Santa Cruz – Technical Tasks Work Plan

# TASK 2: DEVELOPMENT AND DESIGN; ENERGY & BUILDING ENVELOPE

The goal of this task is to understand the co-benefits of robust building envelope and energy performance modeling including thermal comfort modeling and/or daylight modeling analysis. Whole building LCA will be included as to quantify embodied carbon and other environmental impacts in material selection and overall building design. Emerging technologies that will be explored include:

## Energy Modeling Report (Due 8/8/2022)

*Evaluate interactions between envelope systems noted in option selection matrix and produce energy modeling reports for code, baseline, and emerging technology options. Produce Energy Modeling Report.*

The energy modeling exercise will inform design decisions. The team will consider various technology packages, and optimize for (1) energy efficiency, minimizing need for on-site generation and storage, and (2) operational cost, minimizing tenant energy burden.

The format of the optimization modeling is TBD (parametric runs, sensitivity analysis, potentially other methods). Various energy modeling software may be used to evaluate energy and cost impacts of the baseline and alternative energy systems under consideration: IES, …

This report may include:

1. Modeling methodology: including the various software, tools, and methods used to evaluate baseline and alternative designs
2. Code baseline energy model outputs
3. FCH build energy model outputs
   1. Noting changes from baseline
4. EPIC build energy model outputs
   1. Outputs of the various runs (whole technology packages or isolated runs) and a comparative analysis, showing cost-optimization charts and discussion.
5. Discussion on design decisions and how the energy modeling exercise influenced these decisions.

## Load Management Report (Due 9/5/2022)

*Leverage energy modeling results to produce Load Management Report*

This report may do a few things:

1. Define needs of building management system
   1. “Eliminate net energy use from the community between the hours of 4 and 9 PM while ensuring uninterrupted, renewable based power for Tier 1 loads, which will comprise 10% of total energy use of the building.“
   2. Microgrid controller
   3. Island-able
   4. Critical / non-critical load hierarchy
   5. Load flexibility
   6. Consumer level and facility management control
2. Consider technology options that satisfy the needs
   1. Commercial off-the-shelf solutions (EMCS)
3. Use energy modeling outcomes to right-size microgrid: PV array and BESS.

## Resiliency Architecture Report (Due 10/3/2022)

*Conduct a Resilience Strategies Analysis that will include implementation of following: passive design strategies, increase fire resistance at exterior building envelope, resiliency hub (resilience energy infrastructure), and IAQ mitigations in unhealthy air events*

*Leverage the Resilience Strategies Analysis to prepare Resiliency Architecture Report.*

This exercise is heavily linked with the energy modeling and load management exercises.

Outcome should be a description of the resilience methods designed in the building (distinguishing between what is resilient in the FCH Baseline Build and how the EPIC Build takes it any number of steps forward.

Includes a forward on how we define resilience (prevention, mitigation, and response?).

Four resilience focus areas:

1. Passive survivability (temperature maintenance during prolonged grid power outage)
2. Wildfire resistance (fire-rating of exterior wall assembly)
3. Resilient electrical design (microgrid island-ability with uninterrupted critical loads, community )
4. Building envelope and mechanical filtration impacts to IAQ during

## Life Cycle Environmental Impact Report (Due 11/7/2022)

*Perform life cycle assessment of environmental impact for the whole building, both construction materials and construction strategies, utilizing the Tally Environmental Impact tool and prepare report on life cycle assessment.*

This exercise will inform the environmental impact of the building design and construction practices.

Methodology will be defined. Various software, tools, and methods may be used. Define comparative metrics.

Cradle-to-grave: Resources > Material processing > Manufacturing > Distribution > Construction > Operations > end-of-life.

Develop whole-building life cycle environmental impact of T24 baseline, FCH build, and EPIC build.

## Architectural & Mechanical Design Documents (Due 12/19/2022)

*Advance the design and integration of systems in collaboration with Owner and consultants.*

*Coordinate preliminary Project Manual Division 1 requirements with Owner.*

*Generate and coordinate technical specifications; identify preliminary scope of delegated design services.*

*Prepare for and participate in Life Safety and Energy Code pre-application meetings with the local jurisdiction officials.*

*Prepare materials for Design Review and participate in Design Review Presentations. Establish cost plan for iterative design packages.*

Product may include:

1. Abridged plan sets
2. Preliminary project specs (div 1, other relevant sections) if available
3. Identification of delegated design services (EMCS?)
4. Items included in Design Review Presentation(s)

# **TASK 3: COMMUNITY ENGAGEMENT**

The goals of this task are to obtain pre-occupancy evaluation from stakeholders, including tenants, developers, and property management. To properly vet the proposed emerging technologies multiple charettes, discussions and surveys will be conducted throughout the design and permitting process. Educational sessions for prospective affordable housing tenants and local community will also include a separate children’s session on energy use.

## Equipment and Materials List (Due 8/22/2022)

*Organize monthly review of proposed systems with developer and property/asset management teams and develop and maintain the Equipment and Material List.*

This product will be some iteration of what will be a living document that will be updated periodically, as equipment selections are refined.

This list should include details of the equipment / material found during the exercises in Task 2, i.e., technical specifications, life cycle environmental impact, …

## Operation and Management Manual (Due 9/19/2022)

*Prepare Operation and Management Manual for property management review, to include list of equipment manuals and maintenance procedure summaries for discussion regarding possible risks and opportunities*

This product should include a summary of proposed building systems, manuals for these systems, proposed maintenance plans (preventive and other), as well as potential risks and preliminary risk management concepts.

## Survey Report (Due 10/24/2022)

*Analyze data and publish findings from surveys in a Survey Report detailing the analysis.*

# **TASK 4: SITE READINESS, PERMITTING/ PRE-CONSTRUCTION**

The goals of this task are to incorporate the design analysis and systems selection into permit documents and work with the City of Santa Cruz towards an approved set of permit documents. 100% construction documents to be used for subcontractor selection at prevailing wage.

## Design Report (Due 12/5/2022)

Advance design and coordination with other disciplines; develop details necessary to communicate design intent.

Conduct design charette activities working with contractors, device manufacturer and site owner and prepare Design Report for review and pricing.

## Building Permit Application (Due 1/9/2023)

Work with the City of Santa Cruz on completion of zoning parcel maps, securing site control and developer agreements for all four parcels.

CEQA, entitlements, and Costal Commission approval for this project have been secured- all design development & permitting will fall under these conditions of approvals or through accepted alternate means and methods.

Generate and submit a Building Permit Application.

## Sustainability Plan and LEED Scorecard (Draft/Final) (Due 6/5/2023 and 8/7/2023)

Develop a Sustainability Plan and LEED Scorecard to advise the owner about the necessary Sustainability Plan adjustments to achieve LEED platinum.

Update Sustainability Plan and LEED scorecard as necessary.

## Permit Drawing Package (Due 1/9/2023)

Respond to permit review comments. Submit permit drawing package.

Develop Permit Drawing Package required for permitting by the local AHJ and submit permit once approved.

## Construction Drawings and Project Specification Manual for Bid Package (Due 7/10/2023)

Coordinate and update Division One and architectural specification sections.

Coordinate and compile technical specification sections produced by the design consultants; define the extent of delegated design services.

Identify delegated design services and incorporate the necessary performance and design criteria in specifications.

Following Building Permit Application, develop remaining construction details and specifications.

Develop Construction Drawings and Project Specification Manual for Bid Package

Initiate pre-construction coordination meetings.

## Permit Approvals (Due 8/7/2023)

Receive permit approvals by local Authority Having Jurisdiction

# **TASK 5: EVALUATION OF PROJECT BENEFITS**

The goal of this task is to report the benefits resulting from this project. EPRI will handle this task which includes completing questionnaires for the CEC periodically.

Products:

* Initial Project Benefits Questionnaire
* Annual Survey(s)
* Final Project Benefits Questionnaire
* Documentation of Project Profile on EnergizeInnovation.fund
* Documentation of Organization Profile on EnergizeInnovation.fund

# **TASK 6: Technology/Knowledge Transfer Activities**

2023

The goal of this task is to ensure the technological learning that resulted from the project is captured and disseminated to the range of professions that will be responsible for future deployments of this technology or similar technologies.

When directed by the CAM, develop presentation materials for an CEC- sponsored conference/workshop(s) on the project.

When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California CEC.

## Project Case Study Plan (Draft/Final) & Summary of TAC Comments

* Develop and submit a *Project Case Study Plan (Draft/Final)* that outlines how the Recipient will document the planning, construction, commissioning, and operation of the technology or system being demonstrated. The *Project Case Study Plan* should include:
  + An outline of the objectives, goals, and activities of the case study.
  + The organization that will be conducting the case study and the plan for conducting it.
  + A list of professions and practitioners involved in the technology’s deployment.
  + Specific activities the recipient will take to ensure the learning that results from the project is disseminated to those professions and practitioners.
  + Presentations/webinars/training events to disseminate the results of the case study.
* Present the *Draft Project Case Study Plan* to the TAC for review and comment.
* Develop and submit a *Summary of TAC Comments* that summarizes comments received from the TAC members on the *Draft Project Case Study Plan*. This document will identify:
  + TAC comments the recipient proposes to incorporate into the *Final Technology Transfer Plan*.
  + TAC comments the recipient does not propose to incorporate with and explanation why.
* Submit the *Final Project Case Study Plan* to the CAM for approval.

## Project Case Study (Draft/Final)

* Execute the *Final Project Case Study Plan* and develop and submit a *Project Case Study (Draft/Final)*

## High Quality Digital Photographs

Provide at least (6) six High Quality Digital Photographs (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.

# **TASK 7: BUILD PHASE SELECTION**

2023

The goal of this task is to conduct activities and prepare deliverables for the selection process for the Build Phase. These deliverables will be used to select which Design Phase projects will receive funding for the Build Phase. In addition, deliverables developed under this task will be used to amend the agreement for those projects chosen to move onto Build Phase.

Develop and prepare *Conceptual Design and Engineering Report*, describing drawings, design plans, and photos of an architectural-scale model of the project. At least photos from each perimeter side of the model shall be included in the report (e.g., north, east, south, and west views). The actual architectural-scale models will be on display during the team’s project presentation at the event, as well as during a model showcase networking session

* Develop and submit an *Energy and Emissions Performance Model Report*, detailing the plan for software modeling of the development’s expected energy and emissions performance and impacts on tenants’ energy bills.
* Prepare and submit an *Emerging Technologies and Strategies Report*, describing the emerging technologies and strategies proposed to be used in the Build Phase and why they were chosen.
* Prepare and submit a *Zero-Emission Cost-Benefit Analysis Report* detailing the estimated cost difference between the zero-emission build-out compared to standard building design, construction, and operations.
* Prepare and submit a *Community Engagement Plan* documenting the strategy for soliciting and incorporating input from the community throughout the design process.
* Create and submit a two-minute *Concept Video* that will air at the Zero-Emission Building Forum (i.e., Showcase Event).
* Develop and submit additional *Presentation Materials* for the Zero-Emission Building Forum, as determined and requested by the CAM.
* Provide a presentation to the Build Phase Evaluation Committee.
* Develop and submit a Build *Phase Amendment* Package that includes revisions as necessary to all of the Design Phase “full application” attachments:
  + Attachment 4 - EPIC Application Form (i.e., Design Phase application, confirmed and/or amended, as necessary, for the Build Phase)
  + Attachment 5 - EPIC Executive Summary (i.e., Design Phase application, confirmed and/or amended, as necessary, for the Build Phase)
  + Attachment 6 - EPIC Project Narrative (i.e., Design Phase application, confirmed and/or amended, as necessary, for the Build Phase)
  + Attachment 7 – Project Team Form
  + Attachment 8 – Scope of Work
  + Attachment 9 – Project Schedule
  + Attachment 10 – Budget
  + Attachment 11 – CEQA Compliance Form (Must be filled out again, to reflect at a minimum: (a) changes in the proposed project and (b) any changed external circumstances that are relevant to the prior environmental impact analysis.) (Applicant must confer with Lead Agency, if proposed project has increased in magnitude or changed in a way that is relevant to the prior environmental impact analysis.)
  + Attachment 12 – References and Work Product Form
  + Attachment 13 – Commitment and Support Letters
  + Attachment 14 – Project Performance Metrics
  + Attachment 15 -- Applicant Declaration (must be filled out again)

**Products:**

* Conceptual Design and Engineering Report
* Energy and Emissions Performance Model Report
* Emerging Technologies and Strategies Report
* Zero-Emission Cost-Benefit Analysis Report
* Community Engagement Plan
* Concept Video
* Presentation Materials
* Build Phase Amendment Package that includes revisions to the following Design Phase attachments:
  + Attachment 4 - EPIC Application Form
  + Attachment 5 - EPIC Executive Summary
  + Attachment 6 - EPIC Project Narrative
  + Attachment 7 – Project Team Form
  + Attachment 8 – Scope of Work
  + Attachment 9 – Project Schedule
  + Attachment 10 – Budget
  + Attachment 11 – CEQA Compliance Form
  + Attachment 12 – References and Work Product Form
  + Attachment 13 – Commitment and Support Letters
  + Attachment 14 – Project Performance Metrics
  + Attachment 15 -- Applicant Declaration