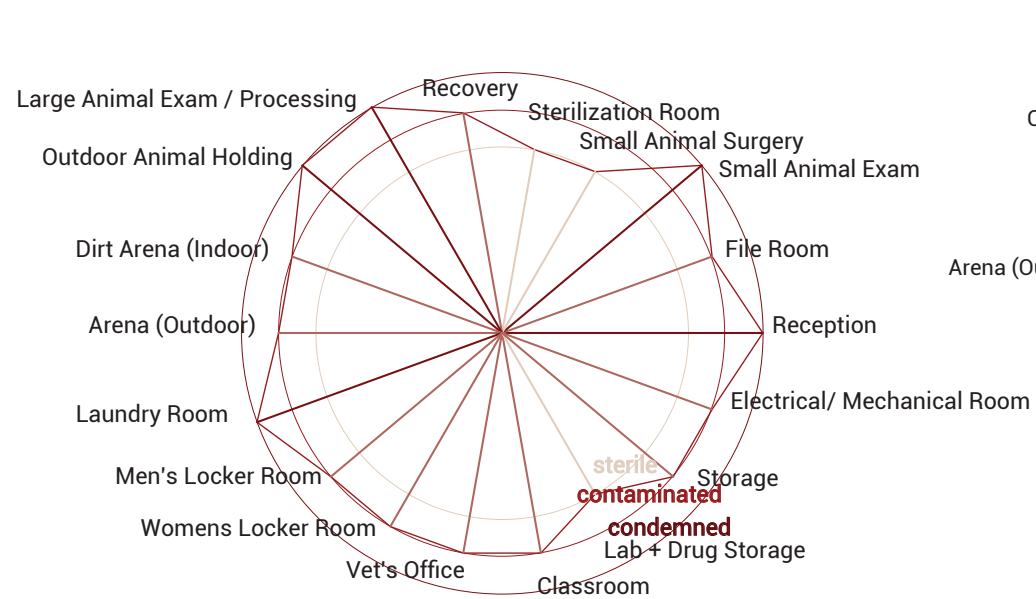
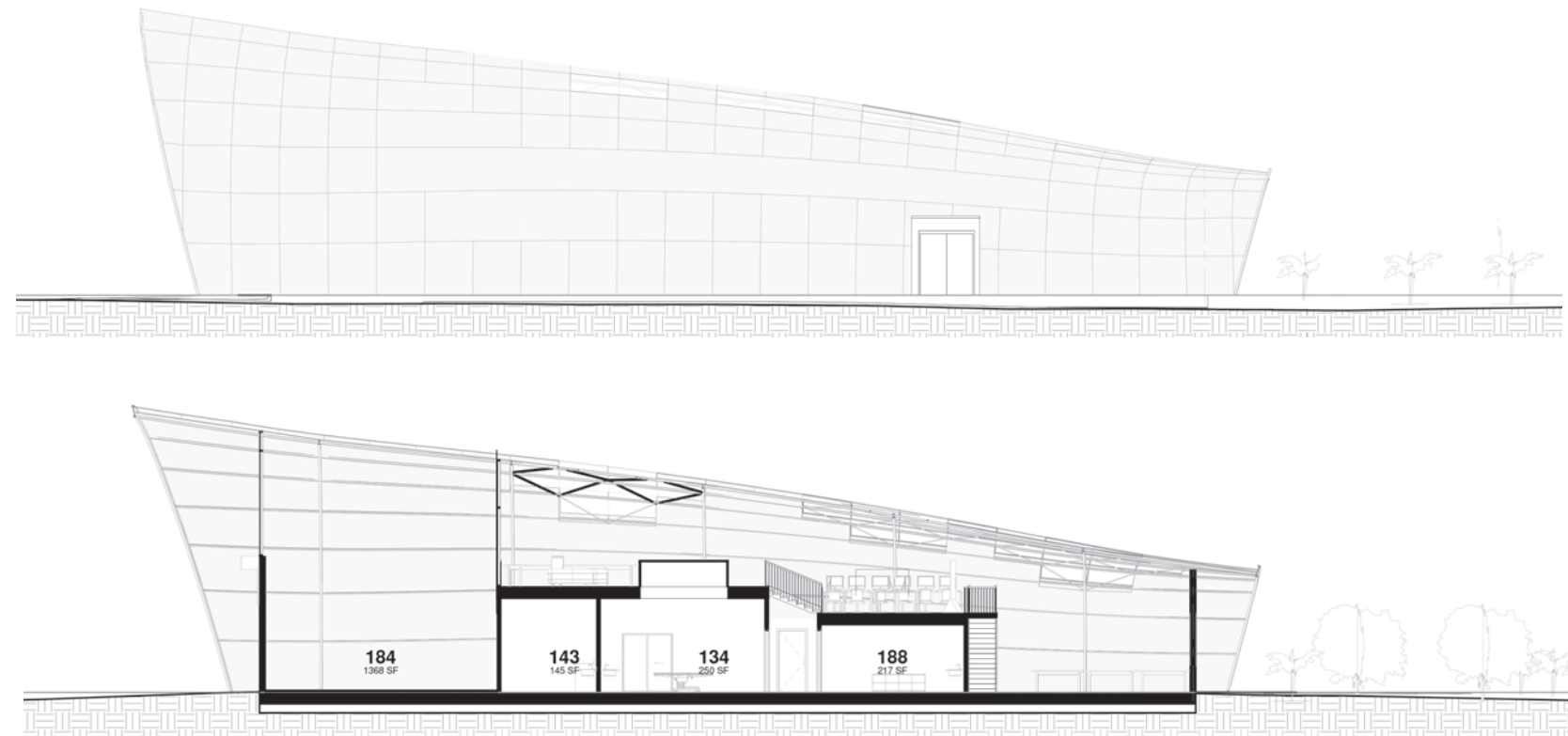
# SITE | PLAN



# VET TECH | ORGANIZATION

# VET TECH | ELEVATION + SECTION

VET	Reception	File Room	Animal Exam	Animal Surgery	Sterilization Room	Recovery	Animal Exam /	Animal Holding	Dirt Arena (Indoor)	Arena (Outdoor)	Laundry Room	Locker Room	Locker Room	Vet's Office	Classroom	Drug Storage	Storage	Mechanical Room
Reception		1	1	2	2	3	1	3	3	3	4	4	4	1	3	4	4	4
File Room	1		3	4	4	4	3	4	4	4	4	4	4	1	4	4	4	4
Animal Exam	1	3		1	1	1	2	3	3	3	2	2	2	1	2	1	1	4
Animal Surgery	2	4	1		1	1	2	3	3	3	2	2	2	1	1	1	1	4
Sterilization Room	2	4	1	1		1	1	4	3	4	3	3	3	2	3	4	2	4
Recovery	3	4	1	1	1		1	1	2	2	2	3	3	2	3	2	2	4
Animal Exam /	1	3	2	2	1	1		1	1	1	3	3	3	1	1	1	2	4
Animal Holding	3	4	3	3	4	1	1		1	1	4	4	4	3	3	4	4	4
Dirt Arena (Indoor)	3	4	3	3	3	2	1	1		1	4	4	4	3	3	4	4	4
Arena (Outdoor)	3	4	3	3	4	2	1	1	1		4	4	4	3	3	4	4	4
Laundry Room	4	4	2	2	3	2	3	4	4	4		1	1	4	2	4	2	3
Locker Room	4	4	2	2	3	3	3	4	4	4	1		1	4	1	4	3	4
Locker Room	4	4	2	2	3	3	3	4	4	4	1	1		4	1	4	3	4
Vet's Office	1	1	1	1	2	2	1	3	3	3	4	4	4		3	3	4	4
Classroom	3	4	2	1	3	3	1	3	3	3	2	1	1	3		4	4	4
Drug Storage	4	4	1	1	4	2	1	4	4	4	4	4	4	3	4		3	4
Storage	4	4	1	1	2	2	2	4	4	4	2	3	3	4	4	3		3
Mechanical Room	4	4	4	4	4	4	4	4	4	4	3	4	4	4	4	4	3	



# VET TECH | PLANS

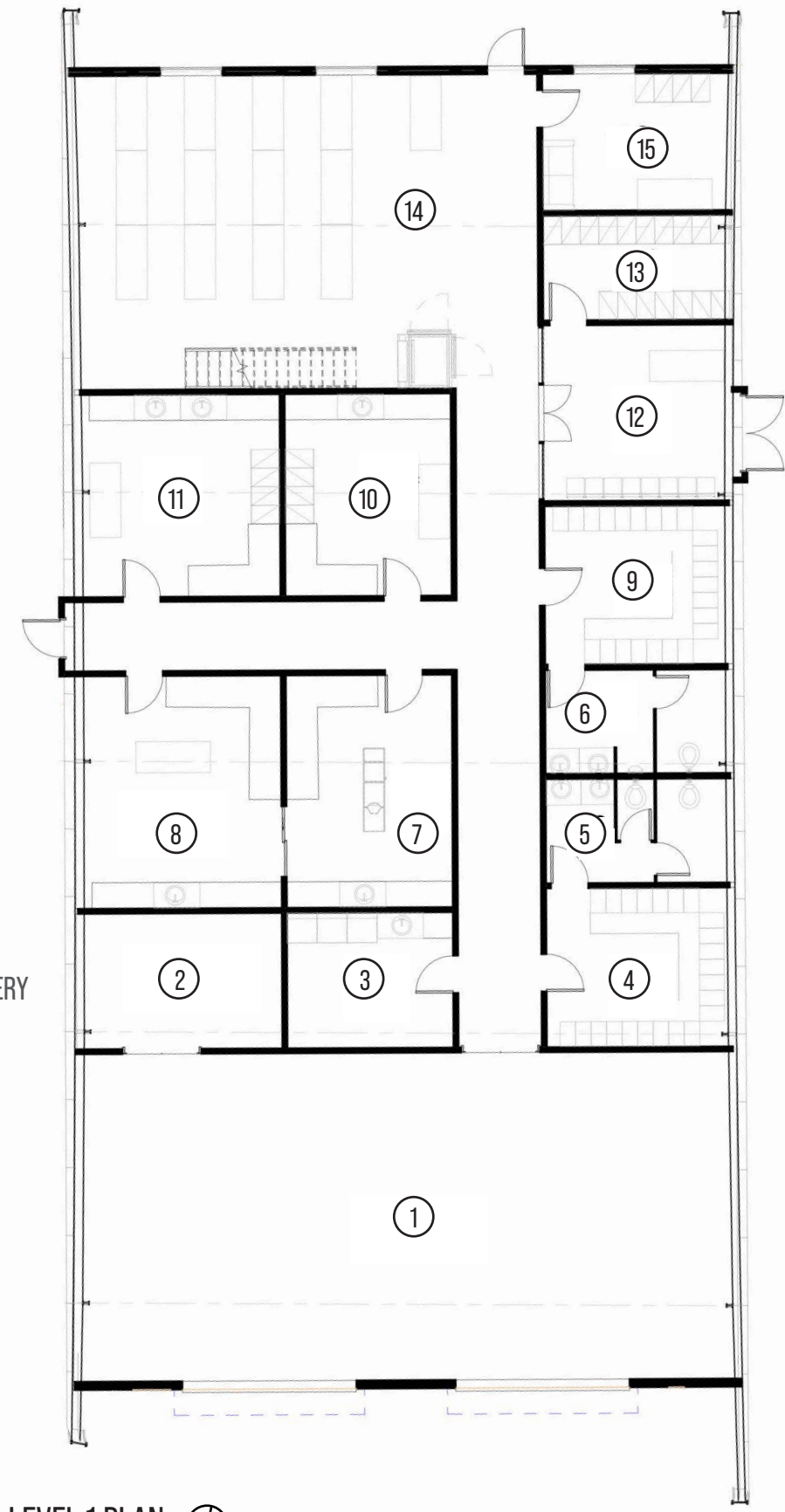


## KEY

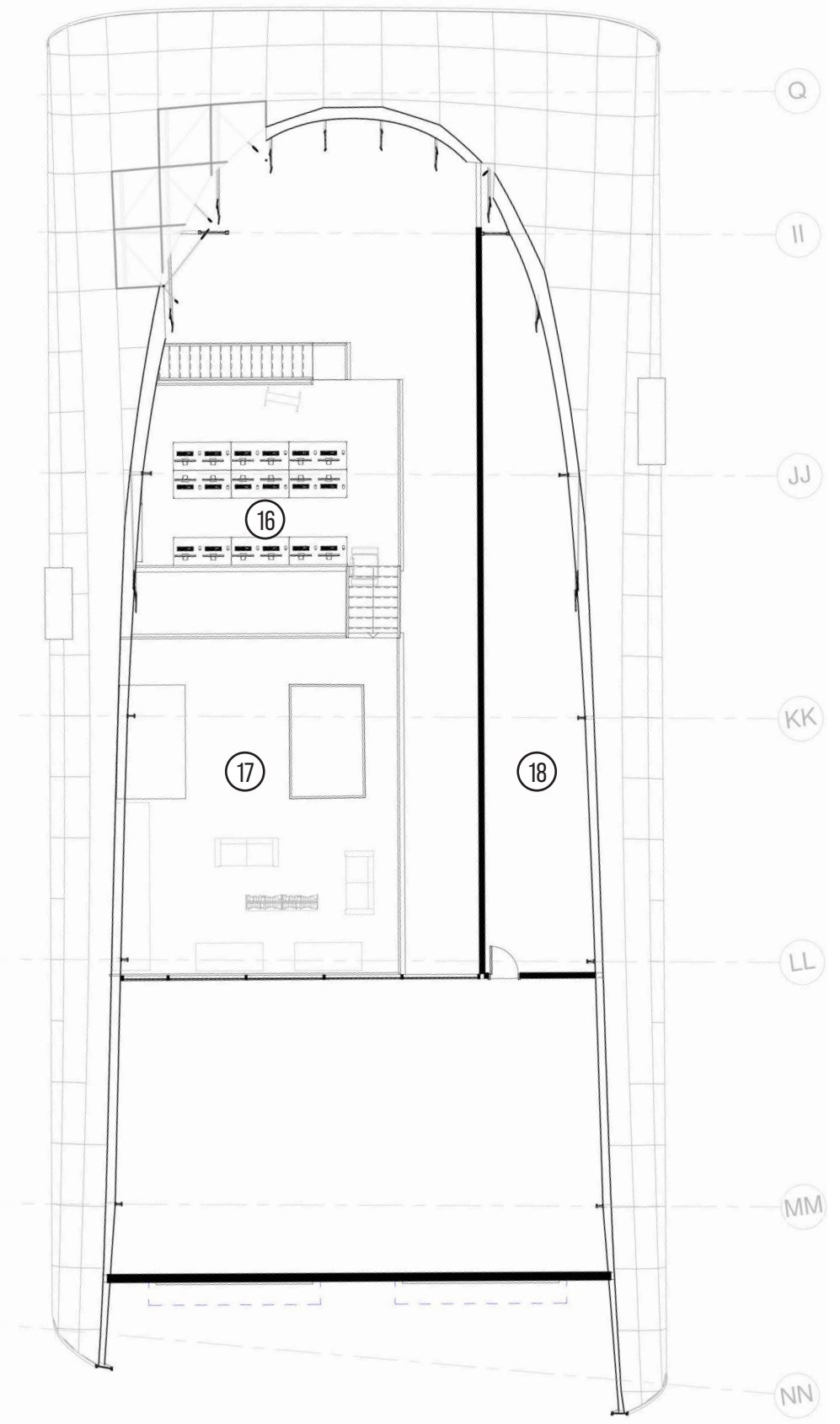
- 1. INDOOR ARENA
- 2. STORAGE
- 3. LAUNDRY
- 4. WOMEN'S LOCKERS
- 5. WOMEN'S RESTROOM
- 6. MEN'S RESTROOM
- 7. SMALL ANIMAL SURGERY
- 8. SMALL ANIMAL EXAM
- 9. MEN'S LOCKERS
- 10. LAB + STORAGE
- 11. STERILIZATION
- 12. RECEPTION
- 13. FILE ROOM
- 14. CLASSROOM
- 15. VET'S OFFICE

## LEVEL 2 KEY

- 16. COMPUTER LAB
- 17. CLASSROOM
- 18. MECHANICAL



LEVEL 1 PLAN



LEVEL 2 PLAN

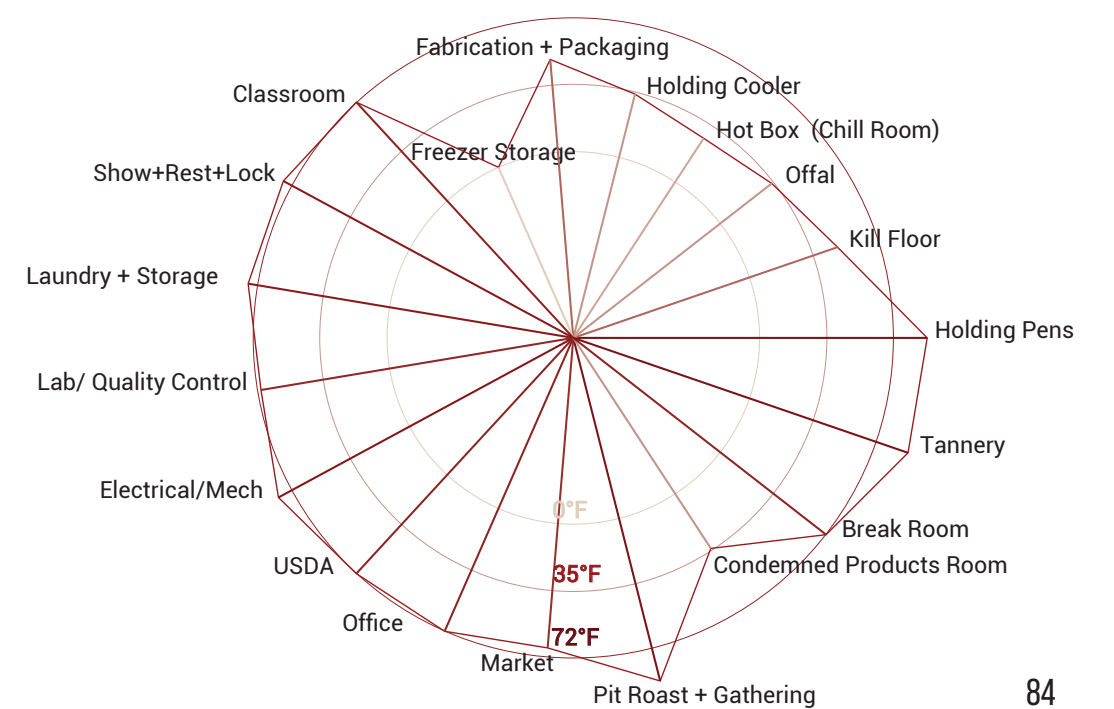
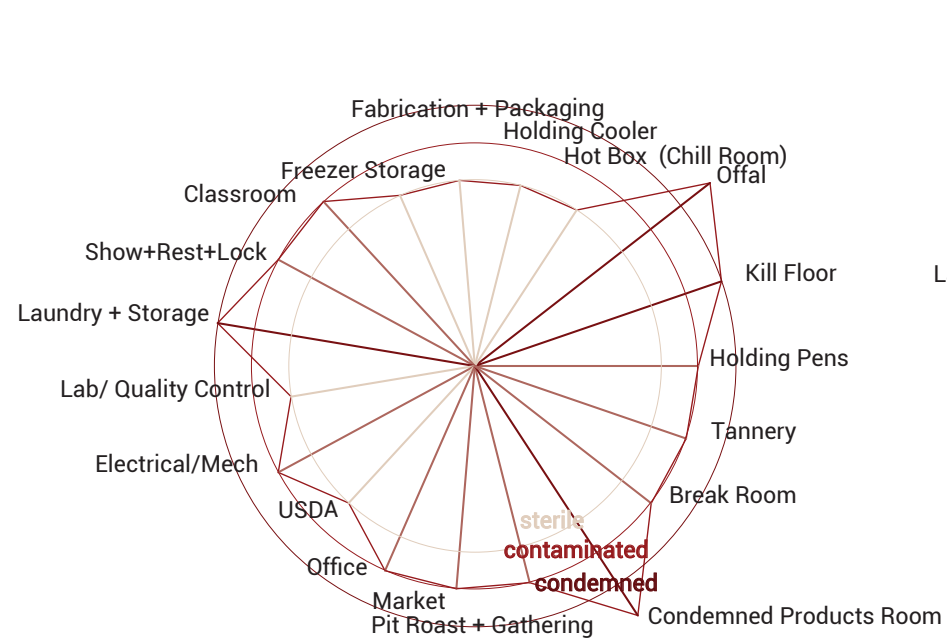
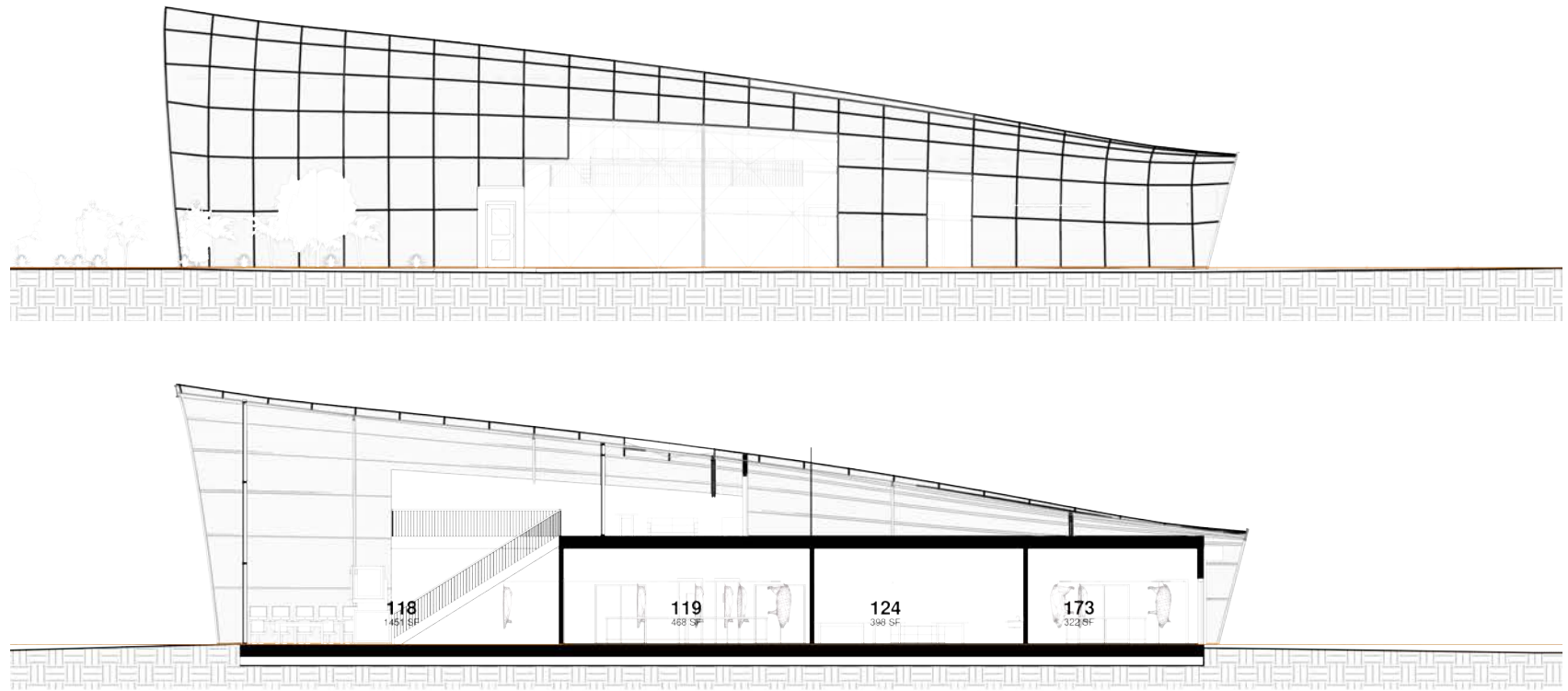
# VET TECH | INDOOR ARENA RENDERING



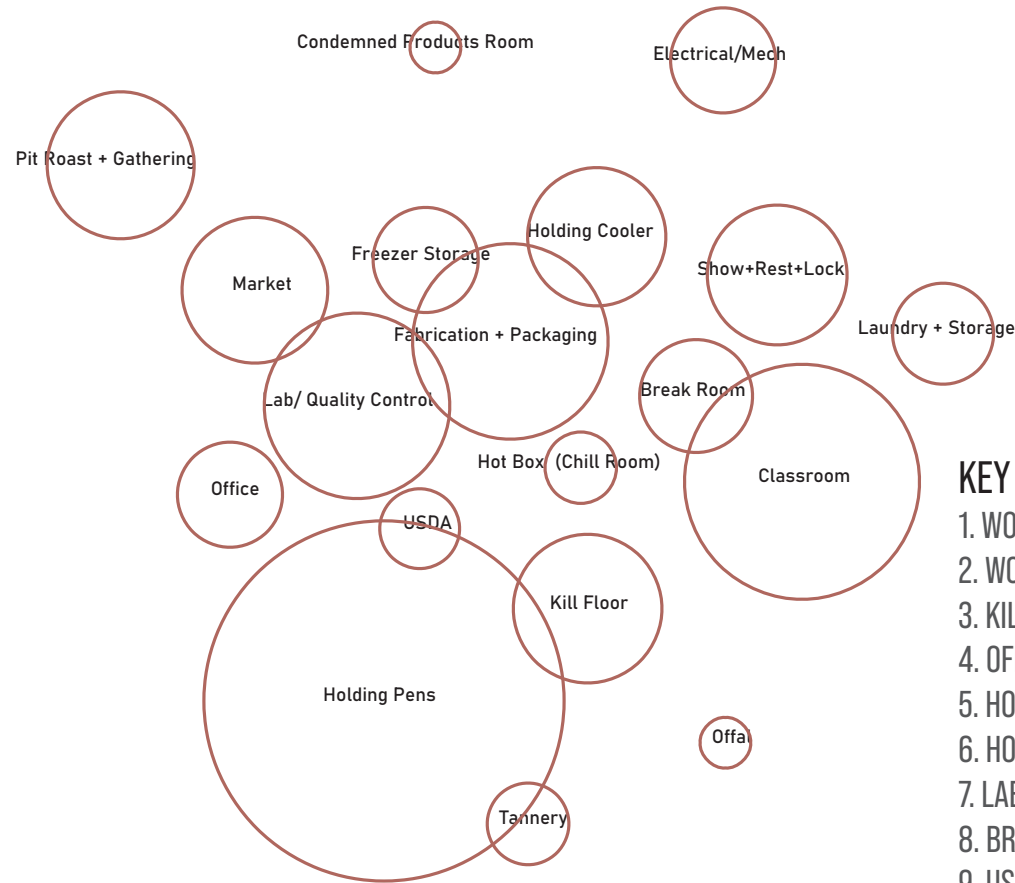
# MEAT FAB | ORGANIZATION

# MEAT FAB | ELEVATION + SECTION

MEAT	Holding Pens	Kill Floor	Offal	(Chill Room)	Holding Cooler	n + Packagin	Freezer Storage	Classroom	Show+Rest+Lock	Laundry + Storage	Quality Control	Electrical/ Mech	USDA	Office	Market	+ Gathering	ed Products	Break Room	Tannery
Holding Pens		1	2	3	3	3	3	3	4	4	3	4	1	2	4	4	4	3	4
Kill Floor	1		1	1	2	2	2	2	3	4	2	4	1	2	4	4	4	1	1
Offal (Chill Room)	2	1		3	4	4	4	3	4	4	3	4	2	4	4	4	4	4	4
Holding Cooler	3	1	3		1	2	2	2	4	4	2	2	2	3	3	4	4	3	4
n + Packagin	3	2	4	2	1		1	1	2	3	1	2	1	2	1	2	1	1	4
Freezer Storage	3	2	4	2	2	1		3	1	4	1	2	1	2	1	3	3	3	4
Classroom	3	1	3	2	2	1	3		1	1	3	4	4	3	4	3	4	3	4
Show+Rest+Lock	4	3	4	4	4	2	1	1		1	4	3	4	4	4	4	4	1	4
Laundry + Storage	4	4	4	4	4	3	4	1	1		4	2	4	4	4	4	4	2	4
Quality Control	3	2	3	2	2	1	1	3	4	4		4	1	1	2	4	3	3	4
Electrical/ Mech	4	4	4	2	2	2	2	4	3	2	4		4	4	4	4	4	4	4
USDA	1	1	2	2	2	1	1	4	4	4	1	4		1	3	4	3	3	4
Office	2	2	4	3	3	2	2	3	4	4	1	4	1		1	3	4	3	4
Market	4	4	4	3	2	1	1	4	4	4	2	4	3	1		1	3	3	2
+ Gathering	4	4	4	4	3	2	3	3	4	4	4	4	4	3	1		4	4	3
ed Products	4	4	4	4	4	1	3	4	4	4	3	4	3	4	3	4		4	3
Break Room	3	1	4	3	3	2	3	3	1	2	3	4	3	3	3	4	4		3
Tannery	4	1	4	4	4	4	4	4	4	4	4	4	4	4	2	3	3	3	



# MEAT FAB | PLANS

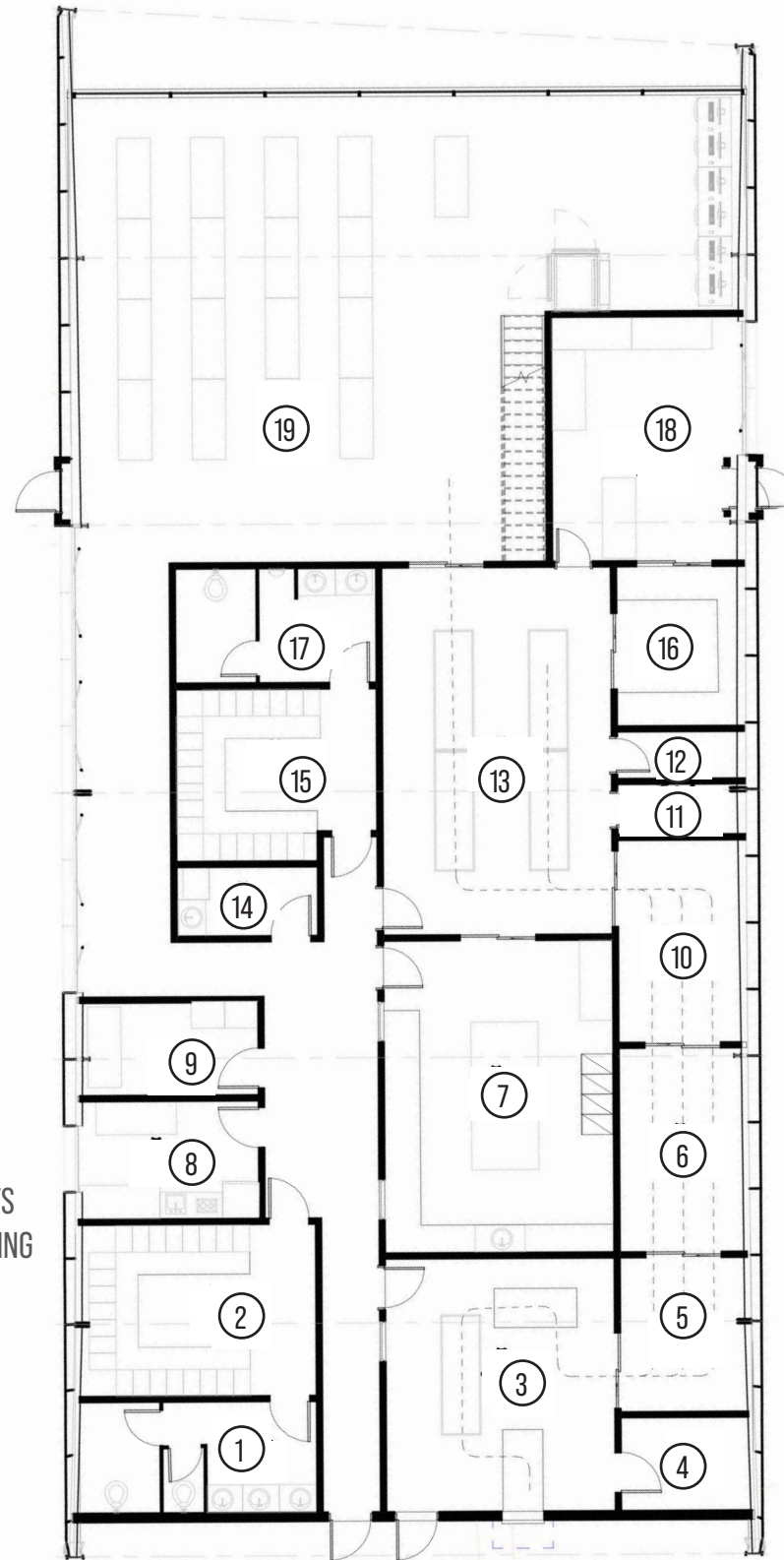


## KEY

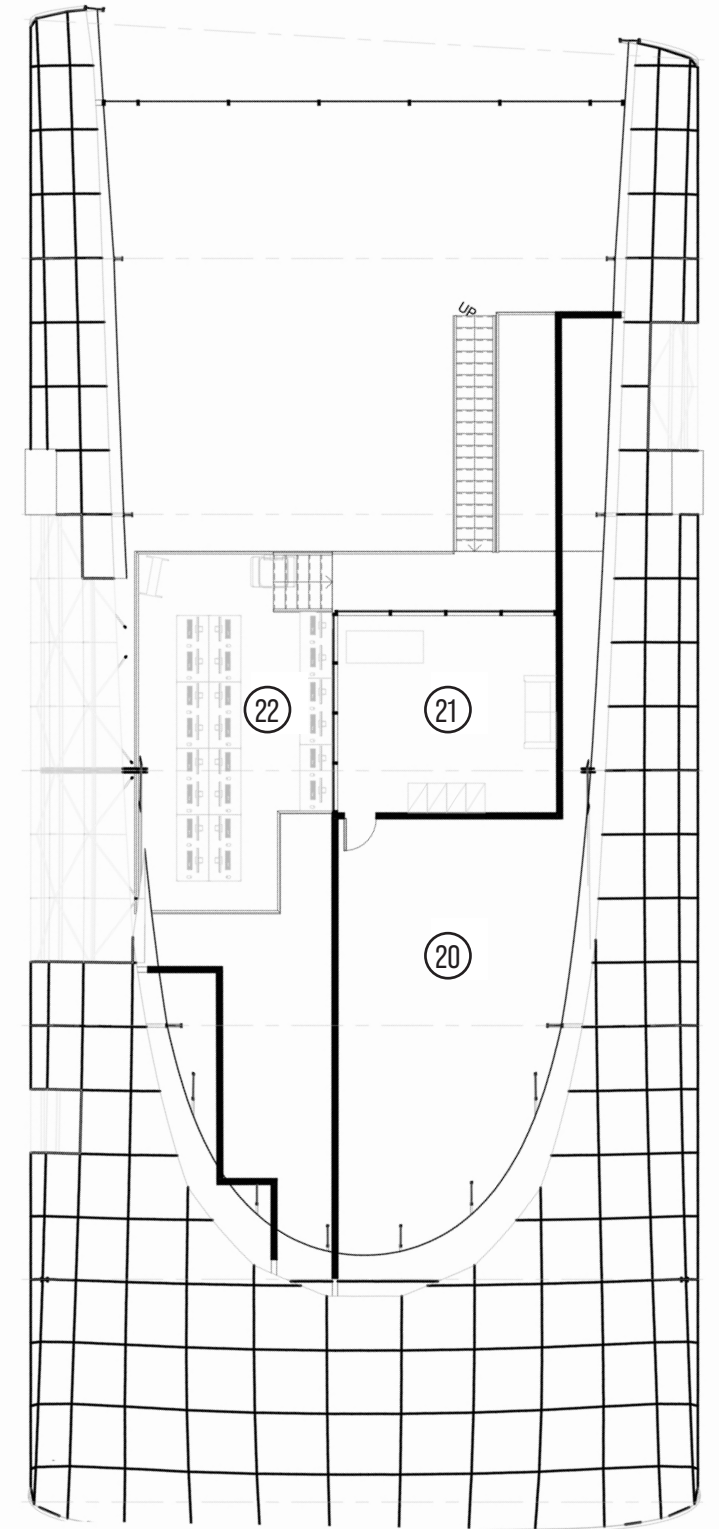
1. WOMEN'S RESTROOM
2. WOMEN'S LOCKERS
3. KILL FLOOR
4. OFFAL
5. HOT BOX
6. HOLDING COOLER
7. LAB
8. BREAK ROOM
9. USDA OFFICE
10. HOLDING COOLER
11. MECHANICAL
12. CONDEMNED PRODUCTS
13. FABRICATION/PACKAGING
14. LAUNDRY
15. MEN'S LOCKERS
16. FREEZER
17. MEN'S RESTROOM
18. MEAT MARKET
19. CLASSROOM

## LEVEL 2 KEY

20. MECHANICAL
21. OFFICE
22. COMPUTER LAB



LEVEL 1 PLAN



LEVEL 2 PLAN



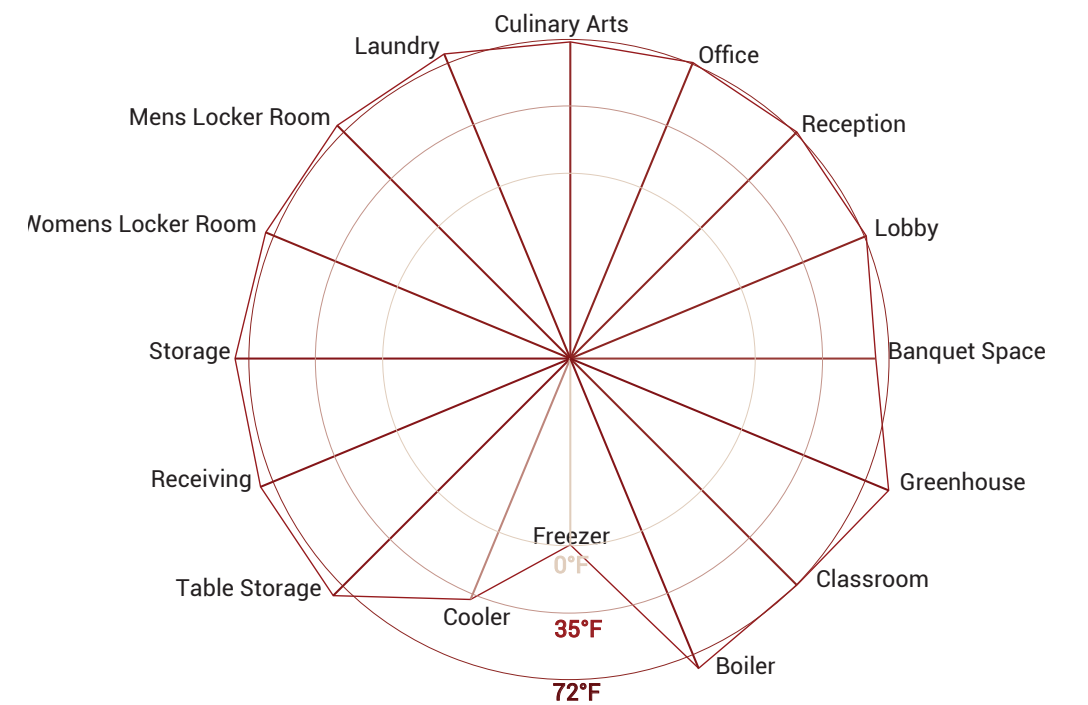
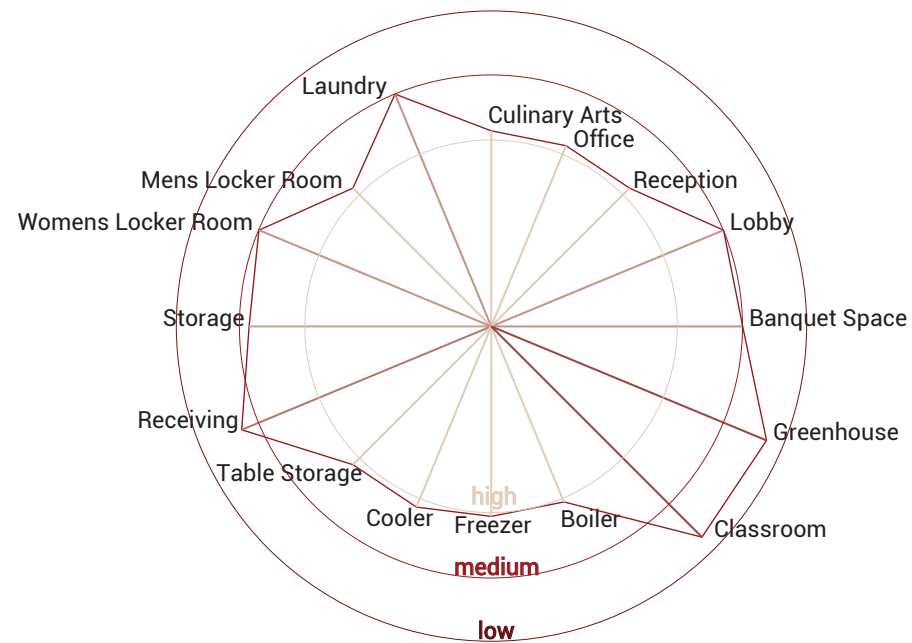
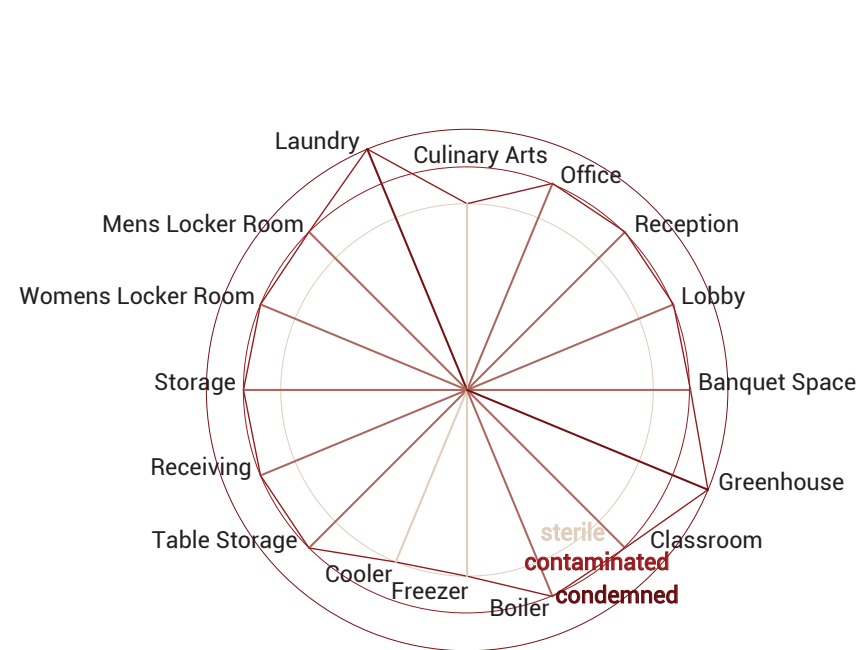
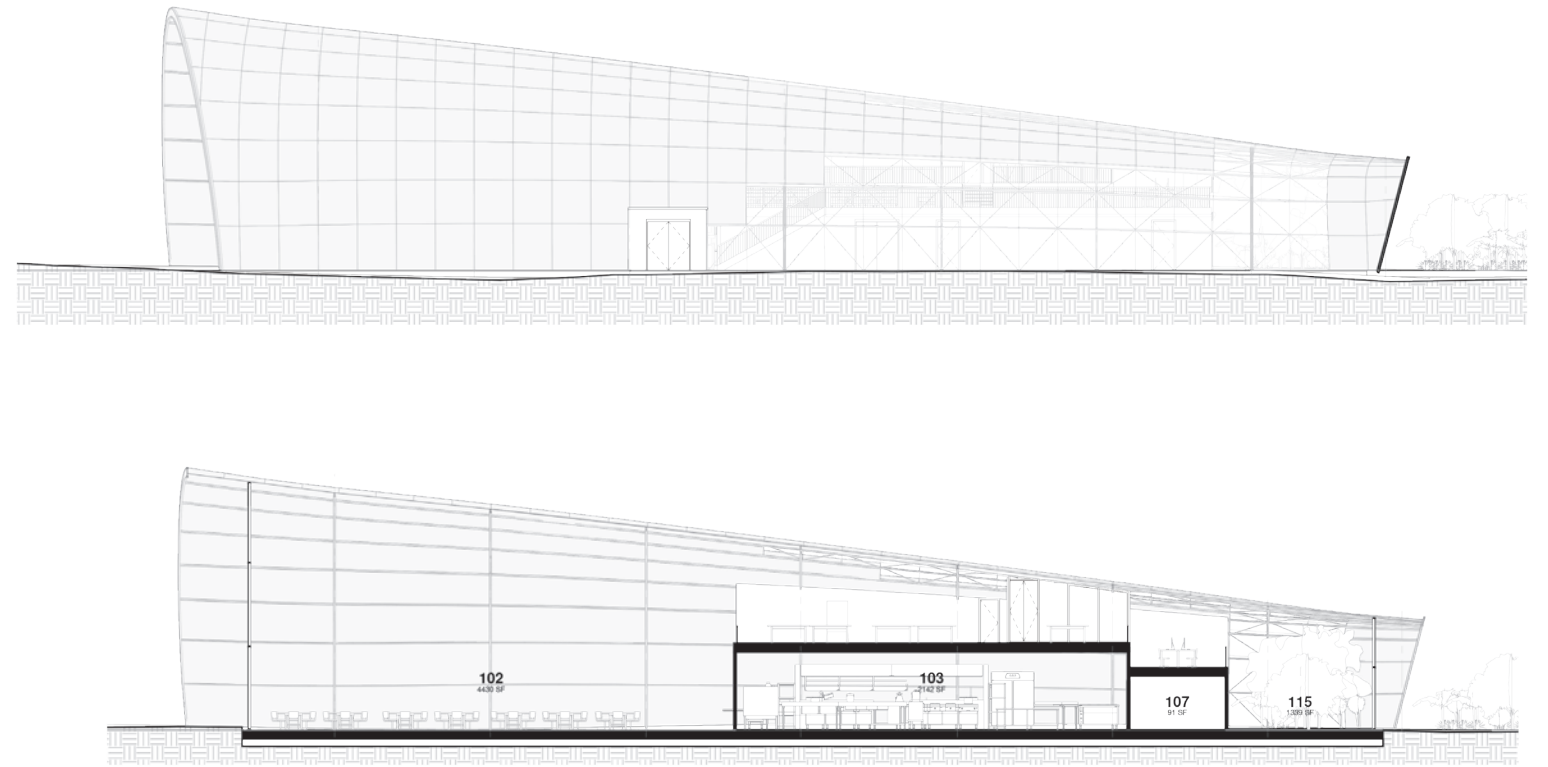
# MEAT FAB | CLASSROOM RENDERING



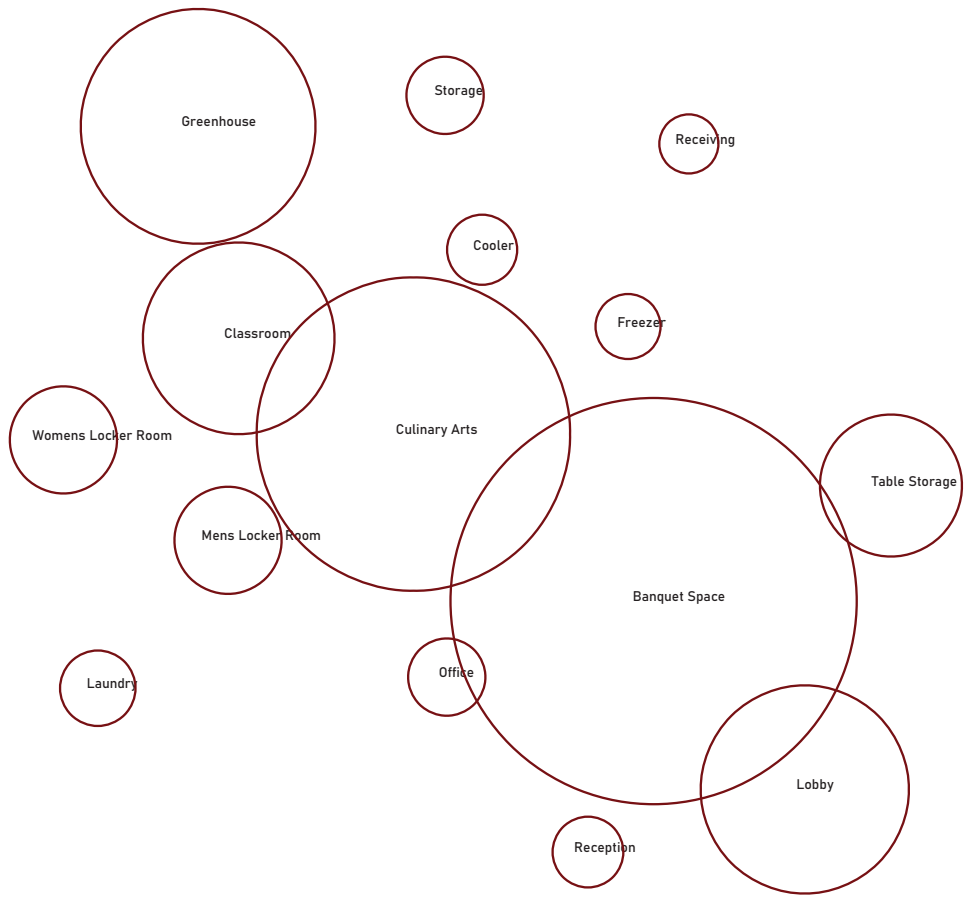
# CULINARY | ORGANIZATION

CULINARY	Banquet Space	Lobby	Reception	Office	Culinary Arts	Laundry	Locker Room	Locker Room	Food Storage	Receiving	Table Storage	Cooler	Freezer	Boiler	Classroom	Greenhouse
Banquet Space		1	1	2	1	2	4	4	3	3	1	3	3	4	2	3
Lobby	1		1	2	3	4	4	4	4	4	2	4	4	4	4	4
Reception	1	1		1	3	4	4	4	4	3	3	4	4	4	4	4
Office	2	2	1		1	4	4	4	3	2	4	3	3	4	2	4
Culinary Arts	1	3	3	1		2	1	1	1	2	3	1	1	4	1	2
Laundry	2	4	4	4	2		1	1	4	4	3	4	4	1	2	4
Locker Room	4	4	4	4	1	1		1	4	4	4	4	4	4	3	1
Locker Room	4	4	4	4	1	1	1		4	4	4	4	4	4	3	1
Food Storage	3	4	4	3	1	4	4	4		1	4	1	1	4	2	1
Receiving	3	4	3	2	2	4	4	4	1		2	1	1	4	3	3
Table Storage	1	2	3	4	3	3	4	4	4	2		4	4	4	4	4
Cooler	3	4	4	3	1	4	4	4	1	1	4		1	4	2	2
Freezer	3	4	4	3	1	4	4	4	1	1	4	1		4	2	3
Boiler	4	4	4	4	4	1	3	3	4	4	4	4	4		4	4
Classroom	2	4	4	2	1	2	1	1	2	3	4	2	2	4		1
Greenhouse	3	4	4	4	2	4	2	2	1	3	4	2	3	4	1	

# CULINARY | ELEVATION + SECTION

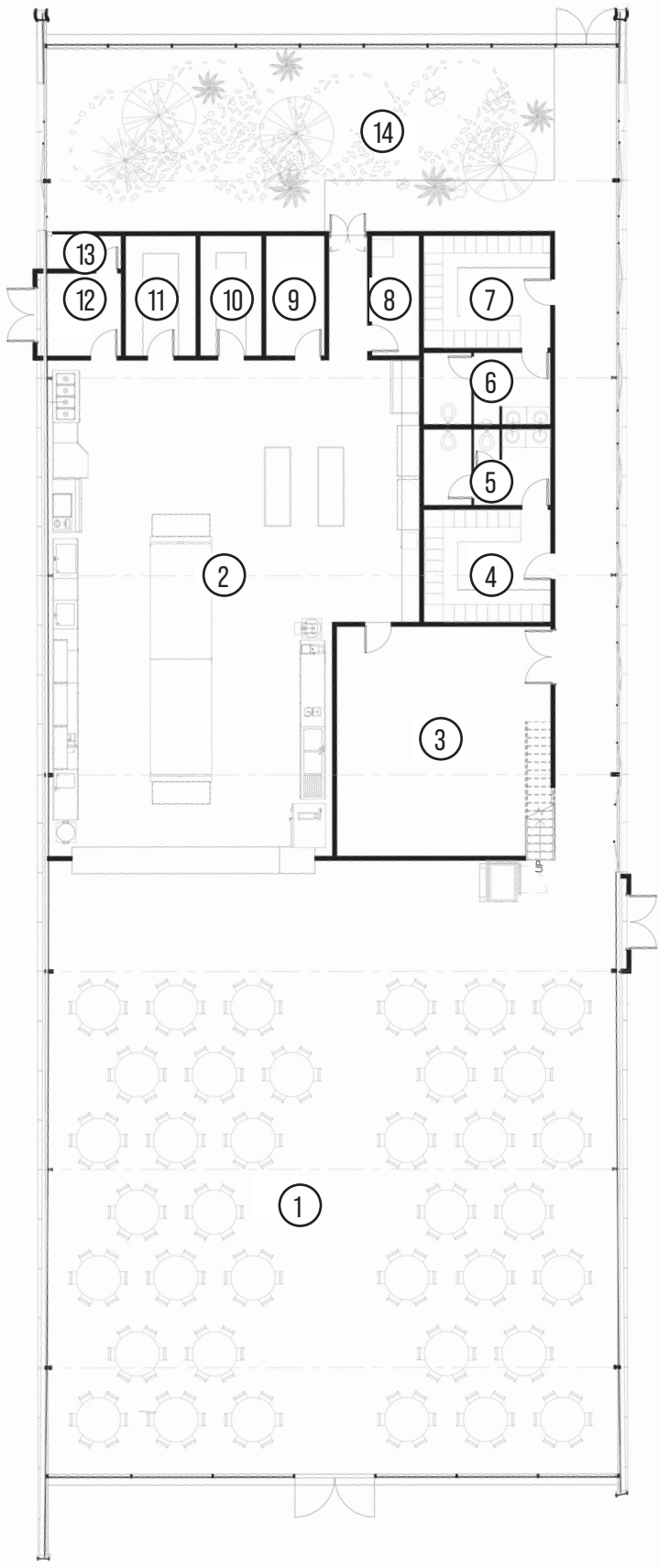


# CULINARY | PLANS

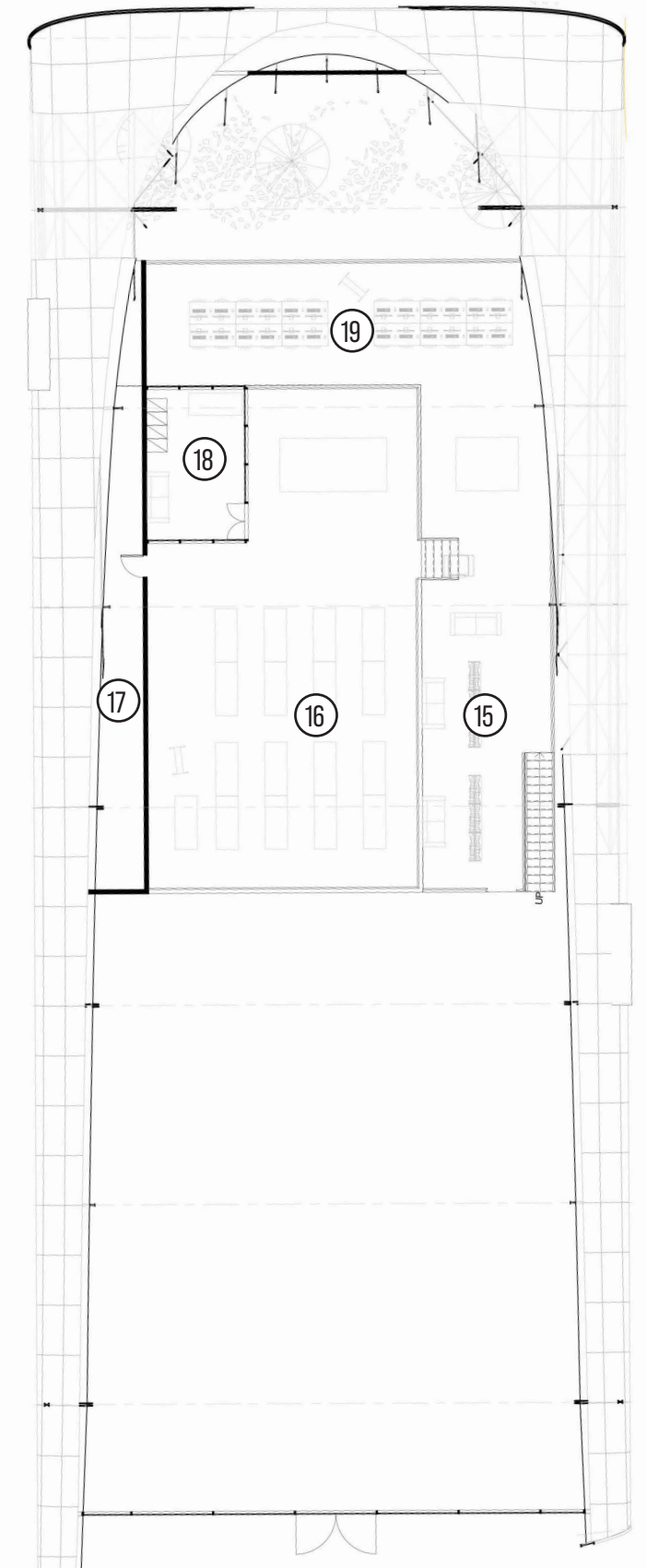


- KEY**
- 1. BANQUET
  - 2. CULINARY KITCHEN
  - 3. STORAGE
  - 4. WOMEN'S LOCKERS
  - 5. WOMEN'S RESTROOM
  - 6. MEN'S RESTROOM
  - 7. MEN'S LOCKERS
  - 8. LAUNDRY
  - 9. BOILER ROOM
  - 10. FREEZER
  - 11. COOLER
  - 12. RECEIVING
  - 13. MECHANICAL
  - 14. GREENHOUSE

- LEVEL 2 KEY**
- 15. LIBRARY
  - 16. CLASSROOM
  - 17. MECHANICAL
  - 18. OFFICE
  - 19. COMPUTER LAB



LEVEL 1 PLAN ⊖



LEVEL 2 PLAN

# CULINARY | CLASSROOM RENDERING



# FACILITY | RENDERING

