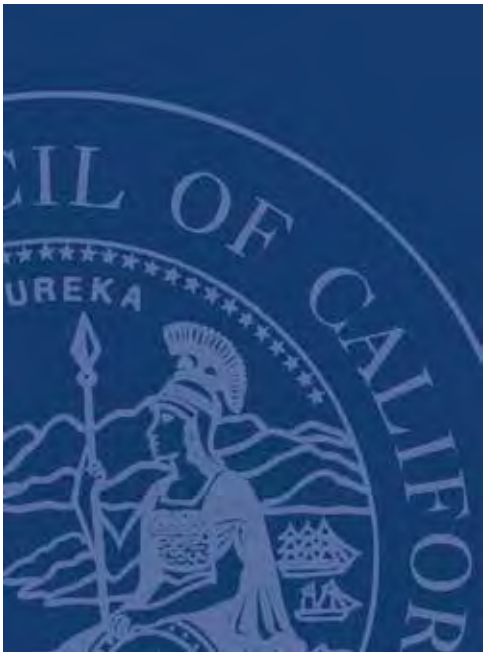
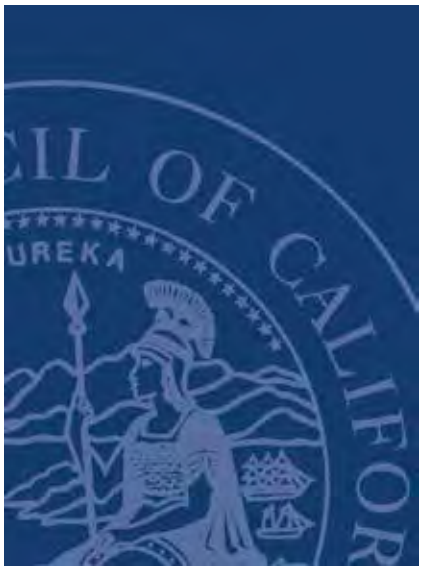


Meeting Binder for Court Facilities Advisory Committee: Courthouse Cost Reduction Subcommittee

NOVEMBER 4, 2014

JUDICIAL COUNCIL
OF CALIFORNIA

OPERATIONS AND PROGRAMS DIVISION
CAPITAL PROGRAM



Meeting Binder

Court Facilities Advisory Committee: Courthouse Cost Reduction Subcommittee

November 4, 2014

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1	Agenda
2	Riverside—New Indio Juvenile and Family Courthouse 50 Percent Design Development Review
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5	Solar Power Options for Judicial Council Facilities
6	Building HVAC Systems for Courthouses
7	Enhanced Seismic Performance
8	Court Facilities Advisory Committee: Courthouse Cost Reduction Subcommittee Roster

JUDICIAL COUNCIL OF CALIFORNIA
OPERATIONS AND PROGRAMS DIVISION
CAPITAL PROGRAM

JUDICIAL COUNCIL
OF CALIFORNIA

COURT FACILITIES
ADVISORY COMMITTEE

www.courts.ca.gov/cfac.htm
cfac@jud.ca.gov

COURT FACILITIES ADVISORY COMMITTEE:

COURTHOUSE COST REDUCTION SUBCOMMITTEE

OPEN MEETING AGENDA

Open to the Public (Cal. Rules of Court, rule 10.75(c)(1))

THIS MEETING IS BEING RECORDED

Date:	November 4, 2014
Time:	10:00 a.m. - 4:00 p.m.
Location:	Judicial Council of California 455 Golden Gate Avenue San Francisco, California 94102-3688 Third Floor – Malcolm M. Lucas Board Room
Public Call-In Number	(877) 820-7831 and enter Passcode: 1027209

Meeting materials will be posted on the advisory body web page on the California Courts website at least three business days before the meeting.

Agenda items are numbered for identification purposes only and will not necessarily be considered in the indicated order.

I. OPEN MEETING (CAL. RULES OF COURT, RULE 10.75(C)(1))

Call to Order, Roll Call and Opening Remarks

II. PUBLIC COMMENT (CAL. RULES OF COURT, RULE 10.75(K)(2))

Public Comment

Members of the public requesting to speak during the public comment portion of the meeting must place the speaker's name, the name of the organization that the speaker represents if any, and the agenda item that the public comment will address, on the public comment sign-up sheet. The sign-up sheet will be available at the meeting location at least one hour prior to the meeting start time. The Chair will establish speaking limits at the beginning of the public comment session. While the advisory body welcomes and encourages public comment, time may not permit all persons requesting to speak to be heard at this meeting.

Written Comment

In accordance with California Rules of Court, rule 10.75(k)(1), written comments pertaining to any agenda item of a regularly noticed open meeting can be submitted up to one complete business day before the meeting. For this specific meeting, comments should be e-mailed to cfac@jud.ca.gov or mailed or delivered to 455 Golden Gate Avenue, San Francisco, CA 94102, attention: Chris Magnusson. Only written comments received by 5:00 PM on November 3, 2014, will be provided to advisory body members prior to the start of the meeting.

III. Discussion and Possible Action Items (Items 1–3)

Item 1

Riverside County–New Indio Courthouse: 50 Percent Design Development (Action Required)

Review of 50 percent design development to confirm that project is within budget, scope, and schedule.

Presenters: Ms. Nora Freiwald, Senior Project Manager, Capital Program
Hon. Harold W. Hopp, Judge, Superior Court of Riverside County
Mr. Sam Hamrick, Court Executive Officer, Superior Court of Riverside County
Mr. Chris Talbot, Deputy Executive Officer of Facilities, Superior Court of Riverside County
Mr. Jorge de la Cal, Principal in Charge, CO Architects
Mr. James Simeo, Project Manager, CO Architects
Mr. Fabian Kremkus, Project Senior Designer, CO Architects
Mr. Bruce McKinley, Project Mechanical Engineer, Arup
Mr. Chris Sterparn, Project Cost Estimator, Capital Projects Group

Item 2

Imperial County–New El Centro Courthouse: 50 Percent Design Development (Action Required)

Review of 50 percent design development to confirm that project is within budget, scope, and schedule.

Presenters: Mr. Gary Swanson, Project Manager, Capital Program
Mr. Malcolm Franklin, Senior Manager, Office of Security
Hon. William D. Lehman, Presiding Judge, Superior Court of Imperial County
Ms. Kristi Kussman, Court Executive Officer, Superior Court of Imperial County
Mr. Eric Lindebak, Project Architect, Safdie Rabines Architects
Ms. Taal Safdie, Principal, Safdie Rabines Architects

Item 3

Electric Vehicle Charging Stations
Discuss electric vehicle charging stations and review considerations related to including infrastructure in capital projects.

Presenter: Ms. Laura Sainz, Manager, Real Estate and Facilities Management
Hon. Benjamin G. Davidian, Judge, Superior Court of Sacramento County

IV. Information Only Items (No Action Required)

Info 1

Solar Power Options for Judicial Council Facilities
Discuss solar options available to California courthouses and review considerations related to including solar power in existing facilities and capital projects.

Presenter: Ms. Laura Sainz, Manager, Real Estate and Facilities Management

Info 2

Discussion of HVAC Systems
Provide a primer on HVAC systems suitable for use in the Judicial Council's Capital Program.

Presenters: Mr. Clifford Ham, Principal Architect, Capital Program
Mr. Nick Turner, Manager, Real Estate and Facilities Management
Mr. Gary Brennen, Co-President, Syska Hennessy Group
Mr. Robert Bohlin, Senior Vice President, Syska Hennessy Group

Info 3

Enhanced Seismic Performance
The *California Trial Court Facilities Standards* require that a determination be made if normal or enhanced seismic performance will be a design criteria for each courthouse construction project. Presentation will focus on key attributes of the two performance levels.

Presenters: Mr. Clifford Ham, Principal Architect, Capital Program
Mr. Dominic Campi SE, Principal, Rutherford & Chekene
Mr. Peter Lee, SE, Director, Skidmore Owings & Merrill

V. Adjournment

Adjourn

Courthouse Cost Reduction Subcommittee

50 Percent Design Development Review Report

NEW INDIO JUVENILE AND FAMILY COURTHOUSE

SUPERIOR COURT OF CALIFORNIA
COUNTY OF RIVERSIDE

November 4, 2014

JUDICIAL COUNCIL OF CALIFORNIA
OPERATIONS AND PROGRAMS DIVISION

CAPITAL PROGRAM

PROJECT MANAGER
NORA FREIWALD

1. Executive Summary of Project Status at 50% Design Development

At the completion of 50 percent Design Development, the project status is as follows:

1.1. Scope—the project is within the approved scope, as described below.

1.2. Budget—the project is tracking on budget with the target amount.

1.3. Schedule—the project is on schedule for construction starting immediately after the Spring 2017 bond sale.

2. Background

2.1. Budget Year 2009–2010—(revised June 2010) initial project authorization:

2.1.1. Project first submitted for SB 1407 funding authorization.

2.1.1.1. Acquisition and Preliminary Plans funding sought from the Immediate and Critical Needs account. Acquisition phase funding transferred in December 2009.

2.1.1.2. Building Gross Square Feet (BGSF): 67,933

2.1.1.3. Construction Cost Subtotal: $40,275,824

2.2. Budget Year 2011–2012:

2.2.1. Working Drawings funding sought from the Immediate and Critical Needs Account.

2.2.2. December 12, 2011 and April 24, 2012:

2.2.2.1. Council adopted the Court Facilities Working Group recommendations to reduce costs for each SB 1407 project. These two sets of council actions have guided the process by which the Judicial Council has developed recommended cost reductions for this project.

2.2.2.2. Minimum reductions to hard construction costs were directed for all projects along with a set of principles for use by the courts, the Judicial Council staff, and the design teams to meet cost reduction minimum goals.

2.2.2.3. Judicial Council approves 10 percent further reduction to project construction budget. Budget reductions were to be reflected in next Budget Year.

2.2.2.4. The hard cost of construction budget was reduced to $35,646,243

2.2.2.5. This project was established as a Cost Reduction Demonstration Project expected to incorporate low cost construction methods and additional reductions over the mandated reduction of 14 percent for this project.

2.3. Budget Year 2012–2013:

2.3.1. Working Drawings funding was re-appropriated from the Immediate and Critical Needs Account.

2.3.2. May 8, 2013: This project was presented to the CCRS for Pre-Design Review.

2.3.2.1. Judicial Council staff identified numerous strategies to achieve cost savings and concluded that the programmed building areas could be reduced by a total of 13,000 BGSF, or 19 percent of the original program.

2.3.2.2. The CCRS accepted the reductions presented by the project team and directed the Project team to implement the following key recommendations:

(1) Design for future efficient and economical expansion including allowing for growth in building infrastructure;

(2) Commit to using tilt-up construction as a demonstration project;

(3) Juvenile dependency cases require larger well areas and a smaller spectator area within the courtrooms;

(4) Reduce the program by reducing the capacity of central and courtroom holding; and

(5) Reduce the size of juvenile courtrooms.

2.3.2.3. The project team was able to accomplish all the recommendations as follows:

(1) The BGSF was reduced from the initial size of 67,933 to 53,255; a 21.6 percent reduction.

(2) Construction cost was reduced from the $35,646,243 in FY 2011–2012 to $24,479,712, reflecting a 39.2 percent reduction from the FY 2009–2010 budget. This reduced budget is based on the reduced building size, and includes the Judicial Council December 2011 mandated 2 percent reduction, the 2 percent reduction for Owner Controlled Insurance Program, and the additional 10 percent unallocated reduction.

2.4. Budget Year 2013–2014:

2.4.1. Working Drawings funding was re-appropriated from the Immediate and Critical Needs Account.

2.4.2. Changes to the BGSF from the CCRS Pre-Design Review in May 2013 were not incorporated into this budget proposal due to the timing of the proposal's submittal. DOF acknowledged the reduction. Actual impact to authorized budget authority will be included in the FY 2016–2017 proposal.

2.5. Budget Year 2016–2017 future submittal:

2.5.1. Working Drawings funding re-appropriated from the Immediate and Critical Needs account.

2.5.2. This submittal will include the reduction approved in May 2013 CCRS Pre-Design Review. The current building size reflects the May 2013 CCRS approved reduction with a total of 53,255 BGSF.

2.6. Summary of changes to Construction Cost Subtotal:

2.6.1. Original (2009/2010 Budget Year): $40,275,824

2.6.2. Current (2014/2015 Budget Year): $24,979,712 (reduction to be recognized in the FY 2016-17 COBCP)

2.6.3. Reduction from Original to Current: $15,796,112; or 39.2 percent.

2.7. Summary of changes to BGSF:

2.7.1. Original (2009/2010 Budget Year): 67,933 BGSF

2.7.2. Current (2016/2017 Budget Year): 53,255 BGSF

2.7.3. Reduction from Original to Current: 14,678 BGSF, or 21.6 percent

3. Project Update

The project is submitted for 50 percent Design Development approval. During this phase, one peer review session was conducted. Judicial Council planning, facilities, security, and architectural/project management staff were engaged to provide input to the design. This peer review regimen will continue in a manner consistent with the policies and procedures that have been established to guide this process.

The project has also undergone constructability and value engineering review. This review has been useful in bringing the project closer to budget. The constructability comments will be incorporated into the project during the final half of the Design Development phase.

C.W. Driver is the Construction Manager at Risk (CMAR) providing pre-construction and construction services.

4. Schedule

The project is ready to move forward with the Design Development phase which is the second half of the Preliminary Plan phase. The target completion date for Preliminary Plans is May 14, 2015.

	Authorized FY 14-15 Schedule[1]		Current Revised Schedule		
Phase	Start Date	Finish Date	Start Date	Finish Date	Percent Complete
Site Selection	7/1/2009	2/16/2010	7/1/2009	2/16/2010	100%
Site Acquisition	2/17/2010	1/14/2011	2/17/2010	1/14/2011	100%
Preliminary Plans	4/1/2013	11/1/2014	9/19/2013	5/14/15	75%
Working Drawings & Approval to Bid	11/2/2014	6/1/2015	5/15/15	7/18/16	–
Bid and Contract Award	6/2/2015	10/2/2015	7/19/16	4/28/17	–
Construction	10/3/2015	6/14/2017	5/1/17	7/19/19	–
Move-in	6/15/2017	9/15/2017	7/29/19	8/23/19	–

[1] Current schedule based on projected target dates; schedule will continue to be updated as project progresses.

5. Status of Hard Construction Cost Budget and 50% Design Development Estimate

Below is a summary of the original hard construction cost, hard construction reductions based on the council direction of December 12, 2011 and April 24, 2012 and additional reductions accepted by the CCRS in December 2012, the current design-to-budget, and a comparison of the current hard construction cost budget to the 100 percent Schematic Design estimate.

5.1. Calculation of Hard Construction Cost Budget with Judicial Council Directed and CCRS Accepted Reductions

Original Hard Construction Cost Subtotal	$	35,646,243
FY 12/13: JC mandated 4%	$	(1,425,850)
FY 13/14: JC mandated 10%	$	(2,748,389)
FY 13/14: CCRS mandated 14,678 BGSF reduction	$	(6,492,292)
Revised Hard Construction Cost Subtotal	*$*	*24,979,712*
Cost Reduction Achieved	$	10,666,531
Cost Reduction as percent of original Construction Cost Subtotal	%	29.9

5.2. Design-to-Budget Calculation

Original Hard Construction Cost	$	35,646,243
Data, Communication and Security	$	1,154,861
CCCI Adjustment	$	41,946
Original Design-to-Budget	$	36,843,050
Current Hard Construction cost	$	25,641,751
Data, Communication and Security	$	934,439
CCCI Adjustment	$	2,836,801
Revised Design-to-Budget	**$**	**29,412,991**

5.3. Summary of Design-to-Budget in Comparison to 50 percent Design Development Estimate

The consultant developed Design Development estimate shows that the project is on budget. The elimination of the basement level and the inclusion of a secure corridor connector at the roof level to provide the necessary separation of in-custody transport between courtroom holding core cells represent the highest proportion of overall savings achieved while preserving basic court functions and the ability to incorporate future growth.

5.3.1. Directives issues by the CCRS at the 100 percent Schematic Design presentation were the following:

5.3.1.1. Provide study information on the durability of louvered glass system:

The proposed louvered glass system has been used internationally in public buildings since 1993. The manufacturer's warranty is 10 years of replacement at no cost covering failure of the hermetic glazing seal, deterioration of tints and coatings, cracking and chipping not caused by impact or abuse, or any other deterioration or discoloration equivalent to other double pane insulated systems in the market. The encapsulated louver allows natural light in the building, reduces energy consumption for lighting and air conditioning, and reduces or eliminates the need for additional sun control systems.

5.3.1.2. Complete further research on the HVAC system alternatives:

After in-depth analysis of multiple options, the team concluded that the dual system previously recommended should be replaced with a single system with a roof mounted air cooled chiller. The proposed air cooled chiller system has shown the lowest life cycle cost and greatest return on investment with quieter, smaller equipment mounted on the roof.

5.3.1.3. Provide cost analysis of a penthouse versus impact of leaving HVAC equipment exposed:

The addition of a penthouse for protection of roof top mounted mechanical equipment is estimated to add approximately $500,000 to the construction budget. The roof mounted equipment is expected to be in good service for an additional 10 years with reduced maintenance costs resulting in an estimated $100,000 in savings. The equipment is manufactured to be exposed and it is expected to perform well in this location. However, providing penthouse protection will greatly improve the working conditions for maintenance workers in this harsh climate.

5.3.1.4. Research on what solar power programs are available, similar to the AOC study for the Imperial—New El Centro Courthouse project:

The installation of photovoltaic panels over the parking areas to provide solar generated power for this building is estimated to add $2,340,000 in cost to the project budget.

5.3.1.5. The penthouse and solar array options have been excluded from the present cost estimate.

Superior Court of California
Riverside County

NEW INDIO JUVENILE AND FAMILY COURTHOUSE

50% Design Development CCRS Project Review
November 4, 2014

CO ARCHITECTS

AGENDA

Introduction

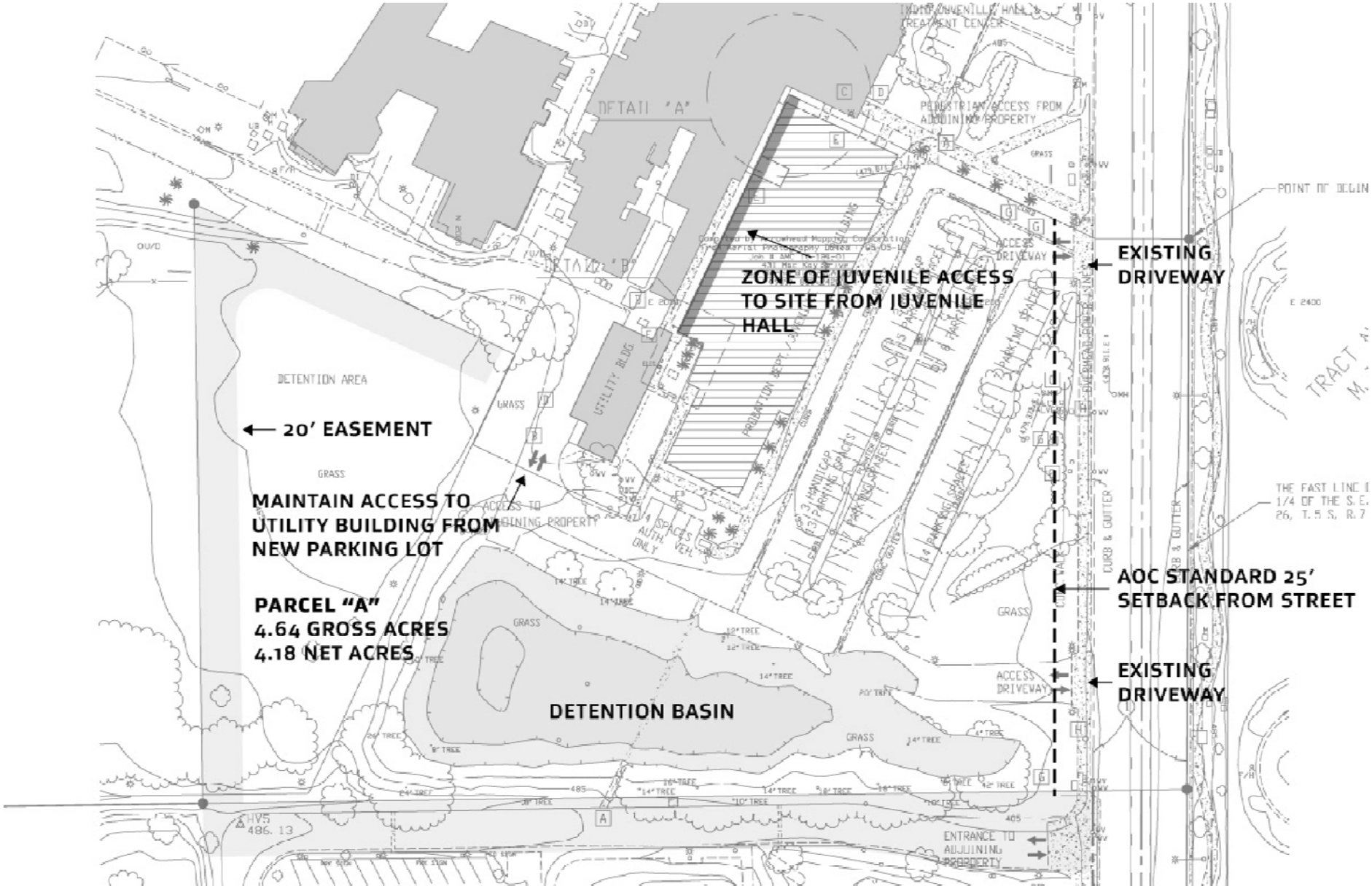
Project Presentation

Q & A

Introduction

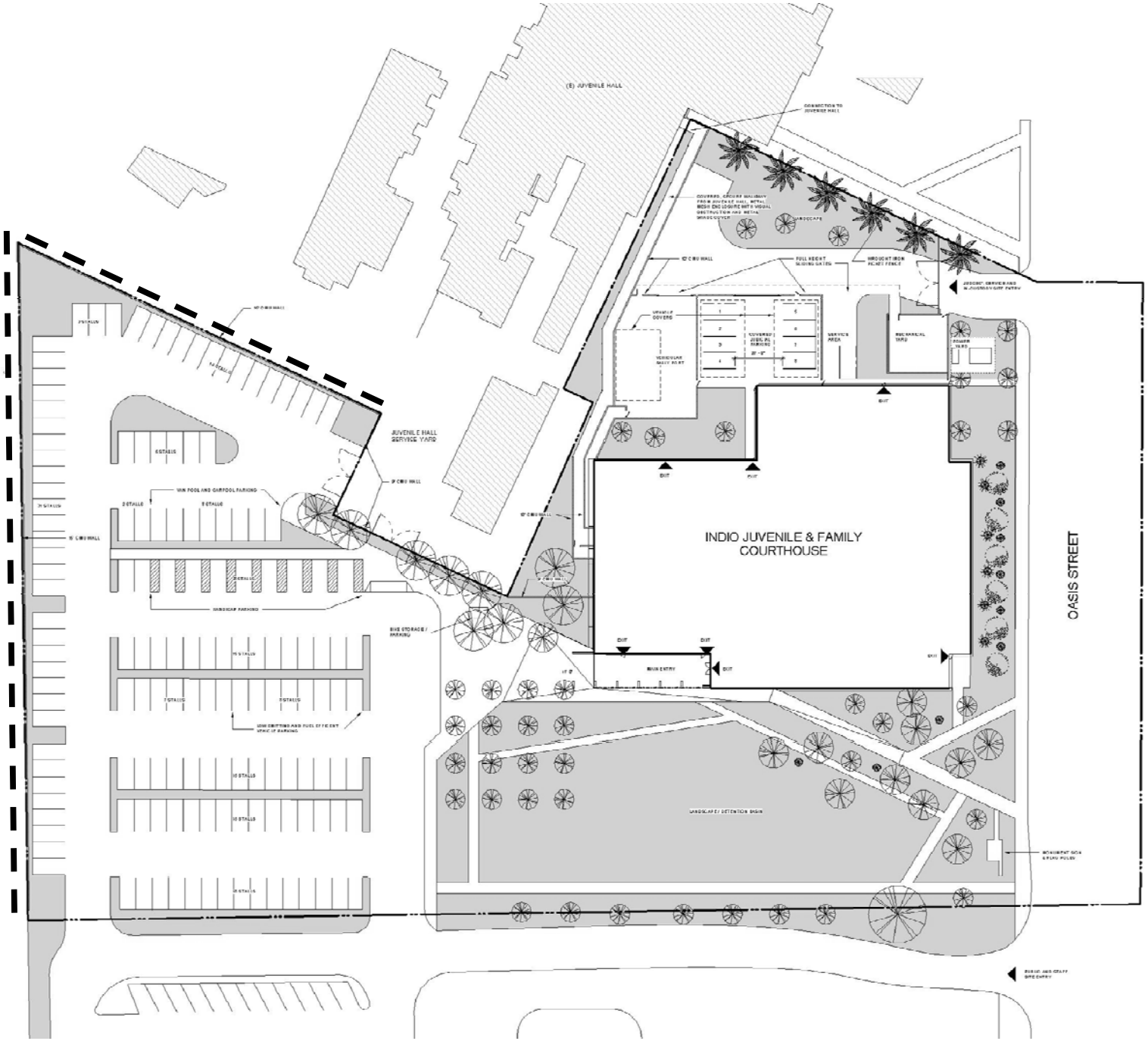
PROJECT OVERVIEW

- AOC Demonstration Project
- Original 67,933 GSF to replace existing courthouse
- Current 53,255 GSF (21% reduction)
- 4.18 Acres, 125 parking spaces
- Courthouse serving delinquency, dependency, probate, and family law
- No jury trials
- 5 courtrooms
- Indio priorities
  - Connection to Juvenile Hall
  - 16’ tall security wall at Juvenile Hall Detention Yard
  - Efficient operation
  - Cost
  - Tilt-up construction
  - Dignified expression
  - Future expansion by 1 courtroom

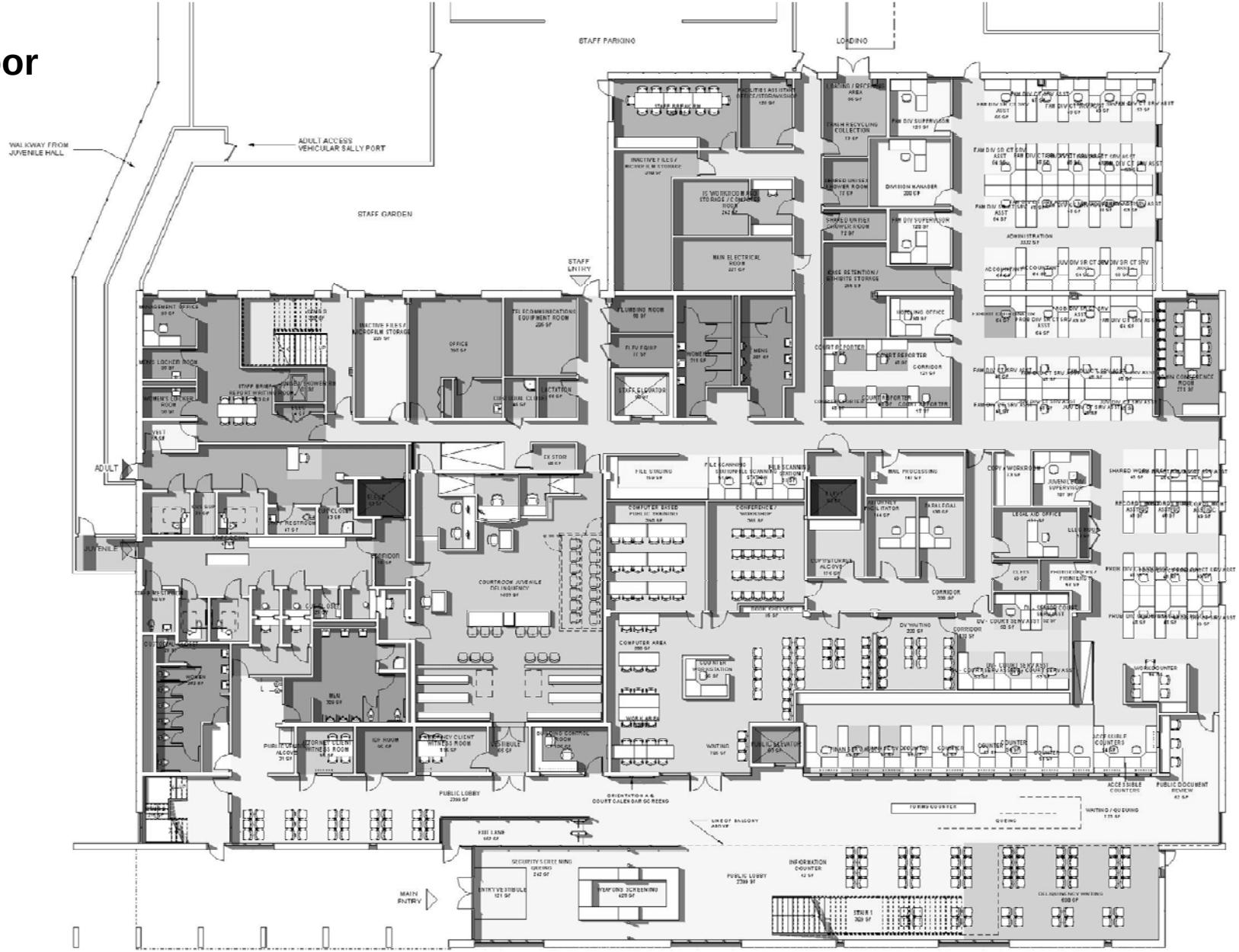


Site and constraints

Site

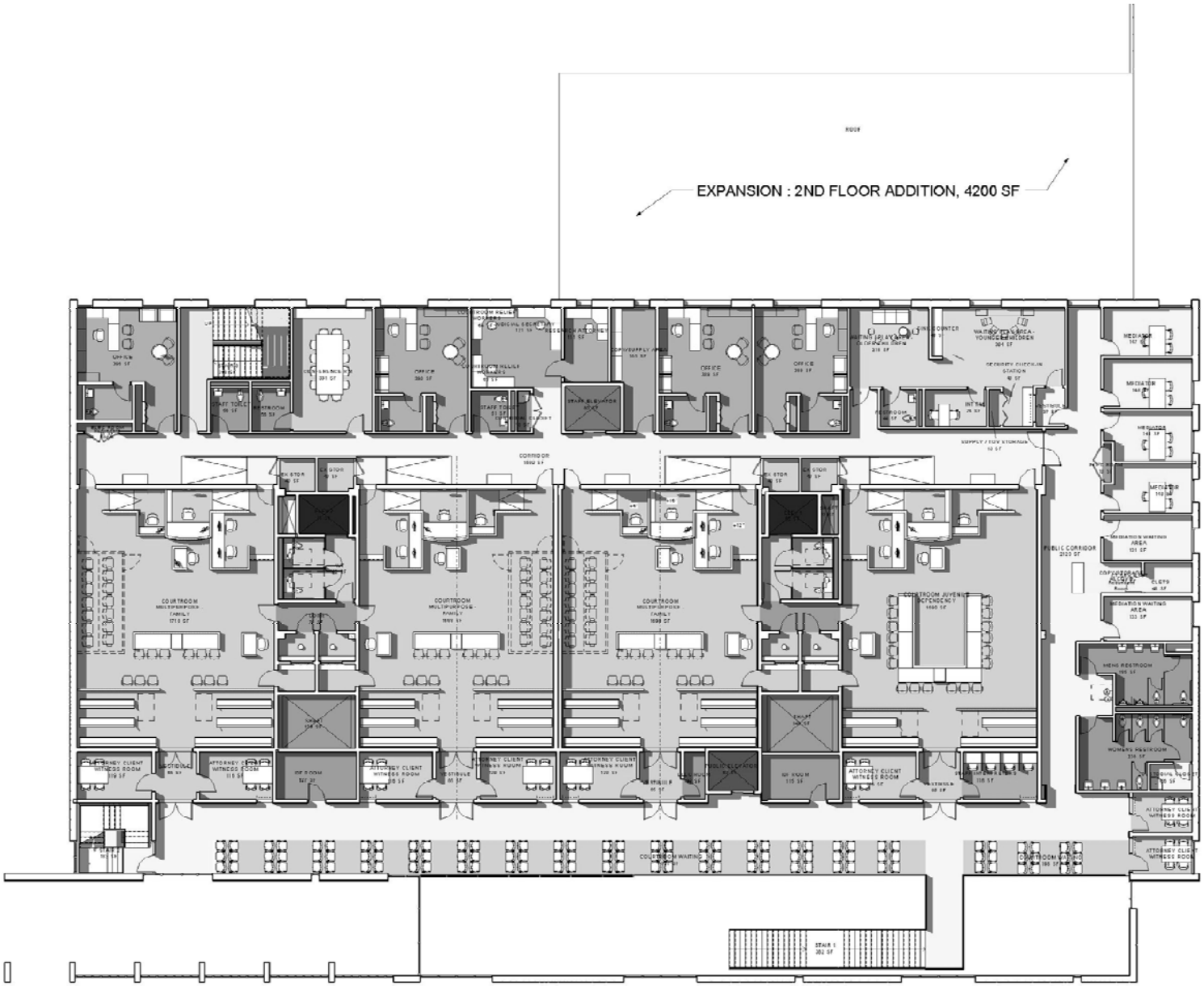

(E) JUVENILE HALL
JUVENILE HALL SERVICE YARD
INDIO JUVENILE & FAMILY COURTHOUSE
OASIS STREET

1st Floor

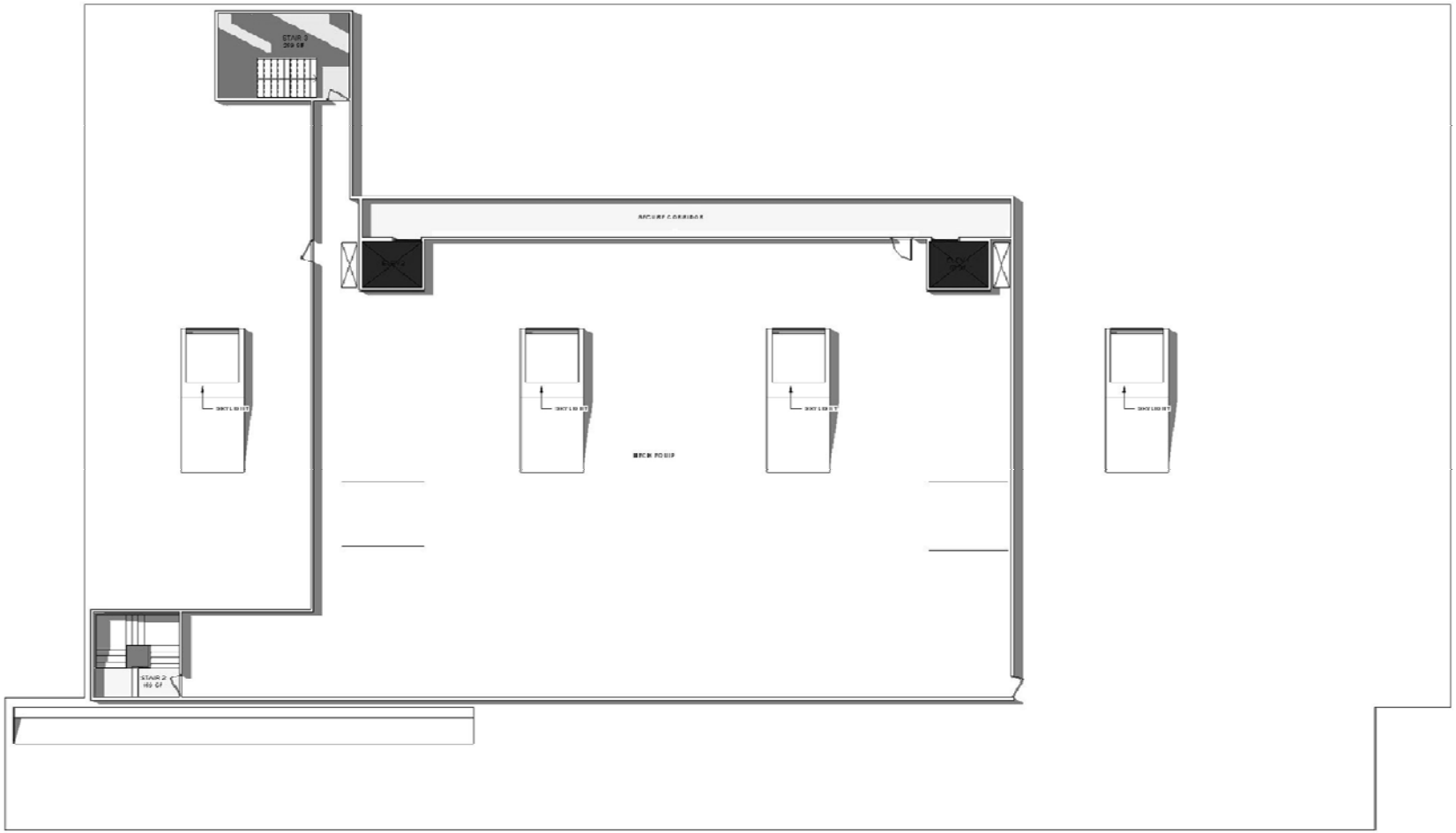


1ST FLOOR

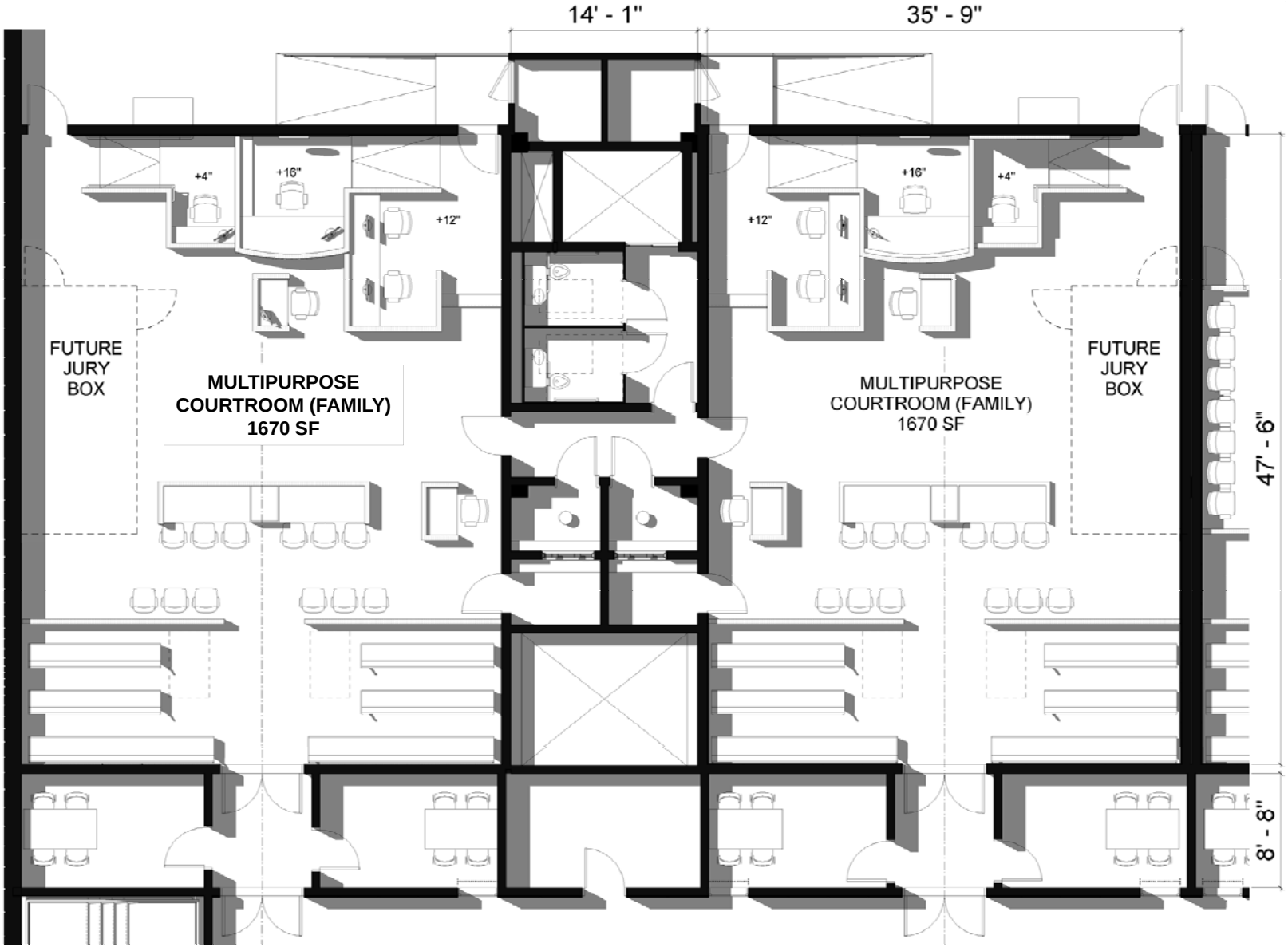
2nd Floor



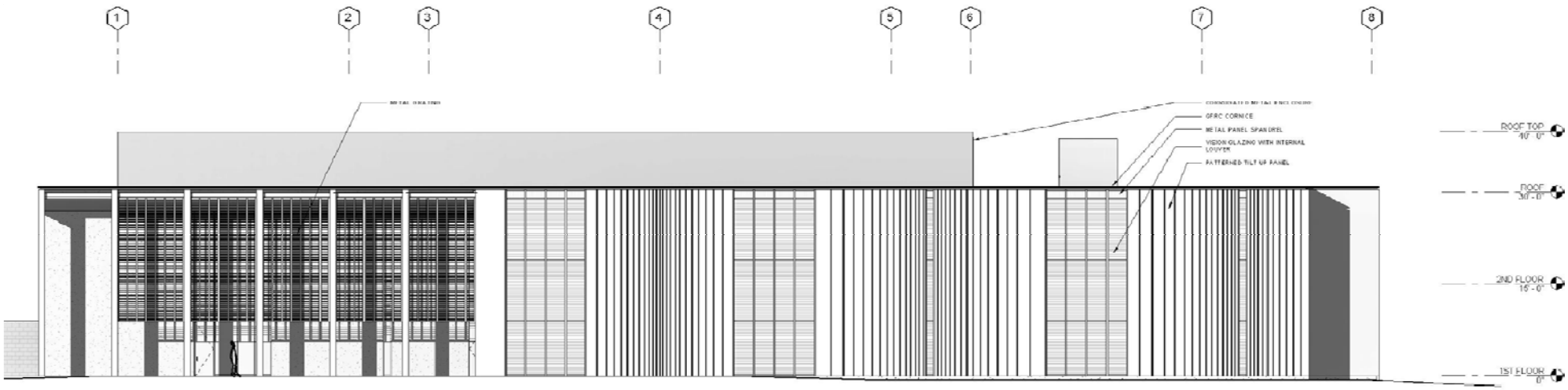
2ND FLOOR



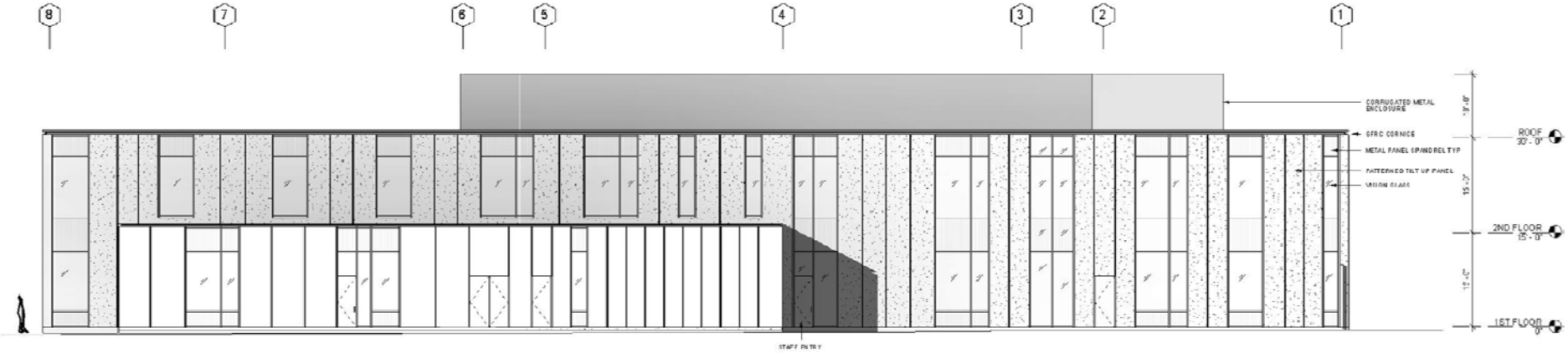
ROOF LEVEL


14' - 1"
35' - 9"
+4"
+16"
+12"
+12"
+16"
+4"
FUTURE
JURY
BOX
MULTIPURPOSE
COURTROOM (FAMILY)
1670 SF
MULTIPURPOSE
COURTROOM (FAMILY)
1670 SF
FUTURE
JURY
BOX
47' - 6"
8' - 8"

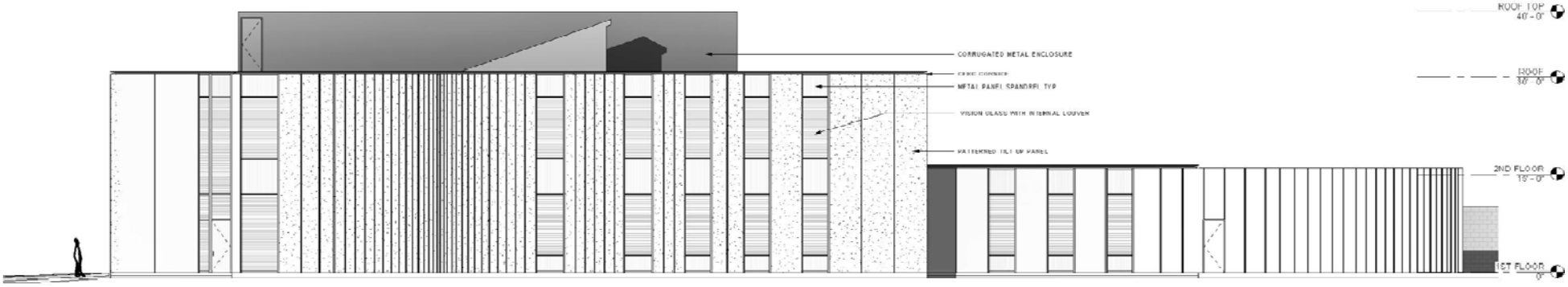
Courtset



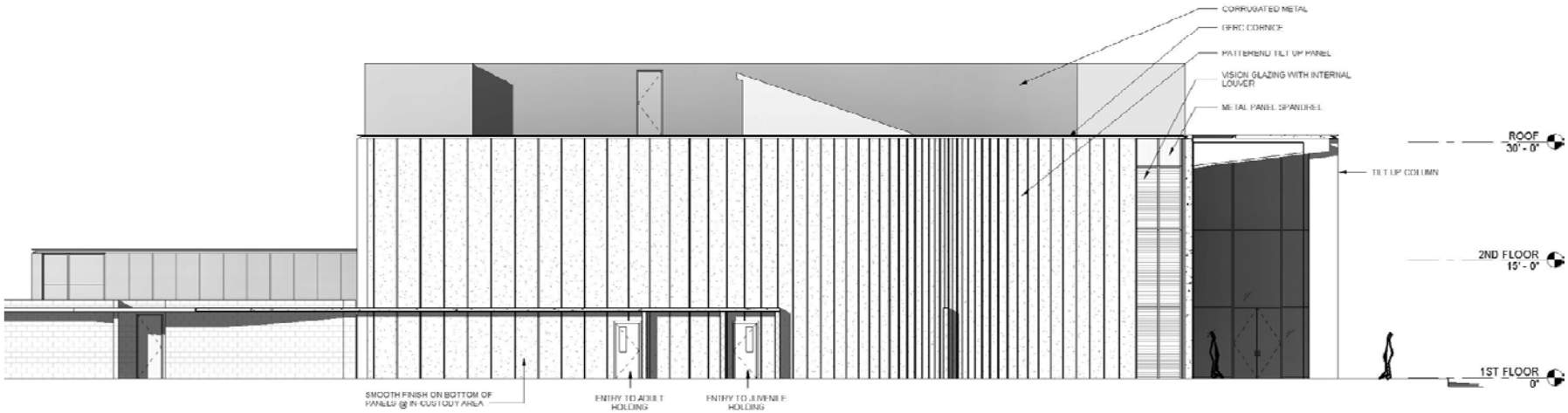
South Elevation



North Elevation



East Elevation

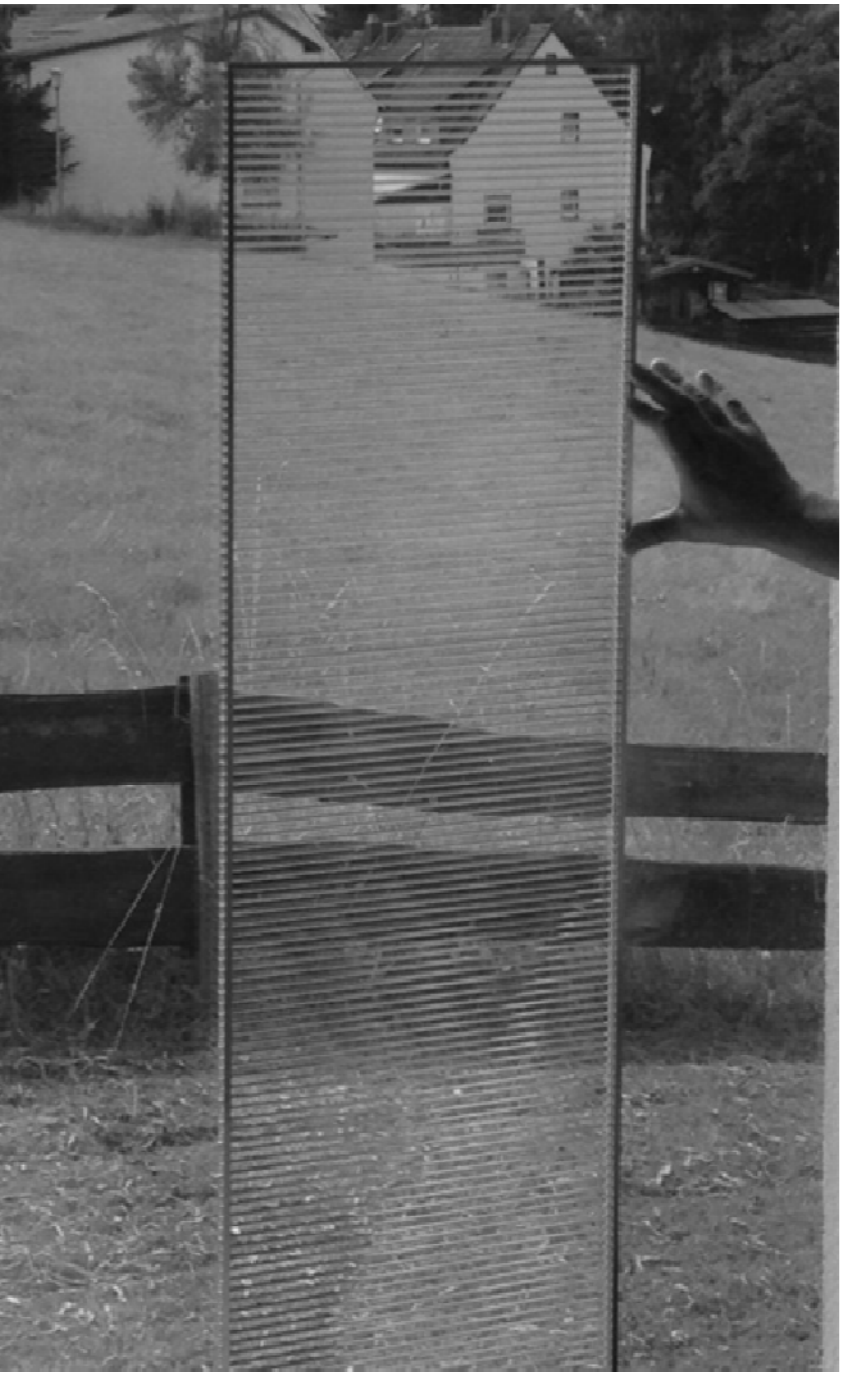


West Elevation

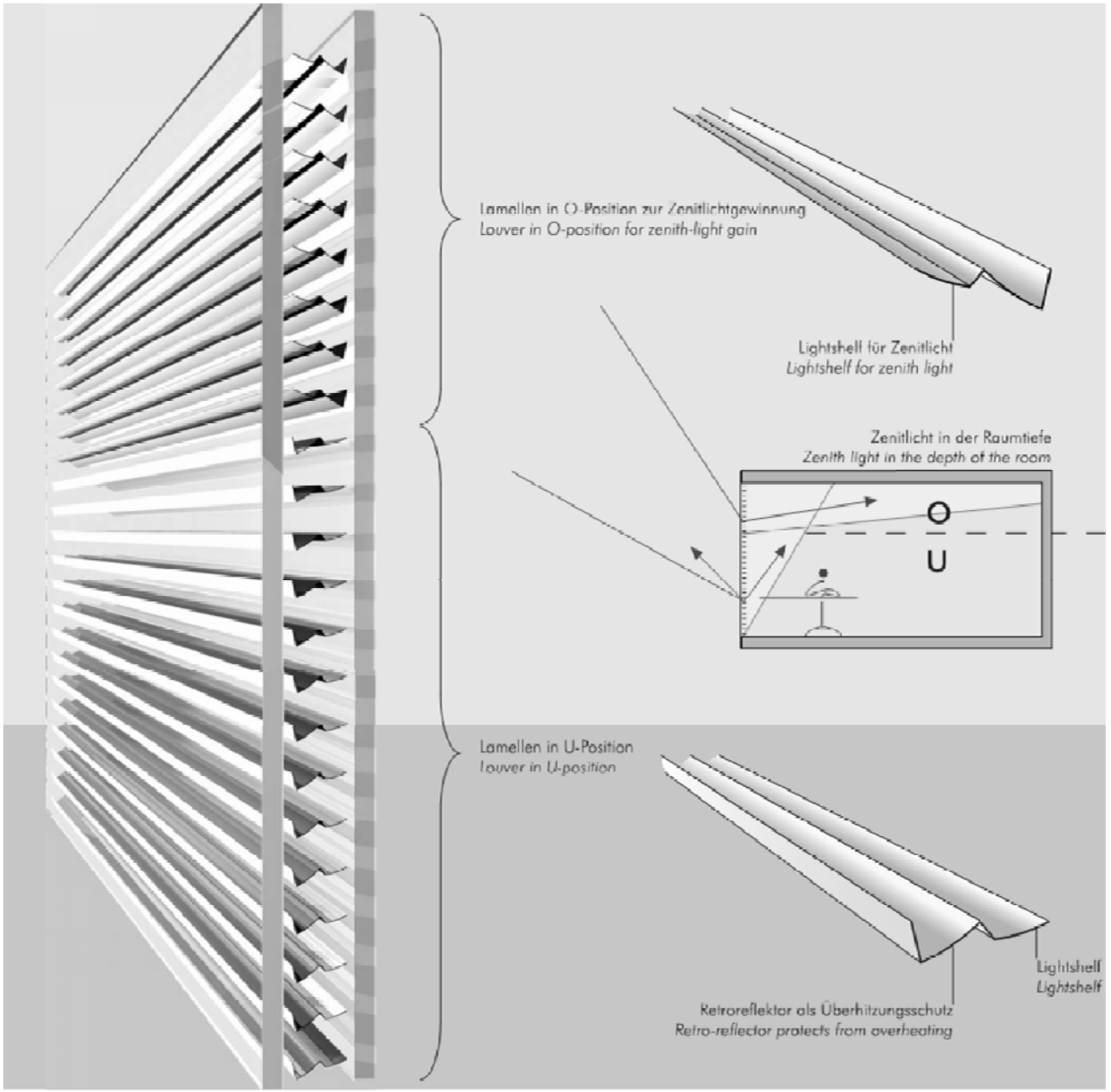
ENTRY VIEW

SOUTH ELEVATION

VIEW FROM SOUTH



Glazing Example



Glazing Sample

Glazing Warranty / Project Reference

HARTUNG
GLASS INDUSTRIES

Insulated Glass Limited Warranty
Dual Seal Polysulfide or Silicone

We, Hartung Glass Industries, Inc., warrant our insulated glass against substantial obstruction of vision from dust or film formation between the sealed panes of glass, resulting from failure of the perimeter seal due to defective materials or defective workmanship in the manufacture of this product. This warranty shall not apply if the failure of the seal is caused by Acts of God, improper installation by persons other than our employees or authorized dealers, mishandling by persons other than our employees, or by any other cause whatsoever not within our exclusive control, and shall not apply unless the failure occurs and claim is delivered to us within 10 years after the unit leaves our possession. Unit(s) must be properly installed following guidelines of the FGMA manual. OUR OBLIGATION IS TO REPLACE THE DEFECTIVE GLASS F.O.B. DEALER'S WAREHOUSE FROM WHICH THE ORIGINAL SALE WAS MADE, NOT TO INSTALL SAID UNIT OR UNITS. We can require an inspection by one of our employees prior to replacement.

Hartung Glass Industries warranty will be void in the event full payment is not received for the goods and services warranted.

** Exception: Warranty does not apply to units installed which exceed 15 degrees from the vertical. Warranty does not apply to units installed in a mobile or marine based application, in a sauna or around a pool. Surface applied films void warranty.

SIGNED: _____
Hartung Glass Industries, Inc. Representative

AGALITE HOLCAM HARTUNG LAMI GLASS

17830 West Valley Highway, Seattle, WA 98188 • Phone: 425-656-2626 / 800-552-2227 • Fax: 425-656-2601
Web. www.hartung-glass.com

1.7 WARRANTY

A. Manufacturer's Warranty for a period of 10 years from date of Substantial Completion, covering:

1. Failure of hermetic glazing seal.
2. Deterioration of tints and coatings.
3. Cracking and chipping not caused by impact or abuse.
4. Any other deterioration or discoloration.

B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10 years from date of Substantial Completion.

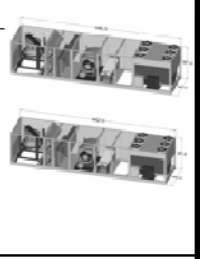
1993 House Od Deputies - Berlin , Germany
RKS Architekten Rolf Rave + Prof. Marina Stancovic, Berlin

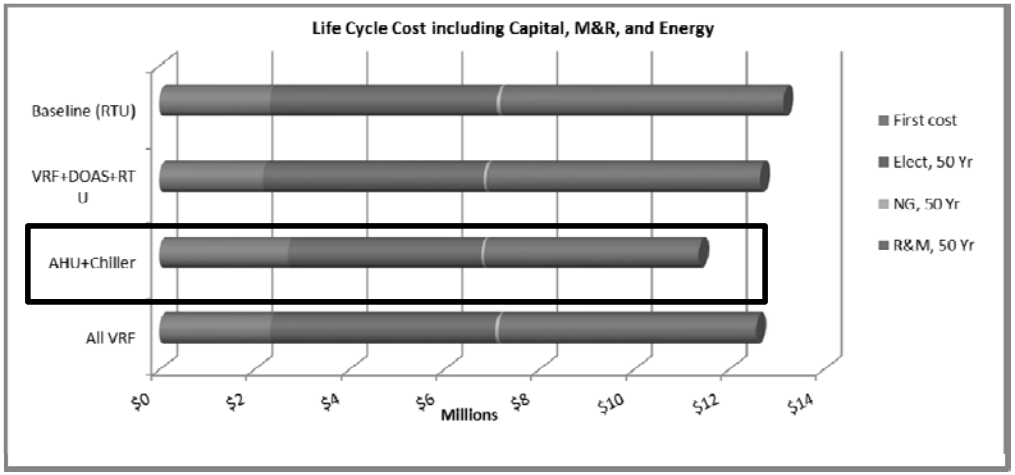
2004 State Office for the Conservation of Historic Monuments, Esslingen, Germany
Odilio Reutter, Architects ,Stuttgart

2004 Department of City Services, Bochum, Germany
Gatermann + Schossig, Architects and Planners, Cologne

Warranty is 10 years like typical insulated glass units

Mechanical Systems Selection

	Option 1 VRV	Option 2 Rooftop package unit	Option 3 Air cooled chiller	Option 4 Central Plant
System				
System	DX VRV (condensers & indoor units) DX RTU DOAS	Packaged DX RTU (w/gas heating & heat recovery wheel) + VAV boxes	Air cooled chiller + AHU (CHW/HHW) + VAV w/reheat + Boiler	Skid-mounted CUP + AHU (CHW/HHW) + FCU (CHW/HHW) + VAV boxes



- <u>Recommended Option-3</u>
- Lowest life cycle cost
- Lower O&M cost
- Greatest Return on Investment
- Lowest carbon emissions
- Less, smaller and quieter equipment on roof

Return on Investment

The Return on Investment analysis is based on the first costs, recurring costs, and financial variables listed on this document.

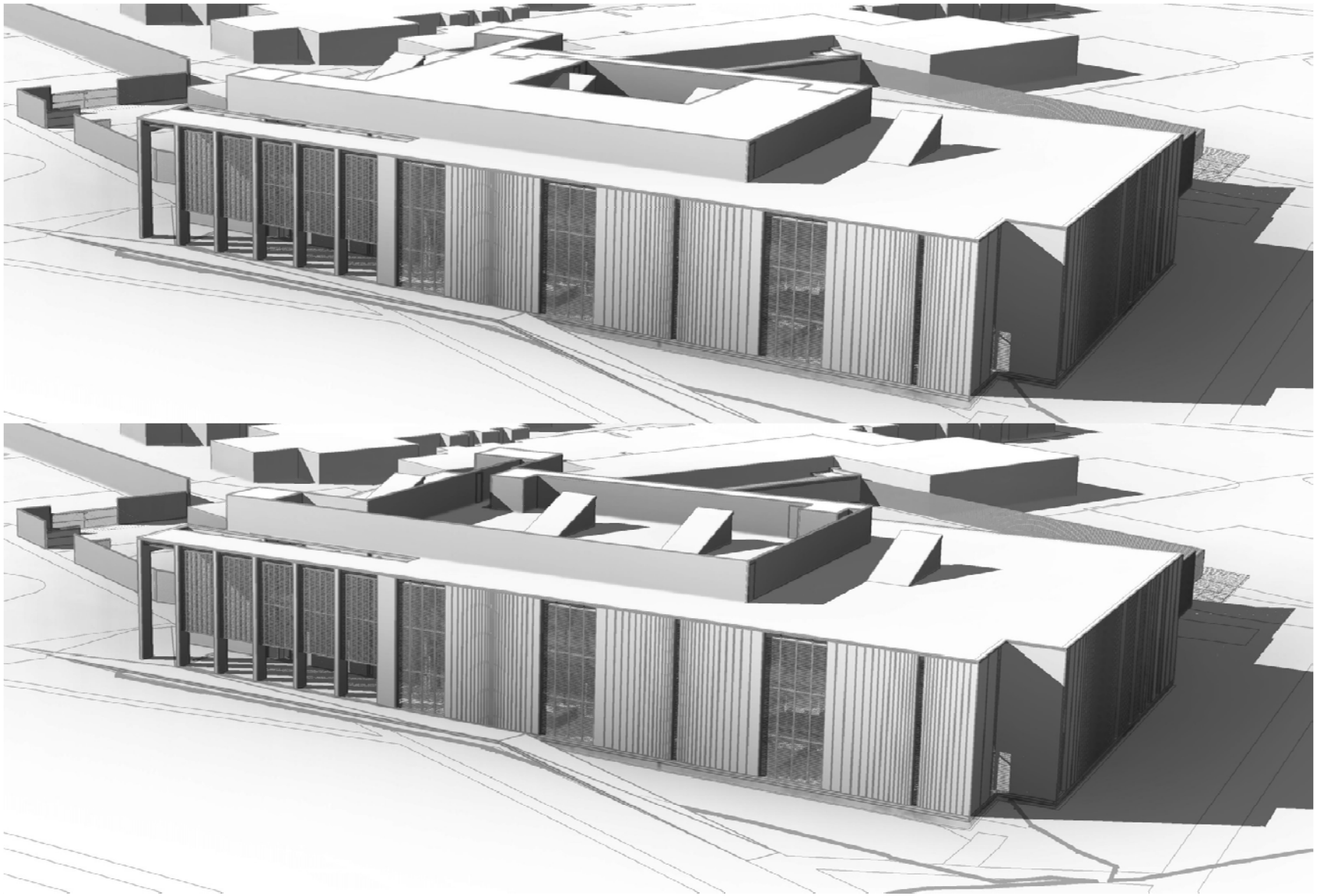
	First cost	First Cost Premium	O&M Cost	Simple payback	50-yr savings
Baseline	$2,327,000	$2,327,000	$180,264	Baseline	Baseline
VRF+DOAS+RTU	$2,180,000	-6%	-3%	Immediate	$336,130
AHU+Chiller	$2,700,000	16%	-21%	9.7 years	$831,940
All VRF	$2,425,000	4%	6%	8 years	$246,640

ENERGY USE, TITLE-24, LEED, CARBON EMISSIONS

Energy use is provided by EnergyPro building simulations.

	Energy Use Index (kBtu/sf·yr)	Title-24 (% better)	LEED (EA points)	Carbon Emissions (metric tons of CO_2)
Baseline (RTU)	54	14%	13	4,550
VRF+DOAS+RTU	52	22%	15	4,426
AHU+Chiller	46	20%	14	3,882
All VRF	53	18%	15	4,518

Penthouse Pros + Cons



Pros:

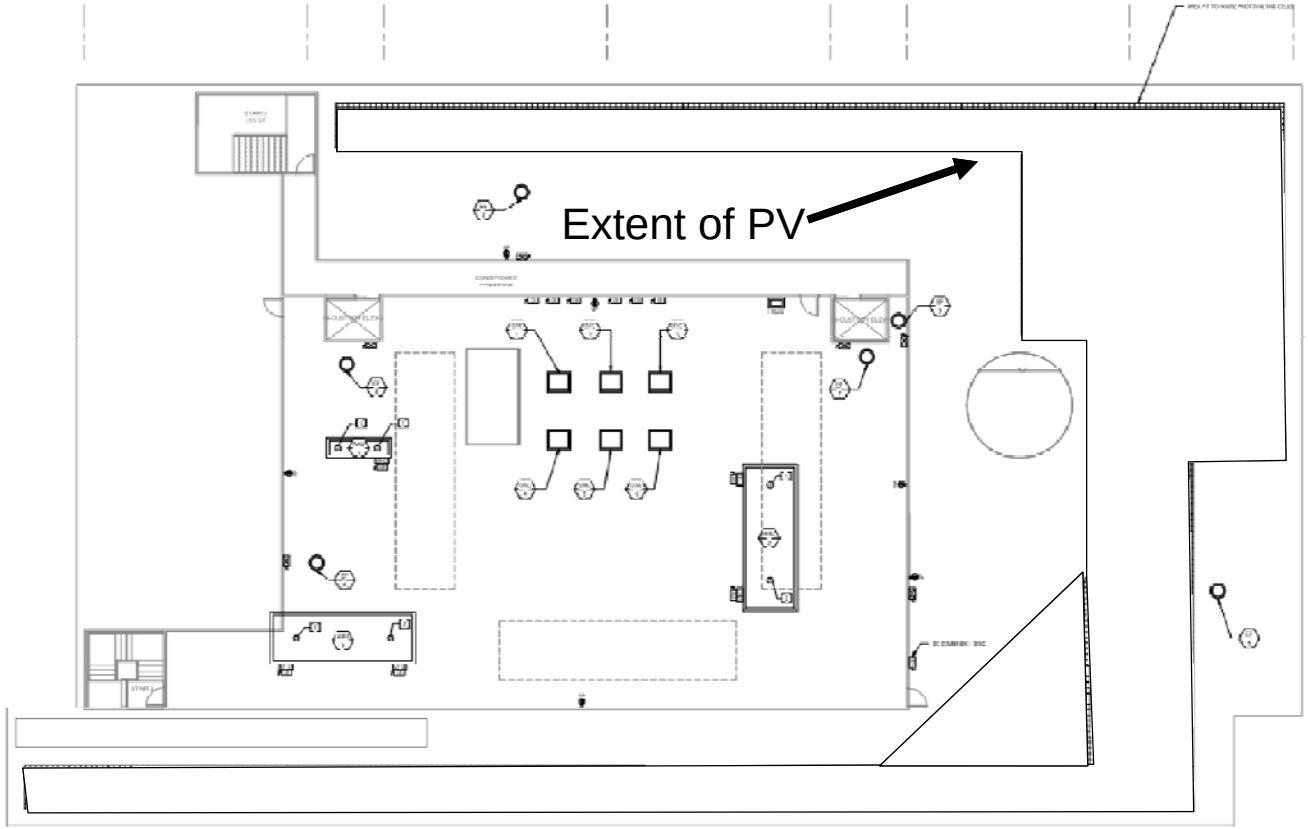
1. Protects equipment from weather related deterioration
2. Provides a protected environment for maintenance
3. Provides potential additional area for solar panel installation
4. Enhances sound insulation to the neighbors
5. NEMA 3 panel boxes are avoided
6. Less complicated roofing installation improves waterproofing
7. Improved efficiency due to cooler intake air temperature

Cons:

1. High first cost
2. Requires additional louvers in the vertical penthouse walls for airflow
3. Potentially complicates the replacement of the equipment
4. Potential extension to the construction schedule

Photovoltaic Panels

- PV selection
  - 6,000 sf area
  - 14 W/sf efficiency
  - 44 kVA power
- Roof installation preferred over ground due to shading
- Conduit stub-outs for future installation at roof (per CalGreen)



PV as car park canopy as an option

Hard construction budget

Original:

Hard Construction Cost	$ 35,646,243
Data, Communication & Security	$ 1,154,861
CCCI Adjustment	$ 41,946
Original Design-to Budget	**$ 36,843,050**

Current:

Hard Construction Cost	$ 25,641,751
Data, Communication & Security	$ 934,439
CCCI Adjustment (to July 2013)	$ 2,836,801
Current Design-to Budget	**$ 29,412,991**

Project Schedule

Phase	**Authorized FY13-14**	**Current Revised**
Site Acquisition	January 2011	100% complete
Preliminary Plans	**February 2014**	**75% complete**
		May 2015

Phases not yet authorized	Start	Completion
Working drawings & Approval to Bid	May 2015	July 2016
Bid & Contract Award	July 2016	April 2017
Construction	May 2017	July 2019
Move-in	July 2019	August 2019

Superior Court of California
Riverside County

NEW INDIO JUVENILE AND FAMILY COURTHOUSE

50% Design Development CCRS Project Review
November 4, 2014

CO ARCHITECTS

STAFF PARKING
LOADING
WALKWAY FROM JUVENILE HALL
ADULT ACCESS VEHICULAR SALLY PORT
STAFF GARDEN
STAFF ENTRY
ADULT
JUVENILE
MAIN ENTRY
STAFF BREAK RM
FACILITIES ASSISTANT OFFICE/STOR/WKSHOP 126 SF
LOADING / RECEIVING AREA 86 SF
TRASH RECYCLING COLLECTION 73 SF
FAM DIV SUPERVISOR 125 SF
INACTIVE FILES / MICROFILM STORAGE 310 SF
IS WORKROOM AND STORAGE / COMPUTER ROOM 242 SF
SHARED UNISEX SHOWER ROOM 77 SF
DIVISION MANAGER 200 SF
SHARED UNISEX SHOWER ROOM 72 SF
FAM DIV SUPERVISOR 120 SF
ADMINISTRATION 3332 SF
MAIN ELECTRICAL ROOM 227 SF
CASE RETENTION / EXHIBITS STORAGE 265 SF
HOTELING OFFICE 90 SF
EXHIBIT COORDINATOR 64 SF
MANAGEMENT OFFICE 93 SF
INACTIVE FILES / MICROFILM STORAGE 226 SF
OFFICE 398 SF
TELECOMMUNICATIONS EQUIPMENT ROOM 206 SF
PLUMBING ROOM 80 SF
ELEV EQUIP 77 SF
WOMENS 211 SF
MENS 207 SF
COURT REPORTER 48 SF
CORRIDOR 121 SF
ADMIN CONFERENCE ROOM 271 SF
MEN'S LOCKER ROOM 58 SF
WOMEN'S LOCKER ROOM 58 SF
STAFF BRIEFING / REPORT WRITING ROOM 63 SF
UNISEX SHOWER RM 61 SF
ELEC 14 SF
CUSTODIAL CLOSET 46 SF
LACTATION 55 SF
STAFF ELEVATOR 80 SF
VEST 55 SF
EX STOR 40 SF
FILE STAGING 159 SF
FILE SCANNING STATION 51 SF
MAIL PROCESSING 147 SF
COPY / WORKROOM 73 SF
JUVENILE DIV SUPERVISOR 107 SF
SHARED WORK AREA 48 SF
CUS SUP 31 SF
STAFF RESTROOM 47 SF
CUS CLOSET 43 SF
ELEC 2 63 SF
COMPUTER BASED PUBLIC TRAINING 390 SF
CONFERENCE / WORKSHOP 365 SF
ATTORNEY FACILITATOR 144 SF
PARALEGAL 130 SF
LEGAL AID OFFICE 151 SF
ELEC ROOM 18 SF
STAFF DESK 43 SF
CORRIDOR 78 SF
COURTROOM JUVENILE DELINQUENCY 1653 SF
COPY/STORAGE ALCOVE 175 SF
CLETS 49 SF
PHOTOCOPIERS / PRINTERS 67 SF
CORRIDOR 330 SF
STAFF RESTROOM 50 SF
CUS CLOSET 27 SF
BOOK SHELVES 16 SF
DV WAITING 220 SF
CORRIDOR 110 SF
DV - SENIOR COURT SERV ASST 52 SF
DV - COURT SERV ASST 50 SF
CUSTODIAL CLOSET 26 SF
COMPUTER AREA 200 SF
COUNTER WORKSTATION 36 SF
WORKCOUNTER 94 SF
WOMEN 262 SF
MEN 309 SF
WORK AREA
PUBLIC VENDING ALCOVE 31 SF
ATTORNEY CLIENT WITNESS ROOM 95 SF
IDF ROOM 95 SF
ATTORNEY CLIENT WITNESS ROOM 116 SF
VESTIBULE 65 SF
BUILDING CONTROL ROOM 125 SF
WAITING 705 SF
PUBLIC ELEVATOR 63 SF
FINAN SERV ASST 53 SF
FINAN SERV ASST 53 SF
COUNTER 56 SF
COUNTER 54 SF
COUNTER 53 SF
COUNTER 54 SF
COUNTER 54 SF
ACCESSIBLE COUNTERS 54 SF
ACCESSIBLE COUNTERS
PUBLIC DOCUMENT REVIEW 62 SF
PUBLIC LOBBY 2399 SF
ORIENTATION A & COURT CALENDAR SCREENS
FORMS COUNTER
QUEING
WAITING / QUEUING 723 SF
LINE OF BALCONY ABOVE
EXIT LANE 152 SF
SECURITY SCREENING QUEING 242 SF
ENTRY VESTIBULE 121 SF
WEAPONS SCREENING 428 SF
PUBLIC LOBBY 2399 SF
INFORMATION COUNTER 42 SF
STAIR 1 309 SF
DELIQUINENCY WAITING 690 SF

1ST FLOOR

ROOF
EXPANSION : 2ND FLOOR ADDITION, 4200 SF
OFFICE 396 SF
STAIR 3 318 SF
STAFF TOILET 56 SF
RESTROOM 55 SF
CONFERENCE RM 331 SF
OFFICE 390 SF
COURTROOM RELIEF WORKERS 65 SF
JUDICIAL SECRETARY 121 SF
RESEARCH ATTORNEY 111 SF
COURTROOM RELIEF WORKERS 65 SF
STAFF TOILET 51 SF
CUSTODIAL CLOSET 19 SF
STAFF ELEVATOR 80 SF
COPY/SUPPLY AREA 165 SF
OFFICE 389 SF
OFFICE 389 SF
WAITING / PLAY AREA - OLDER CHILDREN 218 SF
SINK COUNTER 48 SF
WAITING / PLAY AREA - YOUNGER CHILDREN 304 SF
SECURITY CHECK-IN STATION 40 SF
RESTROOM 44 SF
INT RM 75 SF
VESTIBULE 37 SF
SUPPLY / TOY STORAGE 13 SF
MEDIATOR 147 SF
MEDIATOR 148 SF
MEDIATOR 141 SF
MEDIATOR 140 SF
ELEC ROOM 10 SF
MEDIATION WAITING AREA 131 SF
PUBLIC CORRIDOR 2123 SF
COPY/STORAGE ALCOVE Redundant Room
CLETS 48 SF
MEDIATION WAITING AREA 133 SF
MENS RESTROOM 185 SF
WOMENS RESTROOM 238 SF
CUSTODIAL CLOSET 96 SF
ATTORNEY CLIENT WITNESS ROOM 79 SF
ATTORNEY CLIENT WITNESS ROOM 81 SF
CORRIDOR 1590 SF
EX STOR 40 SF
EX STOR 40 SF
EX STOR 40 SF
EX STOR 40 SF
COURTROOM MULTIPURPOSE - FAMILY 1718 SF
COURTROOM MULTIPURPOSE - FAMILY 1698 SF
COURTROOM MULTIPURPOSE - FAMILY 1698 SF
COURTROOM JUVENILE DEPENDENCY 1698 SF
SHAFT 139 SF
SHAFT 149 SF
ATTORNEY CLIENT WITNESS ROOM 119 SF
VESTIBULE 65 SF
ATTORNEY CLIENT WITNESS ROOM 116 SF
IDF ROOM 127 SF
ATTORNEY CLIENT WITNESS ROOM 116 SF
VESTIBULE 65 SF
ATTORNEY CLIENT WITNESS ROOM 120 SF
ATTORNEY CLIENT WITNESS ROOM 120 SF
VESTIBULE 65 SF
ELEC ROOM 42 SF
PUBLIC ELEVATOR 53 SF
IDF ROOM 115 SF
ATTORNEY CLIENT WITNESS ROOM 116 SF
VESTIBULE 65 SF
STAFF INTERPRETERS 116 SF
STAIR 2 183 SF
COURTROOM WAITING 197 SF
COURTROOM WAITING 198 SF
STAIR 1 382 SF

2ND FLOOR

Courthouse Cost Reduction Subcommittee

50 Percent Design Development Review Report

NEW EL CENTRO COURTHOUSE

SUPERIOR COURT OF CALIFORNIA
COUNTY OF IMPERIAL

November 4, 2014

JUDICIAL COUNCIL OF CALIFORNIA
OPERATIONS AND PROGRAMS DIVISION
CAPITAL PROGRAM

PROJECT MANAGER
GARY SWANSON

1. Executive Summary of Project Status at 50 Percent Design Development

At 50 percent Design Development, the project status is as follows:

1.1 Scope—the project is within the approved scope, as described below.

1.2 Budget—the project is within budget.

1.3 Schedule—the project is on schedule for construction starting immediately after the Fall 2016 bond sale.

2. Background

2.1. Budget Year 2009/2010—initial project authorization:

- Project first submitted as part of SB 1407 funding.
- Acquisition phase funding transferred in December 2009.
- Original Building Gross Square Feet (BGSF): 53,983 SF
- Original Construction Cost Sub-Total: $ 33,917,270

2.2. Budget Year 2013/2014:

- Recognize Scope Change: building was reprogrammed to reduce overall square footage.
- BGSF reduction from 53,983 SF to 47,680 SF. This is an 11.6 percent reduction.
- Construction Cost Subtotal was reduced from $ 33,917,270 to $ 23,571,584. This is a 30.5 percent reduction in the hard construction budget and reflects the Judicial Council mandated reductions of 24 percent for this project.
- May 8, 2013 the project received CCRS pre-design approval.
- November 8, 2013 the project received approval from SPWB for an additional change of scope. Authorized BGSF reduction from 47,680 to 47,512 SF.
- Construction cost was further reduced to a new authorized budget of $23,512,798 due to the reduction in BGSF as a part of the second change of scope.

2.3. Budget Year 2014/2015 proposal:

- Request re-appropriation of funds for the Working Drawing Phase.
- No change to project scope.

2.4. Summary of changes to Construction Cost Subtotal:

- Original (2009/2010 Budget Year): $33,917,270
- Current (2014/2015 Budget Year): $ 23,512,798
- Reduction from Original Budget: $ 10,404,472 or 30.6 percent.

2.5. Summary of changes to BGSF:

- Original (2009/2010 Budget Year): 53,983 BGSF
- Current (2014/2015 Budget Year): 47,512 BGSF
- Reduction from Original to Current: 6,471 BGSF, or 11.9 percent.

3. Project Update:

Representatives from the Superior Court Imperial County, Judicial Council staff and the Safdie Rabines Architects design team presented the Preliminary Plans – 100 percent Schematic Design for the New El Centro Courthouse on May 7, 2014. While the project was well received, the CCRS asked that the project team examine four (4) items as they proceed into the Preliminary Plans—Design Development Phase. The four directives given by the CCRS are summarized below with a brief statement regarding outcome of the project team's actions and/or outcome of their studies.

a. Review and redesign the current exit route for the in-custody vehicles so it does not enter the parking lot..

The design team studied multiple approaches to avoid having the in-custody vehicles leave through the parking lot. Due to the physical space required to maneuver the largest vehicles, the changes made to the site plan compromised the parking lot circulation in ways that may make it difficult to maneuver through the parking lot or service the building by local first responders in the case of an emergency. After reviewing with the Judicial Council security staff, it was recommended that the in-custody vehicles be allowed to exit through the parking area and that parking located in the area where the in-custody vehicles will circulate be relocated to avoid delays to the exit of the in-custody vehicle.

b. Research the feasibility of having solar installed by an outside party at no charge.

The design team studied the cost associated with adding a photovoltaic array over parking areas and determined that the cost to install the canopies, solar panels, and related infrastructure do not provide a return on the investment for over 60 years.

c. Revisit court set design—by following the 1,700 square foot courtroom layout developed by the Courtroom Standards Workgroup in April 2014 and reorient access to the jury deliberation so it is not off the public corridor.

The design team has used the 1,700 courtroom layout issued in April 2014 as a guide to form the relative size, shape, and functions of the courtroom. Based on the local Superior Court of Imperial County's Project Advisory Group's recommendations, the following adjustments to the template were made:

A larger spectator seating area has been provided (without increasing the gross floor area of the courtroom). This resulted in a smaller court well area and a reduction to the court security officer's desk.

The design team relocated the Jury Deliberation rooms as requested. The jury's access to the deliberation rooms is through the courtroom into the judicial secure circulation area. Electrical and building utility rooms now occupy the windowless area previously occupied by the jury deliberation rooms.

d. Use durable flooring surfaces at the second floor public areas.

Flooring at the second floor public areas will be a durable material, similar to the material used in the first floor public areas.

A second peer review was conducted on July 17, 2014, which resulted in further analysis of blast conditions within the building as the architect had assumed a very low threat absent the final report.

Due to the potential of seismic activity in the area of the project a site specific hazard analysis was requested by Capital Program to determine if an enhanced seismic performance structural factor greater than one (1) was warranted. The cost value analysis did not support the enhanced factor.

A CMAR firm has been selected through the Capital Program procurement process and negotiations are under way to award a contract and retain the firm by the end of the Design Development phase. As a result of the CMAR not being selected previously, an independent estimate was performed and reconciled against the architects estimate. The project is on budget.

4. Schedule

The project is ready to move into the final Design Development phase. The target completion date for Preliminary Plans was August 21, 2014 and has been extended to December 10, 2014 due to re-base lining the project schedule to incorporate adequate committee review times and vendor contracting procurement.

a	b	c	d	e	f
	Current Authorized Schedule FY 14/15		Current Schedule		
Phase	Start Date	Finish Date	Start Date	Finish Date	Percent Complete
Site Selection	7/11/2009	3/11/2011	7/11/2009	3/11/2011	100%
Site Acquisition	3/12/2011	12/13/2011	3/12/2011	12/13/2011	100%
Preliminary Plans	11/25/2013	7/19/2014	11/25/13	12/10/2014	75%
Working Drawings & Approval to Bid	7/20/2014	3/23/2014	12/11/14	5/4/16	–
Bid and Contract Award	3/24/2015	6/6/2015	5/5/16	2/21/17	–
Construction	6/4/2015	7/21/2017	2/22/17	12/24/18	–
Move-in	7/22/2017	8/8/2017	2/25/18	1/2/19	–

5. Status of Hard Construction Cost Budget and 50% Design Development Estimate

Below is a summary of the original hard construction cost, hard construction reductions based on the council direction of December 12, 2011 and April 24, 2012, and additional reductions accepted by the CCRS in December 2012, the current design-to-budget, and a comparison of the current hard construction cost budget to the 50% Design Development estimate.

5.1. Calculation of Hard Construction Cost Budget with Judicial Council Directed and CCRS Accepted Reductions

Original 09/10 Hard Construction Cost Subtotal	$	33,917,270
BY 12/13: JC mandated 4%,	$	(1,356,690)
BY 13/14: JC mandated 20%,	$	(8,988,996)
BY13/14: CCRS mandated 168 BGSF reduction		(58,786)
Revised Hard Construction Cost Subtotal	*$*	*23,512,798*
Cost Reduction Achieved	$	10,404,472
Cost Reduction as percent of original Construction Cost Subtotal	%	30.6

5.2. Design-to-Budget Calculation

Original Hard Construction Cost w/o FF&E	$	33,917,270
Data, Communication and Security	$	917,711
CCCI Adjustment	$	42,351
Original Design-to-Budget	$	34,877,332

Current Hard Construction cost w/o FF&E	$	23,512,798
Data, Communication and Security	$	807,704
CCCI Adjustment	$	2,494,884
Revised Design-to-Budget	**$**	**26,815,386**

5.3. Summary of Design-to-Budget in Comparison to 50 percent Design Development Estimate

The consultant developed 50 percent Design Development estimates shows the project to be within budget. The architect worked with the design consultants to further refine the building systems in order to give the cost estimators a more specific scope. Building materials and palettes were simplified to maximize repetition and quantity value pricing as well as reducing the number of trades and manufacturers.

Superior Court of California, County of Imperial

New El Centro Courthouse

CCRS Project Review

50% Design Development
4 November 2014

A g e n d a

1. CCRS Directives
    - Courtroom Layout with Jury Deliberation Location
    - Durable Floor Finishes in Second Floor Public Circulation
    - Sallyport / In-Custody Entry and Exit through Site
    - Photovoltaic Study / Analysis

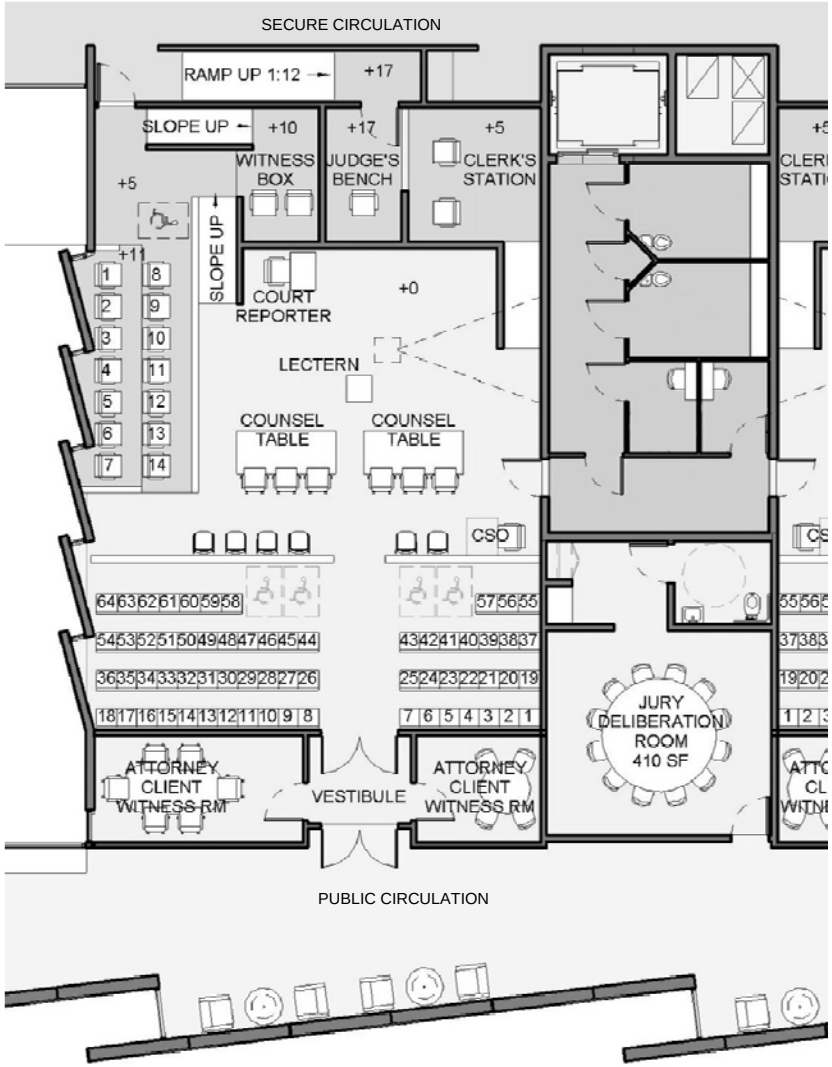
2. Building Plan Updates

3. Life Cycle Cost Analysis

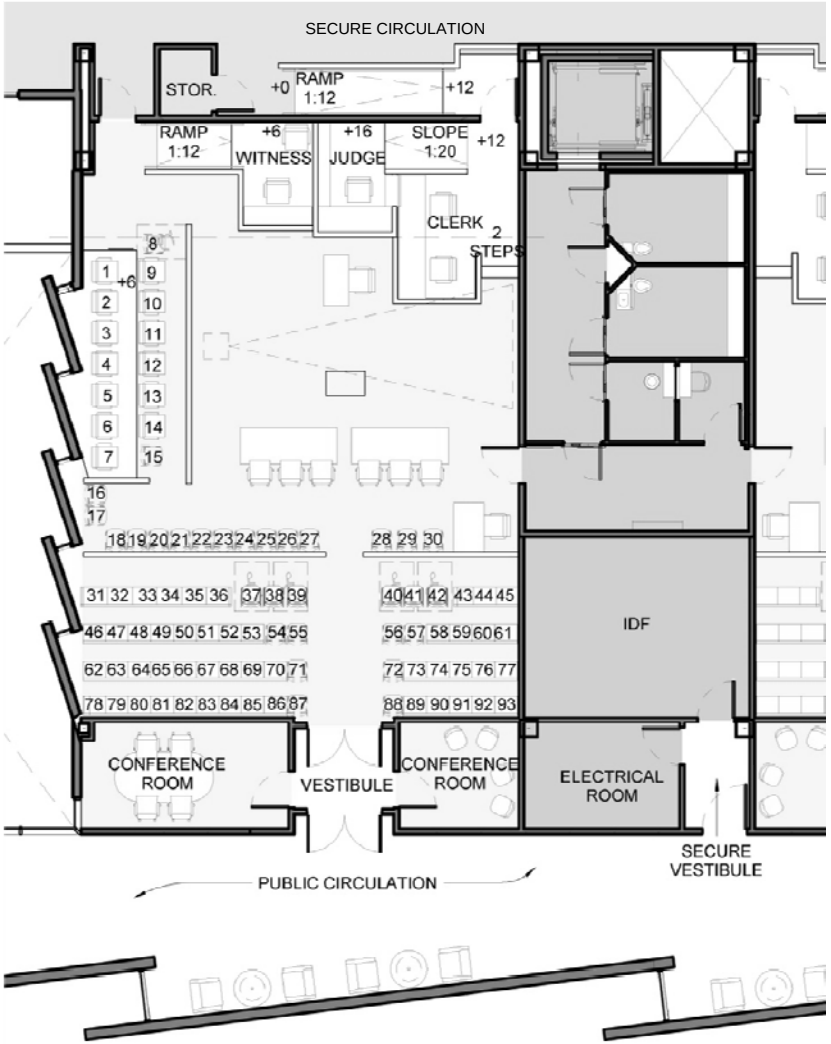
4. Cost Estimates
    a. Campbell Anderson Associates
    b. O'Connor Construction Management

5. Schedule

Original Design



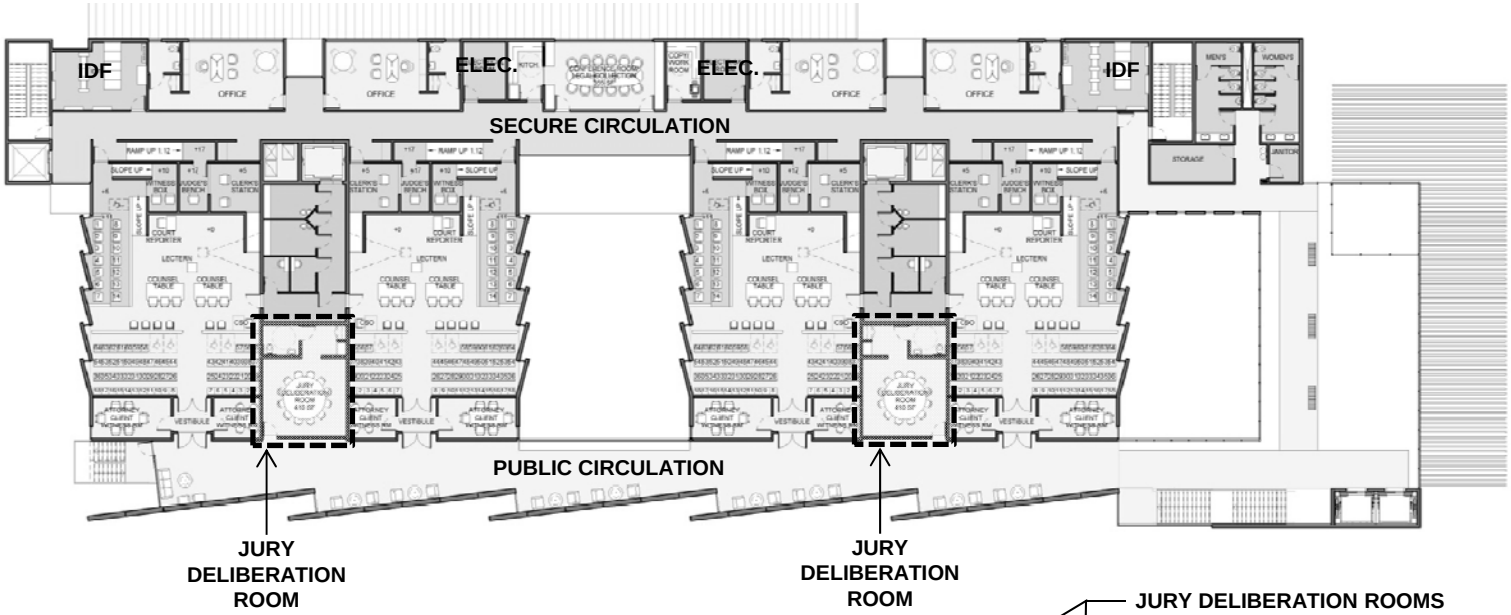
Revised Design



Courtrooms have been revised to reflect the 1,700 SF Courtroom Layout.

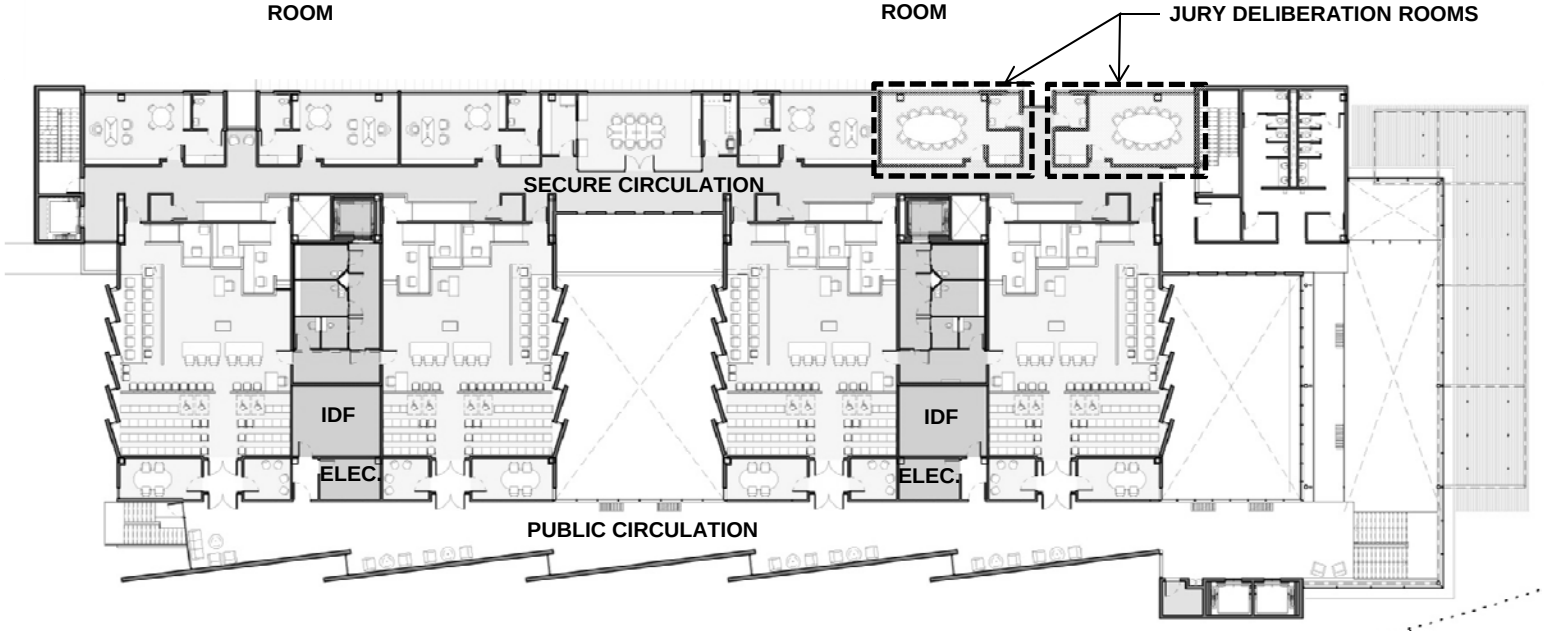
2 Deviations:

- Additional row of spectator seats (1,700 SF Courtroom Layout= 36, Proposed =49). This does not increase the area of the courtroom, but shortens the depth of the well.
- Court Security Officer Station is one-sided, not "L" shaped to allow access into courtroom holding area



Original Design Level 2

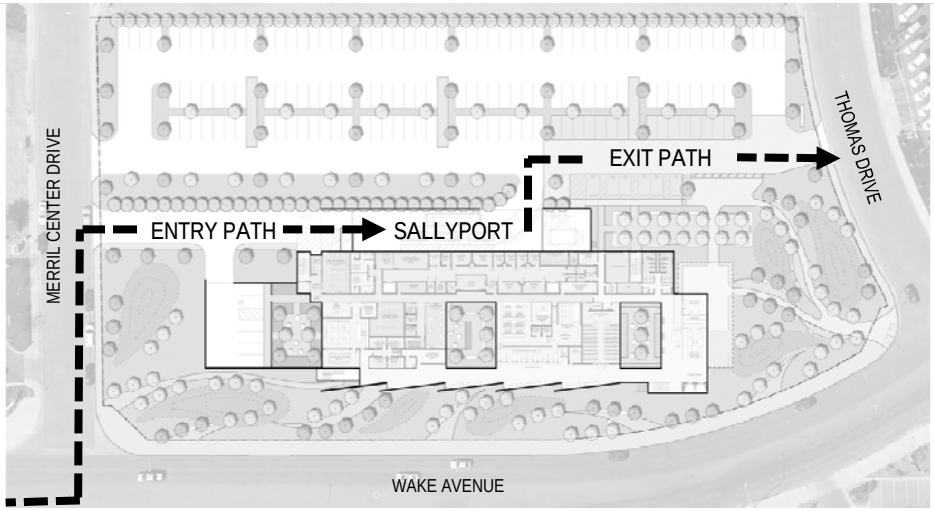
- The Jury Deliberation Rooms were previously accessed from the Public Circulation



Updated Design Level 2

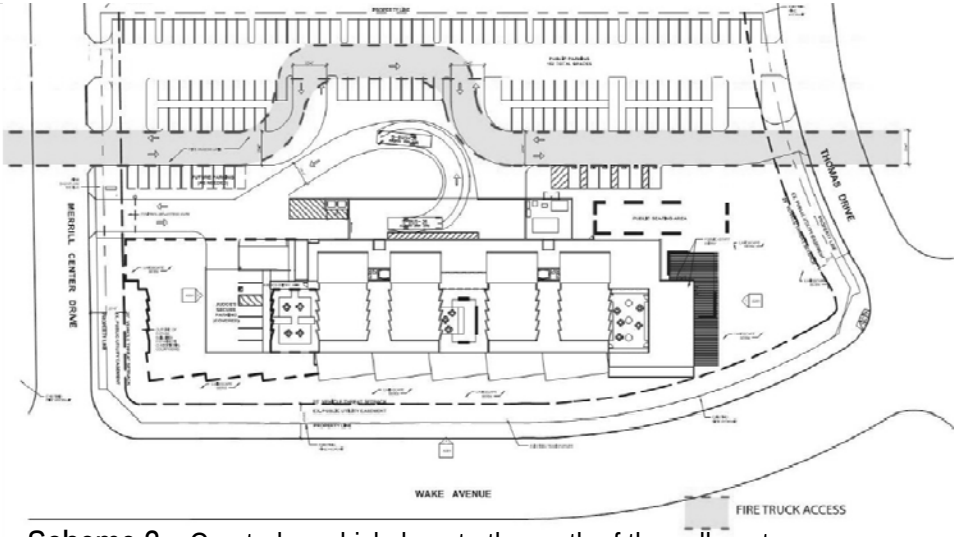
- The Jury Deliberation Rooms have been relocated and are now accessed from the Secure Circulation
- The IDF and Electrical Rooms have been relocated to the previous location of the Jury Deliberation Rooms
- Durable floor finishes in Public Circulation

CCRS Directives – Jury Deliberation Location



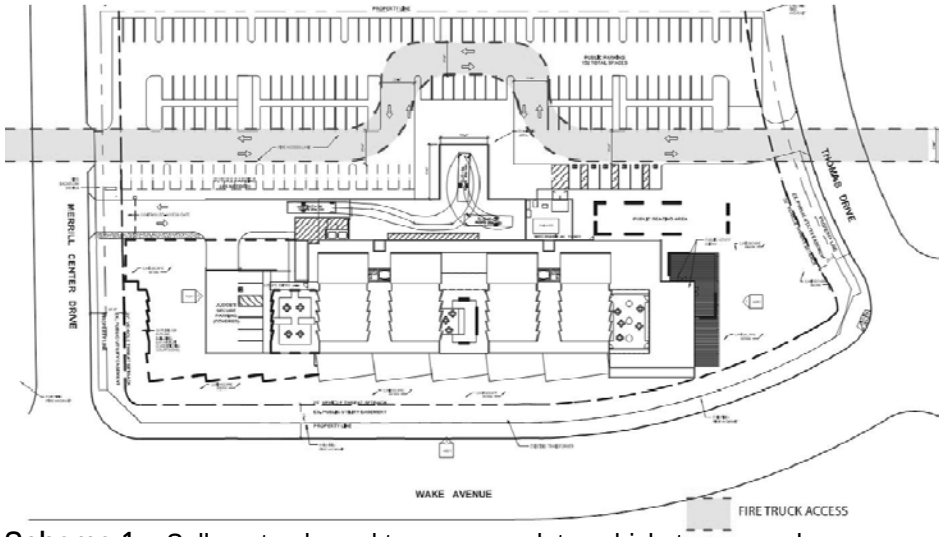
Original Configuration

- CCRS Directive: Study options for in-custody vehicles entering and exiting the site while avoiding public parking areas



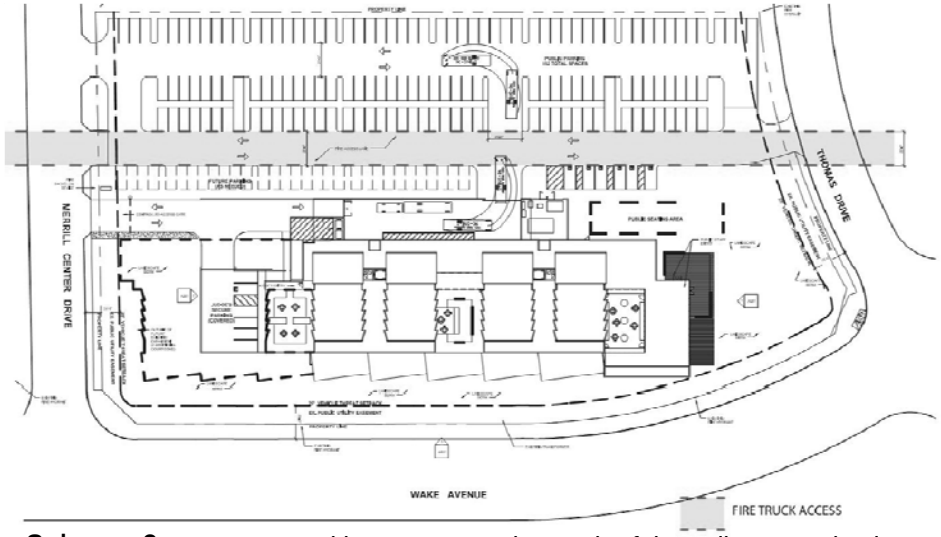
Scheme 2 – Created a vehicle loop to the north of the sallyport

- Eliminated many parking spaces
- Extended into fire lane which impaired fire truck access



Scheme 1 – Sallyport enlarged to accommodate vehicle turnaround

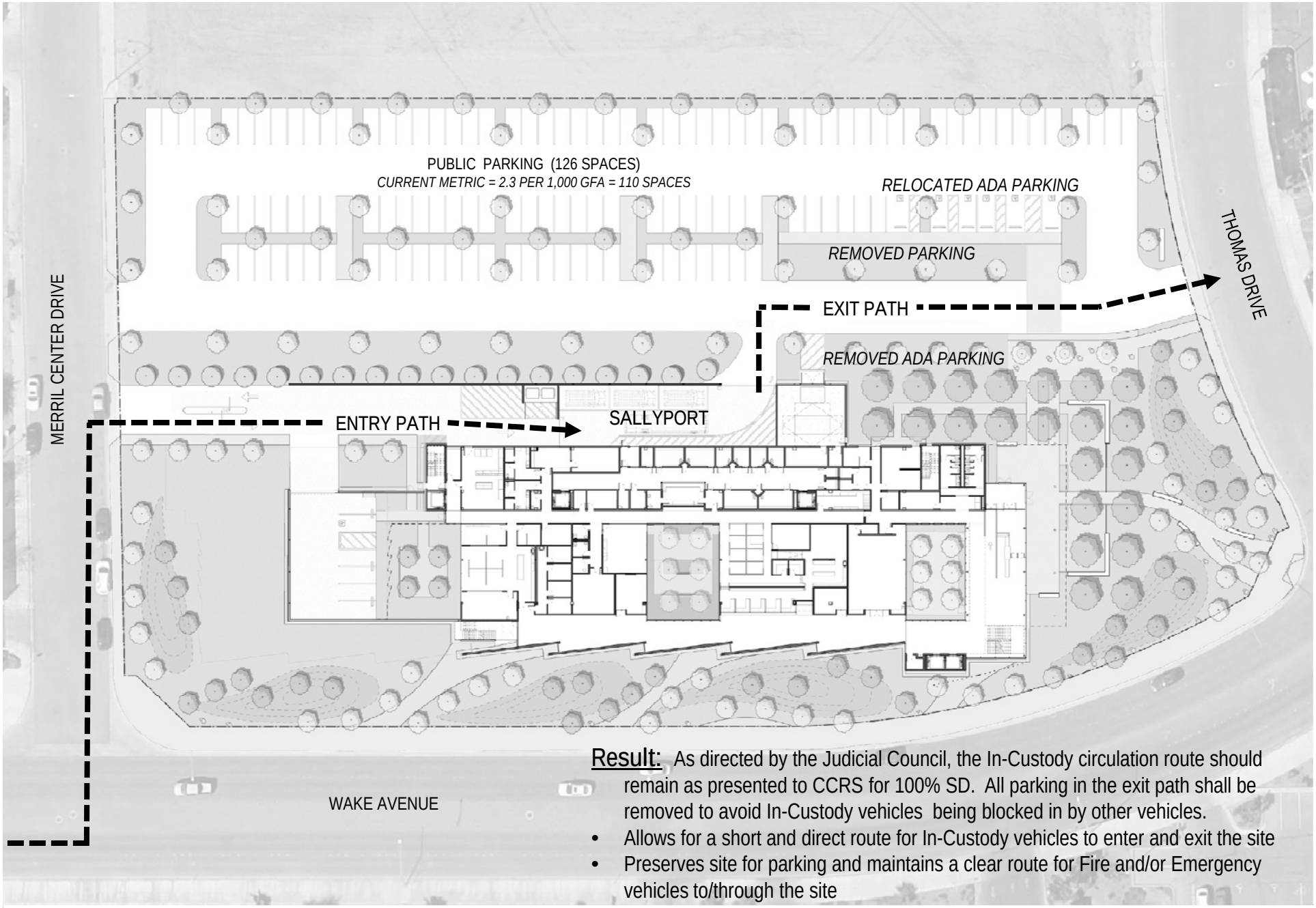
- Increased building cost.
- Eliminated parking spaces
- Extended into fire lane which impaired fire truck access



Scheme 3 – Remove parking spaces to the north of the sallyport and exit vehicles through public parking lot onto Merril Center Drive

- Additional curb cut on Merril Center Drive
- Risk of buses being blocked in by cars in public parking lot

CCRS Directives –Sallyport / In-Custody Entry And Exit Through Site



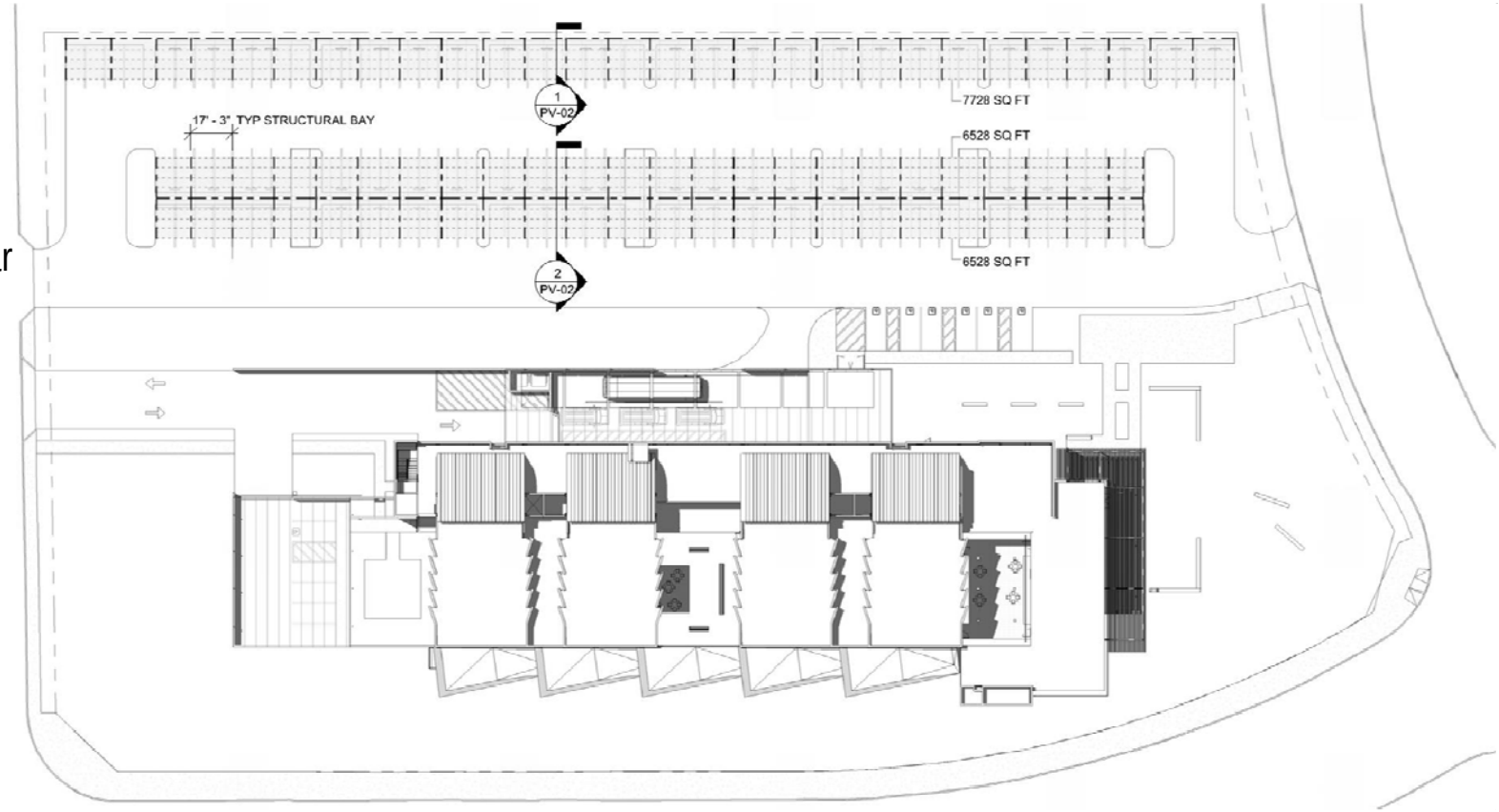
Result: As directed by the Judicial Council, the In-Custody circulation route should remain as presented to CCRS for 100% SD. All parking in the exit path shall be removed to avoid In-Custody vehicles being blocked in by other vehicles.

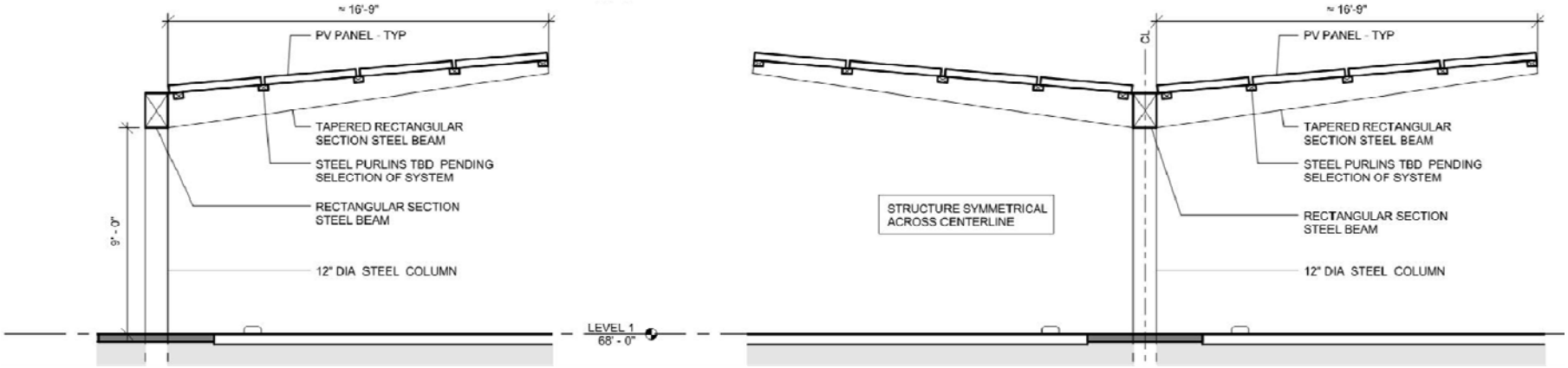
- Allows for a short and direct route for In-Custody vehicles to enter and exit the site
- Preserves site for parking and maintains a clear route for Fire and/or Emergency vehicles to/through the site

CCRS Directives –Sallyport / In-Custody Entry And Exit Through Site

Total Panel Area =
20,784 sf

Total Output =
419,589 kWh per year





CCRS Directives – Photovoltaic Study / Analysis

RESULTS = 419,589 kWh per Year

Month	Solar Radiation (kWh / m^2 / day)	AC Energy (kWh)	Energy Value ($)
January	5.79	33,355	4,211
February	5.77	30,061	3,795
March	6.92	38,060	4,805
April	7.52	39,871	5,034
May	7.29	38,807	4,899
June	7.17	35,714	4,509
July	6.87	34,985	4,417
August	7.14	36,501	4,608
September	7.05	35,447	4,475
October	6.14	33,292	4,203
November	5.84	31,176	3,936
December	5.61	32,321	4,081
Annual	6.59	419,589	$ 52,973

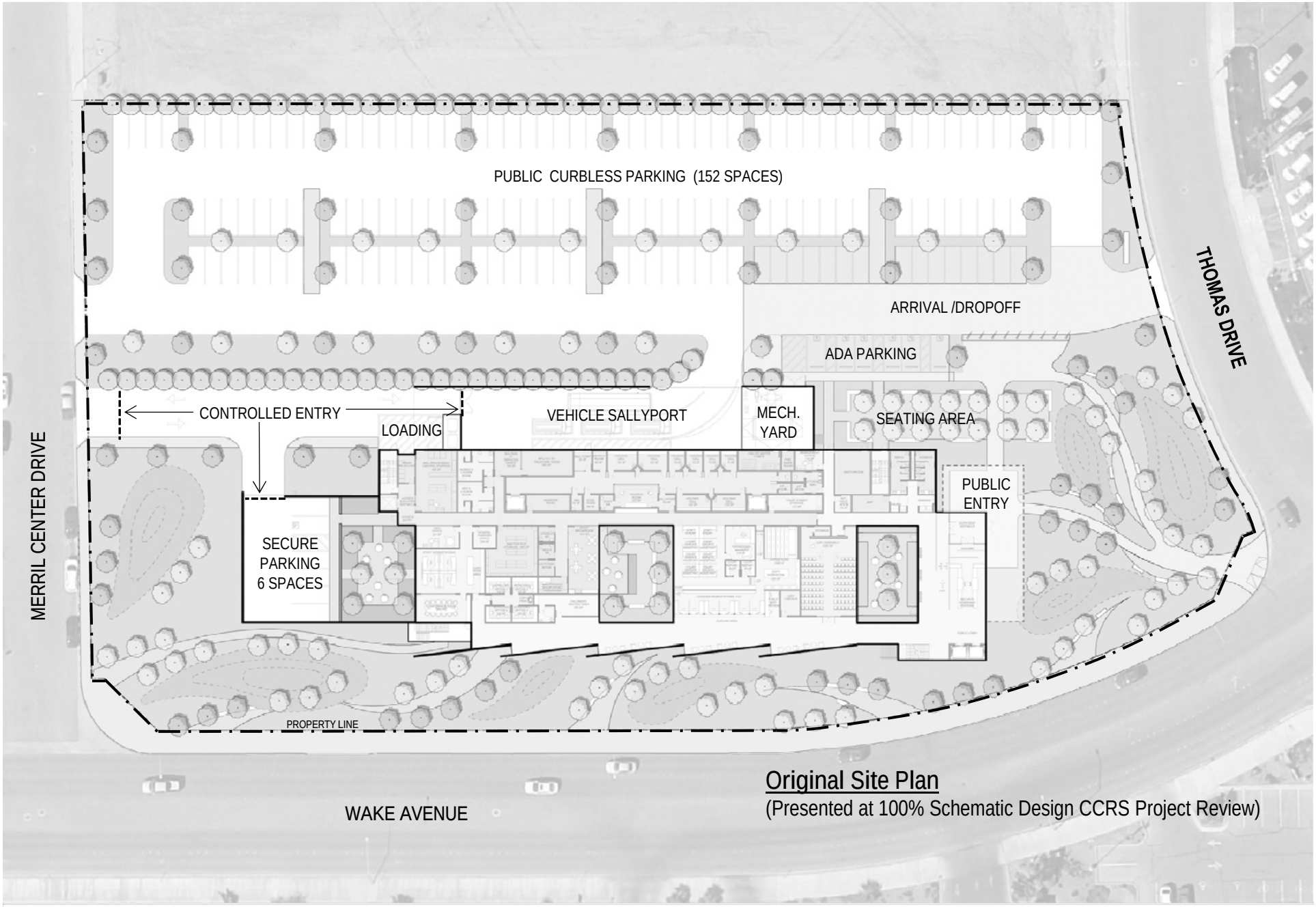
Campbell Anderson Associates Cost Analysis

Element/Specification		Quantity		Unit Rate	Estimated Cost
Structural Supports					
1.	Tapered steel beam, 12" x 50 PLF	34	TONS	5,000.00	170,000
2.	Steel purlins	31	TONS	4,000.00	124,000
3.	Rectangular steel beam, 12" x 12" x 50 PLF	33	TONS	4,750.00	156,750
4.	12-3/4" diameter steel column x 50 PLF	15	TONS	4,250.00	63,750
5.	30" diameter drilled concrete pier, 9'-6" deep	54	EA	1,000.00	54,000
6.	Pile cap/base plate, etc.	54	EA	250.00	13,500
7.	Miscellaneous steel connections, plates, etc.	17	TONS	4,000.00	68,000
8.	Paint to steel		ALLOWANCE		50,000
PV Panels					
9.	PV system	420,000	WTTS	5.00	2,100,000
Mark-Ups					
10.	General conditions, overhead, profit, bond and insurance (15%)		ALLOWANCE		420,000
11.	Design Contingency (7%)		ALLOWANCE		225,400
12.	Inflation adjustment beyond a start date of construction of September 2015 (4%)		ALLOWANCE		137,800
				ESTIMATED TOTAL:	$3,583,200

Summary:

Annual Energy Value = $52,973
Total Construction Cost = $3,583,200

<u>Total System Payback = 67.64 years</u>

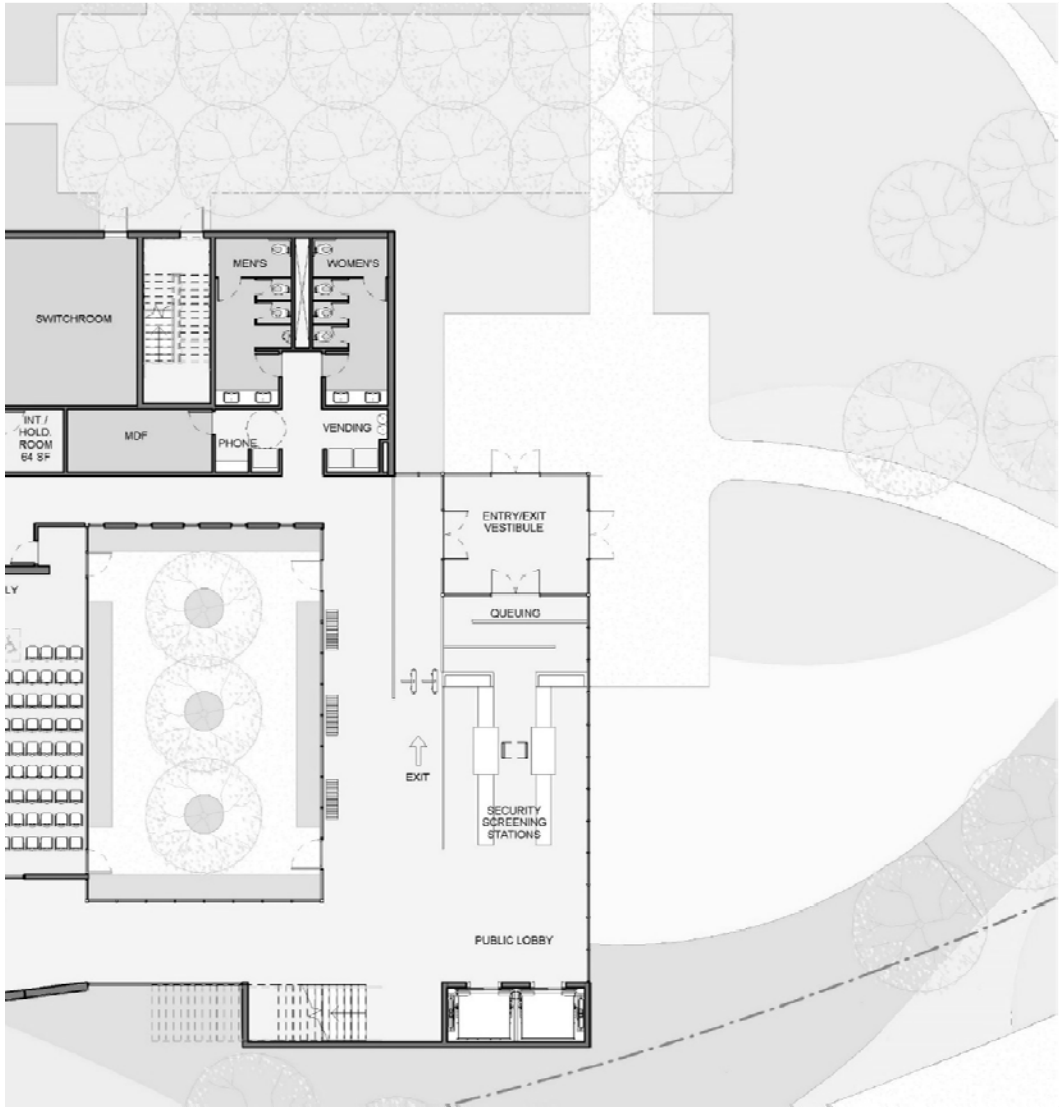


Original Site Plan
(Presented at 100% Schematic Design CCRS Project Review)

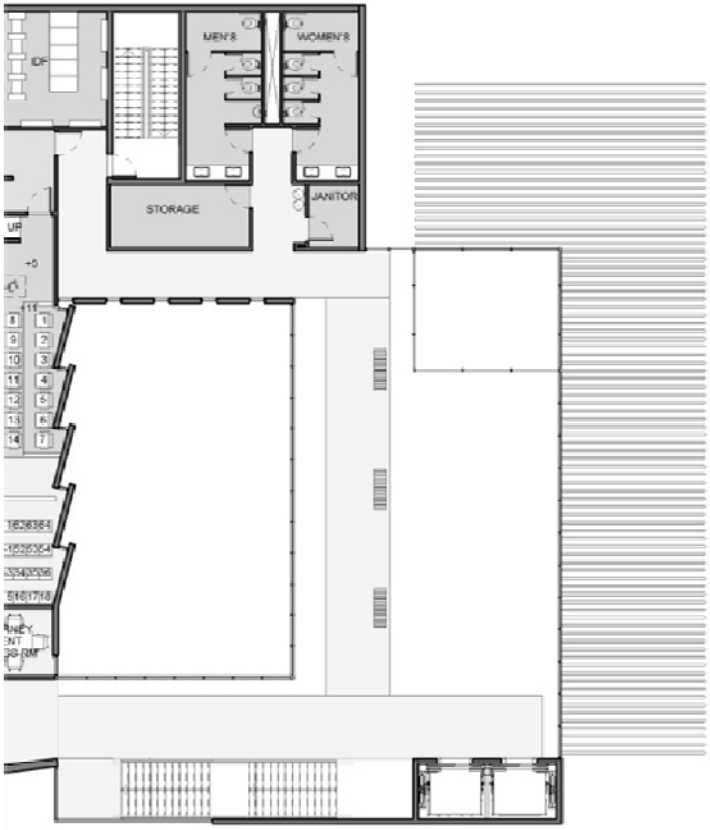
Building Plan Updates – Public Lobby

Original Floor Plans at Public Lobby

(Presented at 100% Schematic Design CCRS Project Review)

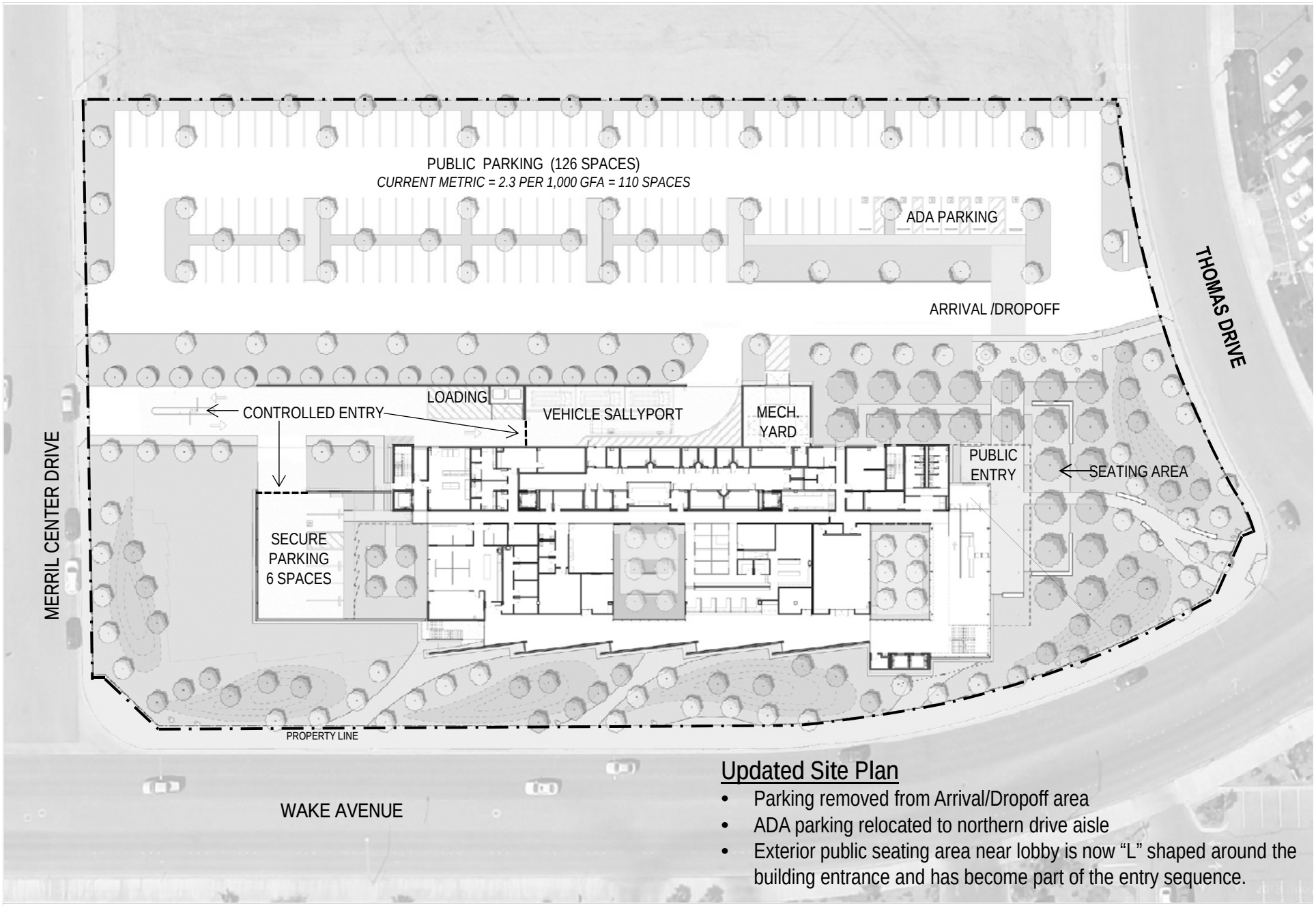


Level 1



Level 2

Building Plan Updates – Public Lobby



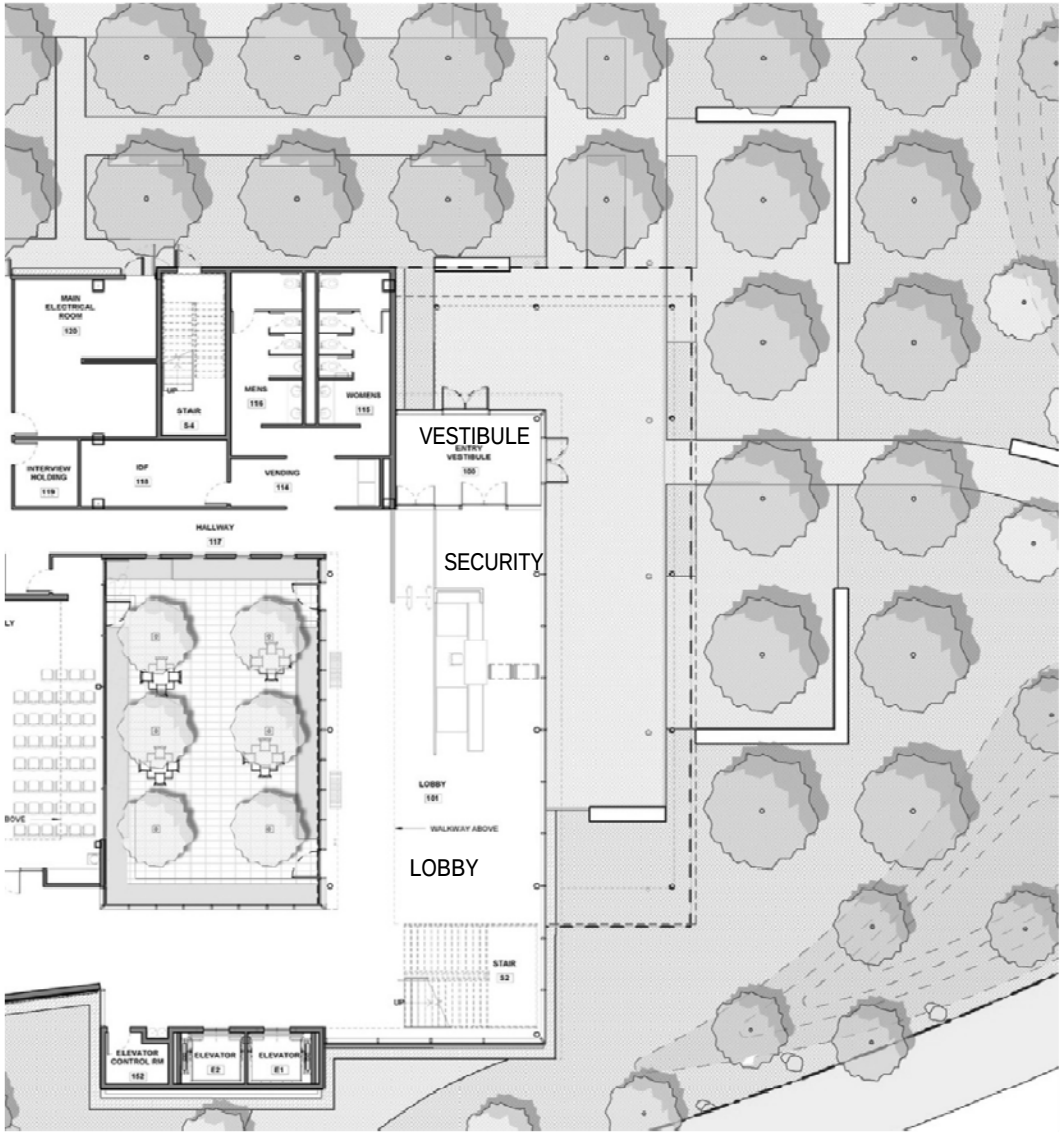
Updated Site Plan

- Parking removed from Arrival/Dropoff area
- ADA parking relocated to northern drive aisle
- Exterior public seating area near lobby is now "L" shaped around the building entrance and has become part of the entry sequence.

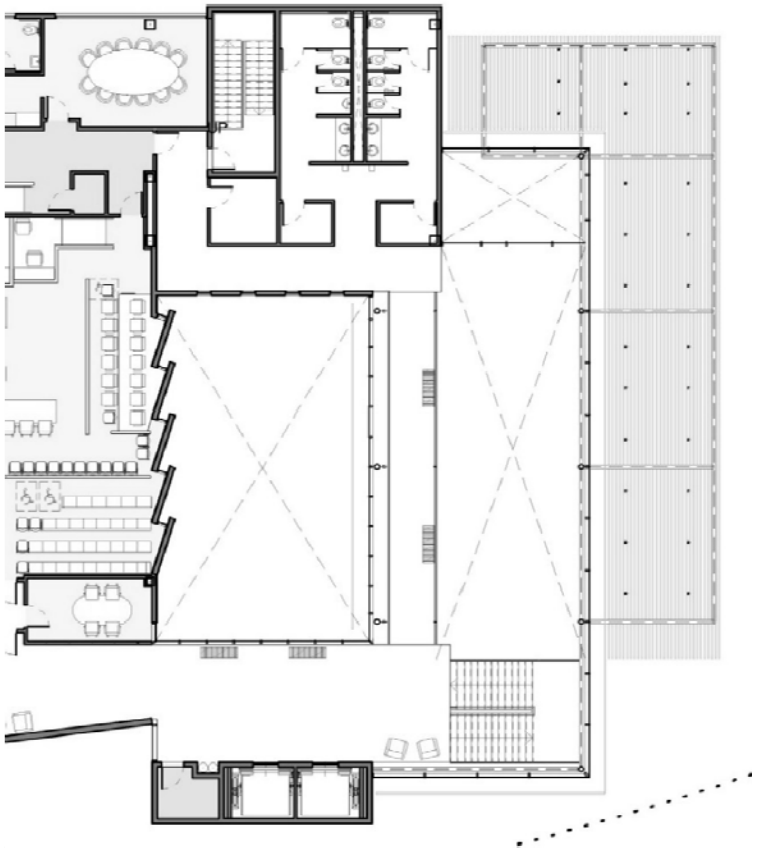
Building Plan Updates – Site Plan

Updated Floor Plans at Public Lobby

- Reconfigured Public Lobby – The lobby has become narrower and longer after an x-ray scanner was removed from the project.
- Vestibule reconfigured to simplify entry/exit sequence
- Stair and elevators have swapped locations to improve flow through lobby and enhance views to the exterior after passing through security screening
- Entry of the public restrooms have been reconfigured to improve access to these spaces.



Level 1



Level 2

Building Plan Updates – Public Lobby

STRUCTURAL LIFE CYCLE COST ANALYSIS

SRA was requested by the Judicial Council to perform a Life Cycle Cost Analysis to examine the following design alternatives to the structural system due to the Project's proximity to a nearby fault and history of earthquake activity:

- Stiffen the structural system to reduce drift-related structural and nonstructural damage
- Replace the reinforced concrete slab-on-grade with a structural slab-on-grade to reduce or eliminate damage produced by differential settlements between the pile-supported columns and the slab-on-grade that could settle with liquefying soils.

	I=1.0	I=1.25	I=1.5
Parameters	**Code Baseline**	**Opt 2**	**Opt 3**
Building			
Height Class	Low	Low	Low
Stories	2	2	2
Height (ft) Per Story	20	20	20
Model Type	S1	S1	S1
Modal Height			
Design Level	High Code	High Code	High Code
T	0.87	0.78	0.69
Cs	0.2425	0.303	0.36
Elastic Damping	5	5	5
Kappa	0.9	0.9	0.9
STR-Complete Drift	0.08	0.08	0.08
NSD-Complete Drift	0.05	0.05	0.05
NSA-Complete Accel	2.4	2.4	2.4
Location of NSA elements	distributed	distributed	distributed
Square Footage	47,662	47,662	47,662
Retrofit Cost	$ -	$ 283,900	$ 715,100
Exposure			
Bldg Replacement Value	$ 23,276,600	$ 23,276,600	$ 23,276,600
Occupancy	GOV1	GOV1	GOV1
Avg Number of Occupants	499	499	499
Fraction-STR	0.21	0.22	0.24
Fraction-NSD	0.43	0.42	0.41
Fraction-NSA	0.36	0.36	0.35
One-time Displ Cost		$ 30,211	$ 30,211
Cost of Temp Space/Mo		$ 5,263	$ 5,263
Loss of Rental Inc/Mo	0	0	0
Loss of Business Inc/Mo		$ 19,444	$ 19,444
AAL Results			
AAL-STR	$ 20,426.00	$ 16,870.00	$ 14,738.00
AAL-NSD	$ 70,332.00	$ 59,653.00	$ 48,163.00
AAL-NSA	$ 13,937.00	$ 15,902.00	$ 17,928.00
AAL-Casualty	$ 12,198.00	$ 8,860.00	$ 6,198.00
AAL-Relocation	$ 1,090.00	$ 917.00	$ 747.00
AAL-Loss of Business Income	$ 444.00	$ 36.00	$ 28.00
AAL-Loss of Rental Income			
PV of ∂AAL over bldg life		$ 217,899.00	$ 414,312.00
Benefit-Cost Ratio		0.65	0.49

Daytime occupants only

Options progressively stiffen the building to limit damage to nonstructural drift-sensitive elements

Notes
Discount Rate = 7%
Version 4.8 of the FEMA BCA Tools is used.
25-year remaining useful life after retrofit

Alternative 1 – Stiffen the structural system to reduce drift-related structural and nonstructural damage

- Options were analyzed using the FEMA's BCA Toolkit, based on FEMA's HAZUS Software
- Current Building Importance Factor(Code Baseline) = Ie 1.0
- Examined options for increased stiffness, Importance Factor of Ie 1.25 and Ie 1.5
- The analysis estimated the benefit-to-cost ratio

RESULT:

- A benefit-to-cost ratio (BCR) greater than 1.0 indicates a statistical expectation that the benefits of the design option considered will pay for itself in the form of reduced losses and business interruption costs.
- None of the options examined result in a BCR greater than 1.0

Structural Slab Option

Incremental cost for the structural slab option: $513,100

			0<PGA<0.1g		0.1g≤PGA<0.2g		0.2g≤PGA<0.4g		0.4g≤PGA<0.75g		0.75g≤PGA<1g		PGA > 1g		
		Settlement (in)	0		Avg=.03	Max = 0.1	Avg=1	Max = 2	Avg=1.8	Max = 3	Avg=1.8	Max = 3	Avg=1.8	Max = 3	
Damage with slab-on-grade	Notes		Damage Cost	Annual Hazard Bin Probability	Damage Cost	Annual Hazard Bin Probability	Damage Cost	Annual Hazard Bin Probability	Damage Cost	Annual Hazard Bin Probability	Damage Cost	Annual Hazard Bin Probability	Damage Cost	Annual Hazard Bin Probability	**Average Annual Loss**
Structural repair of slab by epoxy injection		1	0	0.946	$ 1,000	0.0294	$ 50,000	0.0181	$ 100,000	0.00584	$ 100,000	0.0006	$ 100,000	0.0002	$ 1,598
Demolition of story 1 TI		2	0	0.946	$ -	0.0294	$ 30,000	0.0181	$ 100,000	0.00584	$ 100,000	0.0006	$ 100,000	0.0002	$ 1,207
Refloat of slab		3	0	0.946	$ -	0.0294	$ 10,000	0.0181	$ 200,000	0.00584	$ 200,000	0.0006	$ 200,000	0.0002	$ 1,509
Repair / reconstruction of story 1 TI		4	0	0.946	$ 2,000	0.0294	$ 100,000	0.0181	$ 2,000,000	0.00584	$ 2,000,000	0.0006	$ 2,000,000	0.0002	$ 15,149
Repair for curtain wall		5	0	0.946	$ 1,000	0.0294	$ 50,000	0.0181	$ 100,000	0.00584	$ 100,000	0.0006	$ 100,000	0.0002	$ 1,598
Repair of floor-to-floor mechanical		6	0	0.946	$ 500	0.0294	$ 5,000	0.0181	$ 20,000	0.00584	$ 20,000	0.0006	$ 20,000	0.0002	$ 238
					$ 4,500		$ 245,000		$ 2,520,000		$ 2,520,000		$ 2,520,000		$ 21,300
		δDF	0		=0%		0.9%		10%		26%		28%		
Downtime Costs		Downtime	0 days		1 day		2 weeks		3 months		3 months		3 months		
		7 Labor	0	0.946	1000	0.0294	15000	0.0181	90000	0.00584	90000	0.0006	90000	0.0002	$ 899
		8 Relocation	0	0.946	0	0.0294	0	0.0181	20000	0.00584	20000	0.0006	20000	0.0002	$ 133
															$ 1,031
Damage with structural slab															
Structural repair of slab by epoxy injection			0	0.946	0	0.0294	0	0.0181	0	0.00584	0	0.0006	0	0.0002	
Demolition of story 1 TI			0	0.946	0	0.0294	0	0.0181	0	0.00584	0	0.0006	0	0.0002	
Refloat of slab			0	0.946	0	0.0294	0	0.0181	0	0.00584	0	0.0006	0	0.0002	
Reconstruction of story 1 TI			0	0.946	0	0.0294	0	0.0181	0	0.00584	0	0.0006	0	0.0002	
Repair for curtain wall			0	0.946	0	0.0294	0	0.0181	0	0.00584	0	0.0006	0	0.0002	
Repair of floor-to-floor mechanical			0	0.946	0	0.0294	0	0.0181	0	0.00584	0	0.0006	0	0.0002	
Downtime costs		Downtime	0 days		0 days		0 days		0 days		0 days		0 days		
		Labor	0		0		0		0		0		0		
		Relocation	0		0		0		0		0		0		

Benefit/Cost ratio	δAAL	r	n	PV	BCR
	22000	0.07	25	$256,379	0.50

PV(AAL, 50, rate)/Structural Slab Cost

General: 2-story steel framed structure. Area of F1 = 24,689 SF

Useful life = 50 years Discount rate = 7% Benefits accumulated over 25 years (AOC Standards, 2011)

Replacement Value = $23.3M STR/NSD/NSA = 0.21, 0.43, .36

References

Campbell Anderson cost memo

Ninyo-Moore settlement estimates

Notes - Scope of Repair

1. Structural epoxy injection of floor cracking. Requires removal and replacement of floor finishes in affected areas, injection, inspection
2. In areas where more than local re-leveling of slab is needed, tenant improvements supported by slab on grade may need to be removed
3. Re-floating slab would use sand-cement over the affected area.
4. Any demolished TI needs to be re-built
5. Some areas of curtain wall may need new mullions at grade
6. M/E/P equipment spanning floor-to-floor may be wrenched by settlements
7. Significant downtime associated with re-floating of F1 slab
8. 3-month relocation associated with re-floating of F1 slab and reconstruction of F1 TI

Alternative 2 – Replace the reinforced concrete slab-on-grade with a structural slab-on-grade to reduce or eliminate damage produced by differential settlements between the pile-supported columns and the slab-on-grade that could settle with liquefying soils.

RESULT:

- A benefit-to-cost ratio (BCR) greater than 1.0 indicates a statistical expectation that the benefits of the design option considered will pay for itself in the form of reduced losses and business interruption costs.
- The BCR results indicated 0.50 benefit and is therefore not recommended

PROJECT COST ESTIMATE

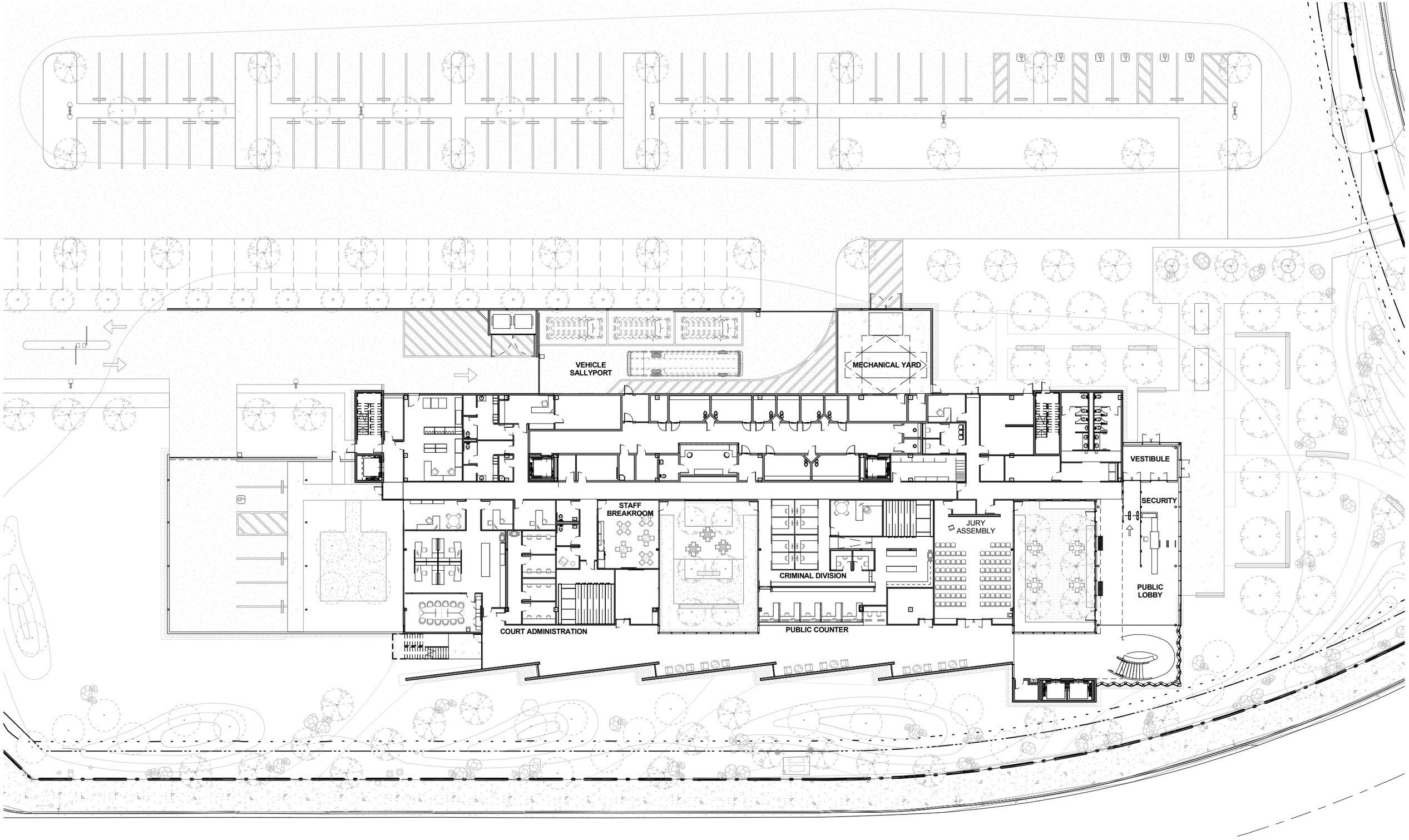
	Judicial Council Budget
Original FY 09/10 Hard Construction Cost Sub-Total	**$ 33,917,270.00**
Current FY 14/15 Hard Construction Cost Sub-Total	**$ 23,512,798.00**
Total Reductions	$ 10,404,472.00
Percent Reduced	**30.7%**
Original FY 09/10 Design-To Budget	**$ 34,877,332.00**
Current FY 14/15 Design-To Budget	**$ 26,815,386.00**
Total Reductions	$8,061,946.00
Percent Reduced	**23.1%**

SAFDIE RABINES ARCHITECTS COST ESTIMATE	**50% SD Estimate**	**100% SD Estimate**	**50% DD Estimate**
Cambell Anderson & Associates, Inc.	**$ 28,587,700.00**	**$ 26,805,800.00**	**$ 26,807,000.00**
	less than FY 14/15 Design-To Budget	*$ (9,586.00)*	*$ (8,386.00)*

INDEPENDENT COST ESTIMATE		**100% SD Estimate**	**50% DD Estimate**
O'Connor Construction Management, Inc.	-	**$ 26,288,716.00**	**$ 26,764,466.00**
	less than FY 14/15 Design-To Budget	*$ (526,670.00)*	*$ (50,920.00)*

Upcoming Milestones:

CM at Risk Contract Finalized	Late 2014 / Early 2015
100% Design Development	Early 2015
100% Working Drawings and approval to Bid	Spring 2016
Bid and Contract Award	Early 2017
Construction	Early 2017 – Late 2018
Move-In	Late 2018 / Early 2019



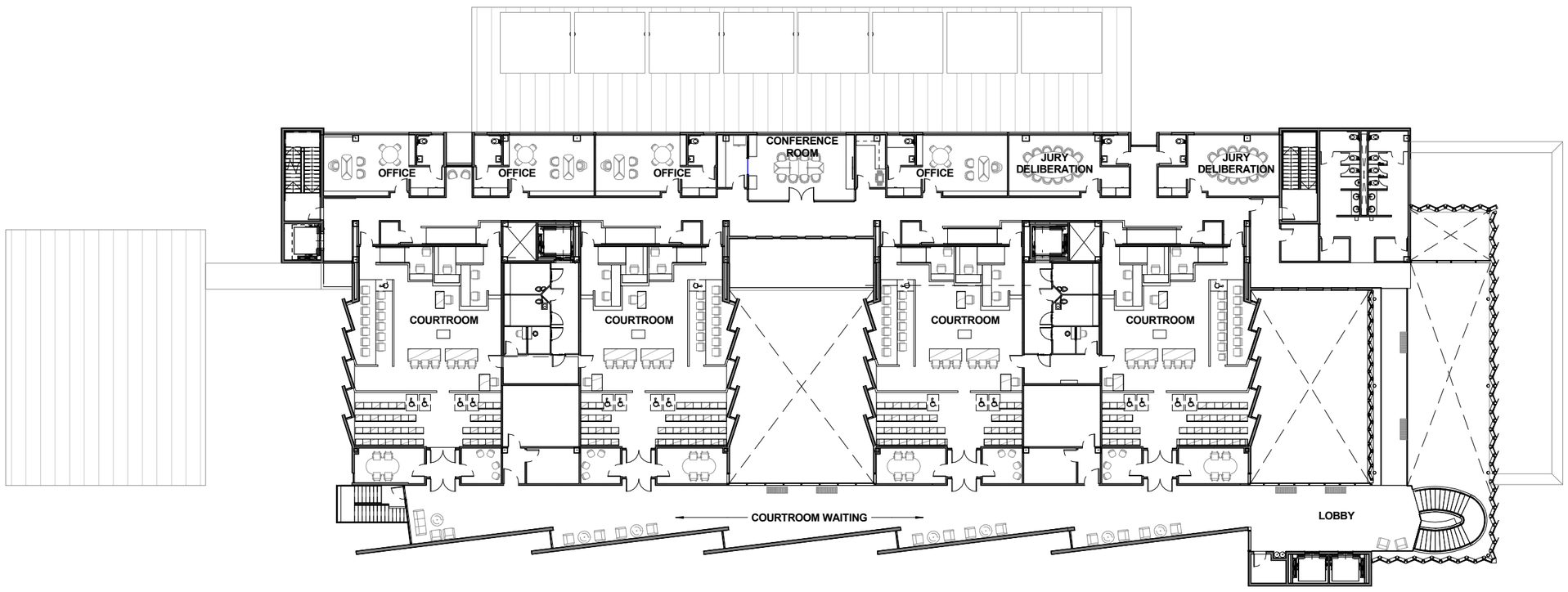
SAFDIE RABINES *ARCHITECTS*
925 Fort Stockton Drive, San Diego, CA 92103

FLOOR PLAN - LEVEL 1

1" = 30'-0"

NEW EL CENTRO COURTHOUSE

10/16/14



SAFDIE RABINES *ARCHITECTS*
925 Fort Stockton Drive, San Diego, CA 92103

FLOOR PLAN - LEVEL 2

1" = 30'-0"

NEW EL CENTRO COURTHOUSE

10/16/14

Electric Vehicle Charging Stations at California Courthouses

Policy Issues, Implementation and a Pilot Program

Court Facilities Advisory Committee:

Courthouse Cost Reduction Subcommittee Meeting

November 4, 2014

Policy Issues

- Current Issue:
  - Rise in number of electric vehicle users.
  - Use of courthouse outlets at existing facilities.
  - Some courts have implemented their own/self funded programs.

Additional Background

Executive Branch Efforts –

Executive Order B-18-12

"State agencies shall identify and pursue opportunities to provide electric vehicle charging stations, and accommodate future infrastructure where most cost-effective and appropriate."

Implementation Issues

- TCFMAC Guidelines (May 2014)
  - Courts can fund/install EV chargers through CFR process.
- Required Infrastructure
  - Electrical infrastructure can be expensive.
  - Charging technology varies.
- Who should have access to EV chargers?
  - Judges
  - Staff
  - The public

New Courthouses

Provide Infrastructure to Address Changing Technology

- Much less expensive to include necessary infrastructure during design/construction vs. retrofit after-the-fact. Cost during construction is negligible.
- “Infrastructure” could potentially include:
  - Dedicated circuit large enough to handle charging requirements;
  - Separate meter; and/or
  - Space for charger and/or actual charger.

New Courthouses

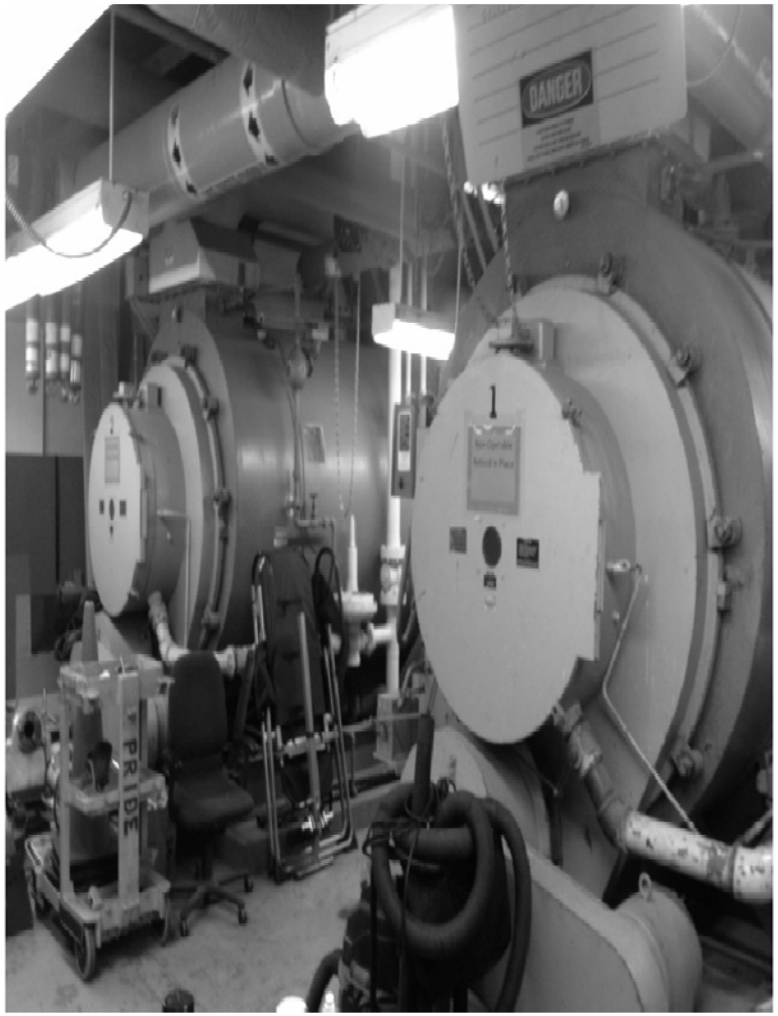
- Design Standards could:
  - Require infrastructure be included in all capital outlay projects.
  - Address where infrastructure would be installed, i.e. secured parking, staff, public, etc.
  - Address implementation issues.

Pilot Program

- Judge Ben Davidian
  Sacramento Superior Court

23
22

PRIDE


DANGER
PRIDE

EV PANEL 1
KWH METER
METER
3.5
kwh

Q & A

Solar Options for Judicial Council Facilities

Court Facilities Advisory Committee: Courthouse Cost Reduction Subcommittee Meeting

November 4, 2014

Evaluating Solar

Capital Projects

- Consider early in the project as part of integrated design.
- Solar/PV costs must be included in overall project budget.
- Judicial Council <u>not</u> eligible for Federal Tax Incentive.

Existing Facilities

- Does it makes sense to even consider solar, i.e. is the building as energy efficient as possible?

When Does it Make Sense to Pursue Solar – Existing Facility?

- Is the building already as energy efficient as possible?
- What is the building profile?
- What is the climate zone?
- Who is the utility provider/What is the rate structure?
- How old/what is the type/condition of the roof?
- Are there obstacles, i.e. tall buildings, trees, etc?

When Does it Make Sense to Pursue Solar – Capital Project?

- Is the building being built as energy efficient as possible ? (minimum standards)
- Have we maximized the site in terms of building orientation?
- Building Basics: envelope and glazing
- Mechanical Systems: HVAC and building controls
- Do renewables make sense, i.e. solar, wind, etc?

When Does it Make Sense to Pursue Solar – Capital Project?

- Is the building as energy efficient as possible (Renewables Analysis)?
- What is the building profile: low rise or high rise?
- What is the climate zone?
- Who is the utility provider/What is the rate structure?
- What type of roof? How large is the roof? Is there equipment on the roof? Size of parking lot? Land available for ground mount?

Payback Analysis

- How to pay for the solar system? Part of capital project budget? On-bill financing?
- Want to make sure you are buying the smallest system possible, therefore need to make your building as energy efficient as possible.
- When do we break even with the cost of the system versus utility costs? Depends on utility provider and rate structure.
- Reality is, different funding source. Utilities out of O&M budget, but CFPs aren't increasing while electricity costs go up minimum of 5% annually.

What Solar Programs are Available?

JC-Owned System

- JC purchases system and mounts on building, on the ground or in the parking lot (canopy system).
- JC maintains system.
- JC pays for repairs (inverter).

Power Purchase Agreement

- 20-year lease.
- Panels ground mounted or in surface parking lots.
- Private party installs, maintains, and repairs.
- Private party able to take advantage of incentives.
- JC pays reduced rate of electricity generated.

Pros & Cons

JC Owned System

- Offset long-term utility costs.
- “Net-metering” as well as selling back to the grid.
- Return on Investment? How long before “break even?”
- JC responsible for system maintenance.
- JC responsible for repairs (inverters).

Power Purchase Agreement

- Minimal upfront costs (staff time).
- No long-term maintenance requirement.
- Electric rate “reduced” for 20 year period.
- May have some contracting challenges.
- May have bond encumbrance issues.

Moving Forward

- Recommend exploring options with “obvious” projects, i.e.
  - Size of building
  - Climate
  - Utility Provider
  - Where in design phase?
- Report back to committee
  - Analysis impacts on building envelop, mechanical systems, etc.
  - Potential break even analysis

SYSKA HENNESSY
GROUP

CONSULT + ENGINEER + COMMISSION

Building HVAC Systems for Courthouses

Gary Brennen, PE, LEED AP, CRM Co-President
Rob Bolin, PE, LEED Fellow, HBDP, Senior Vice President

10/6/2014

Building HVAC Systems for Courthouses

AGENDA

- Setting the Stage
- 2006 & 2011 California Trial Court Facility Standards
- Impact of California's varied climate zones
- Building massing and geometry – HVAC planning
- Central plant systems
- Comfort cooling and distribution systems – conventional and innovative
- Specialty ventilation systems
- The "abilities" – flexibility, reliability, serviceability, affordability, sustainability
- Q&A

Building HVAC Systems for Courthouses

SETTING THE STAGE

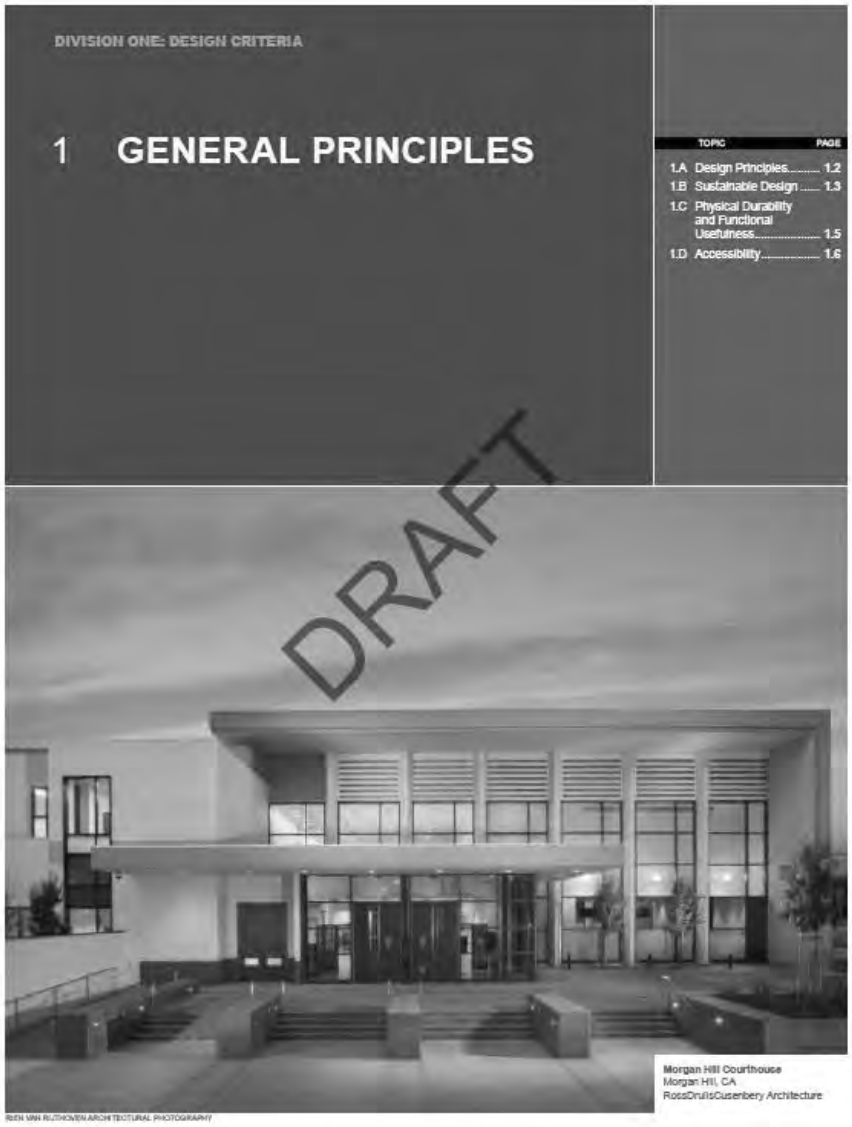
Typical Court Building HVAC System

- 10% of total construction cost
- 20% of total O&M and Lifecycle Expense
- 40 – 50% of total building energy consumption

Building HVAC Systems for Courthouses

2006/2011 Judicial Council Design Standards - General

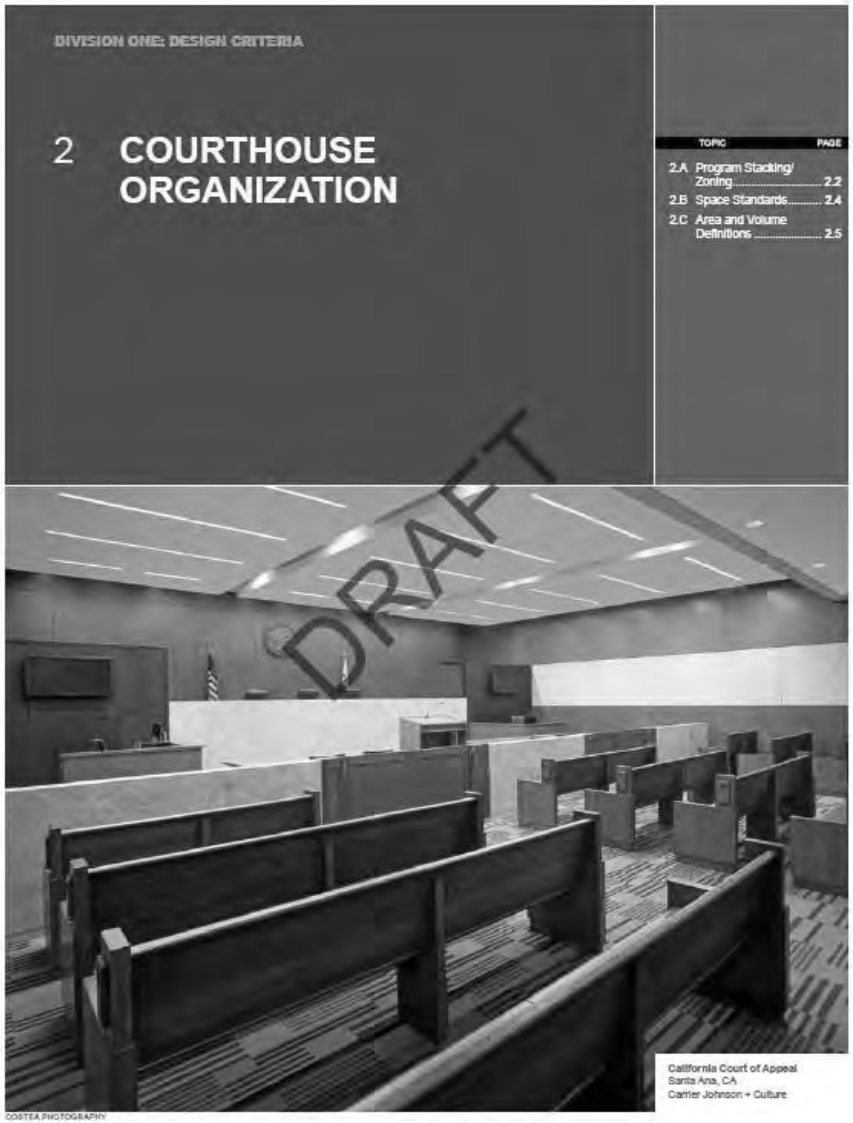
- Chapter 1 – General Principles
  - Design Principles
    - Design Excellence
    - Flexibility and Growth
    - Small, Medium and Large Courthouses
  - Sustainable Design
    - Objectives
    - Design Criteria / Performance Goals
    - Energy Savings Programs
  - Physical Durability and Functional Usefulness
    - Life Cycle Cost Analysis



Building HVAC Systems for Courthouses

2006/2011 Judicial Council Design Standards - General

- Chapter 2 – Courthouse Organization
  - Area and Volume Definition
    - Predesign Planning Factors for Mechanical and Electrical Equipment Spaces



Building HVAC Systems for Courthouses

2011 AOC Standards - HVAC

- Chapter 13 – Mechanical Criteria
  - Objectives
  - HVAC Criteria
  - Humidification, Water Treatment
  - Specific Spaces Requirements
  - Plumbing and Piping Criteria
  - Insulation
  - Instrumentation

DIVISION TWO: TECHNICAL CRITERIA

13 MECHANICAL CRITERIA

TOPIC	PAGE
13.A Objectives	13.2
13.B HVAC Criteria	13.2
13.C Humidification and Water Treatment	13.10
13.D Mechanical Requirements for Specific Spaces	13.10
13.E Plumbing and Piping Systems Criteria	13.12
13.F Insulation	13.16
13.G Thermometers and Gauges	13.16

DRAFT

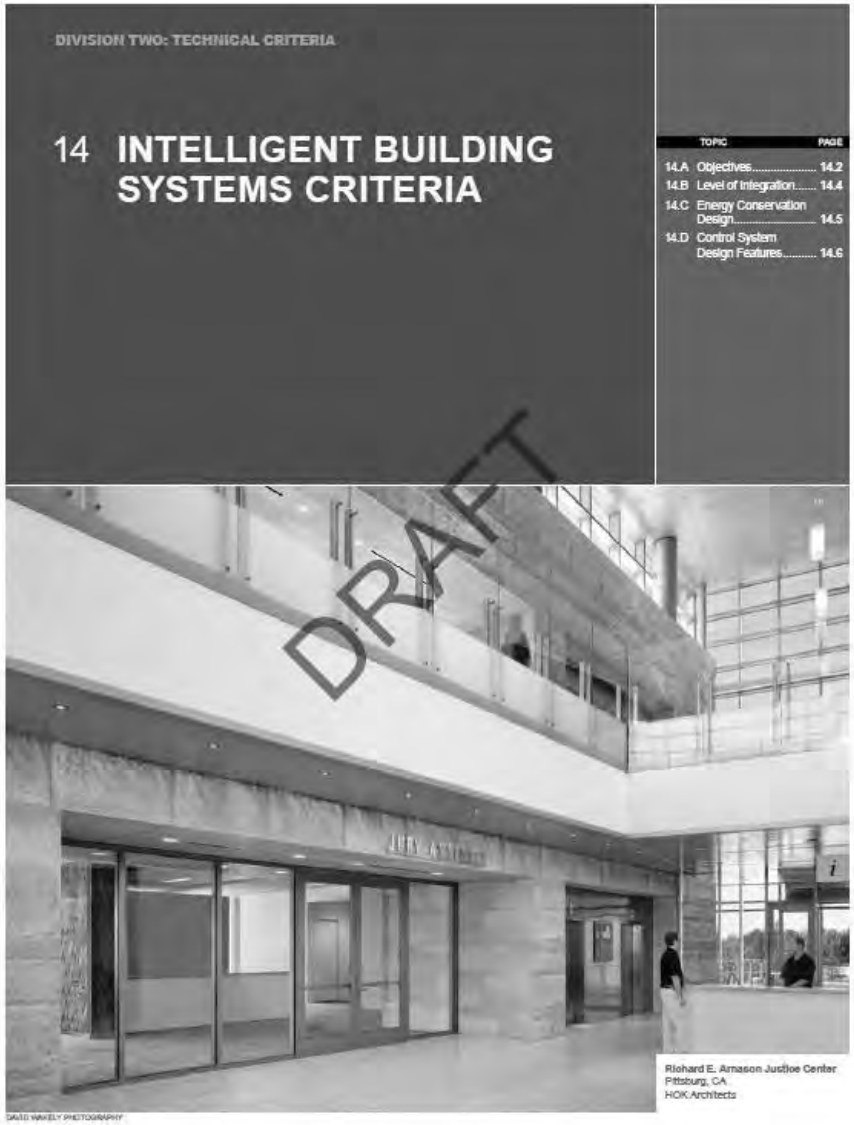
Morgan Hill Courthouse
Morgan Hill, CA
RossDrulisCusenbery Architecture

BEN VAN RUTHOVEN ARCHITECTURAL PHOTOGRAPHY

Building HVAC Systems for Courthouses

2011 AOC Standards - IBS

- Chapter 14 – Intelligent Building Systems Criteria
  - Objectives
  - Level of Integration
  - Energy Conservation Design
  - Control System Design Features


DIVISION TWO: TECHNICAL CRITERIA

14 INTELLIGENT BUILDING SYSTEMS CRITERIA

TOPIC	PAGE
14.A Objectives	14.2
14.B Level of Integration	14.4
14.C Energy Conservation Design	14.5
14.D Control System Design Features	14.6

DRAFT

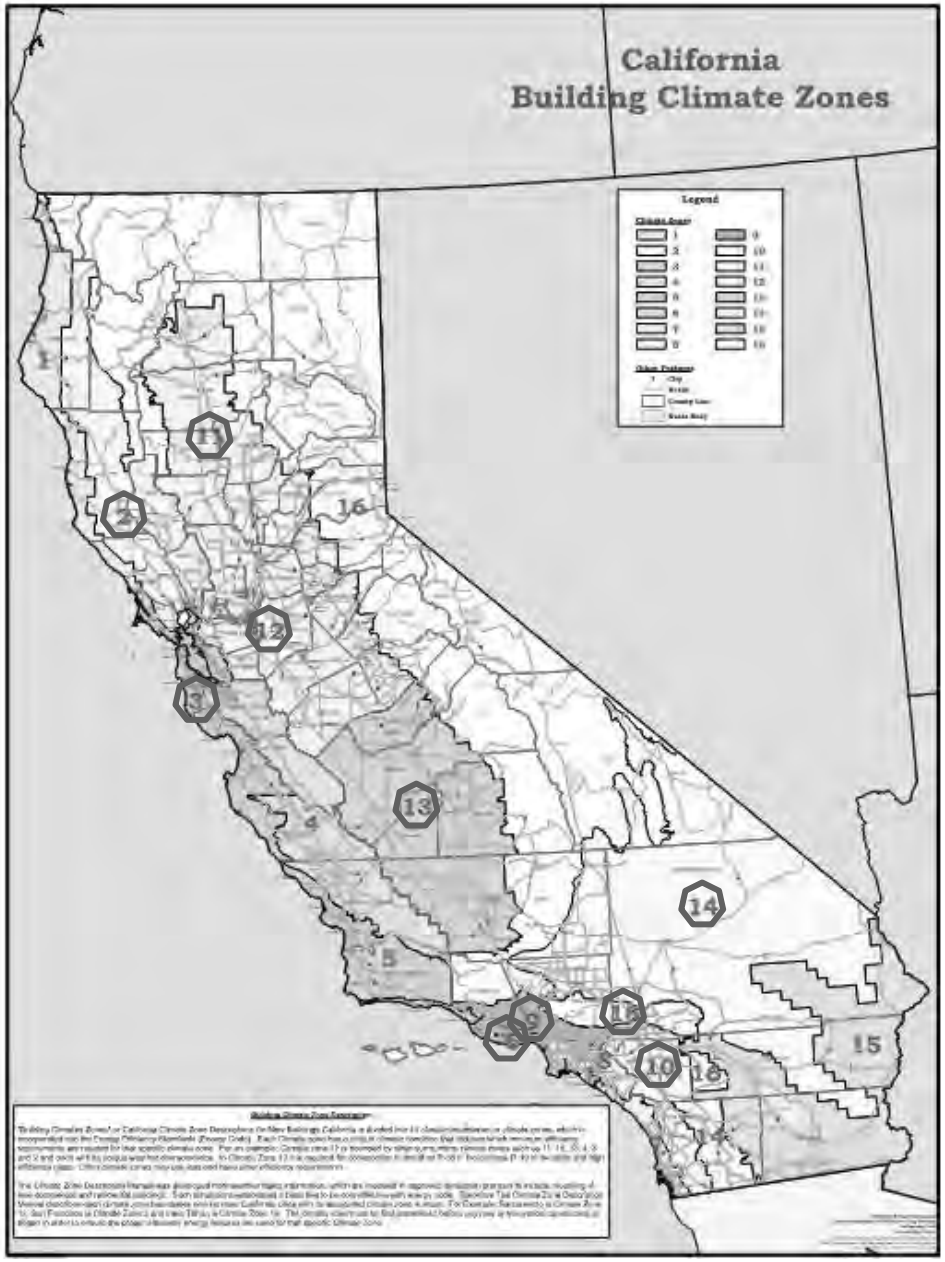
Richard E. Arnason Justice Center
Pittsburg, CA
HOK Architects

DAVID WAKELY PHOTOGRAPHY

Building HVAC Systems for Courthouses

California's Climate Zones

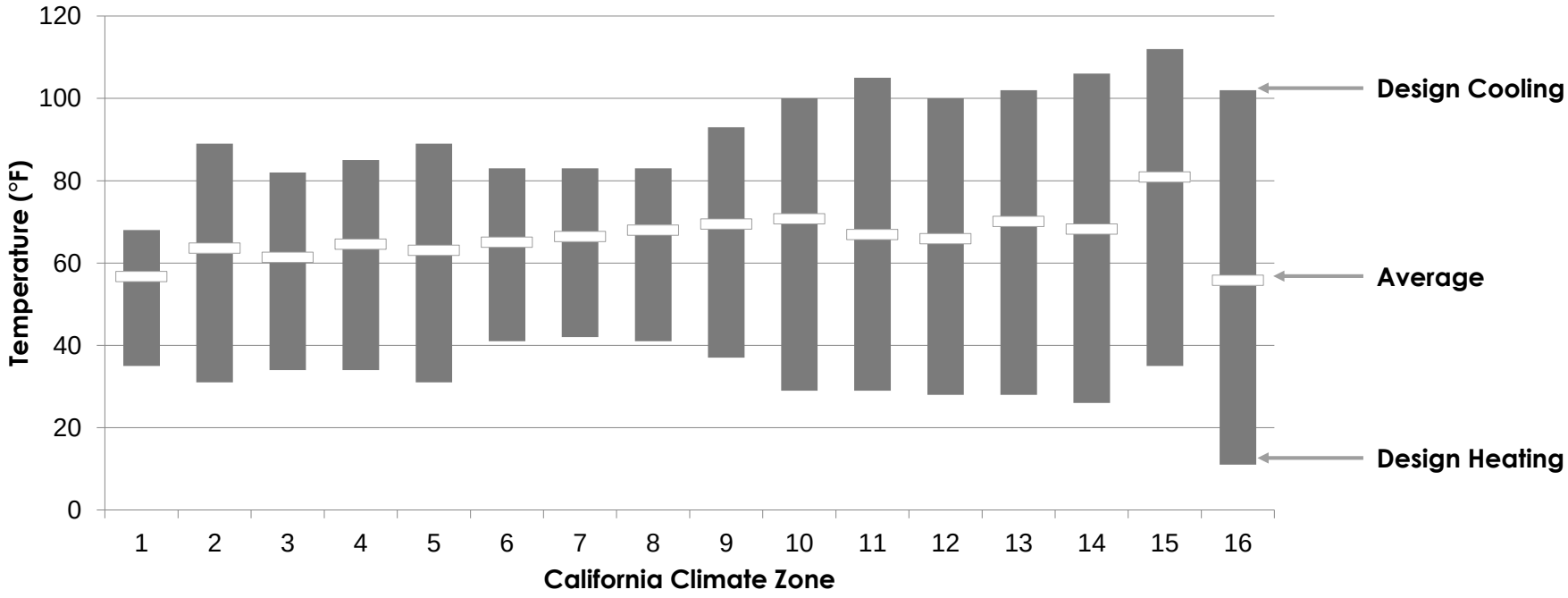
Courthouse Project	Climate Zone
Projects Starting Design in July 2014	
El Dorado – New Placerville Courthouse	12
Inyo – New Inyo County Courthouse	16
Mendocino – New Ukiah Courthouse	2
Riverside – New Riverside Mid-County Courthouse	10
Santa Barbara - New Santa Barbara Criminal Courthouse	6
Shasta – New Redding Courthouse	11
Sonoma – New Santa Rosa Criminal Courthouse	2
Stanislaus – New Modesto Courthouse	12
Tuolumne – New Sonora Courthouse	12
Projects Starting Design After July 2015	
Fresno – Renovate Fresno County Courthouse	13
Kern – New Delano Courthouse	13
Kern – New Mojave Courthouse	14
Los Angeles – New Glendale Courthouse	9
Los Angeles – New Santa Clarita Courthouse	9
Los Angeles – New Southeast Los Angeles Courthouse	9
Monterey – New South Monterey County Courthouse	3
Nevada – New Nevada City Courthouse	11
Placer – New Tahoe Area Courthouse	16
Plumas – New Quincy Courthouse	16
Sacramento – New Sacramento Criminal Courthouse	12



Building HVAC Systems for Courthouses

California's Climate Zones

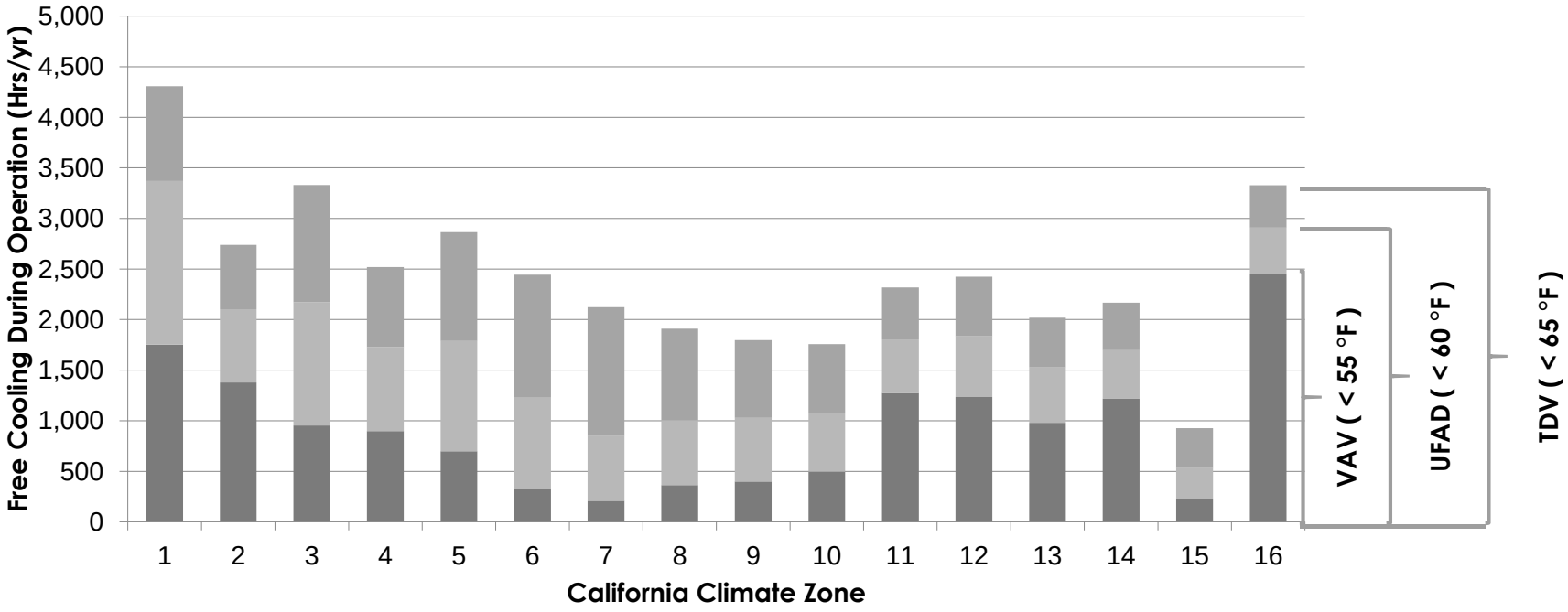
- Temperature bands by climate zone



Building HVAC Systems for Courthouses

California's Climate Zones

- Free cooling hours/yr by climate zone for 3 system types

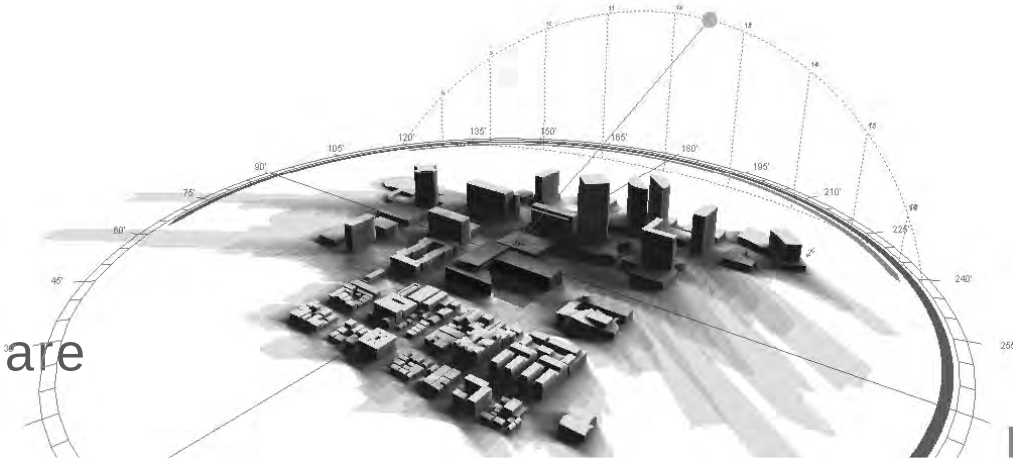


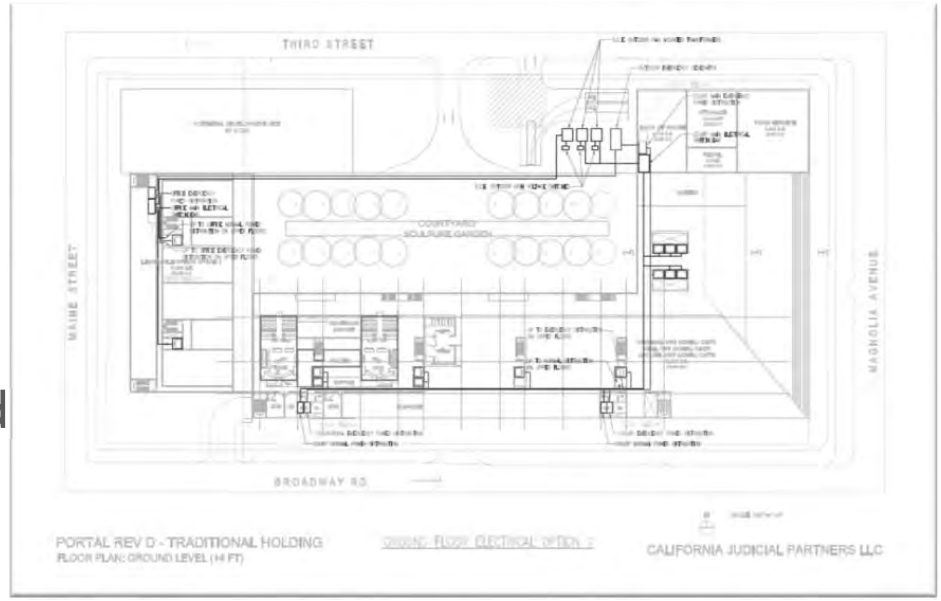
VAV – Variable Air Volume
UFAD - Underfloor Air Distribution
TDV – Thermal Displacement Ventilation

Building HVAC Systems for Courthouses

Building Geometry /Massing – HVAC Planning

- Geometry and Massing Matter Because:
  - HVAC equipment sizes are impacted
  - HVAC equipment locations are impacted
  - HVAC system types are impacted
  - Energy consumption and costs are impacted

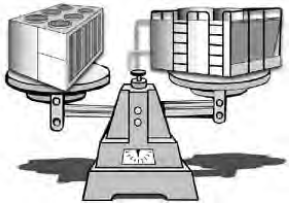


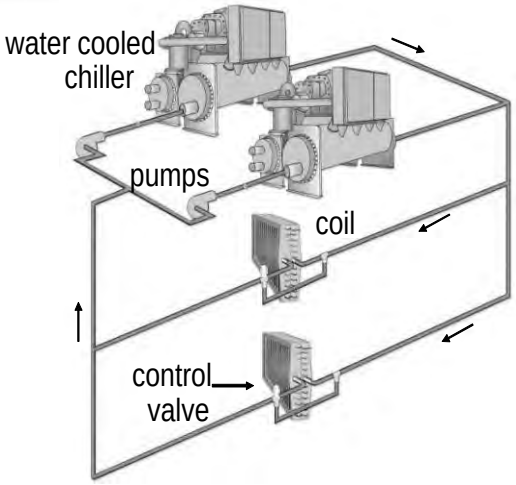


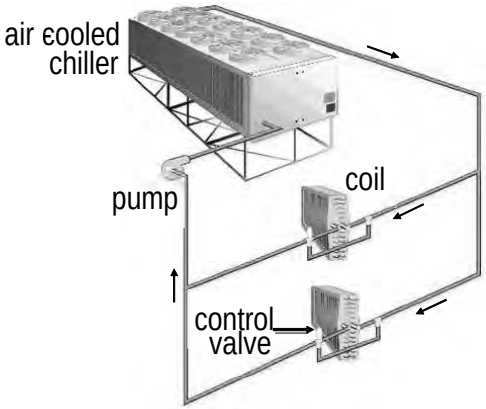
Building HVAC Systems for Courthouses

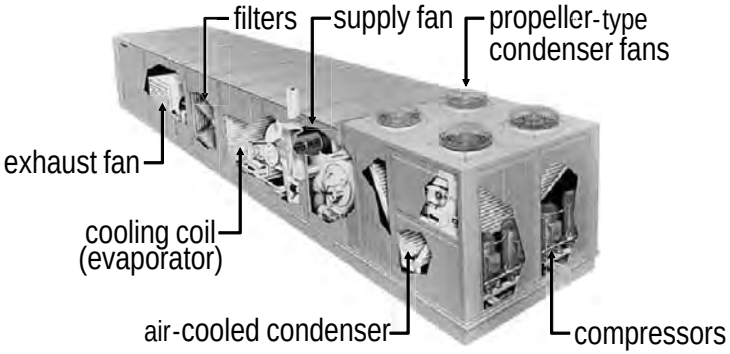
Central Plant Systems

- Water-Cooled Chiller Plant
- Air-Cooled Chiller Plant
- Packaged Equipment
- Where do they go?
- What are the operational considerations?





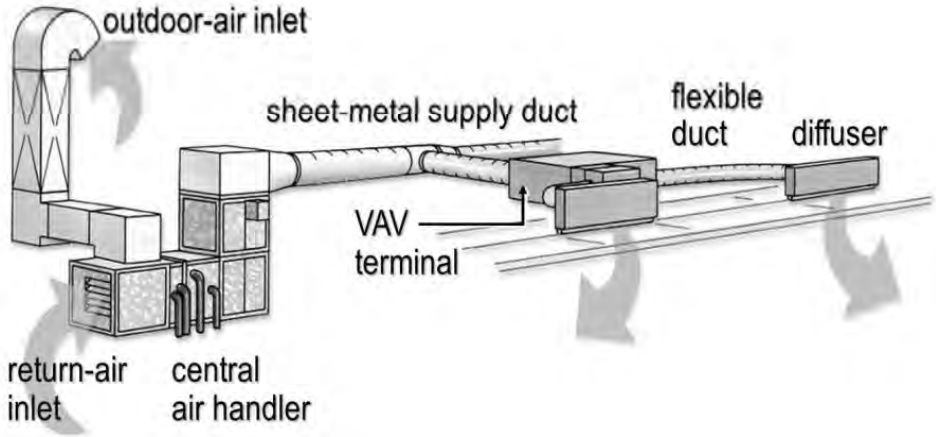


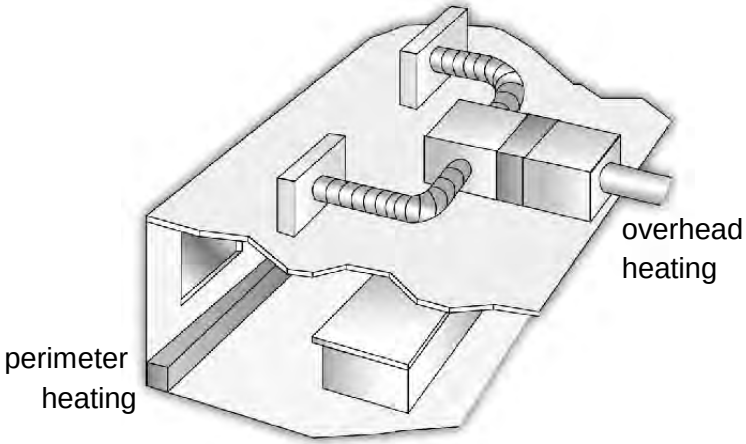


Building HVAC Systems for Courthouses

Comfort Cooling - Conventional

- Variable Air Volume
  - With reheat
- Fan Coil Units
- Perimeter heating convectors

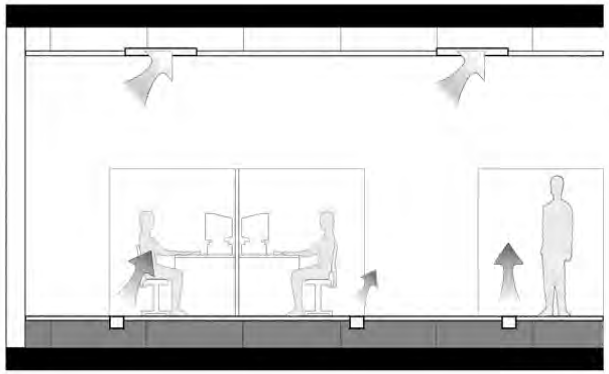


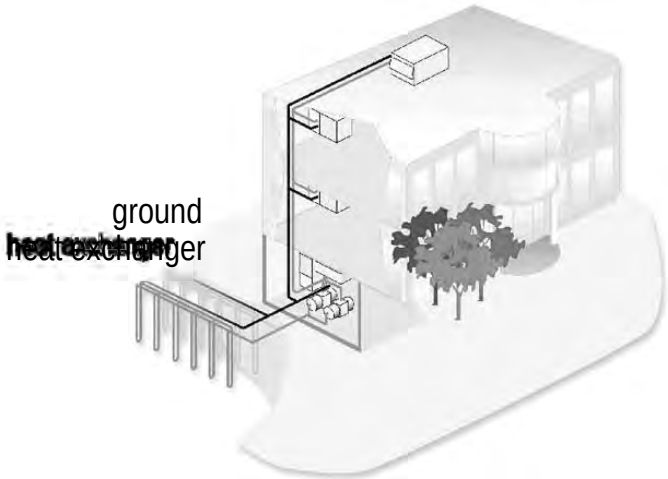


Building HVAC Systems for Courthouses

Comfort Cooling - Innovative

- Displacement ventilation/UFAD
- Radiant cooling / heating slabs and surfaces
- Chilled Beams and Sails – active and passive
- Ground source cooling / heat rejection
- Variable Refrigerant Flow / Volume (VRF / VRV)
- Natural Ventilation?

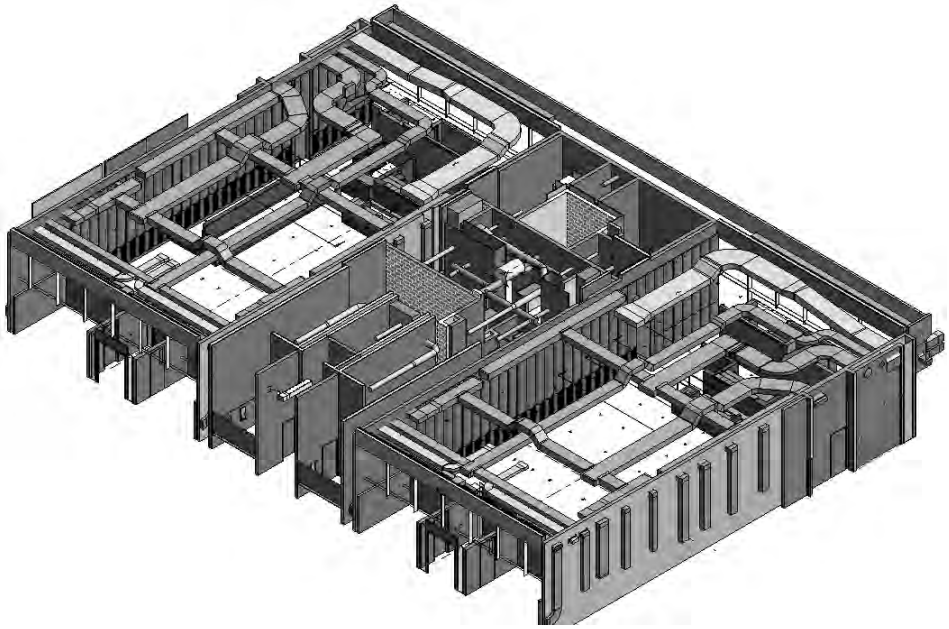


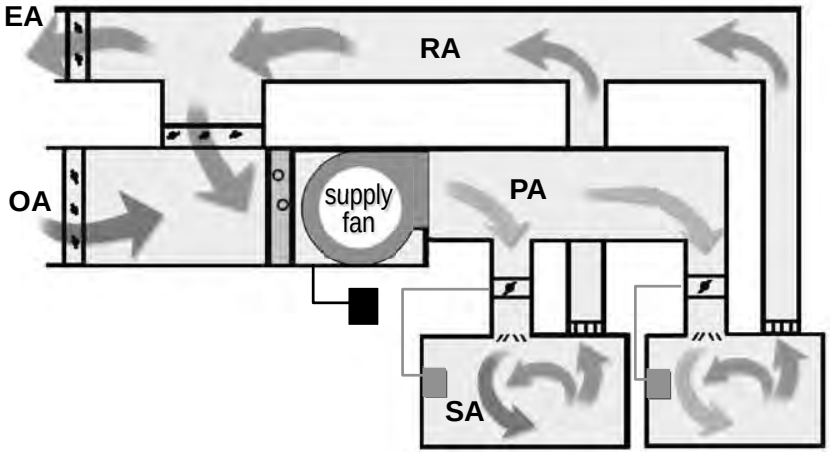


Building HVAC Systems for Courthouses

Specialty Ventilation Req'ts

- Holding areas
- Mail rooms
- Sallyports
- Building Pressurization





Building HVAC Systems for Courthouses

The "Abilities"

- Flexibility/Adaptability
- Reliability
- Serviceability/Maintainability
- Affordability
- Sustainability

QUESTIONS AND DISCUSSION

Thank You
FOR YOUR TIME

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SYSKA HENNESSY GROUP

Enhanced Seismic Performance

Earthquake Performance Goals

- Trial Court Facilities Standard requires a choice: Normal or Enhanced Seismic Performance criteria
- Normal Seismic Performance is minimum required by the California Building Code (CBC)
- Enhanced Seismic Performance would reduce damage & shorten time to regain functional occupancy after an earthquake

Earthquake Performance Goals

- Our primary focus on business continuity – time to functional recovery after an earthquake. Life Safety is provided by either performance criteria
- Staff considers the seismic performance criteria based on vulnerability, risk & consequence of business interruption to Superior Court, caused by seismic activity at the individual building site.

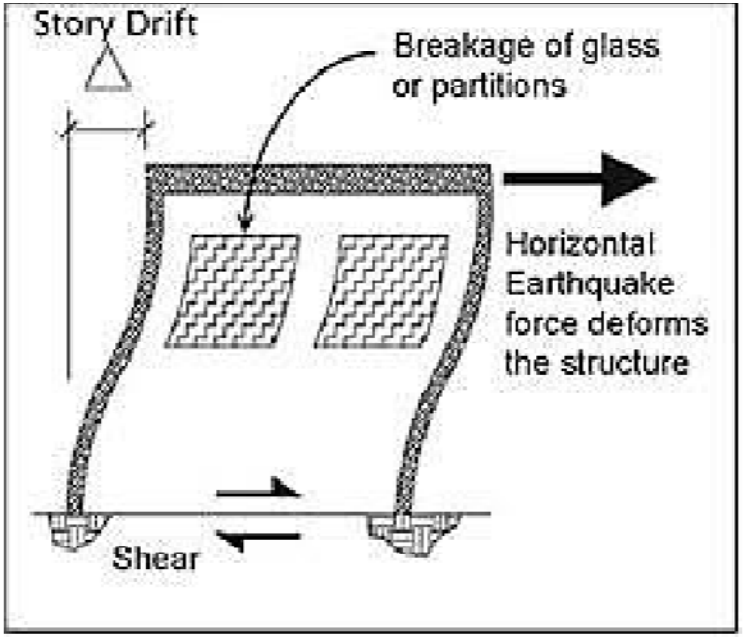
Building Code Earthquake Performance Goals

- “Life-Safety”
- Few buildings (<10%) should collapse in the maximum expected earthquake shaking
- Measures that impact construction industry usually must pass the “Show me the bodies” test
- Big EQ in Dense Area = Much Dislocation

Starting Point for Court Buildings

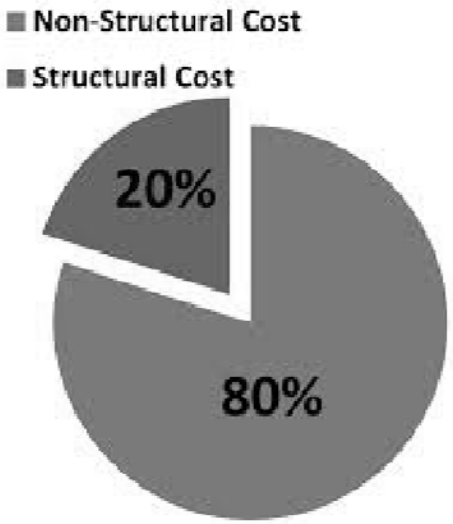
- Court buildings already enhanced by an Importance Factor, I = 1.25
  - Why?
    - Primary Occupancy is Assembly with Occupant Load > 300
  - Result
    - Less lateral drift
    - More lateral strength

Earthquake (EQ) Fundamentals
Lateral Force and Drift



Types of EQ Damage

- Nonstructural Components
  - Accounts for 80% of EQ Losses
- We're Dealing with Modern Buildings
  - Duck and Cover, not Run for Your Life



EQ Damage Causes

- Drift-Sensitive Components
  - Exterior Cladding
  - Full Height Partitions
  - Doors and Door Hardware
  - Stairs and Elevators
- Acceleration-Sensitive Components
  - Acoustic Tile Ceilings/ Lights
  - Mechanical Equipment
  - Contents

Enhanced Performance Goals

- Intended to provide greater “Business Continuity“ protection
- Simple Code I-factor approach assumes that control of drift is most important
  - Code increases strength as well, which makes acceleration (i.e. shaking) even higher

What Happens When Council Picks Enhanced Seismic Performance

- Structural systems and criteria are compared for ability to limit damage
- Peter will present the formal process in a few minutes
- I will use Long Beach as an example of simple approach

Damage Prevention

- Drift-Sensitive Components
  - Reduce drift by using a stiffer lateral force resisting system
- Acceleration-Sensitive Components
  - Accept that shaking will be stronger
  - Anchor and/or brace nonstructural components accordingly
  - Accept contents spillage and damage

Damage Prevention

Success

Damage Prevention

Damage Prevention

Enhanced Criteria – Long Beach

Enhanced seismic performance seeks to limit damage for the Code design earthquake to "light" (in accordance with FEMA 356, Table C1-2) to allow for occupancy within a few weeks following a major earthquake. To reach this performance level, the design team is expected to provide a building configuration, structural system, and attention to design that control the amount and type of damage. In addition, seismic protection of nonstructural components shall be addressed.

Enhanced Criteria – Long Beach

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Enhanced Criteria – Long Beach

Considering the importance of proper operation of security doors, vertical transportation systems, and exterior envelope to a courthouse facility, loss of use associated with earthquake damage is more likely to be associated with interstory drift than floor acceleration.

The seismic design criteria herein imposes a more stringent interstory drift limit than is mandated by the minimum standard of the Building Code on this basis.

Enhanced Criteria – Long Beach

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The seismic design criteria herein imposes a more stringent interstory drift limit than is mandated by the minimum standard of the Building Code on this basis.

Enhanced Criteria – Long Beach

SEISMIC DESIGN CRITERIA

1. Occupancy Category: III
2. Seismic Importance Factor, I: 1.25
3. Story Drift Limit: $0.010h_{sx}$
   Note that this limit is more restrictive than the minimum requirement of the CBC

Enhanced Criteria

- Further Limits on Drift Probably Key

- Favors Braces & Shear Walls vs. Frame Buildings
  - Potential Appearance Impacts
  - Reduces Useable Floor Area
  - May be Functional Compromises

New Court Building Design – Sensitivity To Business Interruption

How to determine whether a new court building should be designed for an Enhanced Seismic Performance objective?

What criteria should be established?

- By facility relative regional importance?
- By rural vs. urban?
- By number of courtrooms?
- By number of stories?
- By type of building systems and construction?
- By level of seismic hazard?

What is acceptable time to regain function and normal operations?
What is needed to achieve functional recovery?

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What is needed to achieve functional recovery?

California Trial Court Facility Standards (2006 / 2011)

Chapter 4: Courthouse Security

- Threat assessment, setbacks, hardening, blast pressures, progressive collapse

Chapter 12: Structural Criteria

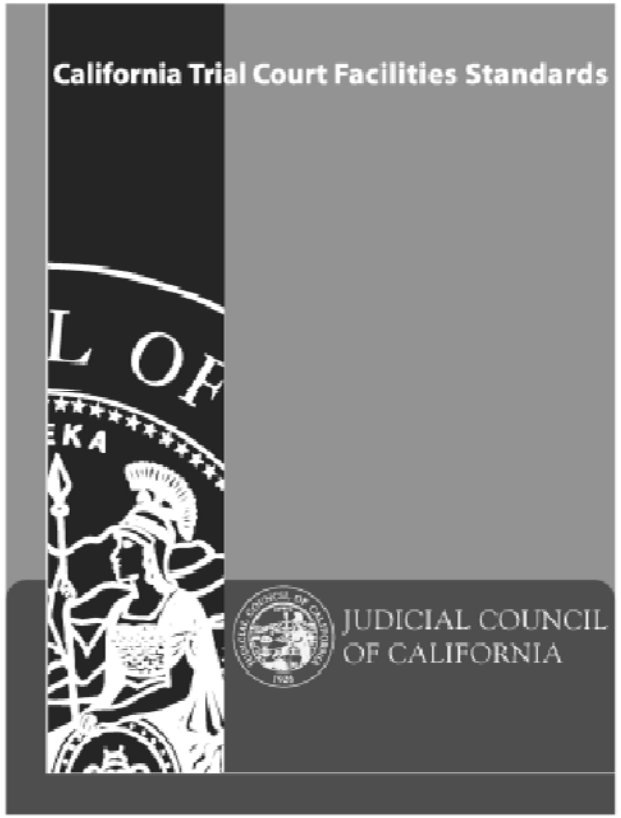
- Structural systems, service loads, rare loads - earthquakes, wind
- Nonstructural Components

Seismic Performance Objectives

- "Normal" Life-safety (CBC)
- "Enhanced" Performance based design

Life-Cycle & Cost/Benefit Analysis

- 25-yr return period



California Trial Court Facility Standards (2006 / 2011)

Intent of Seismic Performance Objectives

a. "Normal" Seismic Performance Objective
   - Code-minimum design criteria
   - Emphasis on cost effective solutions

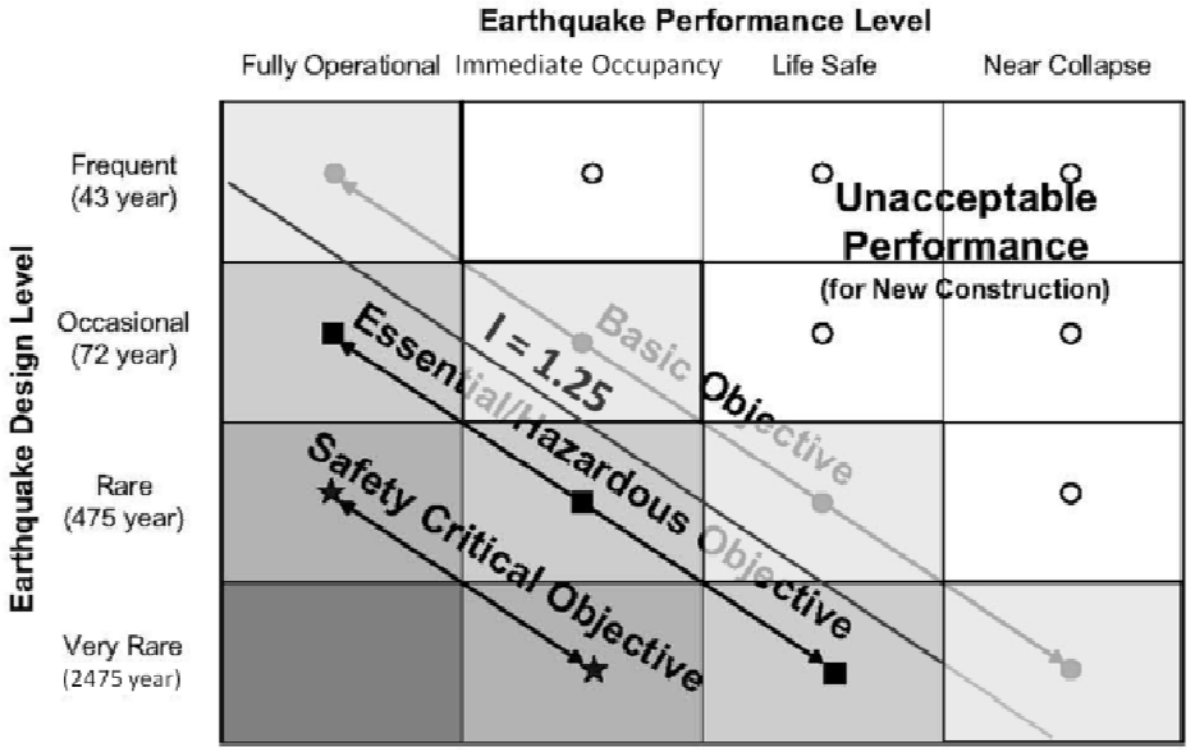
b. "Enhanced" Seismic Performance Objective
   - Better than code-minimum design
   - Level of performance is not well-defined

c. Design goal to achieve better performance without increase in cost

d. Emphasis on non-structural components

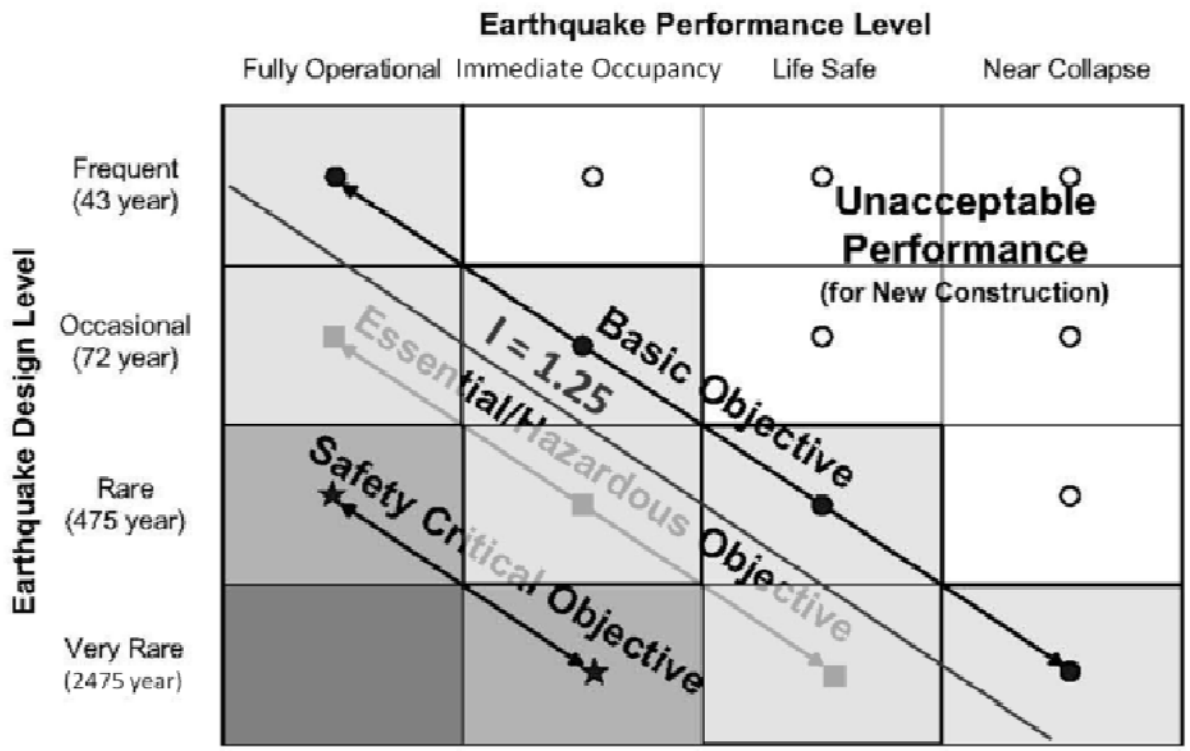
e. Life-Cycle Analysis leading to inform long-term decision making

“Normal” Seismic Performance Objective



SEAOC BLUE BOOK (1999)

“Enhanced” Seismic Performance Objective



SEAOC BLUE BOOK (1999)

US Resiliency Council (USRC)
Earthquake Performance Rating System (EPRS)

USRC EPRS – The Time Has Come

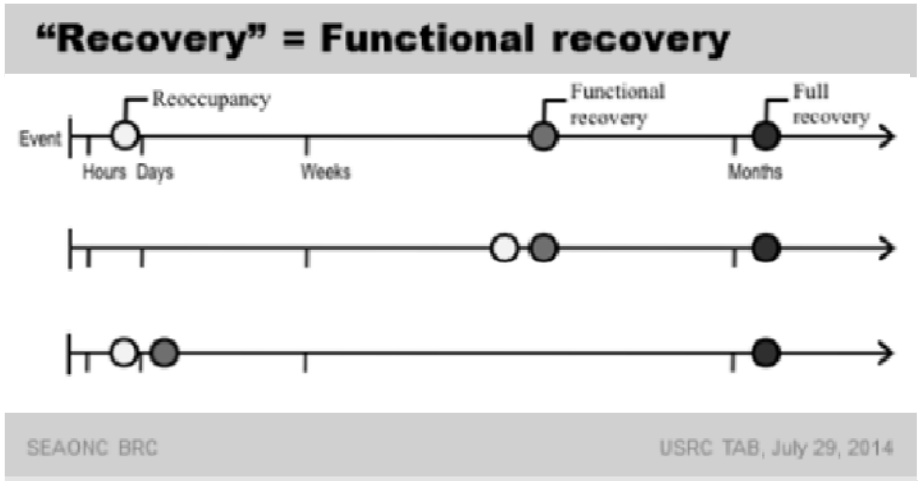
a. 3-Dimensions
   - Safety Rating
   - Repair Cost Rating
   - Functional Recovery Rating

b. Definitions and thresholds

c. Methodologies and software tools
   - FEMA P-58 + new tools (SP3)
   - ASCE 31/41 w/ translations
   - REDi (ARUP) rating system
   - FEMA 154 w/translations

Formerly: "Deaths, Dollars and Downtime"

Time To Regain Function



1. Re-occupancy
2. Functional Recovery
3. Full Recovery

Functional recovery *is defined as the* ***ability to occupy the building and perform basic intended functions*** *assuming that external infrastructure (e.g. utilities, transportation) have been restored to a point that does not appreciably limit access or provision of services to the building.* ***Re-occupancy*** *is defined as the* ***ability to occupy the building without the presence of life safety hazards resulting from structural or nonstructural damage or hazardous materials****. Either or both functional recovery and re-occupancy may be delayed because of damage or post-event conditions in the surrounding area, which are not considered in this rating. Generally re-occupancy will occur prior to functional recovery.*

Functional Recovery Rating (USRC EPRS - draft 10/7/2014)

Functional Recovery Rating	
✌ ✌ ✌ ✌ ✌	**Within days** Performance will likely result in Functional Recovery within hours to days.
✌ ✌ ✌ ✌	**Within weeks** Performance will likely result in Functional Recovery that is delayed a week or more.
✌ ✌ ✌	**Within months** Performance will likely result in Functional Recovery that is delayed for at least one month.
✌ ✌	**More than 6 months** Performance will likely result in Functional Recovery that is delayed for at least six months.
✌	**More than one year** Performance will likely result in Functional Recovery that is delayed for least one year or more.
NE	**Not Evaluated** This dimension has not been evaluated.

Considerations in Design of Judicial Council Court Buildings

Identify Key Project Criteria and Vulnerabilities

- How sensitive is facility to business interruption as a result of moderate to major earthquake event?
- What is acceptable time to functional recovery for facility?
- Determine what redundancies in court facilities exist to allow for potential prolonged business interruptions.
- Determine site-specific seismic hazards during programming and site-acquisition phases.

Considerations in Design of Judicial Council Court Buildings

Evaluate Functional Recovery and Relative Cost Impacts

- Consider schematic level design alternatives for “Normal” and “Enhanced” seismic performance objectives during early design phases.
- Evaluate alternative design options for relative project specific seismic risk and long-term life-cycle analysis based on 25-year return period.
- Determine and compare long-term average annual expected losses, cost benefit, business interruption and annual return on initial capital investments.
- Make recommendation / decision for “normal” vs. “enhanced” seismic performance objective.

Considerations in Design of Judicial Council Court Buildings

Integrating Into the Courthouse Design Process

Schematic Design Phase – Develop three structural system options

- “Normal” seismic performance
- “Enhanced” seismic performance
- Structural systems description, design criteria & summary structural quantities
- contractor cost-estimates

50% Design Development Phase

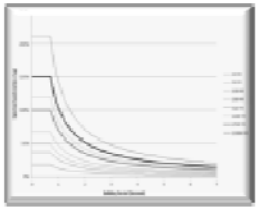
- Seismic risk assessment & life-cycle analysis (LCA)
- Provide stakeholder decision making criteria

100% Design Development Phase

- Final system design & cost validation

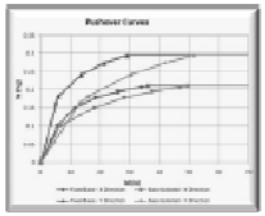
Seismic Risk Assessment & Life-cycle Cost Analysis

HAZARD



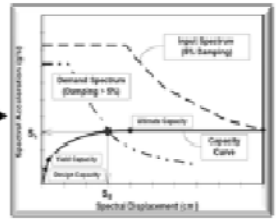
Code based seismic demand

CAPACITY



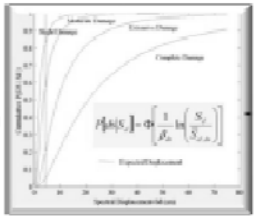
Capacity curve for each building type

DEMANDS



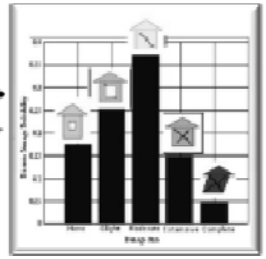
Resulting displacements and forces

FRAGILITY



Damage as function of demands

DAMAGE



Damage as function of seismic demands

VALUE

Building Elements	Value: Base Isolated Scheme (BI + BRBF + SMF)	Value: Conventional System (BRBF + SMF)
Building (excluding sitework)	~ $271,600,000	~ $266,100,000
Structure	~ $55,670,000 (21%)	~ $57,040,000 (21%)
Nonstructural Drift Sensitive	~ $106,040,000 (40%)	~ $108,640,000 (40%)
Nonstructural Acceleration Sensitive	~ $103,390,000 (39%)	~ $105,920,000 (39%)
Building Contents	~ $135,000,000	~ $135,000,000
Business Interruption	Based on 2-year replacement duration	Based on 2-year replacement duration
Moving costs	~ $10/sf	~ $10/sf
Temporary rental costs	~ $3.50/sf/month	~ $3.50/sf/month
Temporary space improvements	~ $100/sf	~ $100/sf

Building replacement and business interruption costs

LOSS

$$
Capital
Contents
Business
Interruption
$$

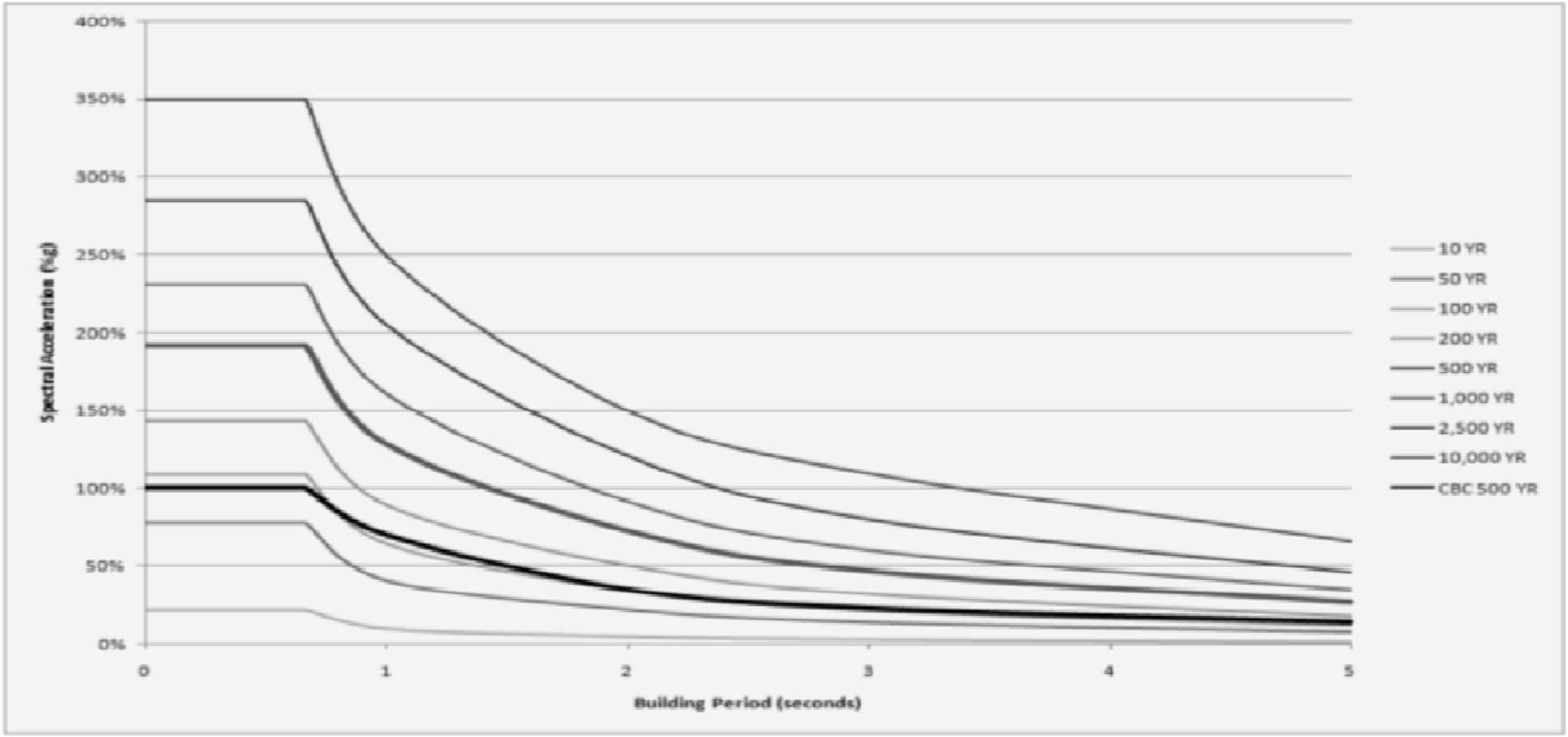
Seismic Risk Assessment & Life-cycle Cost Analysis

Building values

Building Elements	Value	
	Base Isolated Scheme (BI + BRBF + SMF)	**Conventional System (BRBF + SMF)**
Building (excluding sitework)	~ $271,600,000	~ $265,100,000
Structure	~ $55,670,000 (21%)	~ $57,040,000 (21%)
Nonstructural Drift Sensitive	~ $106,040,000 (40%)	~ $108,640,000 (40%)
Nonstructural Acceleration Sensitive	~ $103,390,000 (39%)	~ $105,920,000 (39%)
Building Contents	~ $135,000,000	~ $135,000,000
Business Interruption	Based on 3-year replacement duration	Based on 3-year replacement duration
Moving costs	~ $10/sf	~ $10/sf
Temporary rental costs	~ $3.50/sf/month	~ $3.50/sf/month
Temporary space improvements	~ $100/sf	~ $100/sf

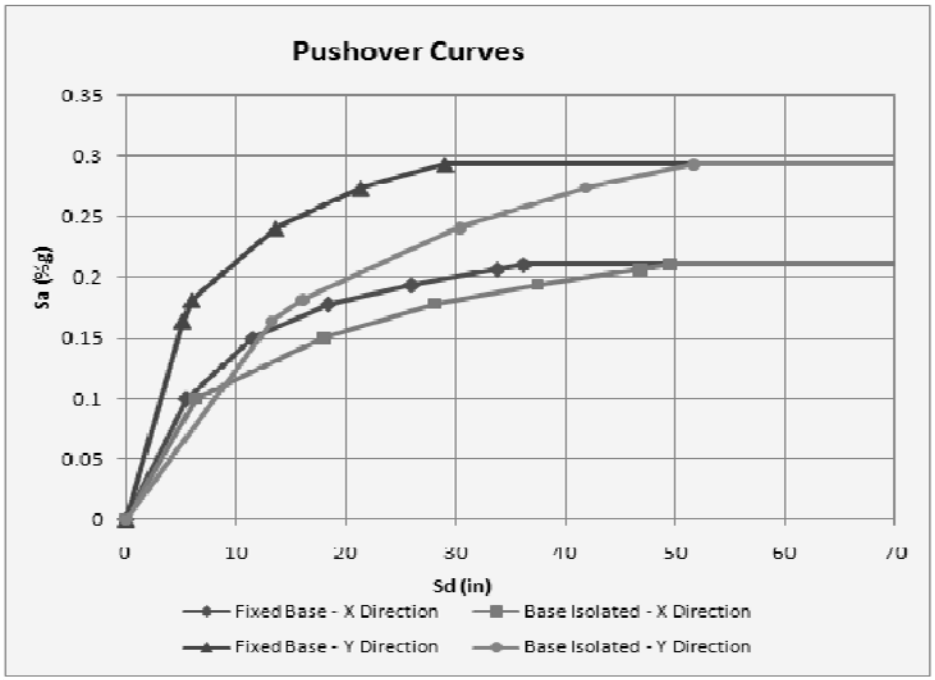
Seismic Risk Assessment & Life-cycle Cost Analysis

Site specific ground motion spectra



Seismic Risk Assessment & Life-cycle Cost Analysis

Building capacity curves



Building fragility values

Building Elements	Damage State			
	2%	10%	50%	100%
Building	Median value of building **superstructure** displacement or acceleration at damage state			
Structure	3.6”	7.2”	21.6”	57.6”
Nonstructural Drift Sensitive	5.9”	11.6”	36.0”	72.0”
Nonstructural Acceleration Sensitive	0.30g	0.6g	1.2g	2.4g
Building Contents	0.30g	0.6g	1.2g	2.4g
	Business relocation time at damage state			
Business Interruption	0	90 days	360 days	1080 days

Seismic Risk Assessment & Life-cycle Cost Analysis

Expected losses as function of recurrence interval (X-Direction)

Annual recurrence interval and probability of occurrence		Expected Loss (in $ Millions) X-DIRECTION: Baseline Conventional System (BRBF + SMF)		Enhanced Base Isolated Scheme (BI + BRBF + SMF)	
10 YR	10.00%	STR:	$ 0.5	STR:	$ 0.0
		NSTR:	$ 0.4	NSTR:	$ 0.0
		BI:	$ -	BI:	$ -
		TOTAL:	$ 0.9	TOTAL:	$ 0.1
50 YR	2.00%	STR:	$ 6.3	STR:	$ 1.2
		NSTR	$ 7.8	NSTR	$ 0.9
		BI:	$ 48.4	BI:	$ -
		TOTAL:	$ 62.3	TOTAL:	$ 2.1
100 YR	1.00%	STR:	$ 10.8	STR:	$ 2.6
		NSTR.	$ 13.4	NSTR.	$ 2.6
		BI.	$ 50.8	BI.	$ -
		TOTAL:	$ 75.0	TOTAL:	$ 5.2
200 YR	0.50%	STR:	$ 16.1	STR:	$ 4.2
		NSTR:	$ 20.6	NSTR:	$ 4.8
		BI:	$ 53.7	BI:	$ -
		TOTAL:	$ 90.4	TOTAL:	$ 9.0
500 YR	0.20%	STR:	$ 25.3	STR:	$ 8.8
		NSTR:	$ 35.4	NSTR:	$ 11.2
		BI:	$ 59.7	BI:	$ 49.6
		TOTAL:	$ 119.4	TOTAL:	$ 69.5
1,000 YR	0.10%	STR.	$ 32.8	STR.	$ 14.3
		NSTR:	$ 49.2	NSTR:	$ 19.3
		BI.	$ 65.9	BI.	$ 52.5
		TOTAL:	$ 147.9	TOTAL:	$ 86.1
2,500 YR	0.04%	STR:	$ 41.2	STR:	$ 22.0
		NSTR:	$ 67.4	NSTR:	$ 32.6
		BI:	$ 76.1	BI:	$ 57.0
		TOTAL:	$ 184.8	TOTAL:	$ 112.4
10,000 YR	0.01%	STR:	$ 49.3	STR:	$ 25.3
		NSTR.	$ 72.3	NSTR.	$ 36.0
		BI:	$ 78.6	BI:	$ 58.3
		TOTAL:	$ 194.2	TOTAL:	$ 120.5
MEAN ANNUAL LOSS (In dollars, rounded)		$1,800,000		$300,000	

Expected losses as function of recurrence interval (Y-Direction)

Annual recurrence interval and probability of occurrence		Expected Loss (in $ Millions) Y-DIRECTION: Baseline Conventional System (BRBF + SMF)		Enhanced Base Isolated Scheme (BI + BRBF + SMF)	
10 YR	10.00%	STR:	$ 0.3	STR:	$ 0.0
		NSTR.	$ 0.3	NSTR.	$ 0.0
		BI.	$ -	BI.	$ -
		TOTAL:	$ 0.5	TOTAL:	$ 0.0
50 YR	2.00%	STR:	$ 4.1	STR:	$ 0.4
		NSTR:	$ 7.0	NSTR:	$ 0.3
		BI:	$	BI:	$
		TOTAL:	$ 11.1	TOTAL:	$ 0.7
100 YR	1.00%	STR:	$ 7.2	STR:	$ 1.2
		NSTR:	$ 11.6	NSTR:	$ 1.3
		BI:	$ 48.9	BI:	$ -
		TOTAL:	$ 67.7	TOTAL:	$ 2.5
200 YR	0.50%	STR:	$ 10.9	STR:	$ 2.4
		NSTR:	$ 16.8	NSTR:	$ 3.2
		BI:	$ 50.9	BI:	$ -
		TOTAL:	$ 70.7	TOTAL:	$ 5.6
500 YR	0.20%	STR.	$ 10.7	STR.	$ 7.6
		NSTR:	$ 28.2	NSTR:	$ 12.6
		BI:	$ 55.1	BI:	$ 49.0
		TOTAL:	$ 102.0	TOTAL:	$ 69.1
1,000 YR	0.10%	STR:	$ 25.7	STR:	$ 12.4
		NSTR.	$ 39.4	NSTR.	$ 20.8
		BI:	$ 58.8	BI:	$ 51.5
		TOTAL:	$ 123.9	TOTAL:	$ 84.7
2,500 YR	0.04%	STR	$ 34.6	STR	$ 18.9
		NSTR:	$ 56.4	NSTR:	$ 31.7
		BI.	$ 68.1	BI.	$ 54.9
		TOTAL:	$ 159.1	TOTAL:	$ 105.5
10,000 YR	0.01%	STR:	$ 37.0	STR:	$ 21.0
		NSTR:	$ 61.5	NSTR:	$ 35.2
		BI:	$ 71.0	BI:	$ 56.0
		TOTAL:	$ 169.5	TOTAL:	$ 112.2
MEAN ANNUAL LOSS (In dollars, rounded)		$1,200,000		$240,000	

Seismic Risk Assessment & Life-cycle Cost Analysis

Average annual expected losses

Average annual expected loss (Mean) X-DIRECTION		
Building Elements	Equivalent Loss	
	Conventional System (BRBF + SMF)	Base Isolated Scheme (BI + BRBF + SMF)
TOTAL Building + Contents + Business Interruption	$1,800,000	$300,000
NET EXPECTED ANNUAL BENEFIT	$1,500,000	
NET ADDITIONAL FIRST COST (Base Isolated Scheme)	$6,500,000	
EQUIVALENT RETURN ON INVESTMENT	23% over 26 years	

Average annual expected loss (Mean) Y-DIRECTION		
Building Elements	Equivalent Loss	
	Conventional System (BRBF + SMF)	Base Isolated Scheme (BI + BRBF + SMF)
TOTAL Building + Contents + Business Interruption	$1,200,000	$240,000
NET EXPECTED ANNUAL BENEFIT	$960,000	
NET ADDITIONAL FIRST COST (Base Isolated Scheme)	$6,500,000	
EQUIVALENT RETURN ON INVESTMENT	14% over 25 years	

Seismic Risk Assessment & Life-cycle Cost Analysis

San Bernardino Justice Center					
Structural System Option	Additional First Cost	Average Annual Loss	Average Annual Return	Business Relocation	Annual Return on Investment
"Normal" (SMF + BRBF)	Baseline	$1.5m	Baseline	210 days	Baseline
"Enhanced" (SMF+BRBF+ BI)	$6.5m	$0.27m	$1.23m	0 days	+18.5%

25-YEAR LIFE CYCLE

San Diego Central Courthouse					
Structural System Option	Additional First Cost	Average Annual Loss	Average Annual Return	Business Relocation	Annual Return on Investment
"Normal" (SMF)	Baseline	$804,000.	Baseline	140 days	Baseline
"Enhanced" (SMF)	$6.1m	$763,000.	$42,000.	125 days	-10.6%
"Enhanced" (SMF+VDD)	$5.5m	$346,000.	$458,000.	0 days	+6.7%

25-YEAR LIFE CYCLE

Enhanced Seismic Performance

Courthouse Cost Reduction Subcommittee

As of July 2014

Hon. Jeffrey W. Johnson, Chair
Associate Justice of the Court of Appeal
Second Appellate District, Division One

Hon. Donald Cole Byrd
Assistant Presiding Judge of the
Superior Court of California,
County of Glenn

Mr. Stephan Castellanos, FAIA
Principal Architect
Derivi Castellanos Architects
Former State Architect of California

Hon. Keith D. Davis
Judge of the Superior Court of California,
County of San Bernardino

Hon. Samuel K. Feng
Judge of the Superior Court of California,
County of San Francisco

Ms. Melissa Fowler-Bradley
Court Executive Officer
Superior Court of California,
County of Shasta

Hon. William F. Highberger
Judge of the Superior Court of California,
County of Los Angeles

Hon. Gary R. Orozco
Judge of the Superior Court of California,
County of Fresno

Mr. Kevin Stinson
Assistant Clerk Administrator
Court of Appeal
Fourth Appellate District, Division Three

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