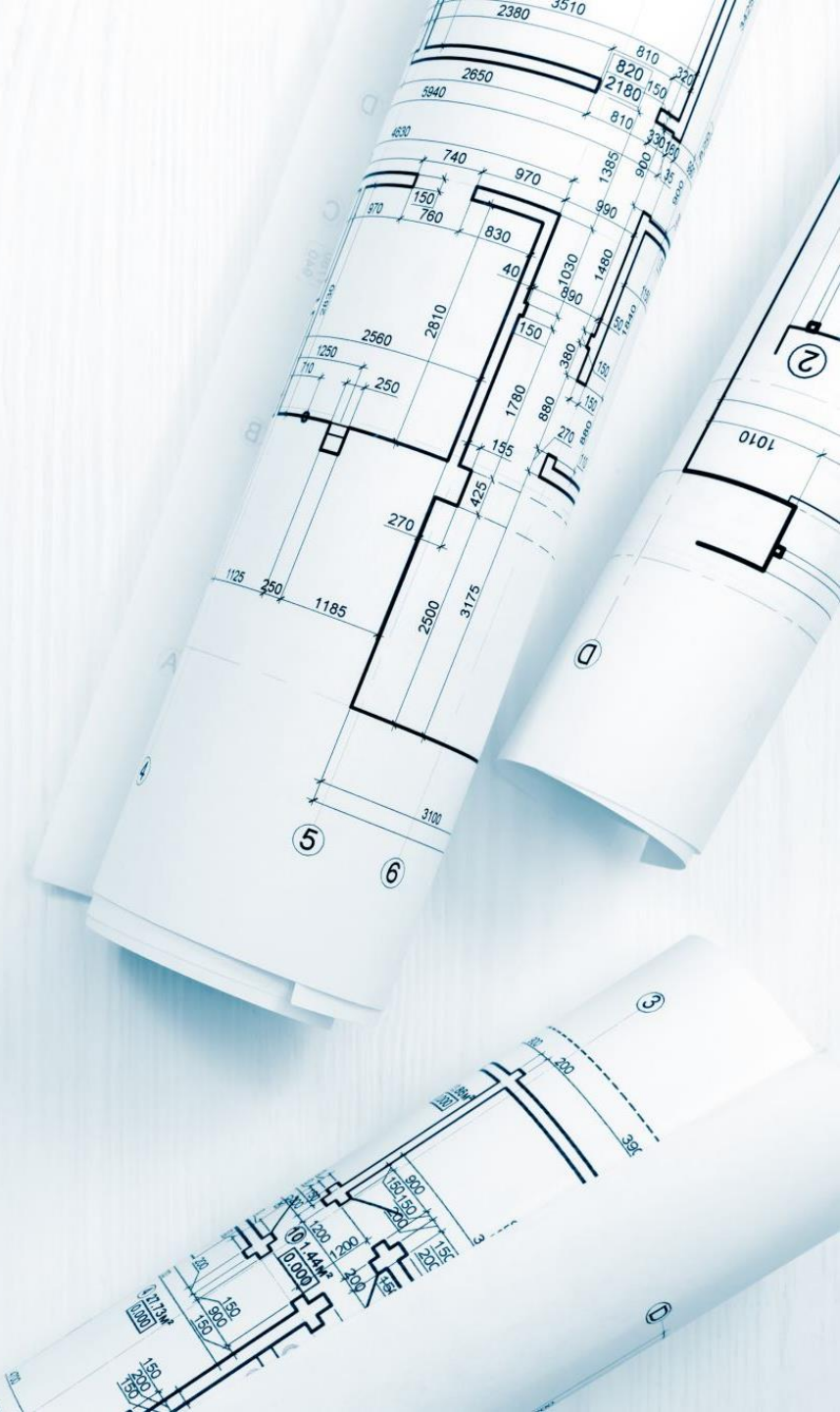
EJAE- Enviromental Justice, Access, and Education

Spring 2022



Design Reviewer Introductions

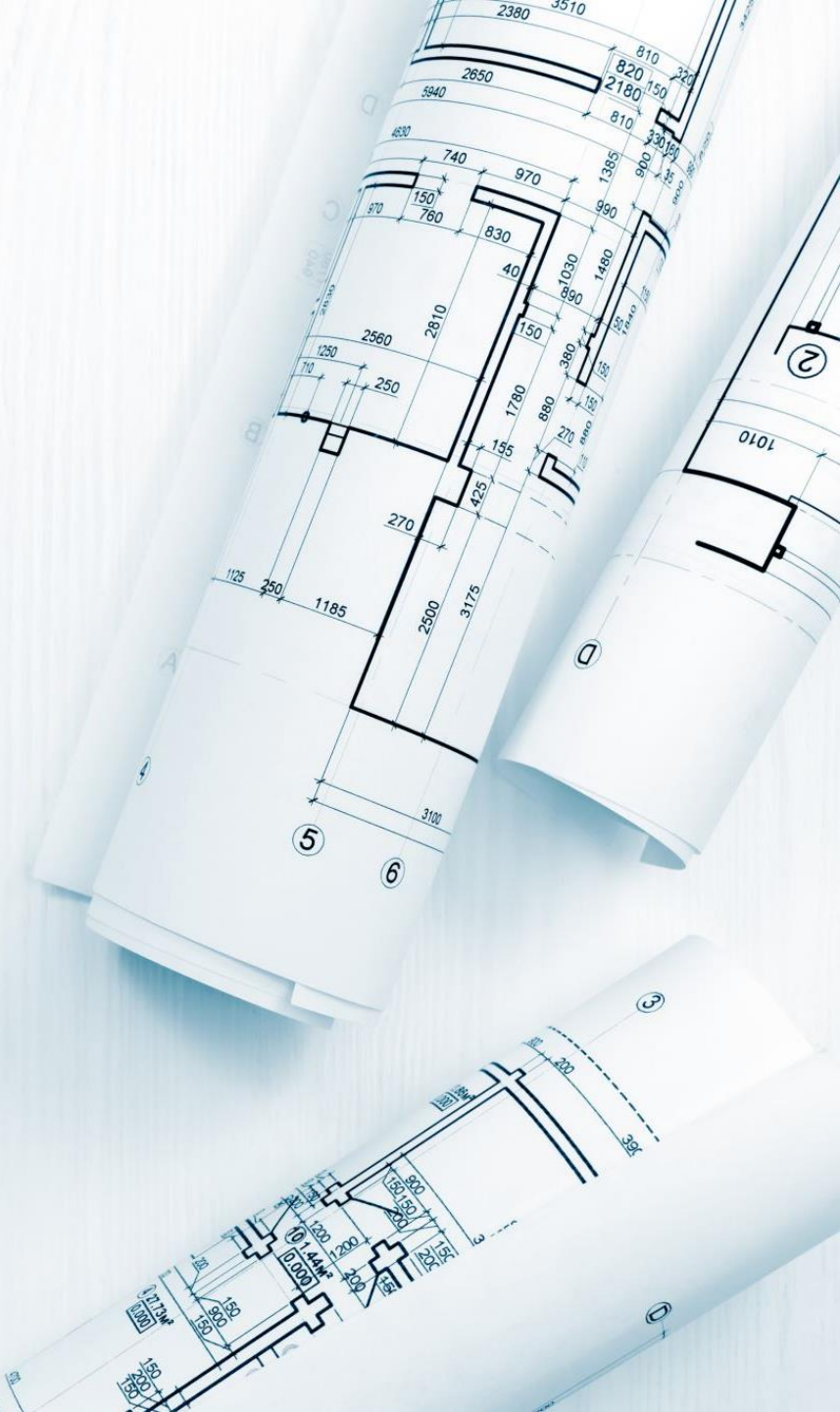
Thank you for being here to support our team!

Projects in EJAE

- GCDB
- K-12
- Overbrook

GCDB

Spring 2022



Team Members

Katy Doninger

Project Manager

Freshman

Communications

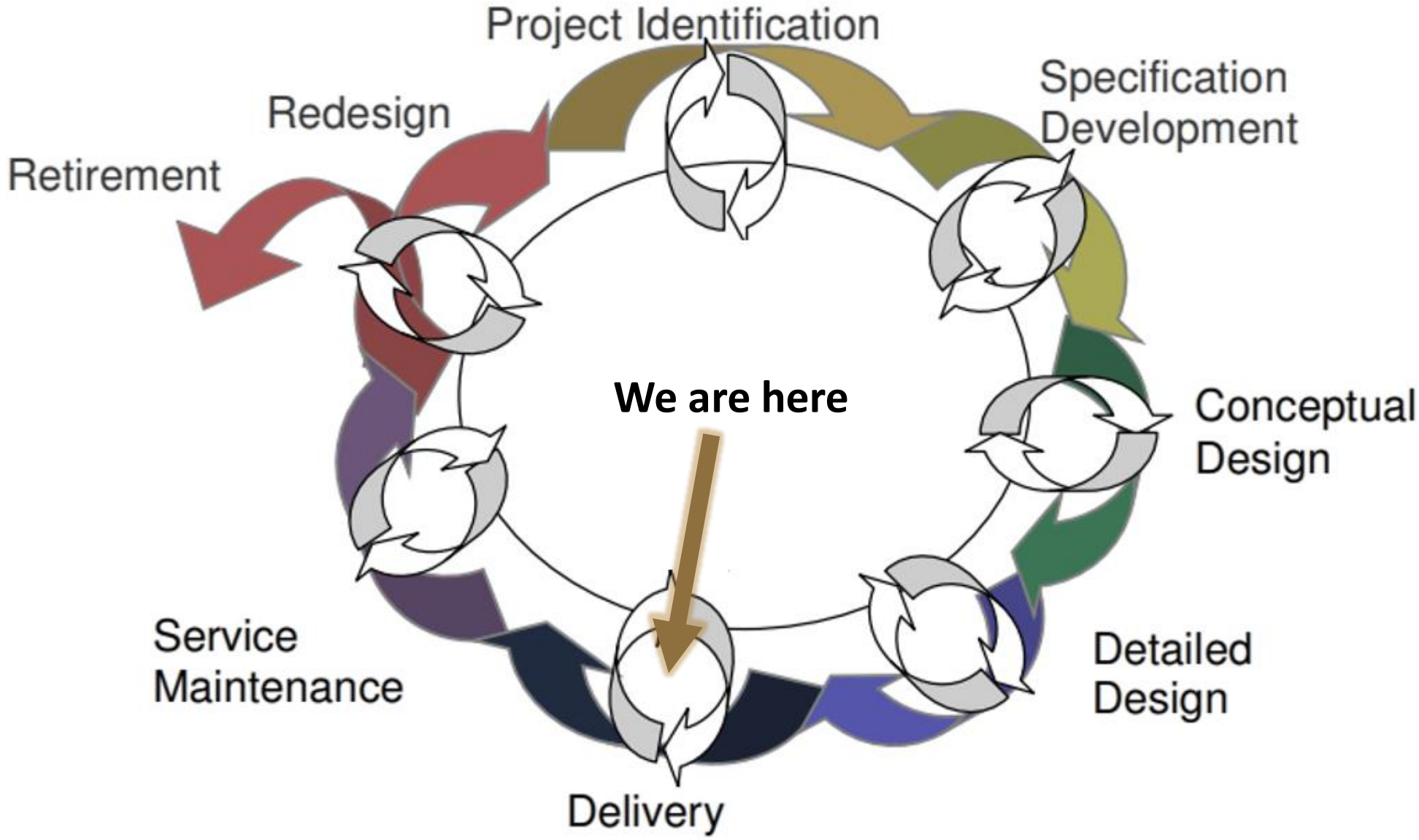
Purbi Das

Design Lead and Liaison

Freshman

Industrial Engineering

Progress


Project Identification
Specification Development
Conceptual Design
Detailed Design
Delivery
Service Maintenance
Retirement
Redesign
We are here

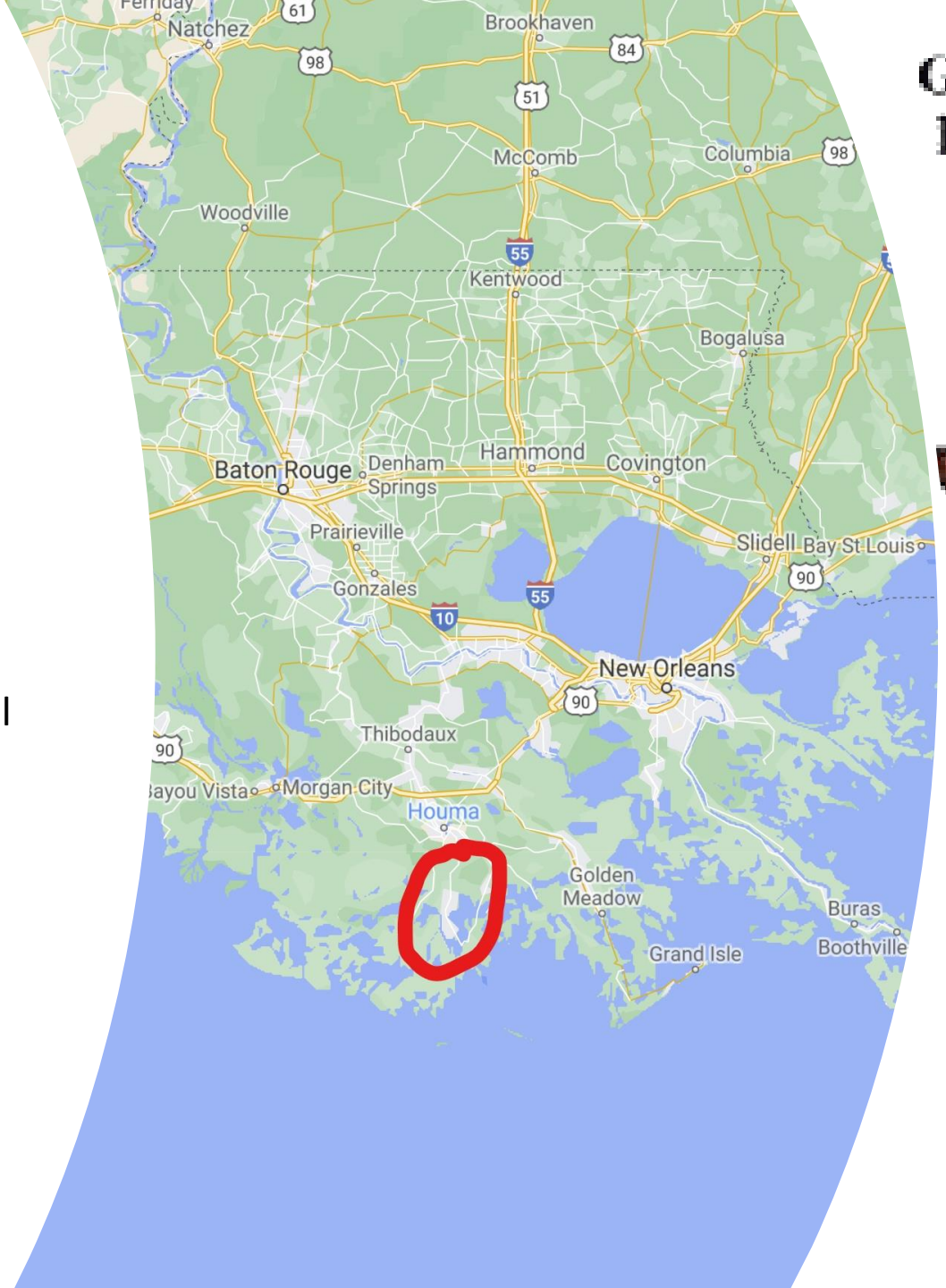
Project Timeline

- Start Semester
- Create Prototype of Cultural Center
- Visit site in Louisiana
- Create finalized report
- Anticipated Completion Semester

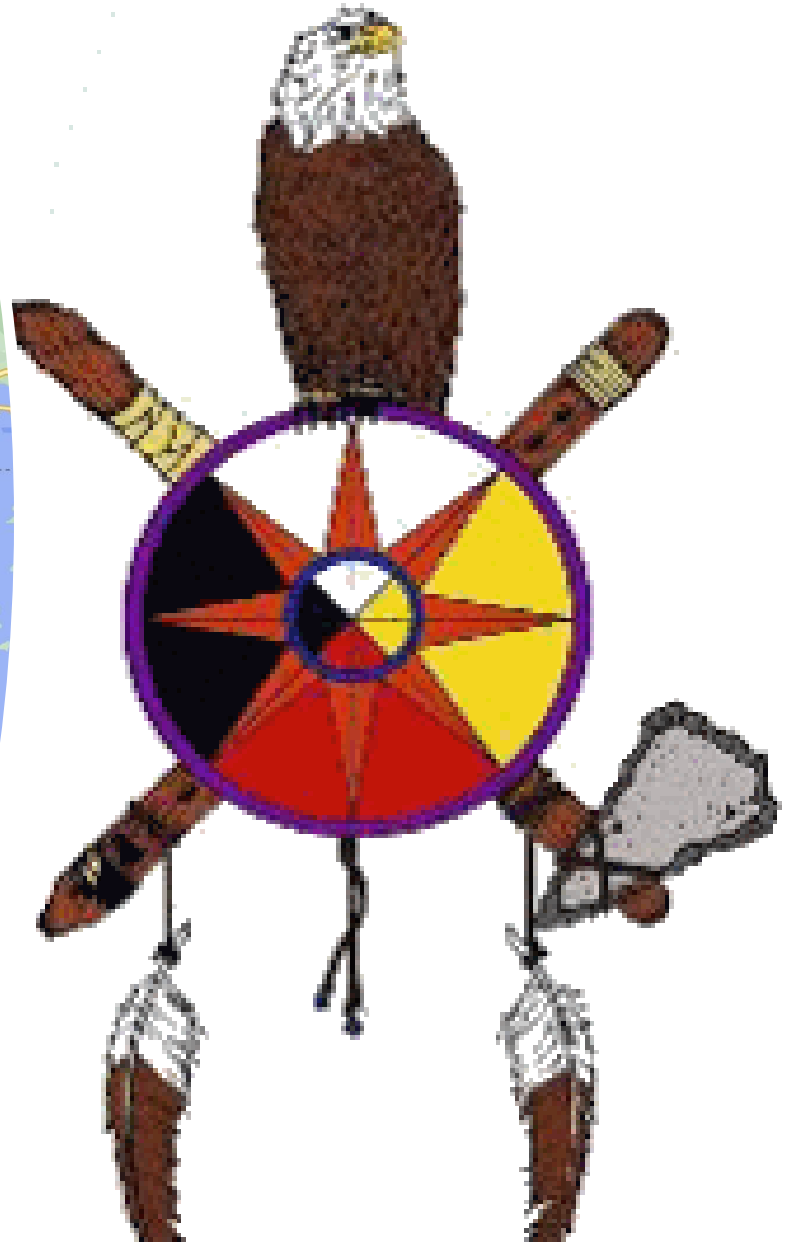
Project Identification

Partner – Grand Caillou/Dulac Band of Biloxi-Chitimacha-Choctaw

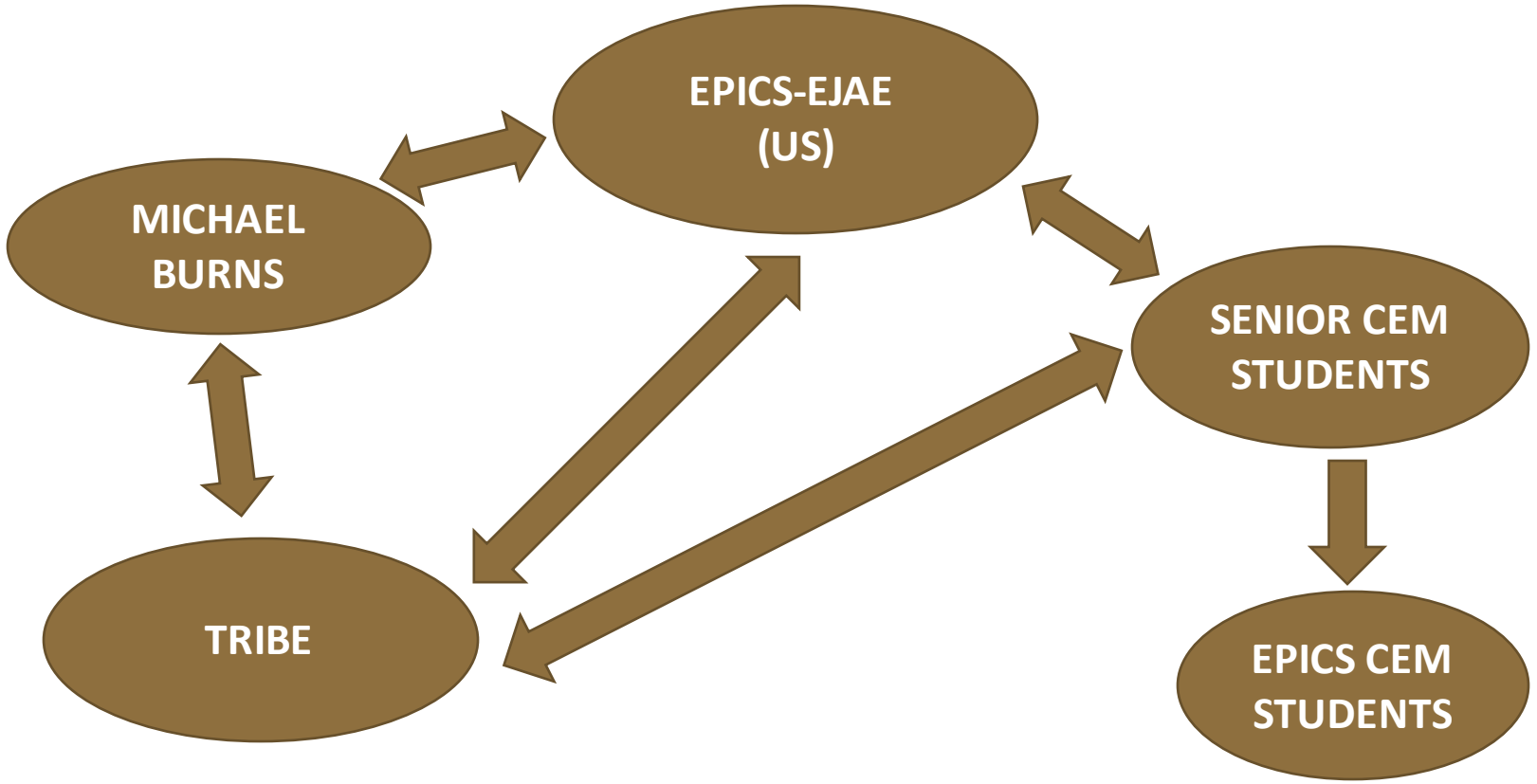
- Native American Tribe based in Southeastern Louisiana
- Mission: To serve the descendants of those who lived in the ancestral village in Grand Caillou/Dulac



Grand Caillou/Dulac Band of Biloxi-Chitimacha-Choctaw



Partner Work



Community Center

- **Shelter**
- **Culture**
- **Community**

Aerial View

Specification Development

Hurricane and Flood Resistant

- Elevated 9 ft
- Reinforced walls and windows

Large Programmable Space

- Gathering place
- Shelters large group of people
- Gallery

Kitchen, Bathroom, and Laundry Room

- Kitchen
  - Store, prepare, cook food
- Family Bathroom
  - Privacy and space
- Communal Bathroom
  - Multiple people can use at once
- Laundry Room
  - Washing and drying clothes

Storage Room & Workshop

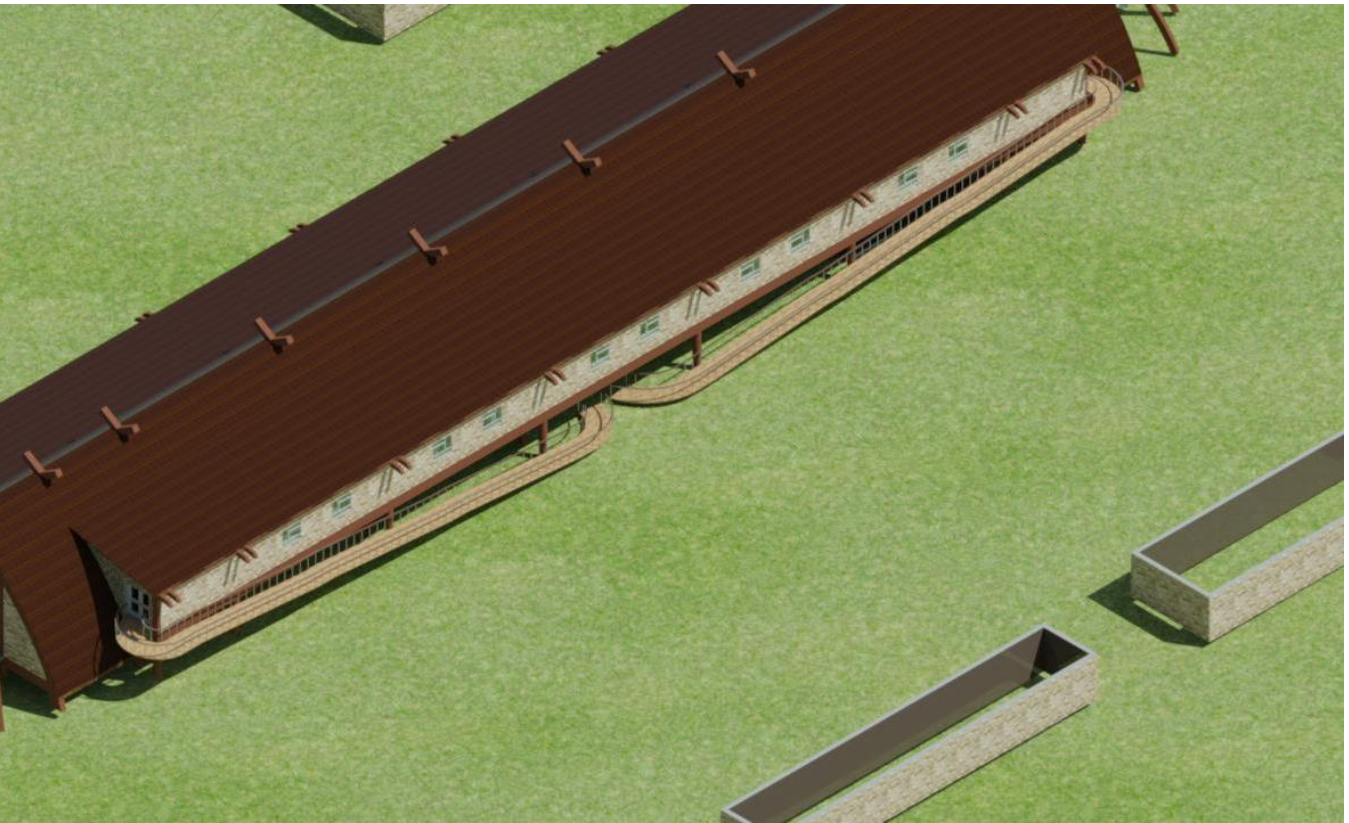
- Storage Room
  - Supplies and personal belongings
- Workshop
  - Has tools and space to create objects

Classroom & Office

- Classroom
  - Learning without distractions
- Office
  - Work atmosphere
  - Encourages productivity

Accessibility

- Ramp & Elevator
  - Adheres to ADA requirements



Environmentally Friendly

- Using materials found in area
  - Oysters and cypress wood
- Made sure to honor land






Spring Break Trip

Budget

Estimate Name	**Titan Construction Lump BC 3-23-22**
	GCDBCC 5256 Shrimpers Row Houma LA 70363
Building Type	Community Center with Face Brick & Concrete Block / Bearing Walls
Location	NEW ORLEANS, LA
	2.00
Stories Height	15.00
Floor Area (S.F.)	16,800.00
LaborType	STD
Basement Included	No
Data Release	Year 2022 Quarter 1
Cost Per Square Foot	$367.32
Total Building Cost	**$6,170,976.08**

Future Plans

- Sent out rough draft of proposal on Tuesday
- Final draft to be done next week
- Engineers Without Borders will continue the project

Thank You

Any Questions?

K12

Spring 2022

Team Members

Sarah Smith
- Design Lead
- First Year
- FYE - Civil Engineering

AJ Marin
- Liaison
- First Year
- FYE – Electrical Engineering

Maddie Abate
- Financial Officer
- First year
- Elementary Education

K-12 History

Objective Statement

- To mentor high school students towards academic and personal success

This Semester

- Mentor high school students through a project and check-ins

Framework: K-12 Mentorship

Peer Mentoring

- Check-ins

Academic Coaching

- Helping with projects (research, brainstorming, etc..)

How K-12 plans to connect with community partners...

EPICS K-12 Project

Objective Statement

- Purdue students will provide aid with local and global community organizations to address human, community, and environmental needs.

This Semester

- We've produced a new EPICS project to implement in any future K-12 EPICS programs.

Community Partner Timeline

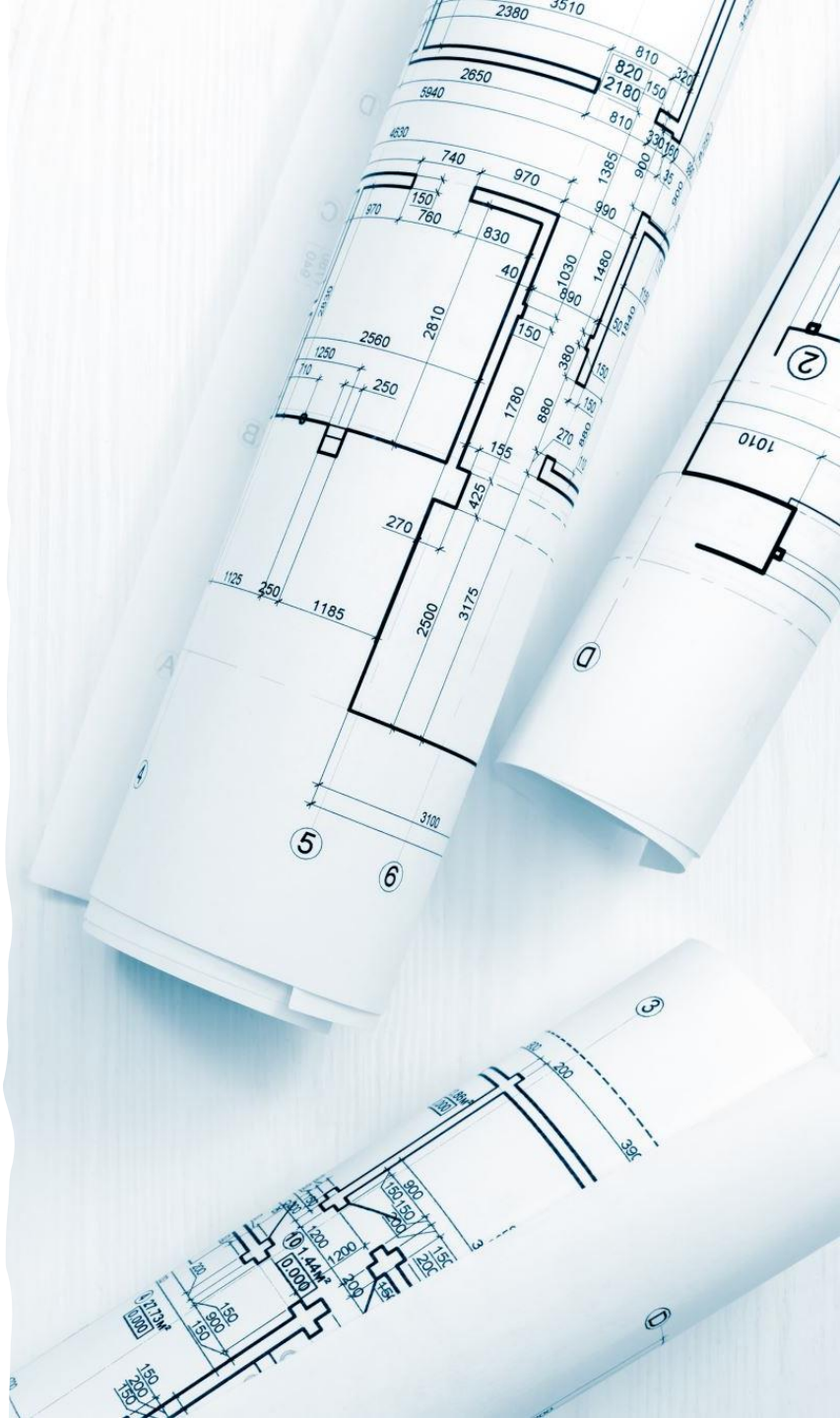
Receiving the project

Overview Potential Project Options

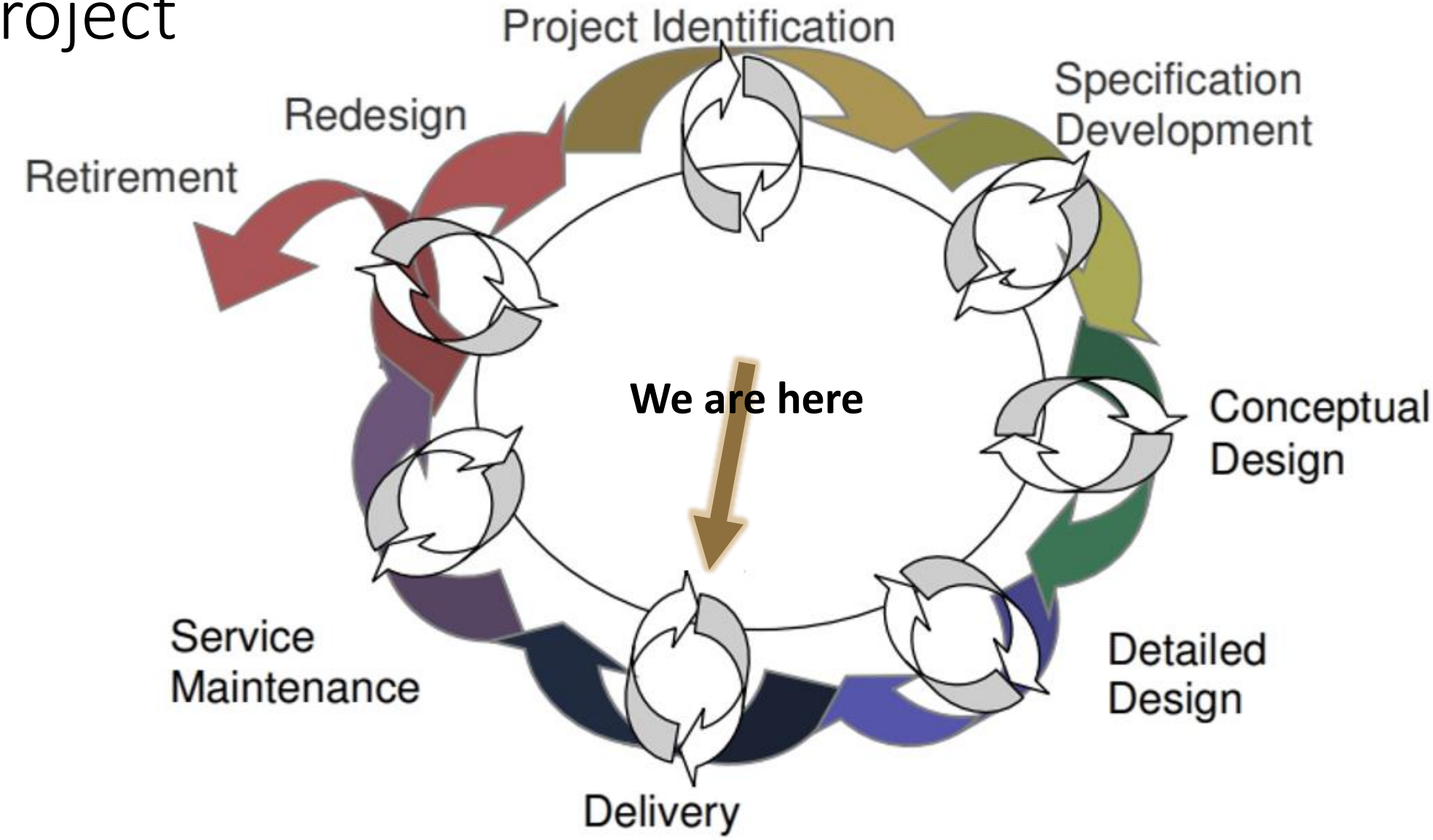
Apply project timeline

Identify project end goal

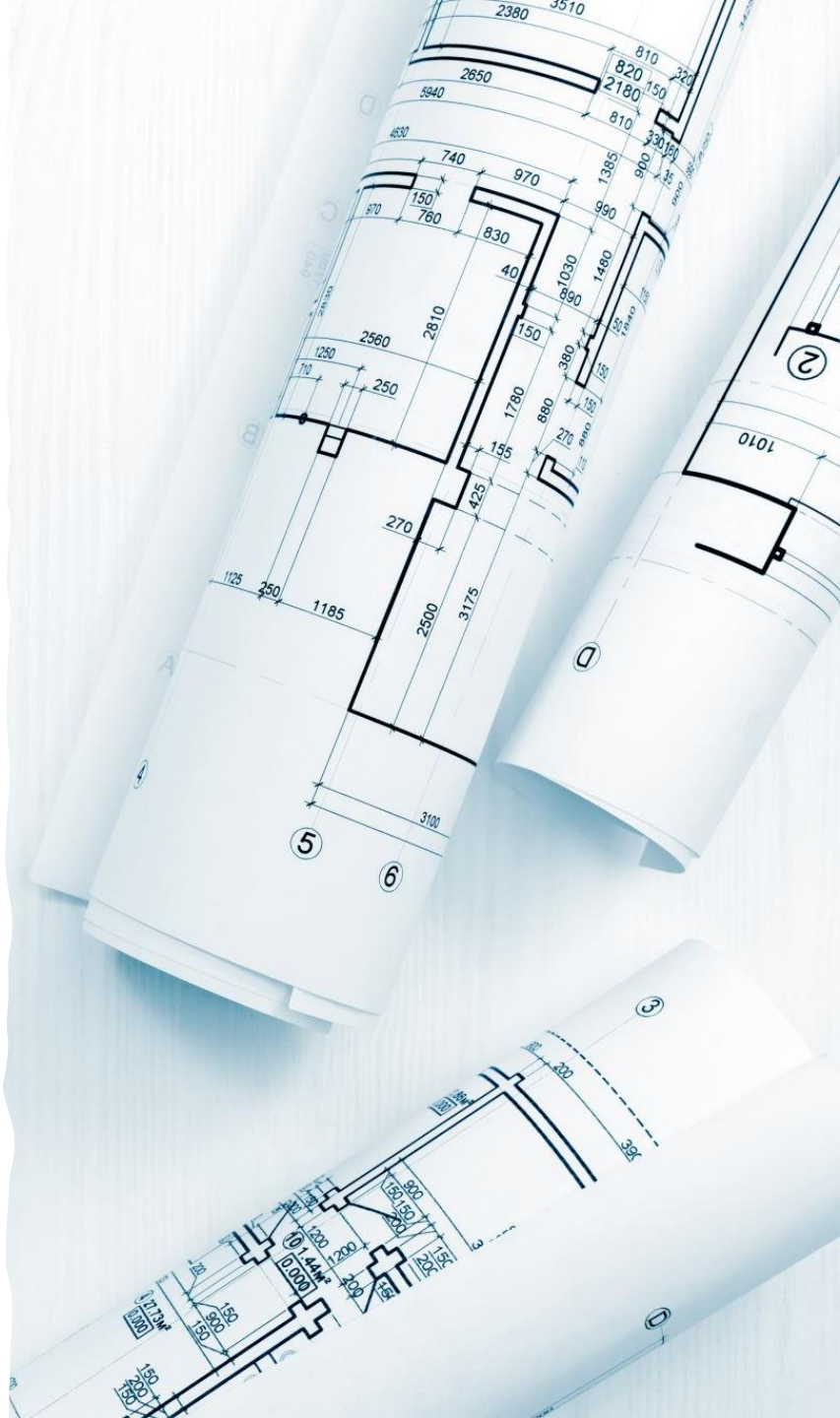
Project Identification



Progress: EPICS K-12 Project



Specification Development



Design Process: Project Model

EPICS Design Process

Project Identification Phase: Goal is to identify a specific, compelling need to be addressed	
Common tasks	• Conduct needs assessment (if need not already defined) • Identify stakeholders (customer, users, person maintaining project, etc.) • Define basic stakeholder requirements (objectives or goals of projects and constraints) • Determine time constraints of the project
Gate 1: Continue if have identified appropriate EPICS project that meets a compelling need	
Specification Development Phase: Goal is to understand "what" is needed by understanding the context, stakeholders, requirements of the project, and why current solutions don't meet need, and to develop measurable criteria in which design concepts can be evaluated.	
Common tasks	• Understand and describe context (current situation and environment) • Create stakeholder profiles • Create mock-ups and simple prototypes: quick, low-cost, multiple cycles incorporating feedback • Develop a task analysis and define how users will interact with project (user scenarios) • Compare to benchmark products (prior art) • Develop customer specifications and evaluation criteria; get project partner approval
Gate 2: Continue if project partner and advisor agree that have identified the "right" need, and if no existing commercial products meet design specifications.	
Conceptual Design Phase: Goal is to expand the design space to include as many solutions as possible. Evaluate different approaches and selecting "best" one to move forward. Exploring "how".	
Common tasks	• Conduct Functional Decomposition • Brainstorm several possible solutions • Create prototypes of multiple concepts, get feedback from users, refine specifications • Evaluate feasibility of potential solutions (proof-of-concept prototypes); select one to move forward
Gate 3: Continue if project partner and advisor agree that solution space has been appropriately explored and the best solution has been chosen.	
Detailed Design Phase: Goal is to design working prototype which meets functional specifications.	
Common tasks	• Design/analysis/evaluation of project, sub-modules and/or components (freeze interfaces) • Complete DFMEA analysis of project • Prototyping of project, sub-modules and/or components • Field test prototype/usability testing
Gate 4: Continue if can demonstrate feasibility of solution (is there a working prototype?). Project Partner and advisor approval required.	

EPICS Project – K12
Instructor's Edition

Project Identification Phase: Goal is to identify factors of violence in communities

Main Idea:
In this lesson, the students will expand their knowledge on the different factors centering violence within their community and how it ultimately affects students' performance in school.

Application:
Provided **3 prompts**, have students briefly look over the different factors of students performance in school, affected by violence in their community.

- The 3 prompts provided include: Student Success Rate, Violence In Schools, and Student Absences.

Instructor's Task:
Find related issues of violence within their community and apply it towards student's performance in school.

Specification Development Phase: Goal is to have students create profiles and develop an analysis of the problem

What The Students Will Do:
Students will choose a topic from the 3 prompts that they wish to focus on. Students will then collect a minimum of 3 research documents/articles of their chosen prompt.

Application:
Provided **3 prompts**, students will choose one subject to home in on.
Think of the 3 prompts as an "emphasis" towards mastering the bigger picture: how violence in inner cities/urban communities affects adolescents attending school.

- The 3 prompts provided include:
  - Student Success Rate
    - Educational Data
    - School Data
    - College Readiness/Test Scores (ACT/SAT)
  - Violence In Schools
    - Policies/Regulations
    - Local Law Enforcement
    - Local Political Organizations
  - Student Absences.
    - Transportation
    - Family Dynamics
    - Demographics

- Family Dynamics
- Demographics

Instructor's Task:
Probe students to look for questions that answer, *"Is the violence demonstrated in school an extension of your community?"*

- Provide Article Summaries Document to students
- (Up to teacher's discretion) Censor student's access for research: to ensure accuracy
  - Provide students with approved website from local government agencies (ensures no misinformation)
  - Examples of this could be: "Don't use Wikipedia" or "Don't use websites that don't end in '.Gov' or '.Edu' "

Conceptual Design Phase: Goal is to expand the design space to include as many solutions as possible. Explaining "how."

What The Students Will Do:
Students will create Journal Summaries that document their work and accomplishments as they progress throughout their project

Detailed Design Phase: Goal is to design an analysis/evaluation of project

What The Students Will Do:
Begin documenting data/research into a Power Point. They'll utilize the provided article summaries document to best format their work in Power Point

Delivery Phase: Goal is to refine data from the detailed design phase, to produce your product/presentation ready to be delivered!

Instructor's Task:
Allow the students to present their findings!

Article Summaries

What is an Article Summary?

- And article summary is a 1–2-page summary of a relevant journal article or news source relating to your research or project.
- Article Summaries are intended to be condensed versions of the data or information in the source document that will be helpful for referral later in the design process

How many Article Summaries do I need to do?

- Every member of the team should complete 2 article summaries
- Each team member must have different articles and summaries
- At least one of your article summaries should be an approved journal article
- The other article summary can be from a different approved journal or any other credible source such as news channels, research institutions, etc.

What is the format for the article summaries?

- Each summary should be at least 1 page (22 lines) in length
- They should be typed
- Double-line spaced
- 12 pt. Times New Roman Font
- Must include citations (at least one in-text citation and a reference list at the end of summary)
- Must have a header that includes first and last name, teacher, class, and date

Article Summary Research

How do I find an acceptable journal article?

The best place to start looking for an acceptable journal article is Google Scholar. In Google scholar you can search your project topic and find reputable sources with relevant information. On the side of Google Scholar, you can also input a time range, acceptable journals must be from within the last five years, so adjust the time range to reflect that. You can also use any free online college libraries to look for journals.

Citations

For the citations in this article summary, you will use the APA format

How do I cite in APA?

- To cite in APA you can use the Purdue OWL tool to help you set up the citations https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_formatting_and_style_guide/general_format.html
- You must include at least 1 citation in your summary and include a full reference to your journal at the end.
- To avoid plagiarism, if you are unsure that the sentence you have typed is citing the source or your own words, err on the side of caution and use a paraphrased citation
- If you are directly quoting the source, be sure to include the cited text in quotations (“”) to show it is not your own words
- If you are paraphrasing, you do not need to use quotations, but you do need to cite your article
- If your article has more than one author, you may write the citation as (first author name et al. Year) and include the full citation in your reference list
- You must also include PDF version of, or if you cannot get a PDF a link, your article at the end of your summary

Examples

Summary header:

Firstname lastname

Teacher name

Class name

Date (February 6th, 2022)

Citation:

In-text-

Reference list-

Framework for K-12 Project

Maddie

- Student success rate

AJ

- Absences

Sarah

- Violence in schools

EPICS Project – K12

Project Identification Phase: Identify major contributing factors to student success

What organizations/people make are key in policy that affects student success?

- Find what issues the organizations/people focus on in their policy

What current efforts are being made to improve student success at different levels?

- Find the different ways school, city, state, board of education, and department of education are trying to improve success rate

What basic steps could be implemented to improve student success?

- Look to see what issues affect your school
- How would you fix these issues?

Specification Development Phase: Goal is to identify 1-2 factors of student success to focus

Conduct research beyond scholarly articles about school climate, student success, important factors, and resources

- What resources are there for struggling students?
- How does school climate affect student success?

Collect 2 Journals per person on factors dictating student success in Urban Schools

- What are the largest determining factors of student success?
- What data has been found in struggling schools to show what areas they lack most in?
- What has changed in schools and how has it improved student success?

Conceptual Design Phase: Goal is to expand the design space to include as many solutions as possible. Summarize.

- Create Journal Summaries which summarize the most important parts of your articles to help condense the content for ease of reference
- Research surrounding area information and how it may affect students (ie: average household income, incarceration rate, work opportunity, healthcare access, poverty rate, satisfaction rate, current political officials and their beliefs, higher education)

Detailed Design Phase: Goal is to design an analysis/evaluation of project. Research possible solutions.

Find school data; graduation rate, college prep access, school counselling/resources, policing within school, absence rate, school population diversity

Find possible solutions to the factors which affect student success

- What have other schools done?
- Did it work?
- How could you alter or improve it?

Delivery Phase: Goal is to refine data from the detailed design phase, to produce your product/presentation ready to be delivered!

Come up with an effective form of presentation

EPICS Project – K12

Absences In School

Project Identification Phase: Goal is to identify the audience of absence in schools

Who is affected? (Students)

- Research statistics on geographics:
  - -What grade levels deal with this problem?
  - -Is it more young men or young women?
  - -Are there two parents in the household?
  - -If there are two parents, are both employed?

Brainstorm some solutions to these barriers

Specification Development Phase: Goal is to pick 1-2 factors of absences among students by answering, "What are the major factors?"

What are some major factors?

- Transportation
  - -Does the guardian not have a vehicle?
  - -Does the guardian work early and can't take the kid to school?
  - -Is there a school/city bus that goes that route?
- Employment
  - -If there are two parents/guardians involved in the student's life, are both employed?
  - -If there aren't two guardians involved, does the student have to help with bills?
- Health
  - -Is the student's guardian/family member ill?
  - -Does the student's guardian/family have a condition that prevents them from working of providing transportation?
- Lack of guardian aid
  - -Is there no guardian involved at all?

-Is the guardian involved but doesn't supply the students with necessities?

Conceptual Design Phase: Goal is to expand the design space to include as many solutions as possible. Research possible solutions.

Create a summary journal

- Take your research and compile it into a 22-line minimum report to organize your thoughts
- Utilize provided article summaries document as an aid for correct formatting

Detailed Design Phase: Goal is to design an analysis/evaluation of project. Research possible solutions.

Good questions to consider:

- Has your school done anything in the past to reduce the absence rate?
- Did it work? If not, can it be improvised to be affective?
- If a method did work for a while but stopped, can it be improvised?
- If there hasn't been anything done, what do you think can be done to reduce the rate of absence?

Delivery Phase: Goal is to refine data from the detailed design phase, to produce your product/presentation ready to be delivered!

Come up with an effective form of presentation

- Pick something that:
  - Will get your point across
  - You are comfortable with, yet formal

EPICS Project – K12

Violence in Schools

Project Identification Phase: Goal is to identify factors of violence in schools

Collect a summary of the subjects affected by violence and conduct a "needs assessment"

- This action can be considered your "rough draft" and can be completed on a Google document.

Specification Development Phase: Goal is to create profiles and develop an analysis of the problem and consumer specifications

Collect a minimum of 3 research documents/articles on issues concerning violence in Schools. Look for questions that answer, *"Is the violence demonstrated in school an extension of your community?"* Do this in three categories (School/community policies and regulations, local political organizations, and local law enforcement).

School/Community Policies and Regulations

- Why and how does it affect students?
- Are the policies put in place targeted towards specific groups of people? (Lower income communities/neighborhoods, minorities…)
- Do local community policies clash with your institution's policies?

Local political organizations

- What are their "goals" while in office? Are they looking to diminish violence in the community? Are they aware of that threat?
- Are people within your community active in politics? What are the demographics of your community's voting polls? How many people are registered to vote?

Local law enforcement

- How does the community interact with local law enforcement? (Community satisfaction)
- Provide statistics on local crime rates

Conceptual Design Phase: Goal is to expand the design space to include as many solutions as possible. Explaining "how."

Journaling Progress

- Create Journal Summaries that document your work and accomplishments as you progress throughout your project

Article Summaries

- Write up a preliminary draft of research conducted in the previous step (specification development phase)

Detailed Design Phase: Goal is to design an analysis/evaluation of project

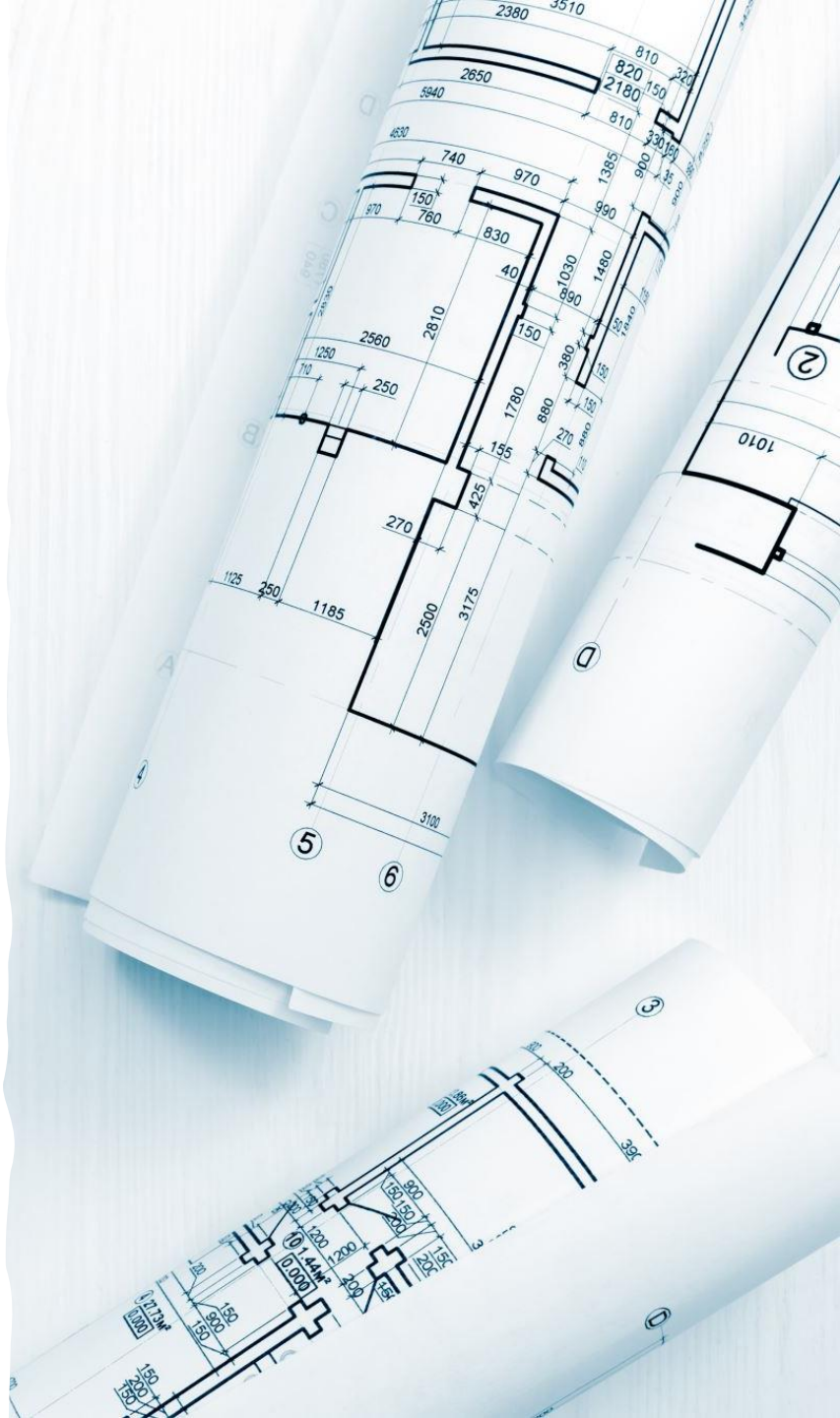
Begin documenting data/research into a Power Point

- Utilize the provided article summaries document to best format your work in Power Point

Delivery Phase: Goal is to refine data from the detailed design phase, to produce your product/presentation ready to be delivered!

PowerPoint Presentation!

K-12: Final Details



Future Plans

- Future community partner
- Implement EPICS project

Thank You

Any Questions?

Overbrook Center

Spring 2022

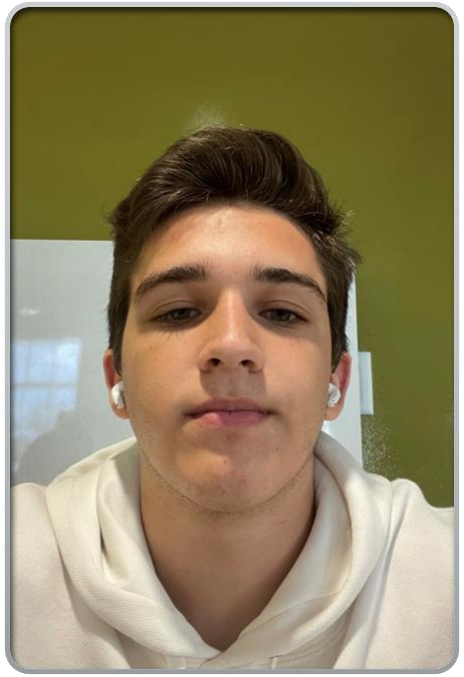
Team Members

Emily Kim

Design Lead

Senior

Electrical Engineering



Carlos Nunez

Team Member

Freshman

Integrated Business and Engineering

Cory Kim

Team Member

Senior

Electrical Engineering

EPICS- EJAE – Overbrook Center

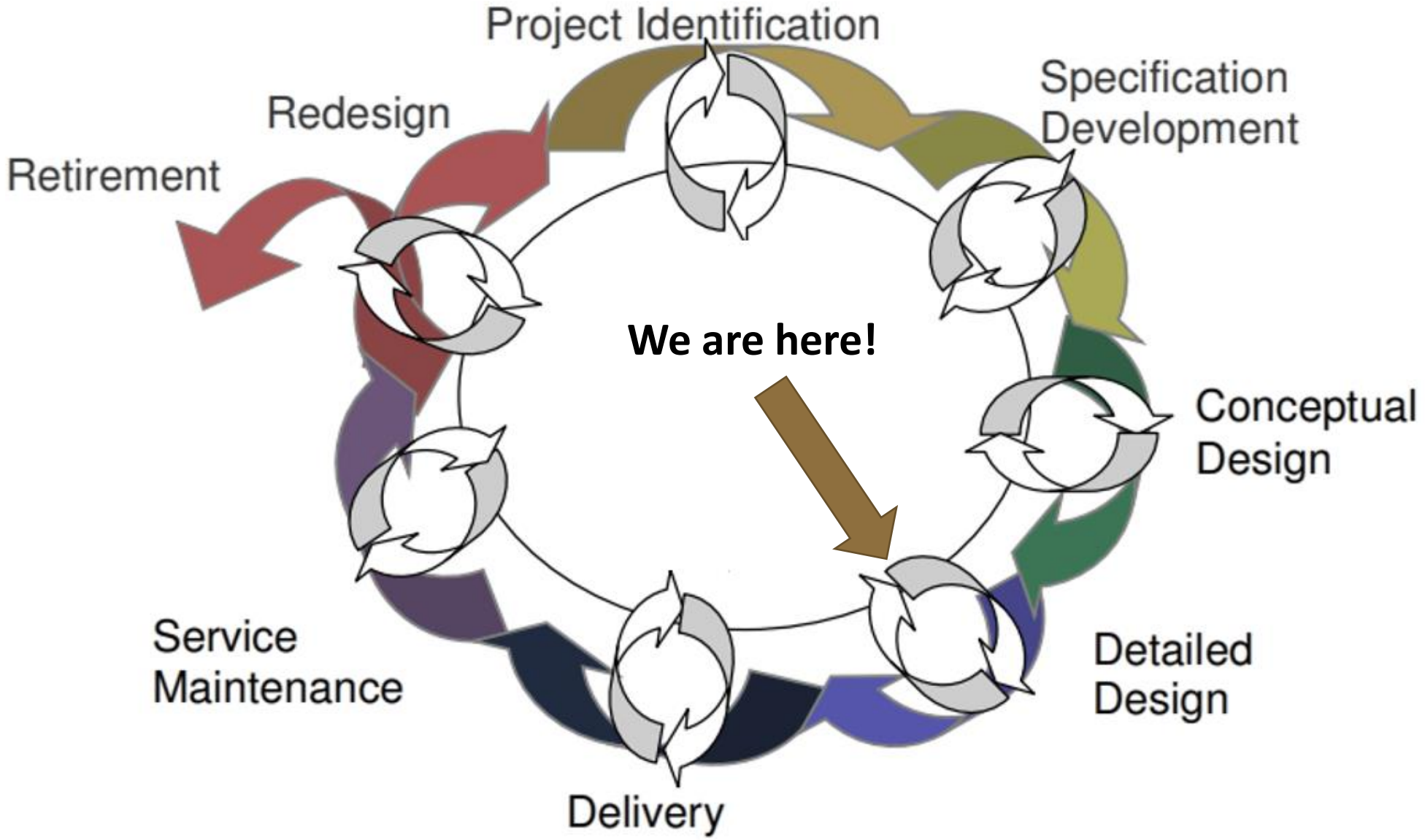
- A community-based center located in West Philadelphia, PA. OEEC was established in 2002 by JASTECH
- "Promote environmental justice”, “encourage sustainable design", "promote improved public health"
- OECC has many amenities for the community; exercise classes, high tunnel, gathering place

Project Objectives

- Help outfit the new greenhouse
  - Irrigation system
  - Lighting
  - Ventilation system

  => Power system (Solar panel, Battery, Inverter)
- Incorporate sustainability and environmental justice
- **Educational Greenhouse**

Progress


Project Identification
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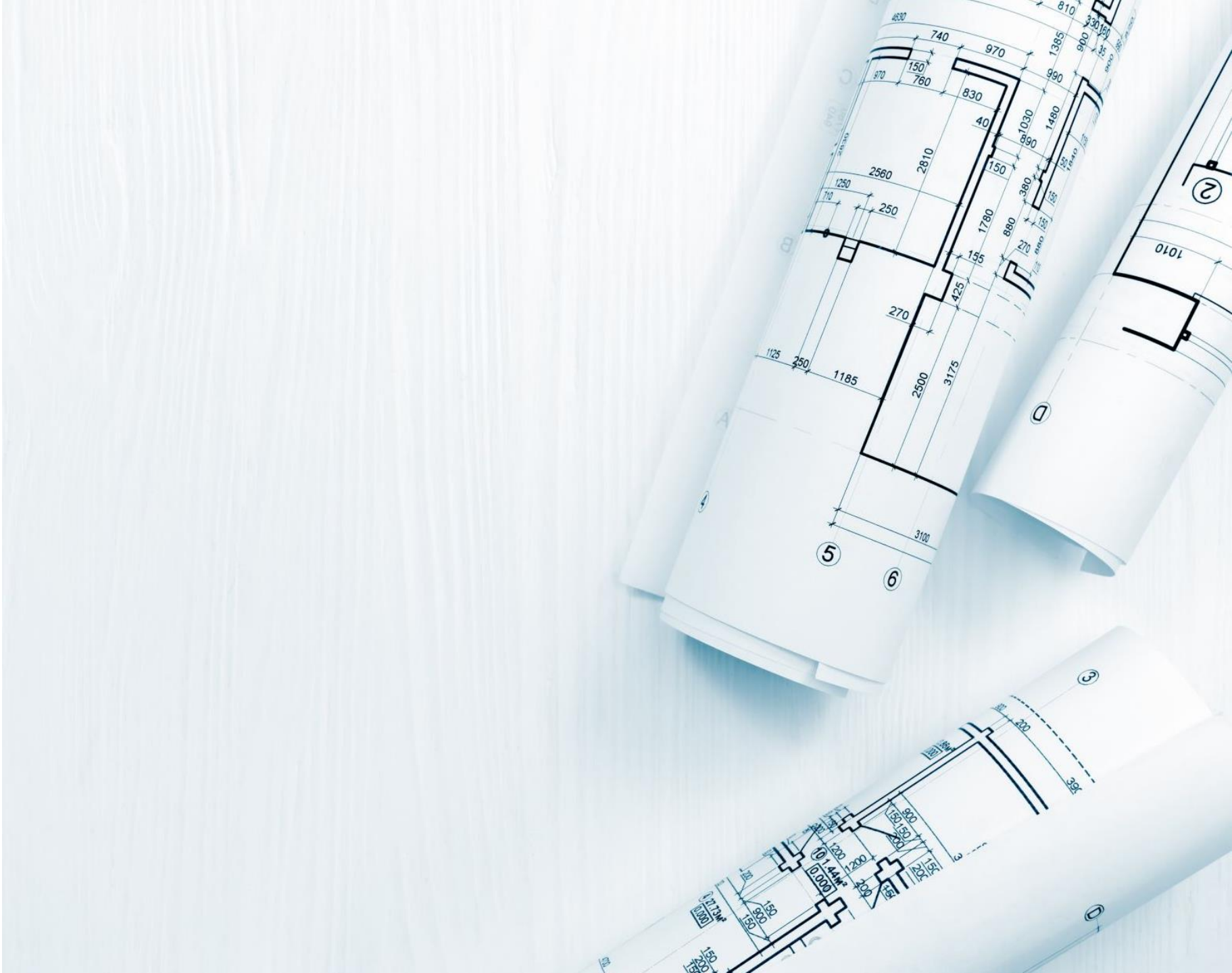
Retirement
Redesign
We are here!

Overbrook Center Greenhouse

Greenhouse: 21 x 60
About 10.8 feet tall on the highest point and 4.5 on the lowest

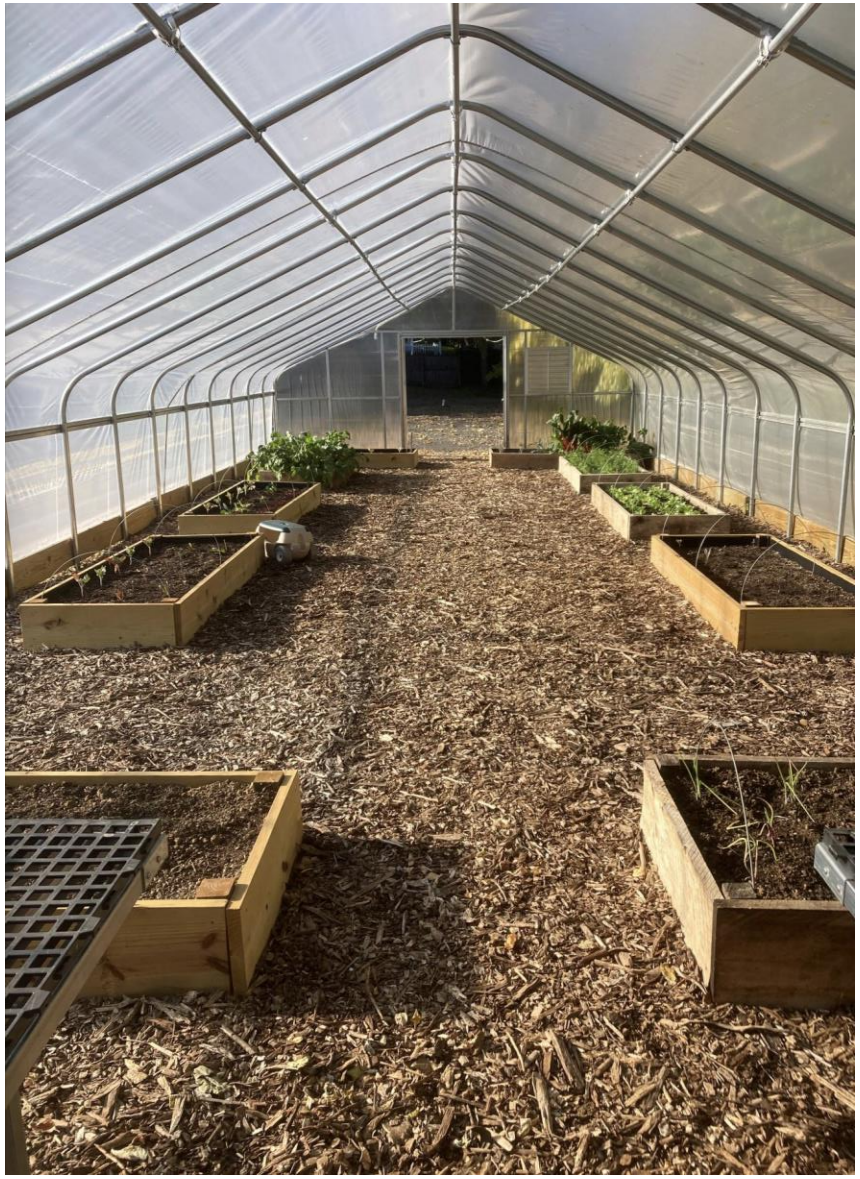
Irrigation

- Project identification
- Specific development
- Conceptual design
- **Detailed Design**



Project Identification

- What will waste the less amount of water?
- How can it be implemented effectively in the greenhouse?
- How will can it be efficient with all the raised beds?



Specific Development

- What is the easiest way to install an irrigation system?
- How can we get all the materials?
- Is it user friendly?
- Is it the best alternative?

Ultimate Drip Irrigation Kit fo Bed Gardening

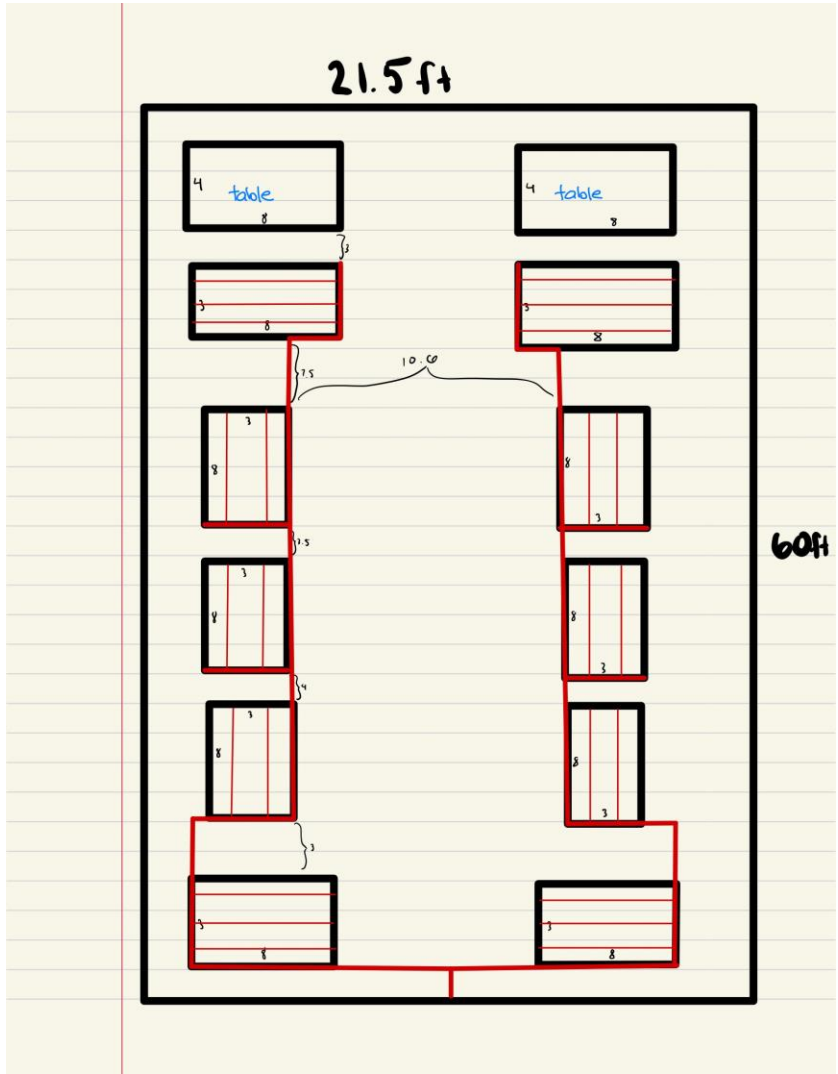
Quantity	Price/Each
1+	$379.46

1 ADD Customize

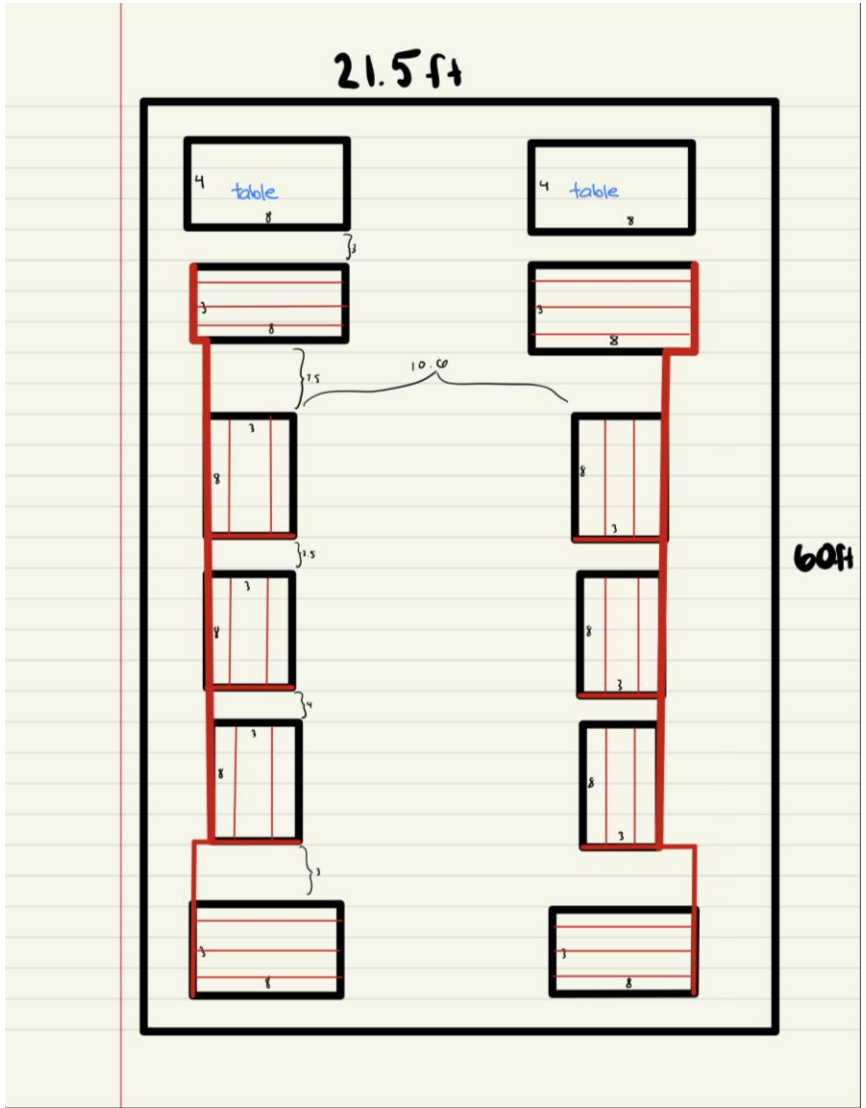
Sub-Assembly	Item	Catalog/ Part No.	Manufactured/ Purchased	Vendor/ Method	Quantity	Cost/ Unit
Drip irrigation	*Drip irrigation kit*	*818564010324*	*Purchased*	*Drip Depot*	*1*	*$379.46*
Drip Irrigation	**Polyethylene Tubing size 1/4**	*n/a*	*Purchase*	*Drip Depot*	*1*	*$6.04*
LED	*Hanging LED light*	*n/a*	*Purchase*	*Harbor Freight*	*8*	*$175.92*
Ventilation	*Vents/Fans*	*FA-VSF*	*Purchased*	*Greenhouse Megastore*	*2*	*$450*

Conceptual design

Initial irrigation system design layout

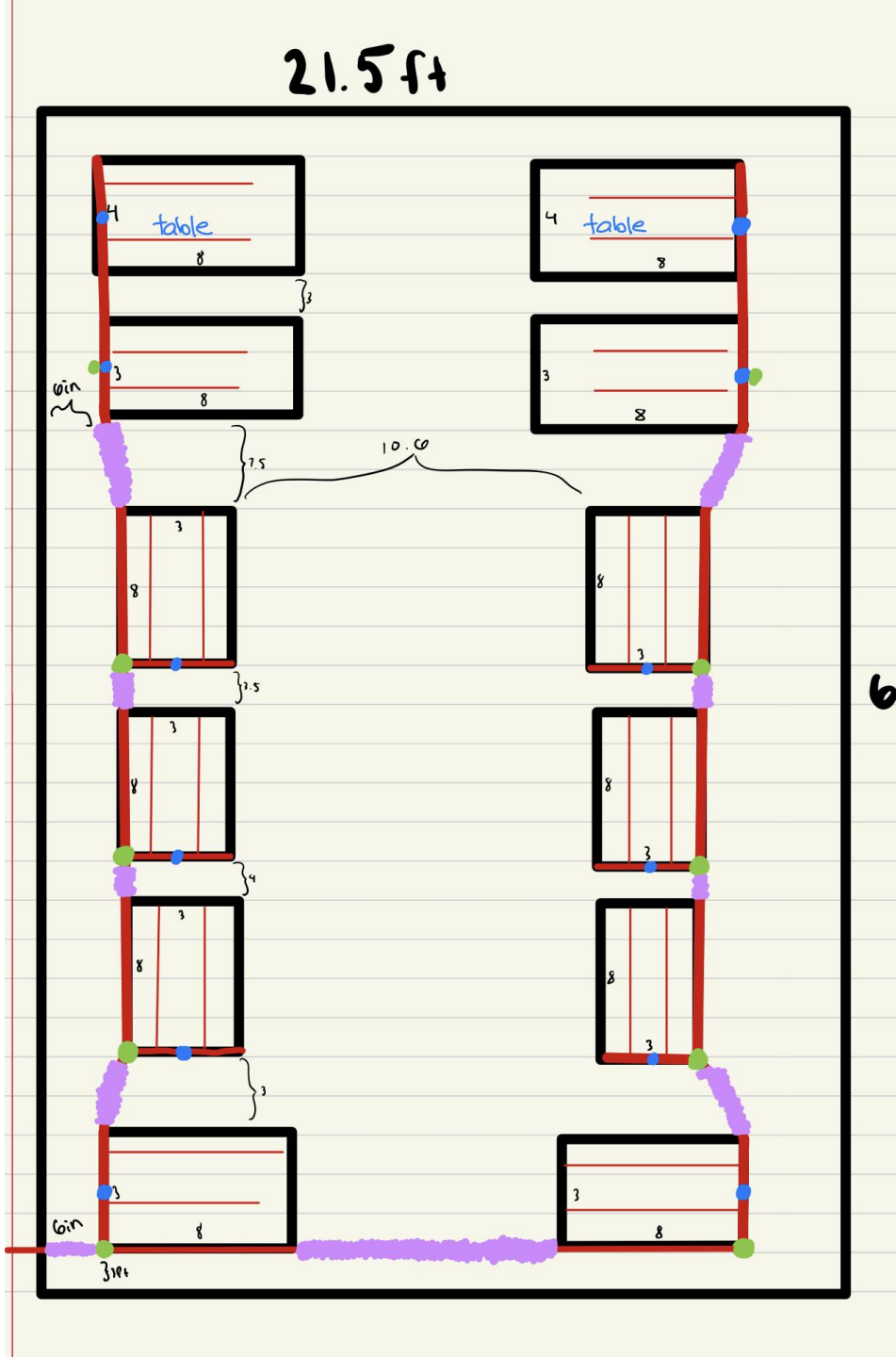


Edited after receiving feedback from project partner.



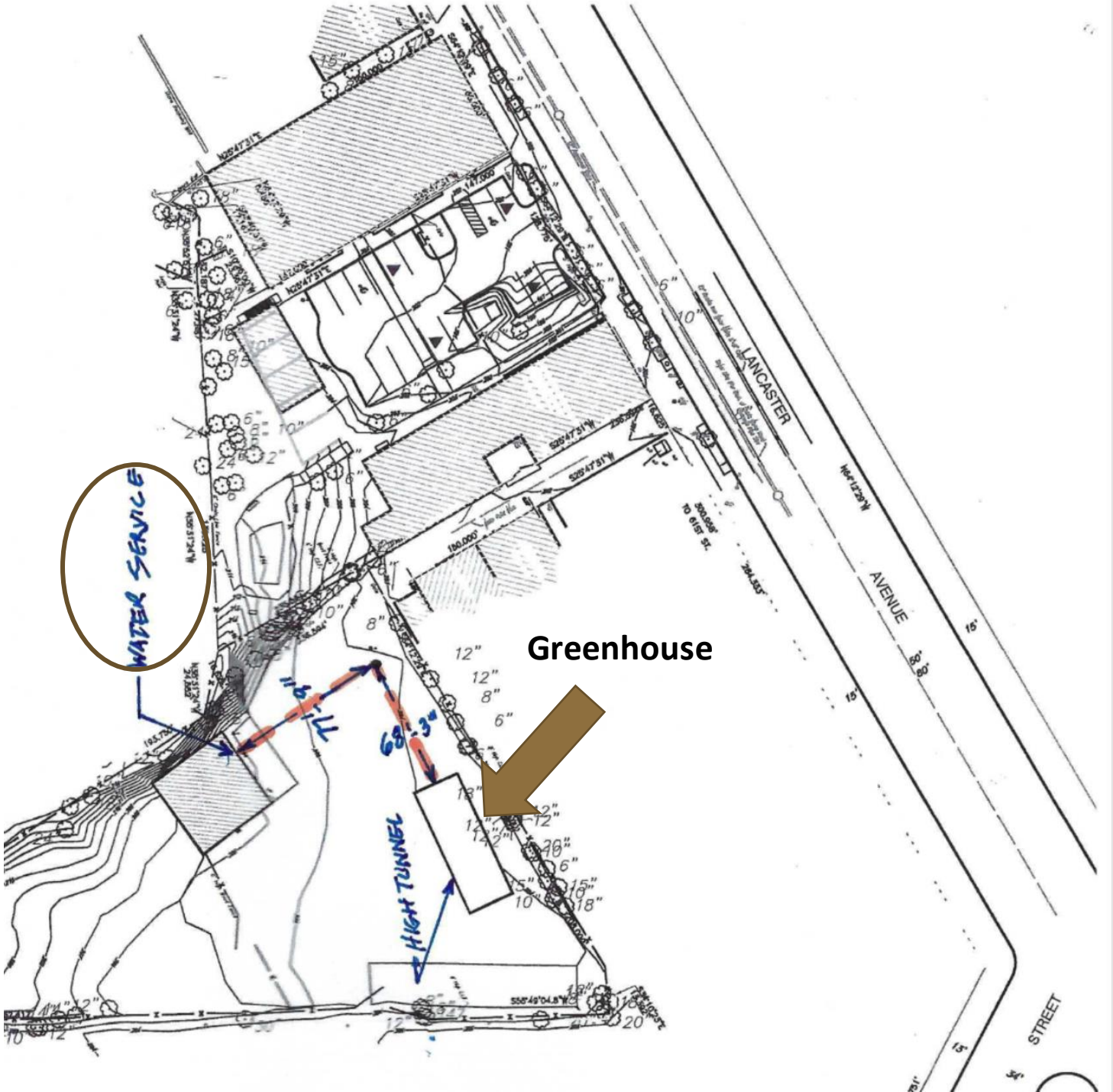
Detailed Design

- After receiving feedback, changes were made.
- Added new materials that would need to be bought
- Brainstormed ideas to improve the safety to the system.



Future Plans

- Figure out how the water source will provide the water to the greenhouse.
- Determine the water pressure to make sure it is above minimum requirement

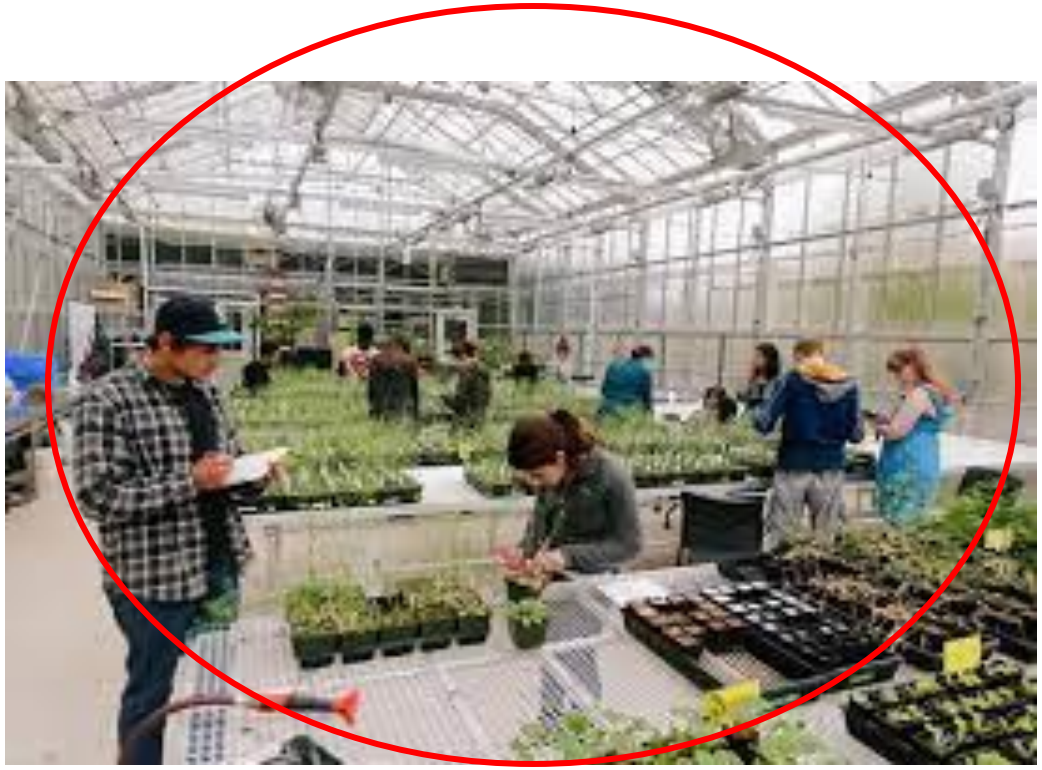


Lighting (LED)

- Project identification
- Specific development
- Conceptual design
- **Detailed Design**

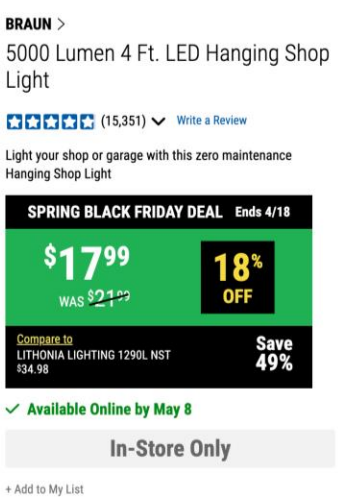
Project Identification

- What is the purpose of having lights?
  - Educational purpose
- What are the constraints?
  - Weight of the lights



Specification Development

- Chose three different kinds of LEDs
  - Grow lights
  - LED
  - **Hanging LED**

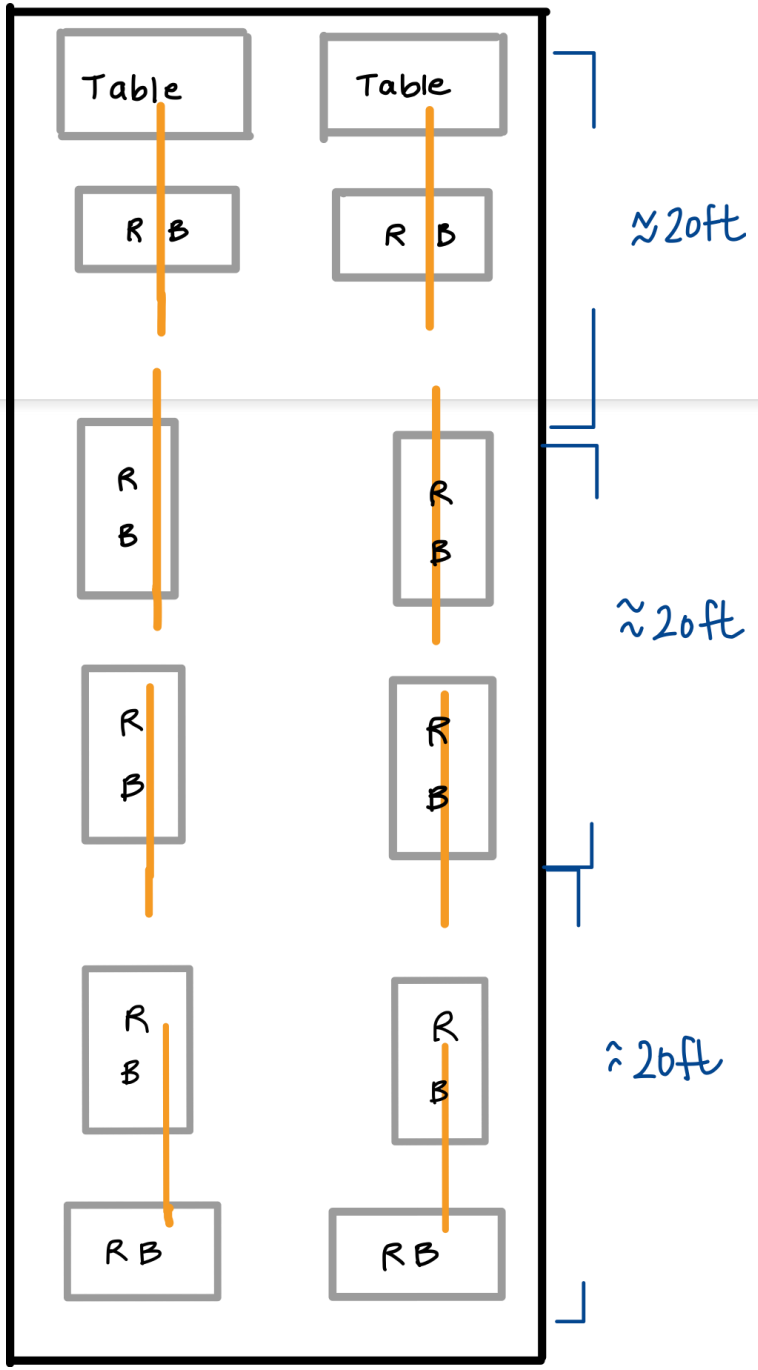


Conceptual Design

- Total of 8 LED lights
  - One LED light (4ft)

Detailed Design

- Total of 8 LED lights
  - One LED light (4ft)
- Two 12.5 in. mounting chains, two 1.75 in. hanging S-hooks and 4 ft. 9 in. ETL certified power cord

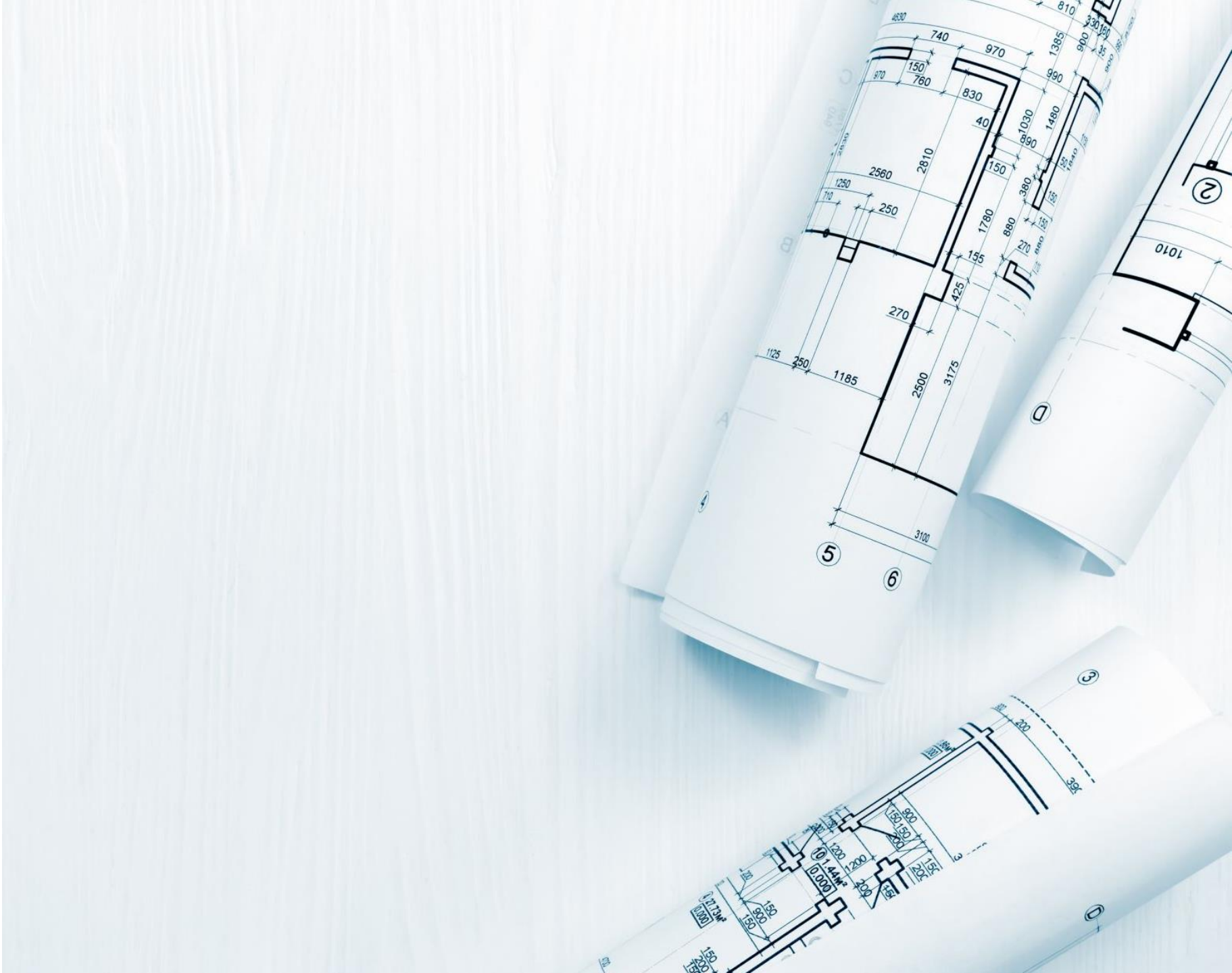


Future plans

- Wiring (Powering the LED)
- Check that the LEDs are close enough to the ceiling.

Ventilation

- Project identification
- Specific development
- Conceptual design
- **Detailed Design**



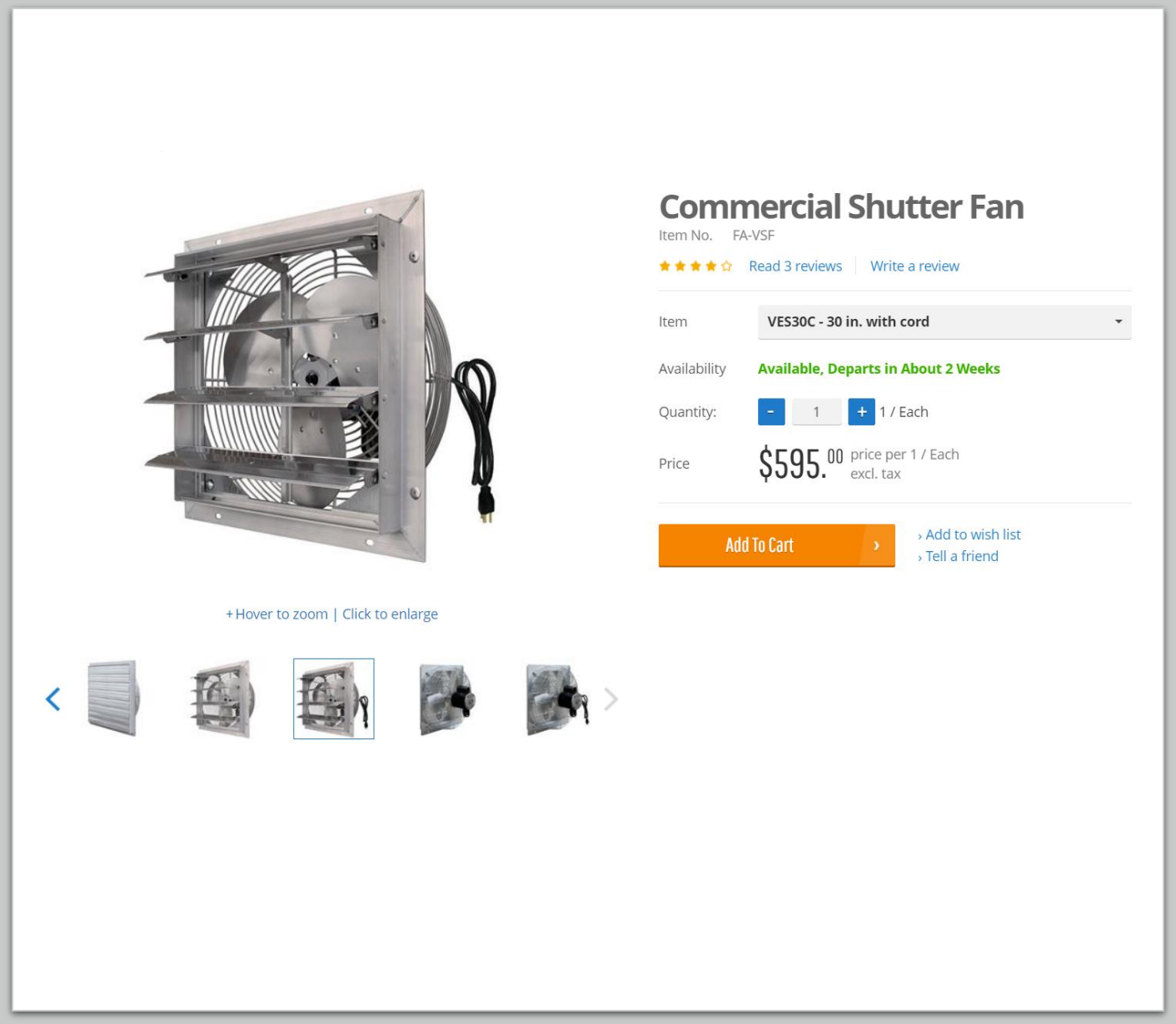
Project Identification

- Appropriate environment for the growth of the crops.
- Cost-effective choices of products.
- Constraints?

  - size of the vent.

Specification Development

- Active ventilation system is chosen.
- The fan was chosen based on required air flow rate.

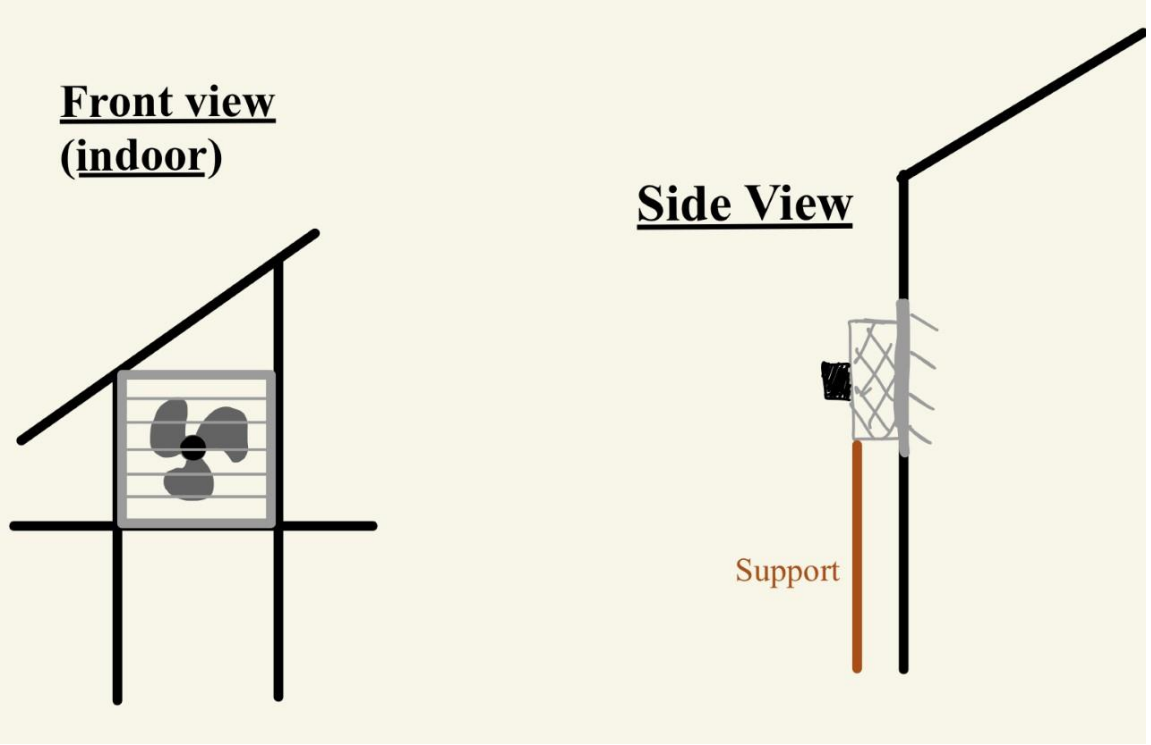


Conceptual Design

- Install at the same position by same method as the old vent.

Detailed Design

- Old Vent Dimension: 32.75" x 32.75"
- New Fan Dimension: 30.5" x 30.5"
- New Fan Weight: 45 lbs



Future Plans

- Work on noise problem.
- Finalize the support design.
- Thermometer.

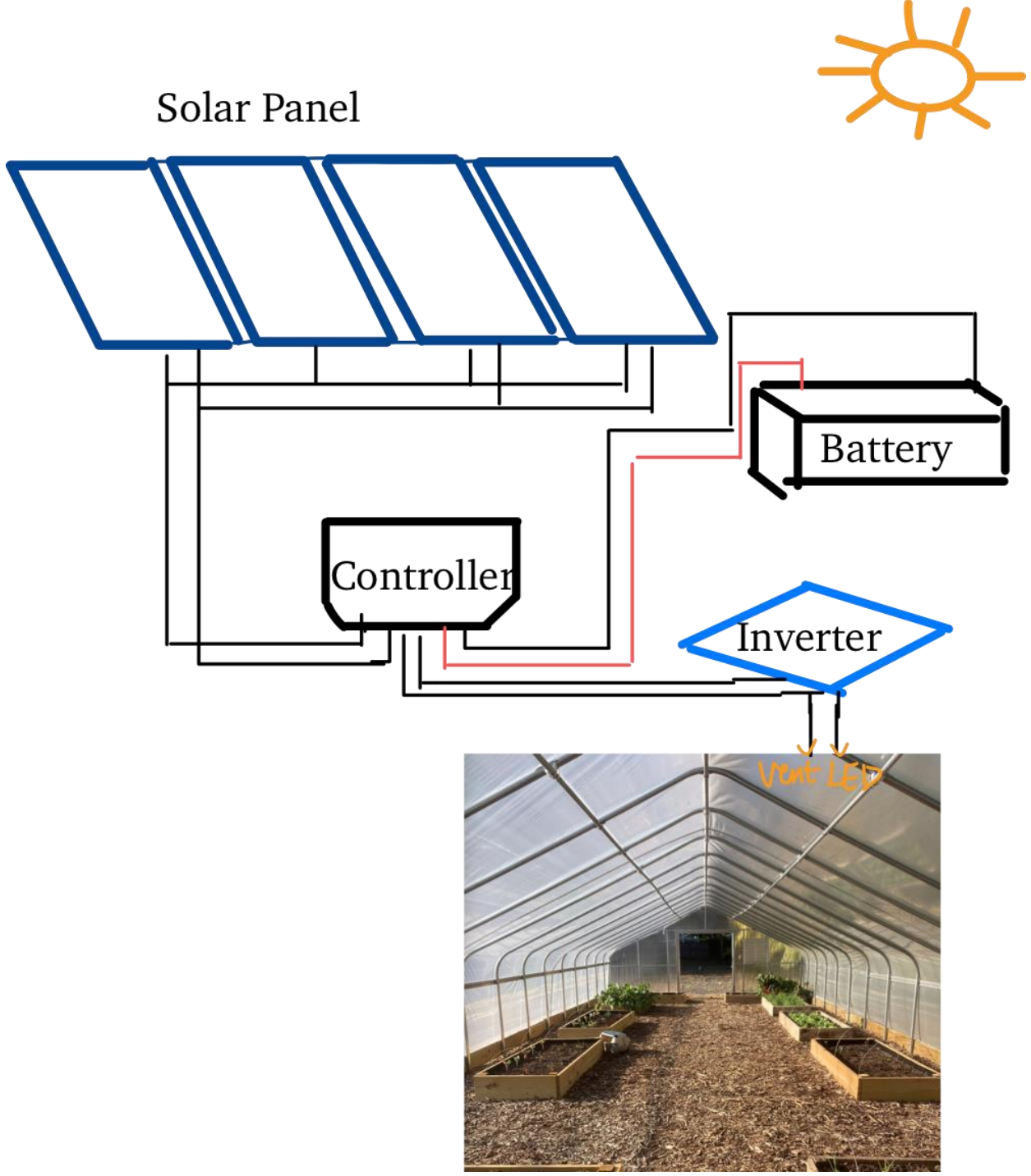
Power System (Solar panel, battery, inverter)

- Project identification

- Specific development
- Conceptual design
- Detailed Design

Power demands

	Type (with the link)	Cost ($)	Power (W)			
Irrigation	Drip Irrigation Kit	***379.46 (need more materials)***				
	Vent/fan link					
Ventilation		$450 total ($225 each)	24.4	two vents		
Lighting	Type2(harbor)	$21.99	480			
					LED (W)	# of LEDs
				type1(3900 Lumens)	30	8
				type2 (5000 Lumens)	60	8
	TOTAL POWER (W)					
	504.4					


Solar Panel
Battery
Controller
Inverter
Vent LED

Thank You

Any Questions?