

A decorative border featuring a variety of tropical plants and flowers. On the left, there are long, slender green leaves. In the center and right, there are several hibiscus flowers in shades of light pink, orange, and bright red. The background is a dark, deep green with subtle patterns of leaves and foliage.

DESIGN BUILD for Mission Critical Facilities

Copyright Notice

This presentation is protected by US and International Copyright laws. Reproduction, distribution, display and use of the presentation without written permission of the speaker is prohibited.

© The American Institute of Architects 2016

AIA/CES Compliance Statement

“AIA Knowledge” is a Registered Provider with The American Institute of Architects Continuing Education Systems (AIA/CES). Credit(s) earned on completion of this program will be reported to AIA/CES for AIA members. Certificates of Completion for both AIA members and non-AIA members are available upon request.

This program is registered with AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

AIA/CES Reporting Details

All attendees will be eligible to receive AIA continuing education for attending this course by completing the electronic form sent via email after the conference.

Continuing education questions can be directed to aaj@aia.org.

Course Description

Developing the criteria and design for public safety operations centers can be a daunting task but coupling that process with a design build delivery method can bring many benefits as well as challenges. This presentation will engage the participants from several perspectives from the County Communications Center and County Capital Projects through the Criteria Architect all the way to the Design Build Entity (Contractor and Architect).

Topics to be explored in the panel discussion will include developing the criteria to meet the standards and user requirements, pros and cons of the delivery process, selection of the design build team, design excellence, mission critical systems integration, and user satisfaction with the process. Recent trends for public safety operations centers (9-1-1 Dispatch) and emergency operations center along with traffic management centers will be a focus throughout the discussion.

Learning Objectives

1. Gain an understanding of the key features required to write critical criteria for public safety operations center bridging documents
2. From a discussion of case studies, gain a further understanding of the design build process as it pertains to this building type
3. Understand project design process and system integration for public safety buildings viewed from the perspective of the Owner and Design Build Entity
4. Hear pros and cons of the design build delivery process and user satisfaction based on discussions with Owner and Design Build Entity

***DESIGN BUILD for Mission
Critical Facilities***



Steve Loomis, FAIA LEED AP
AECOM Norfolk, Virginia

- Over 75 Public Safety projects
- Dedicated Public Safety Principal
- 25+ years with AECOM
- More than 40 Operations Centers
- APCO Member



Amanda Chebalo, AIA

AECOM Norfolk, Virginia

- Registered Architect
- 12 + public safety facilities throughout United States and Canada
- Experienced in Master planning, Programming and Planning, Construction Documents, and Construction Administration



Andrew Vliet, DPhil

Senior Program Manager

SSFM International Honolulu, Hawaii

- 20+ years of program management experience
- Experience in:
 - Requirements definition
 - Concept of operation development
 - Stakeholder involvement
 - Budget development;
 - Contracting
 - Project execution



Chad Foster, AIA, LEED AP BD&C
Project Manager
Johnson County Kansas City, Missouri

- 12 years experience as a Project Manager for Johnson County
- 20+ years as a licensed architect
- Chairman for the Historic Resources Commission in Lawrence, KS
- Experienced in Construction Management for Design-Build Projects



Jaime Young

9-1-1 Communications Director

County of San Mateo Redwood City, California

- 2016 President for the California Chapter of NENA
- 35+ years experience in Emergency Communications
- 24+ years of management of San Mateo's 9-1-1 operation



Bill Niemann, LEED AP BD+C

Project Executive

McCarthy Building Companies San Jose,
California

- 30+ years in the construction industry
- Oversees management for some of Northern California's most notable projects. Clients include:
 - The Irvine Company
 - Bio Med Realty
 - Genentech
 - University of California
 - Stanford University

DESIGN BUILD PROCESS



**Mission Critical
Design Build**

*Specialized Building
Type*

*Stringent Design
Criteria*

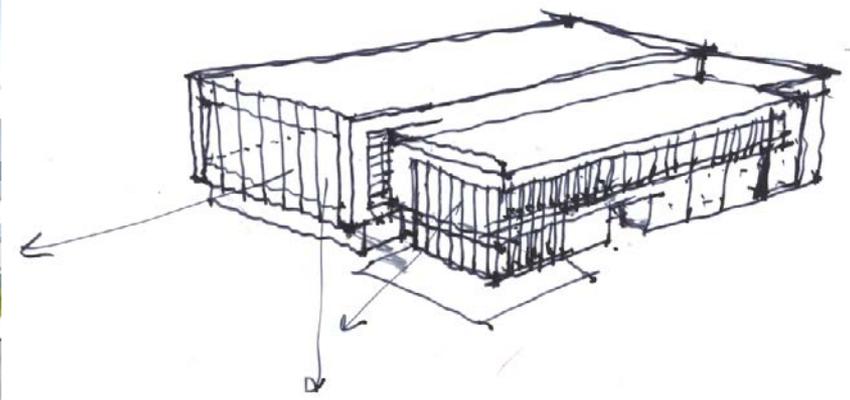
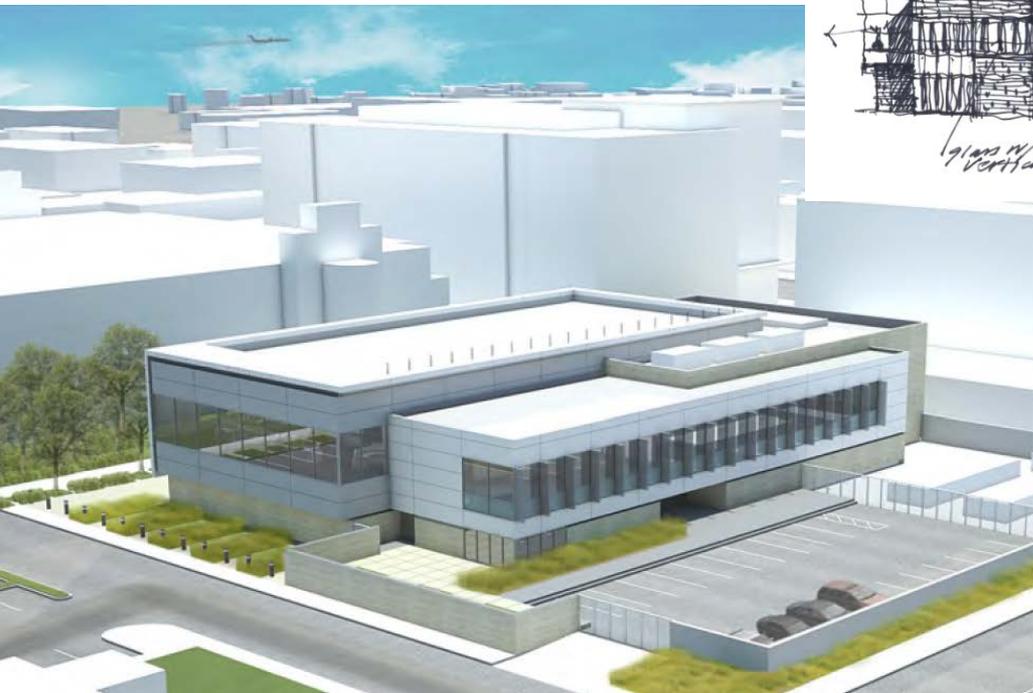
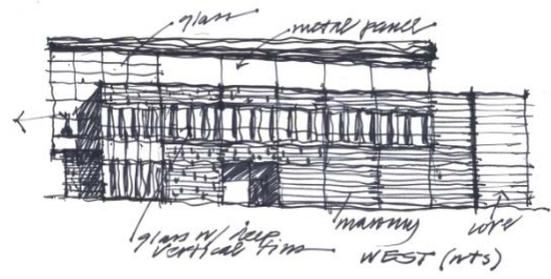
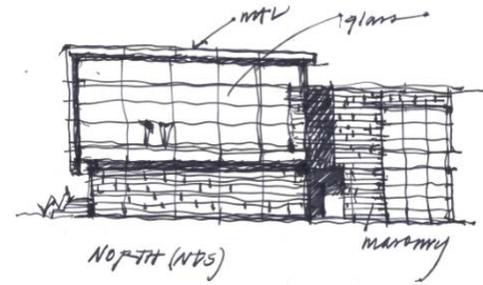
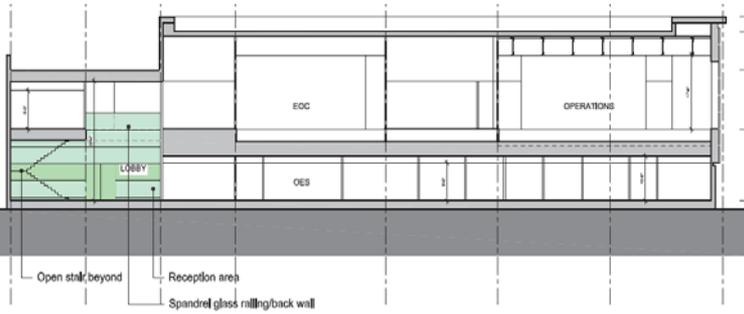
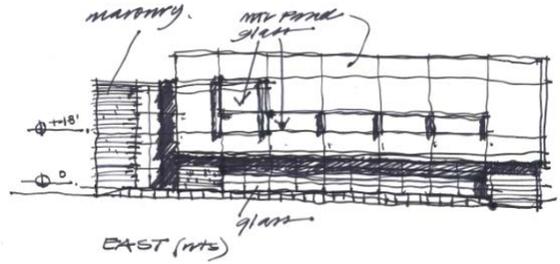
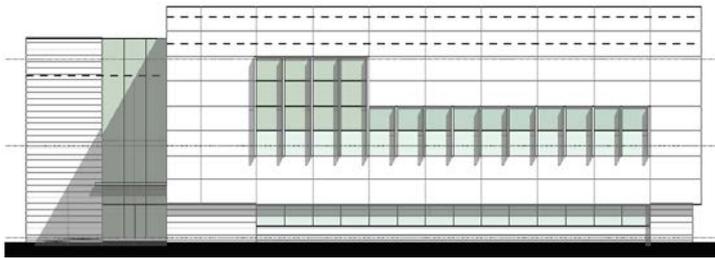
*Early Threat and
Risk Analysis*

*Technology Driven
Design*

MEP Redundancy

Structural Hardening

Cost Estimate



Criteria Design

Documentation

- What's included
- Fixed Price?
- Stipend or Not

Level of Predesign

- Prescriptive vs. Performance

Criteria Documents

Design Narratives

- Owner's Project Requirements
- Architectural Design
- Building Systems

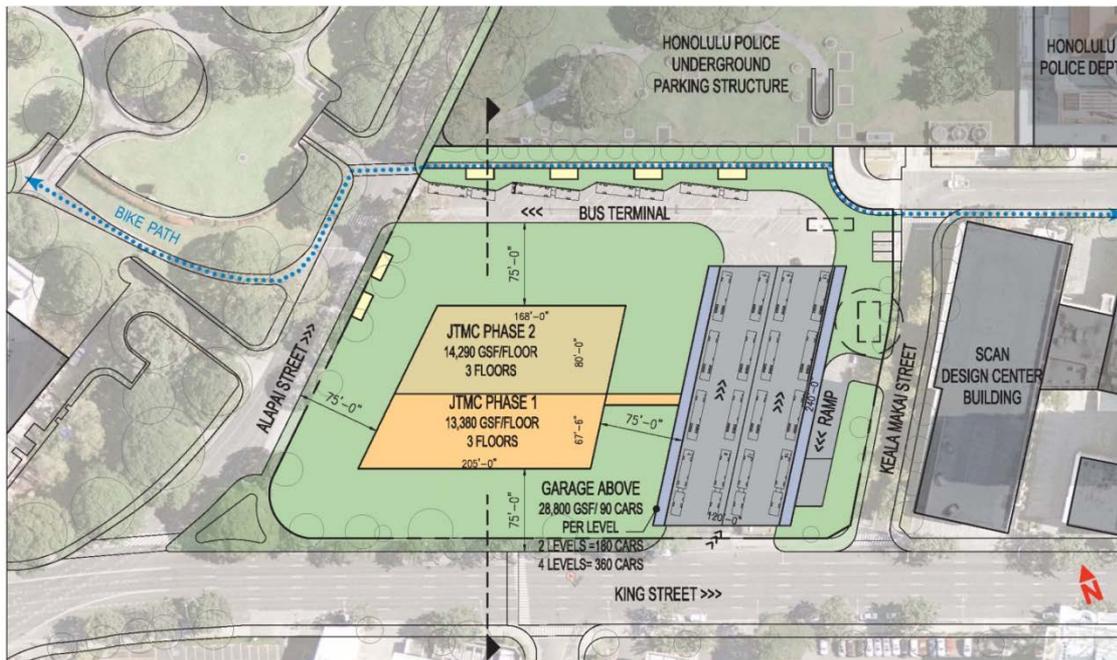
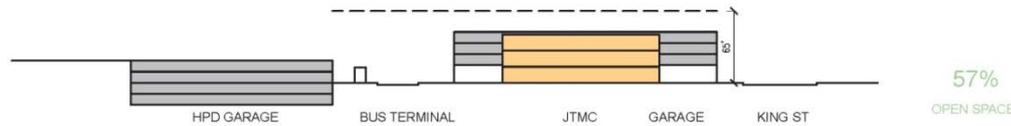
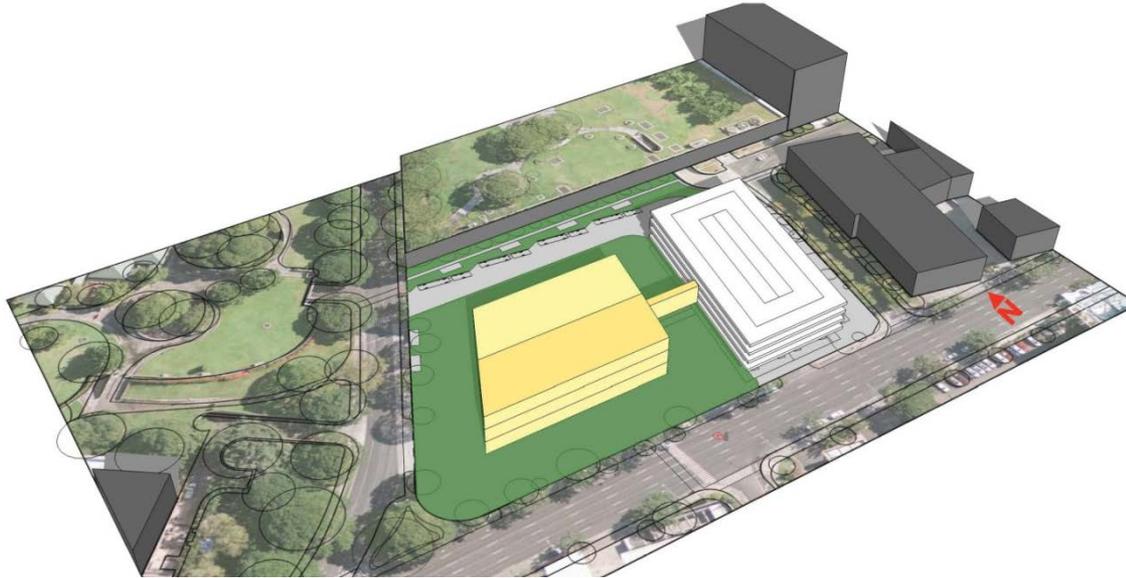
Space Requirements

- Programming
- Adjacencies
- Room Data Sheets

Conceptual Design

- Site Plan
- Floor Plans
- Building Massing

Applicable Codes and Standards



TYPE	ASSESSMENT		DESIGN PRECAUTIONS					
	PROBABILITY	IMPORTANCE	Vulnerability Precautions	Architectural	HVAC, Plumbing, Fire Protection	Electrical	Telecomm	Other
A. NATURAL THREATS								
Weather								
Lightning	Low	High	Proper lightning protection plan				Systems Grounding Plan per R-56	
Flood - Watershed or Tidal	Medium	High	Out of the 500 year flood zone, Storm drainage system, no basement	Raise building from grade, no sub grade levels		Conduit located out of flooding area. Protect underground utilities		Above ground fuel tanks and generators. Clay soils don't allow much absorption
Flood - Inundation	High	High		Same as above		Same as above		Same as above
Drought / Wild Fire/Smoke from Wild Fire	Medium	Medium	Use xeriscaping (landscaping with native plants). Investigate rainwater collection system	Use non-combustible building materials	Plumbing - Grey Water or Rainwater Collection System HVAC - Use Filter System to eliminate smoke, Damper to close off outside air intake	Underground Utilities	Underground Utilities	
Seismic / Geological								
Earthquake	High	High	Comply with California Building Code for essential facility, continuity of operations, during and after an event.	Structure - Strategy to resist forces to maintain operations. Seismic Design required for nonstructural elements. See Spec Section 014600	Brace equipment HVAC - Provide redundant air handlers for ECC (NFPA 1221) Separate Air Cooled and Water Cooled systems	Brace equipment	Brace equipment Dual Path IDF Rooms	Potential Hazard from Adjacent Buildings and Structures, Separate Mechanical and Electrical Equipment from County Building 455 Generator and Fuel Tank.
Liquifaction	High	High	Detailed Geotechnical Analysis	Structure - Soil Enhancement				

A. NATURAL THREATS

Additional Criteria Considerations

Specifications

Threat and Vulnerability Assessment

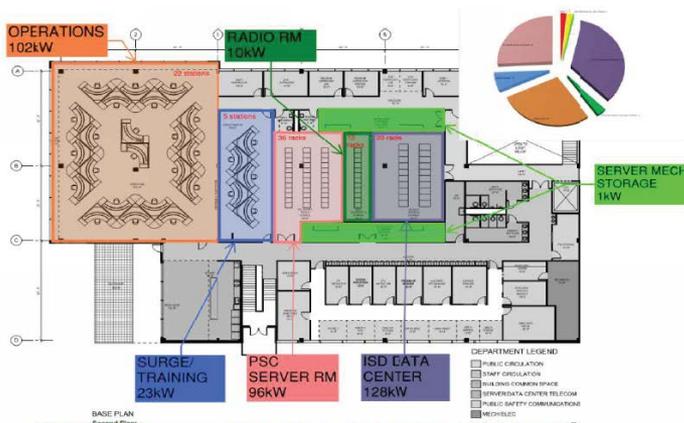
LEED intent

Value Added List (Enhancements)

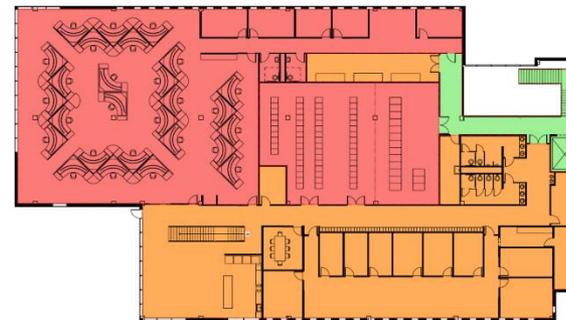
Future Expansion Objectives

Project Schedule

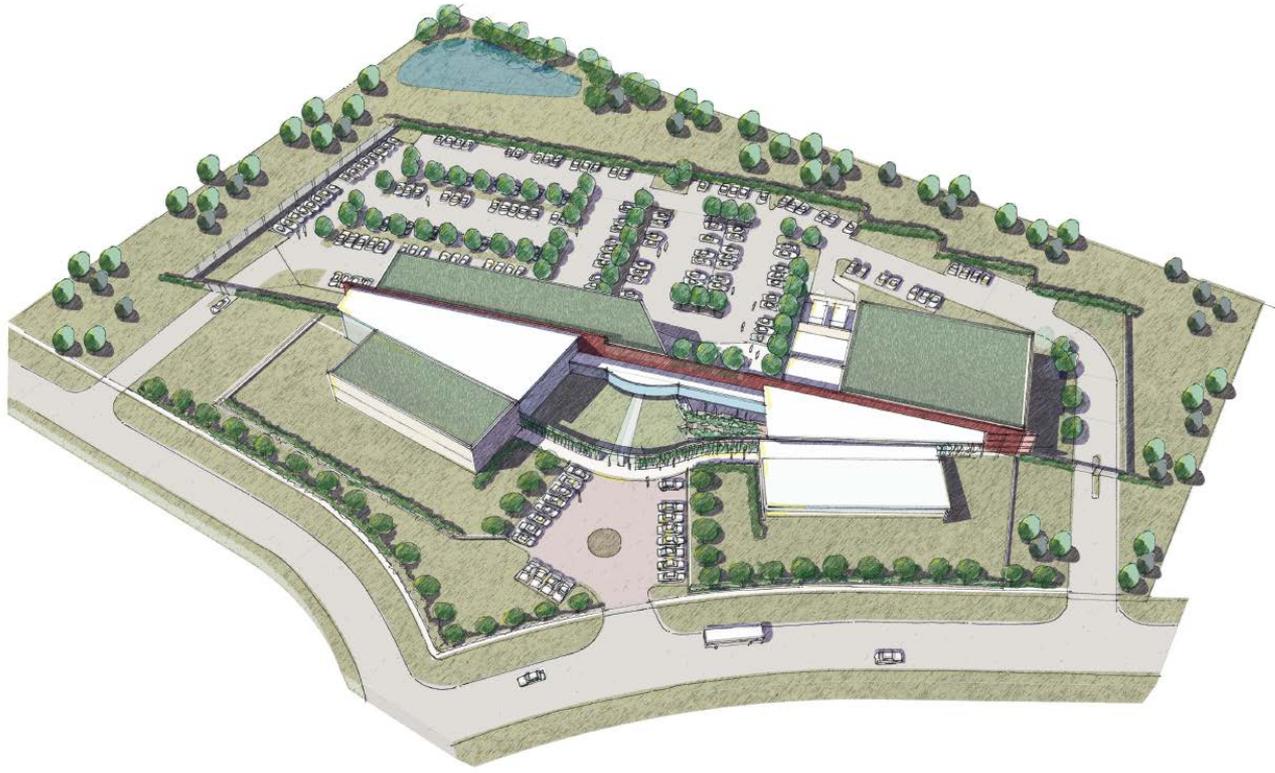
Design Budget



Power Requirements



Security Zones



Selection of
Design Build Entity

Qualify DBE's

*Confidential
Meetings*

*Maintaining an Even
Playing Field*

Award



CASE STUDIES

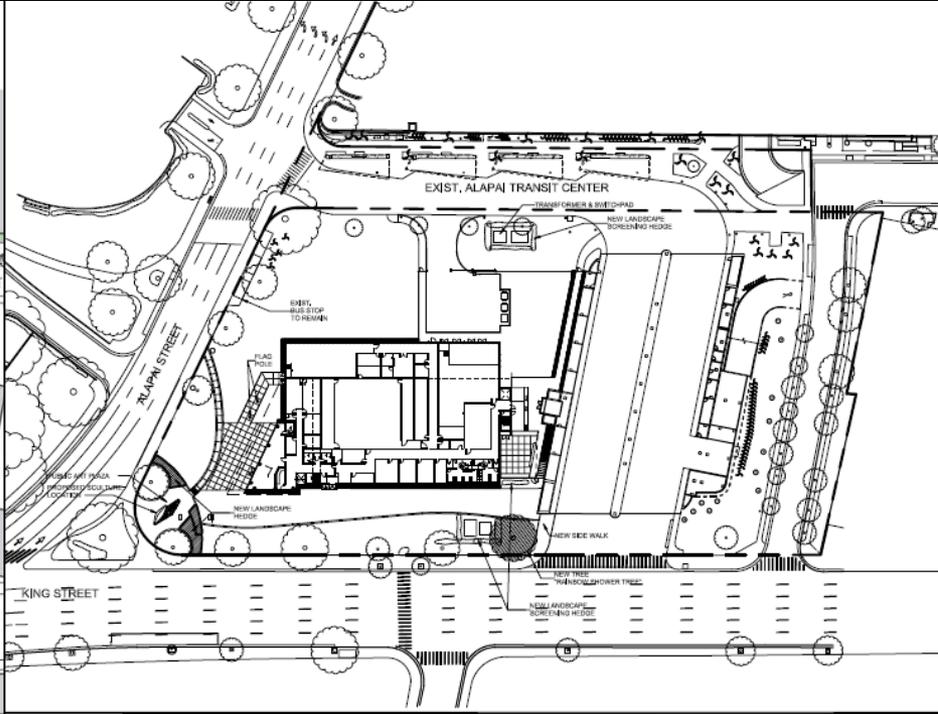
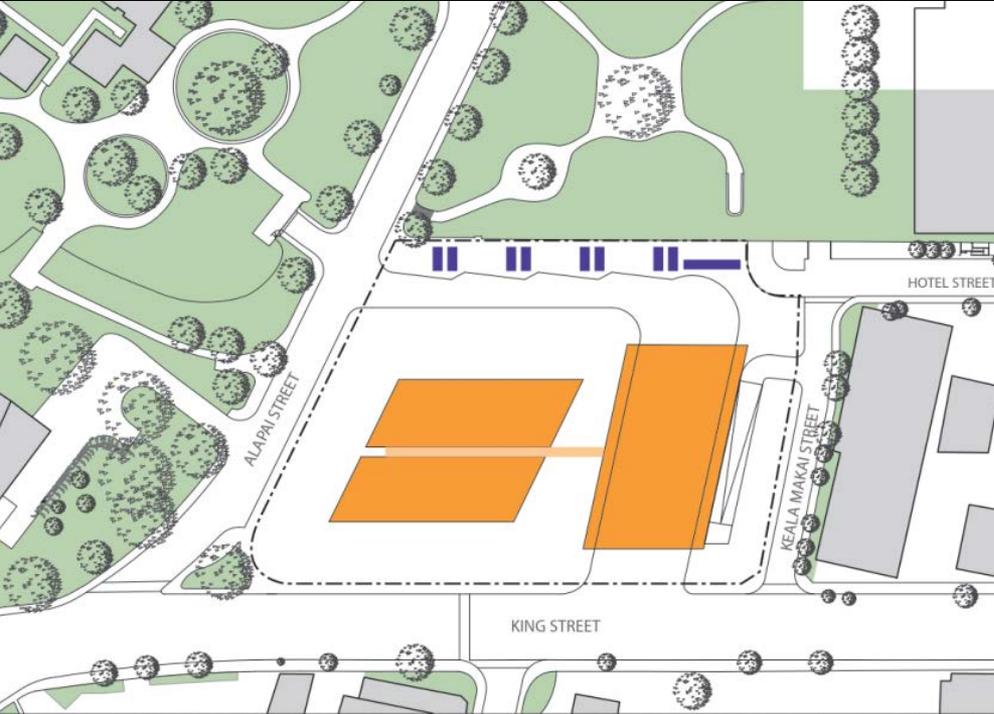
The City and County of Honolulu Joint Traffic Management Center and Emergency Operations Center

Honolulu, Hawaii





Site Management
 Parking Structure
 Transit Center
 Joint Traffic Management Center



Construction Phasing

1. *Parking Structure*
2. *Transit Center*
3. *Joint Traffic Management Center*
4. *Joint Emergency Operations Center?*





Special Considerations

Redundancy & Resilience

Special Design District

Public Outreach

Encumbrances





Lessons Learned

Funding

Political Buy-in

*Stakeholder
Management*

*Change
Management*

Continuity

Johnson County
Consolidated Communications Center
Olathe, Kansas



Project Description

Master Planning

9-1-1 Center

Crime Lab

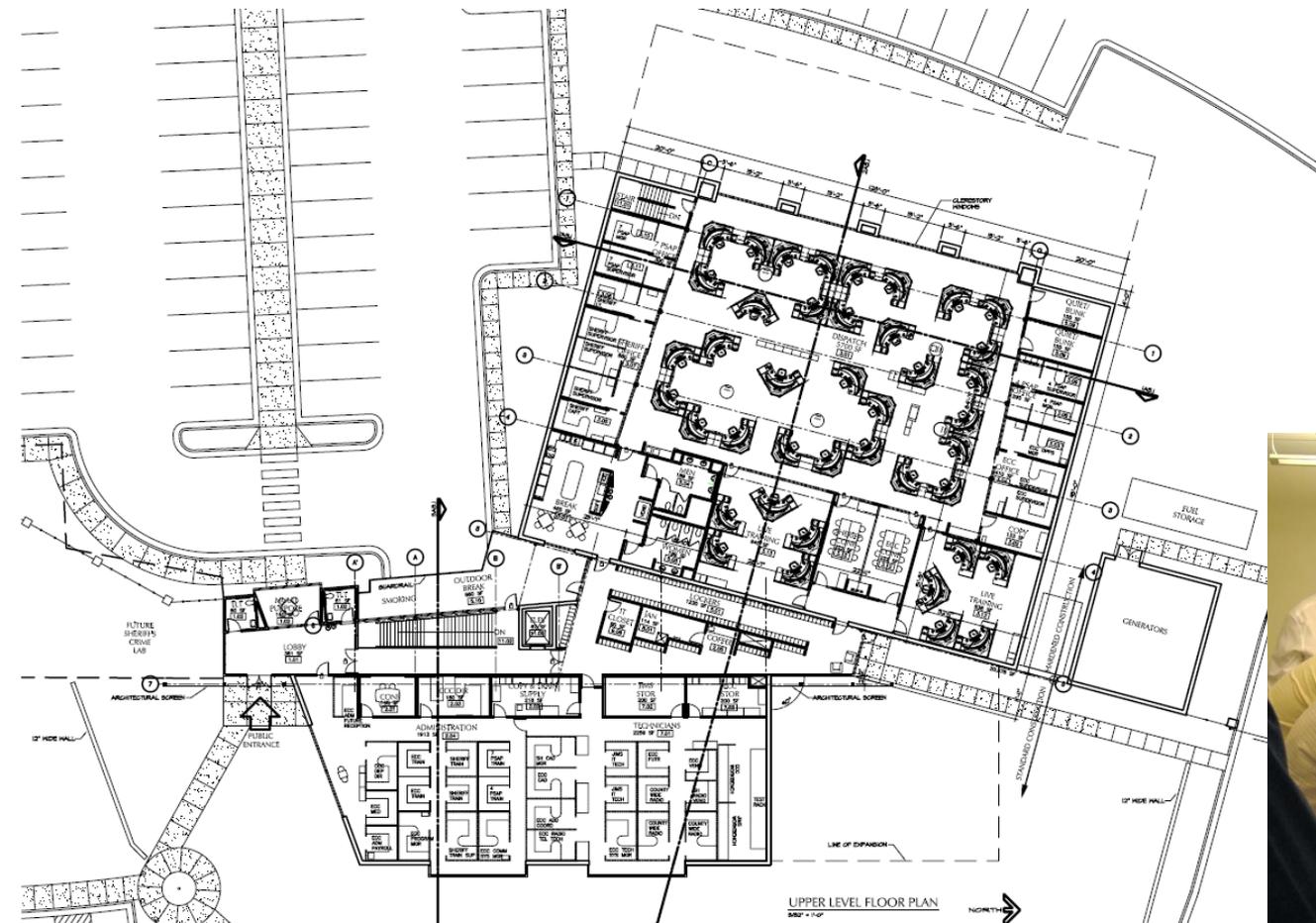


Criteria Documents

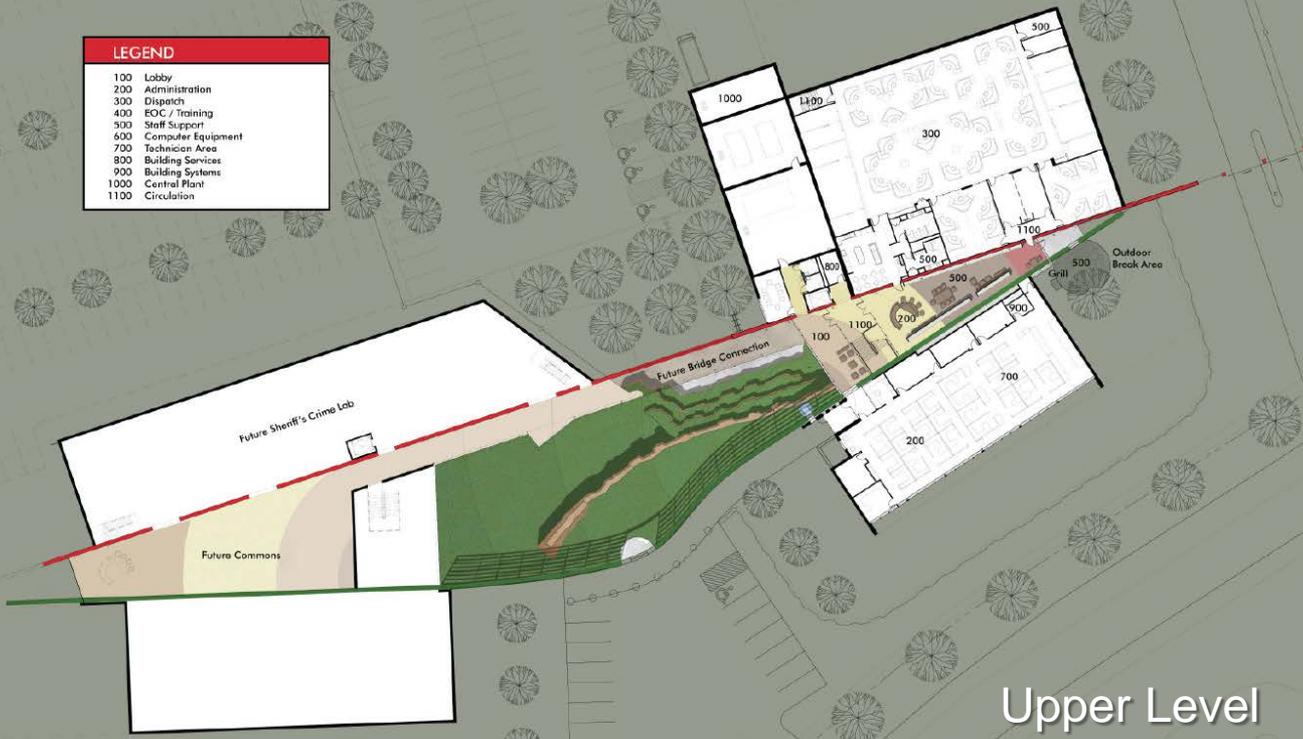
Master Planning

Programming

Schematic Design



LEGEND	
100	Lobby
200	Administration
300	Dispatch
400	EOC / Training
500	Staff Support
600	Computer Equipment
700	Technician Area
800	Building Services
900	Building Systems
1000	Central Plant
1100	Circulation



Upper Level

Selection of Design Build Entity

2-Stage RFP

Fixed Price

Scoring Process

No Feedback

Interview Process

LEGEND	
100	Lobby
200	Administration
300	Dispatch
400	EOC / Training
500	Staff Support
600	Computer Equipment
700	Technician Area
800	Building Services
900	Building Systems
1000	Central Plant
1100	Circulation



Lower Level



**Johnson County Communication Center
Ranking Sheet No. 3**

2006-062

Executive Summary / Project Understanding / Management Approach - 10 Points
Team Organization/ Approach - how the D/B team will work together and with the county during the project
Executive Summary - key aspects of Design-Build Teams' Proposal
Project Understanding - address comprehensive Project Solution and Qualifications update
Management Approach - Project Schedule, Management, coordination, quality control strategies
Provides Health & Safety Program
Project Technical Understanding - 45 Points
Technical understanding of mission critical building functional relationships and site concepts
Mission critical systems - HVAC, Electrical and other system redundancies, electrical grounding, communications infrastructure, building and site security
Meets Program requirements and design approach of Bridging Documents
Context - enhances Sunset Campus and respects surrounding residential community.
Meets design approach of hardened areas, while providing comfortable, productive staff environment.
Building/ Site design is founded on sustainable design principles that respect the environment.
Exterior Expression/ Aesthetics - facility meets aesthetic guideline that respect the environment
Flexibility for Expansion and Functional Changes - building layout promotes adaptability. Integration of building and site that facilitates future expansion of CCC and addition of SCL
Finishes - meets requirements of specifications
Security - high level, integrated
Provides accommodations to future Sheriff's Crime Lab/ takes advantage of shared synergies.
Workplace Environment - design provides positive workplace
Justification of design changes to Bridging Documents
Best Value / Innovation In Design - 30 Points
Provides items of Owner's desired Best Value Options List
Provides other Best Value Options
Explanation of ways the Proposal exceeds the requirements of the RFP
Provides innovative design solutions in building systems, design concepts, aesthetic concepts for areas including Building Exterior, Building Interior, Structural Systems, Central Plant Heating & Cooling Systems, Central Plant location
Energy Performance - 15 Points
Provides building energy savings features
Life Cycle Cost Analysis Data
TOTAL - 100 Points

McCown Gordon / PGAV	Burns & Mac / 360	Turner / SFS
Score 0	Score 0	Score 0
0	0	0
0	0	0
0	0	0
0	0	0

Key Elements of a Responsive Submittal

Meeting the Fixed Price and Maximizing Best Value

Meeting the Design Criteria

Innovation

Understanding of the Owner's commitment to the bridging document design

Ranked By: _____

Date: _____

The selection committee member above agrees to comply with the County Code of Ethics Standard 1101: An official whether elected or appointed and an employee in government service should never allow his judgment to be compromised by any personal, family or business interest not a part of his government service and never act upon any matter in which he, his family, or business has or may have any financial or beneficial interest; and should always declare and disclose the full nature and extent of any personal, family, or business interests in any matter related to governmental actions or duties.

COMMITTEE MEMBER NO. _____



Lessons Learned

Criteria Documents

Construction Documents Phase

Construction Phase



County of San Mateo Regional Operations Center Redwood City, California





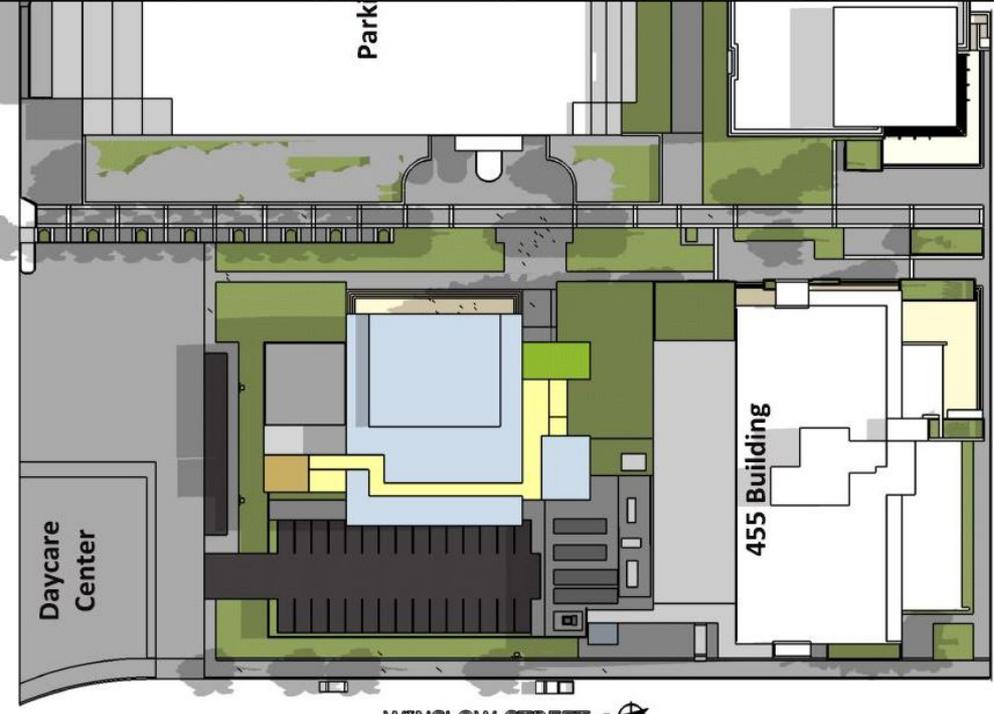
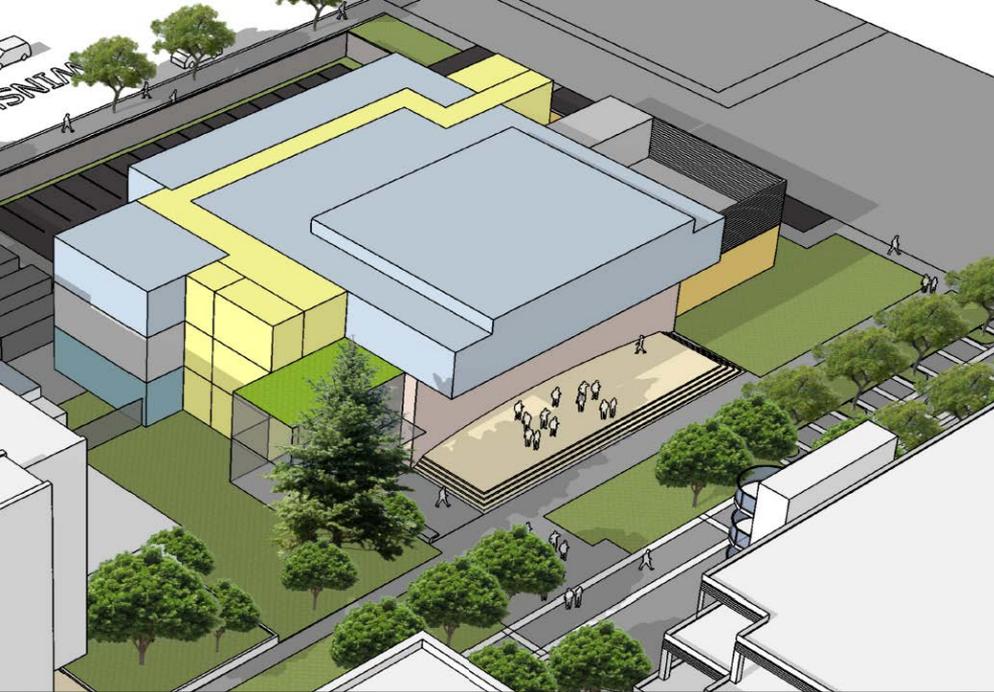
Project Overview

*Emergency
Operations Center*

*Office of
Emergency
Services*

*Public Safety
Communications*

*Information
Services
Department*

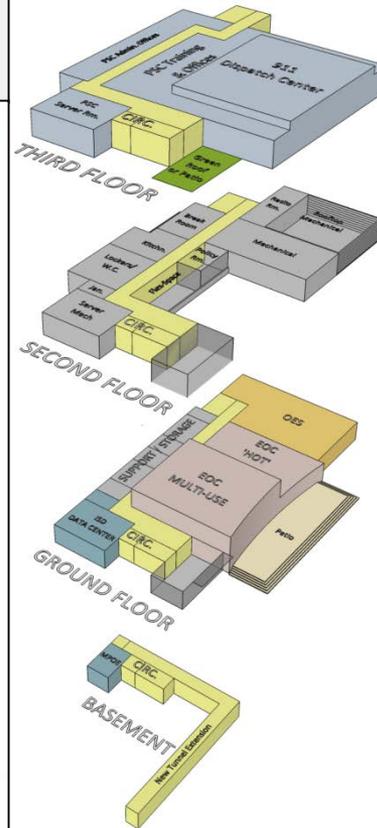


Development of Criteria Documents

Criteria Architect

Early Programming

Planning



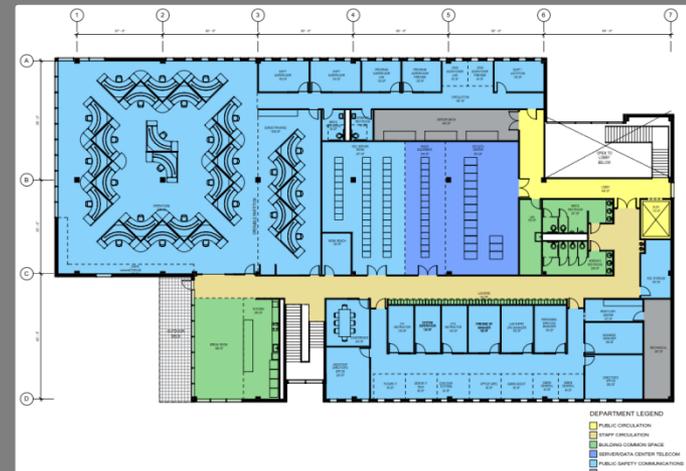
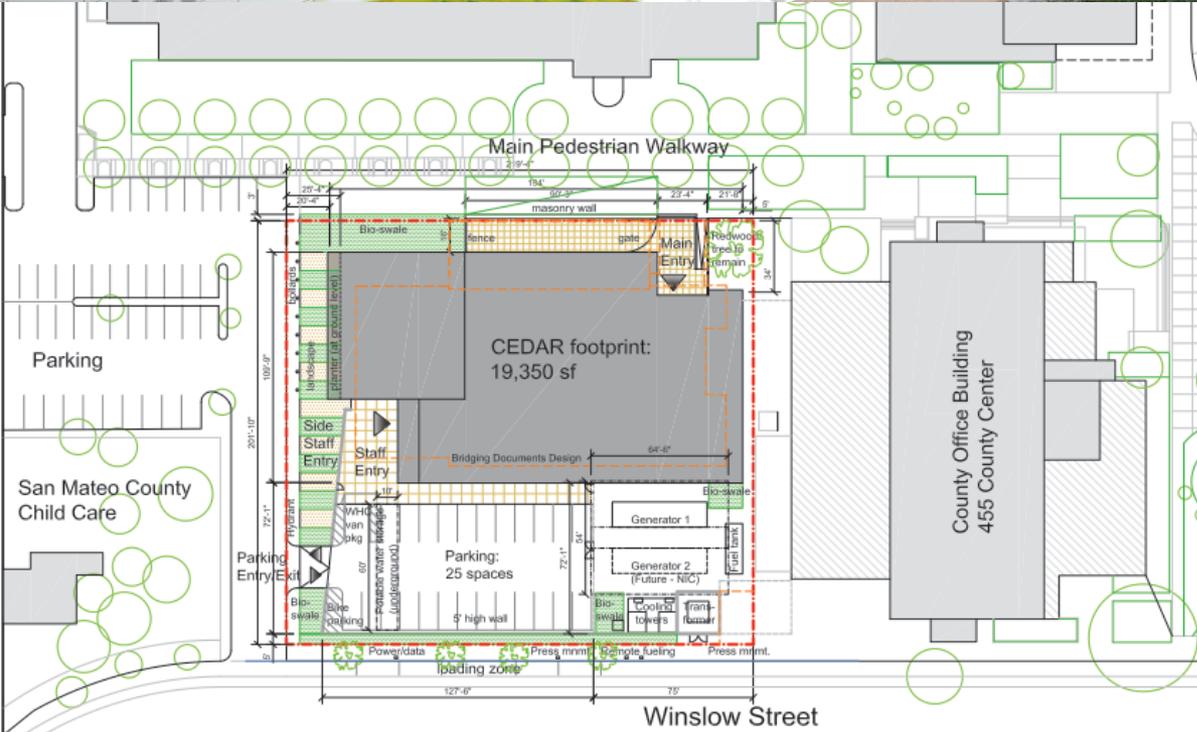


Proposal Phase

Confidential Meetings

Amendments

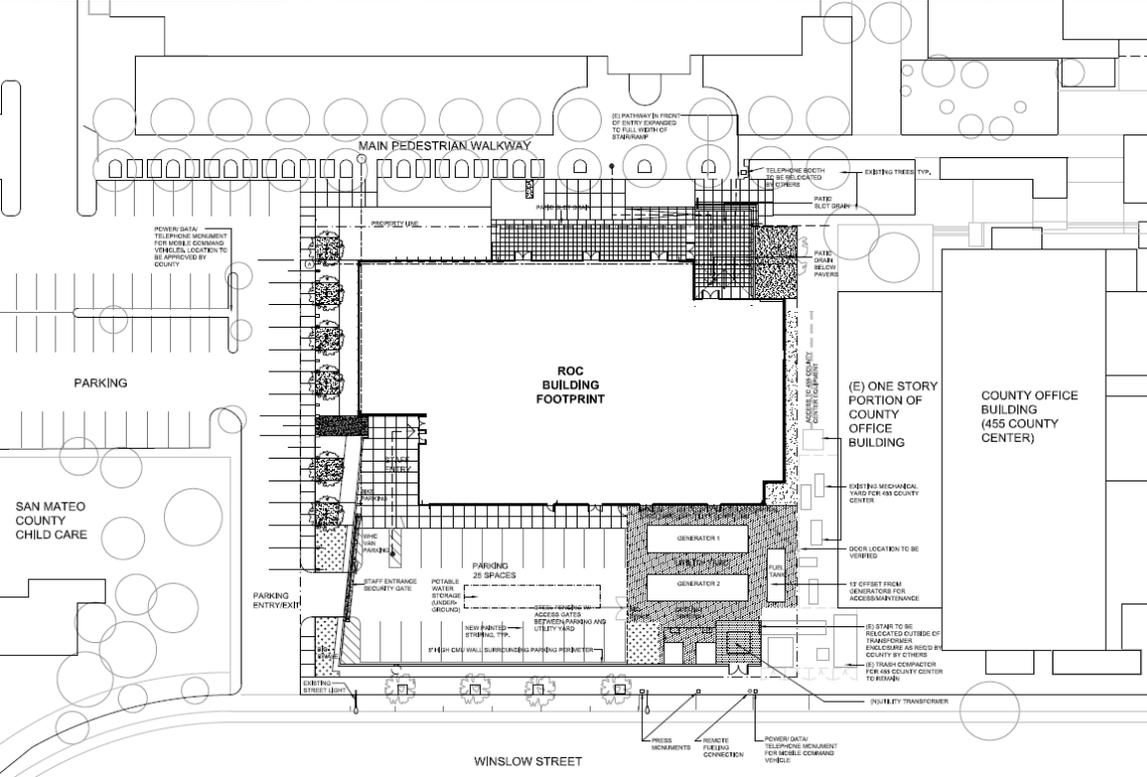
DBE Selection



Design Documents

Program and Plan Validation

Design Refinement





Communications Plan

*Organization and
Lines of Authority*

*Electronic
Communication
Protocols*

*Design Meetings
and Conferences*

RFI's

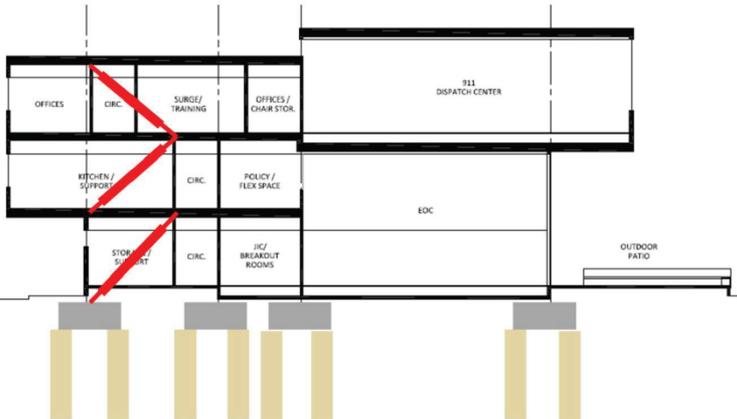
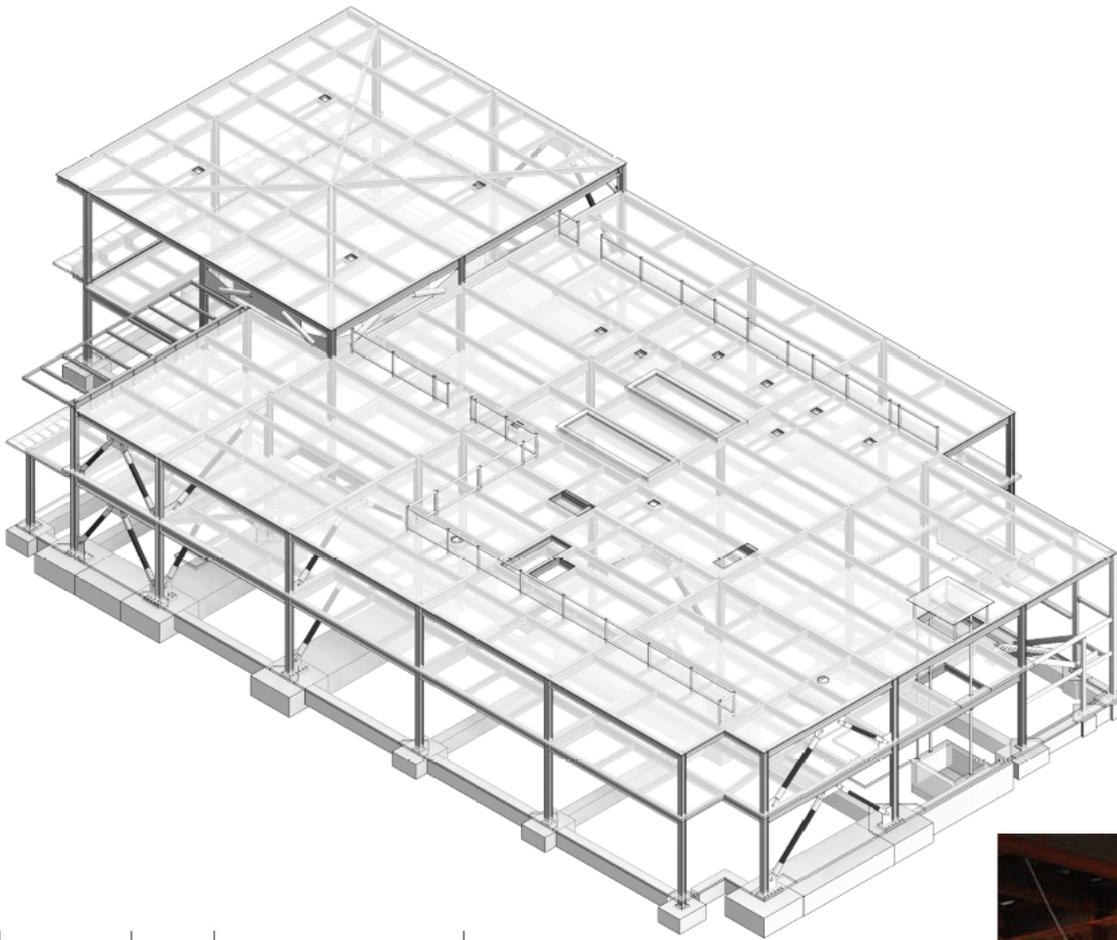
Collaboration and Coordination

Consensus Building

Teamsight

*Periodic Team
Meetings*

MEP Design Build





Quality Assurance /
Quality Control

Left Panel

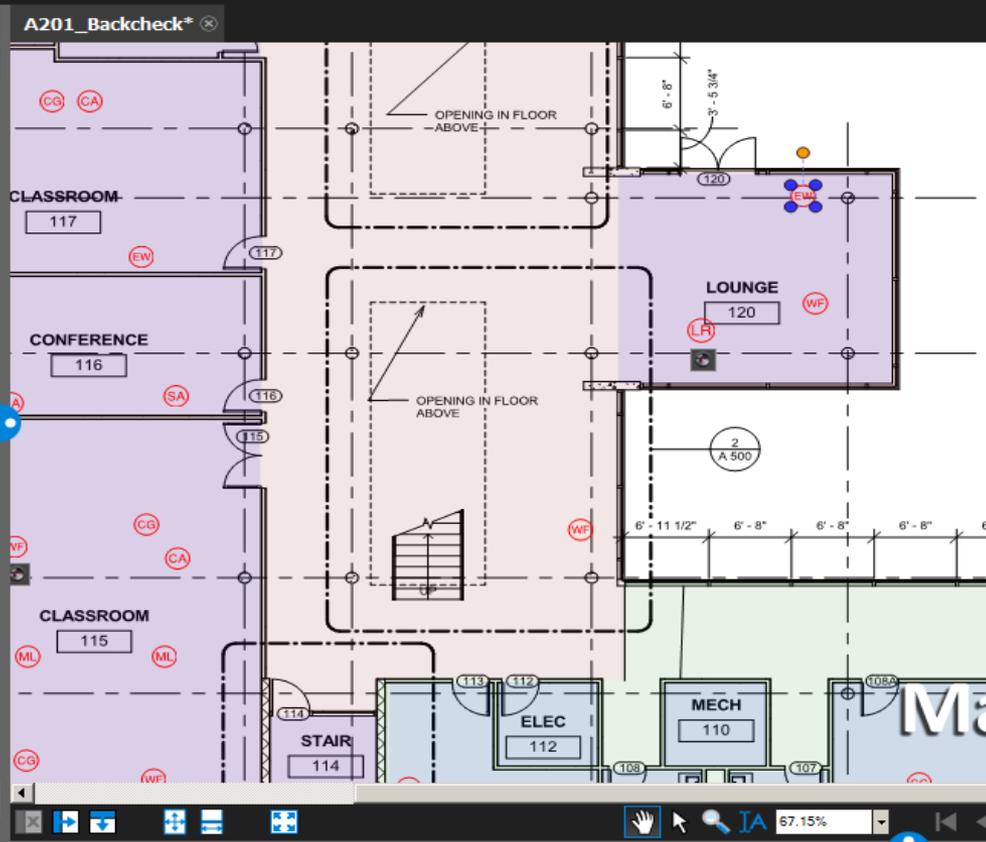
My Tools

Recent Tools

Punchkey Plan

AT CF CJ CO CP DA
 DC DF DH DL DP DT
 EI FL FC FR FW
 GL GR LA LB LI LR
 LS MA MD MI MS PE
 PI PL PO RP SF SM
 SR SV TB TD TS TR
 TU WB WJ WR WC WD

Punchkey Ceiling
 Punchkey Carpentry
 Punchkey Cleaning
 Punchkey Electrical
 Punchkey Flooring
 Punchkey Lighting



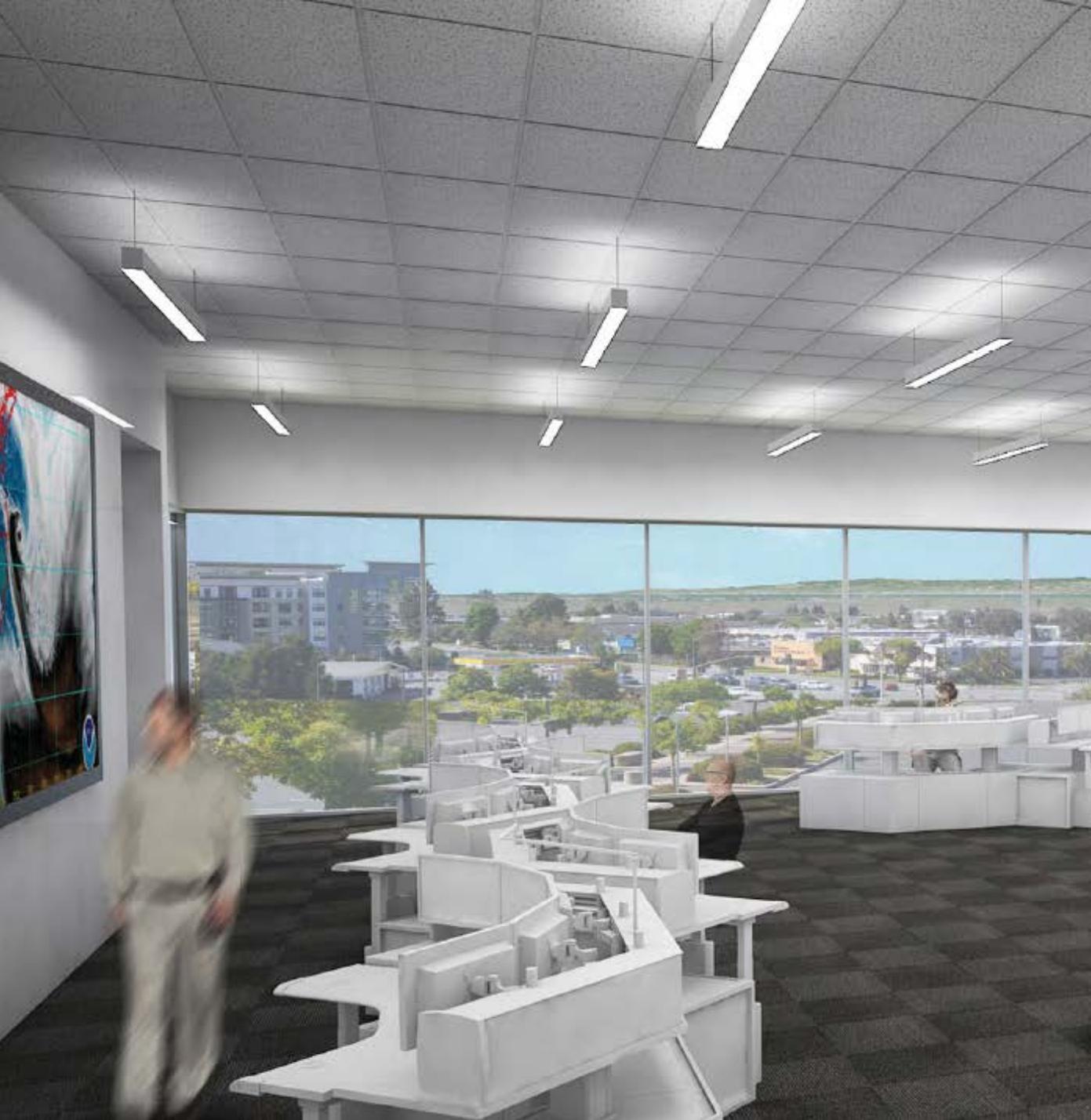
Plan for Design
 BIM Technology
 Plan for Construction

Summary

Subject	Page	Status	Comments	Responsibility	Layer	Space
Electrical	Page 1		Exposed wires			Zone C-Roo
Electrical	Page 1		Exposed Wires			Zone B-Roo
Electrical	Page 1		Exposed Wires			Zone B-Roo
Electrical	Page 1		Exposed Wires			Zone A-Roo
Electrical	Page 1		Exposed Wires			Zone A-Roo
Flooring	Page 1		Warped Floor			Zone B-Roo
Flooring	Page 1		Warped Floor			Zone B-Roo
Flooring	Page 1		Warped Floor			Zone B-Roo
Flooring	Page 1		Warped Floor			Zone B-Roo
Flooring	Page 1		Warped Floor			Zone B-Roo
Flooring	Page 1		Warped Floor			Zone A-Roo

Bottom Panel

Drag control points to resize, or drag ellipse to move



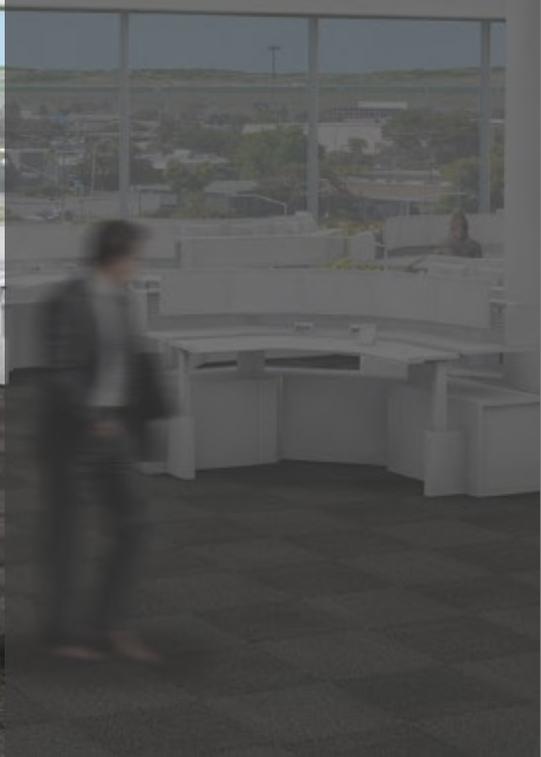
Scheduling

Design

Construction

Start-up

Turn-Over





Lessons Learned

Delivery Method

*Criteria Documents
– Level of Detail*

*User Group
Hierarchy*

Permitting Strategy

*Approach to
Subcontractor
Procurement*

Lessons Learned

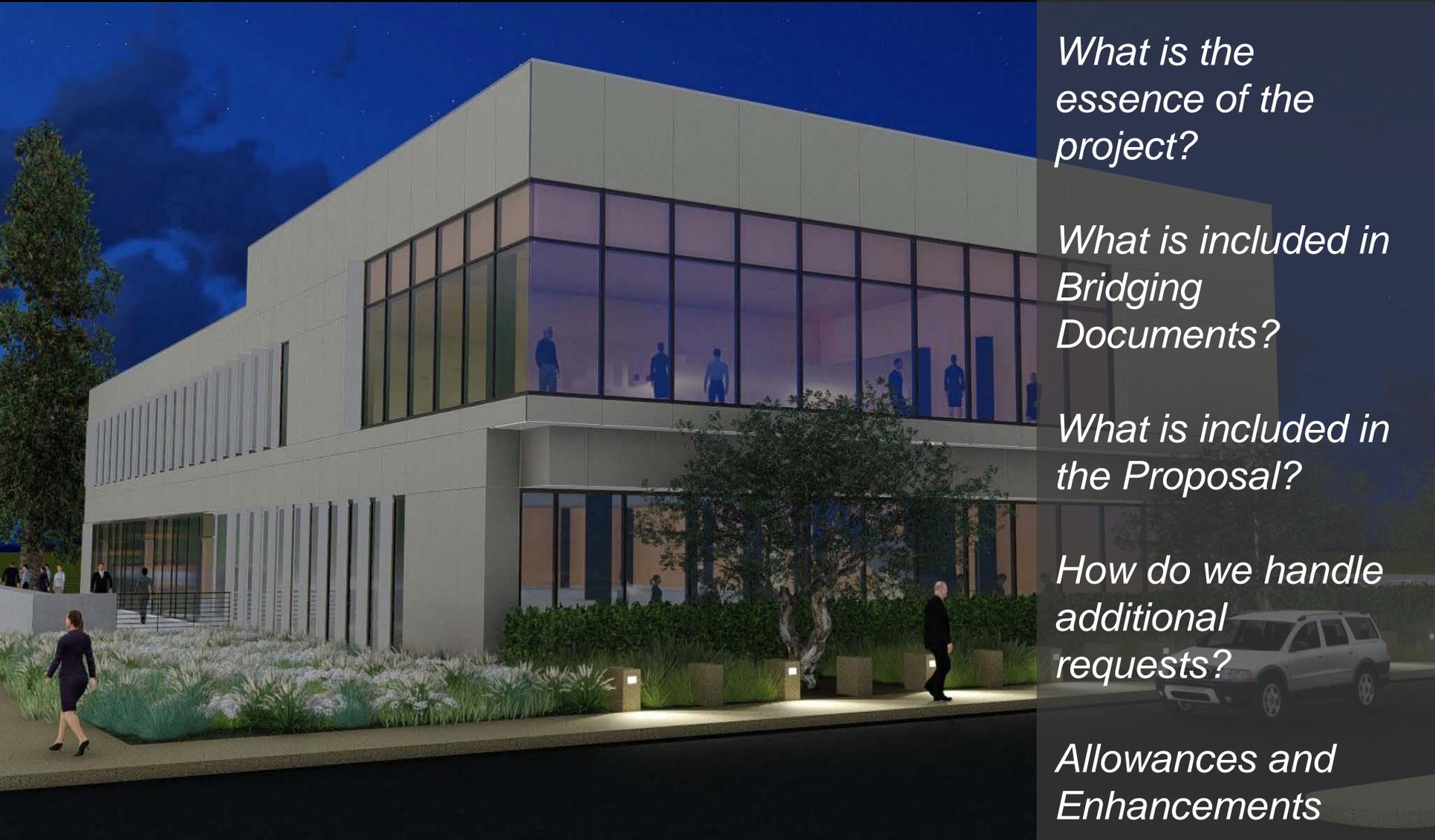
What is the essence of the project?

What is included in Bridging Documents?

What is included in the Proposal?

How do we handle additional requests?

Allowances and Enhancements



***TOP 10
LESSONS LEARNED***

- 1. Understand the essence of the Owner's Vision for a successful project.**
- 2. An established project champion will provide continuity throughout the stages of the project**
- 3. Educate the project stakeholders on the DBE process so they understand the process and critical milestones.**
- 4. More specific design criteria results in more accurate DBE estimates.**
- 5. Update cost estimate throughout project after award to stay on budget.**

- 6. Keep frequent communications between team members for effective collaboration.**
- 7. Delineate clear roles for all participants. Have a reasonable expectation for the Owner's participation in the process.**
- 8. Consider system integration requirements. Oversize the overhead spaces to minimize potential conflicts. Remember many systems are redundant**
- 9. Avoid and or identify early any conflicting information in the Criteria Documents.**
- 10. Define criteria upfront in the bridging process and stick to it. Peer review documents for perspective.**

QUESTIONS