

## **East Contra Costa County Courthouse Design Narrative**

This narrative is intended to supplement the Schematic Design drawings in order to convey the systems and materials contemplated for the design. The descriptions herein were used as the basis for the Schematic Design cost estimate.

### **Threat Assessment**

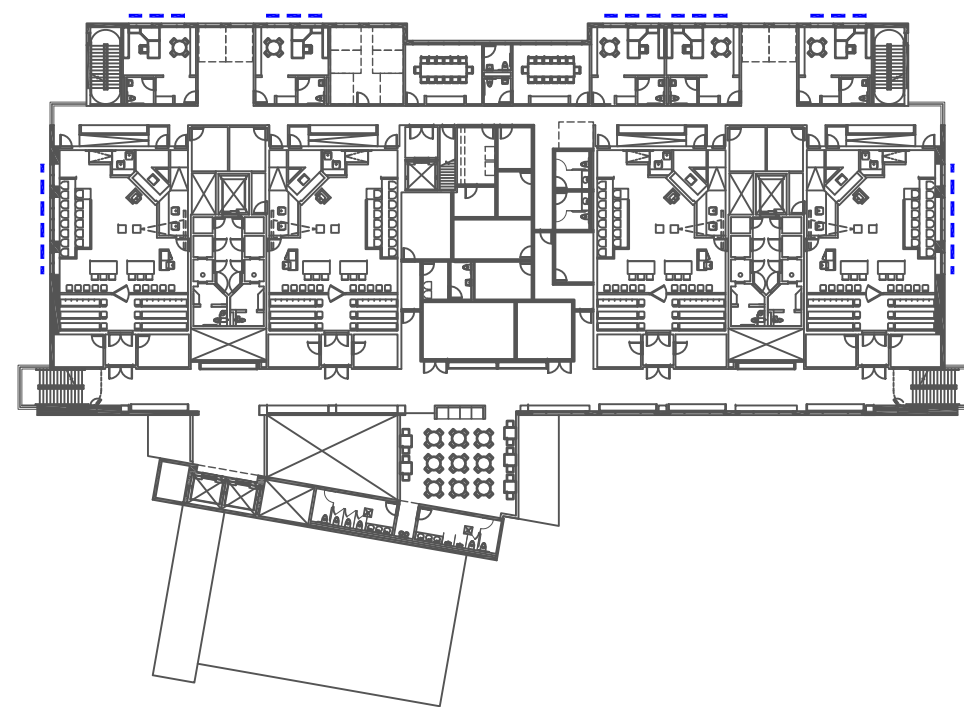
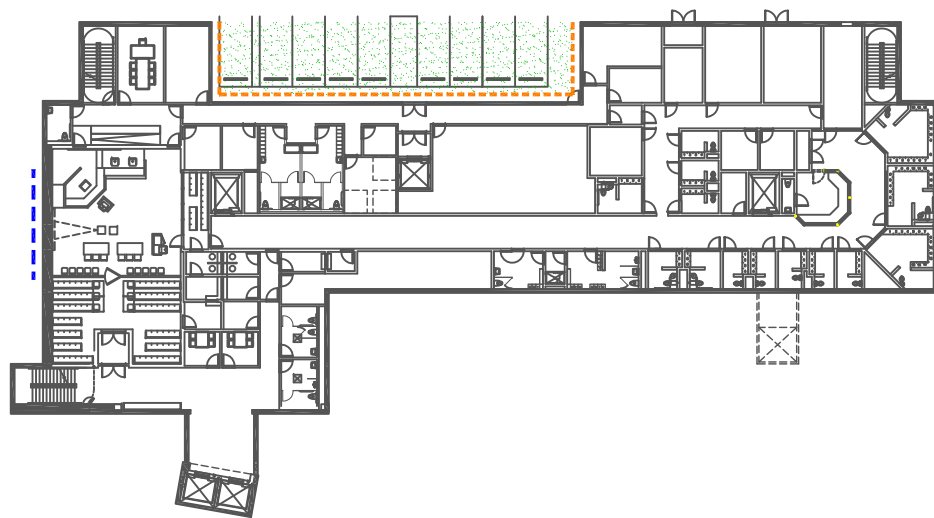
A separate detailed threat assessment is being developed for the project based on the project parameters and the schematic design documents. The measures outlined will be described based on the published standards for federal courthouses, and allow the AOC and the users to make informed decisions on the level of protection that they would like to employ for the building and its occupants. The attached diagram indicated the level of building and occupant protection that is presently carried in the cost estimate, for both exterior blast and ballistic protection.

The siting of the building is in keeping with the AOC Trial Court standards for standoff from vehicular zones. A series of landscape features will act as an anti-ram barrier outside the 20' perimeter zone, and will consist of seat walls, site stairs and ramps, flagpoles, bollards, and engineered bio-swales.

Ballistics protection will be provided at exterior chamber and courtroom windows, and at the first floor gallery windows in the family law court area. The team is investigating hardening the exterior and floor slabs at the secure parking on the lower level, and inside the main entry of the building where the security screening takes place. It is assumed that mail and packages will enter the facility through this main entry and be screened prior to taking them to the mail center. The mail center should be an enclosed space separately ventilated from the rest of the structure.

An area of concern going forward is the level of protection to be provided at the jury assembly space. If the space will be used in the future as an additional hearing room or temporary courtroom, different architectural treatment will be contemplated to improve the safety of the occupants.

Interior ballistic protection will be provided at the window counters, and inside the courtrooms for the judge, witness, clerk and bailiff.



- BALLISTICS PROTECTION
- WALL HARDENING
- SLAB HARDENING

## Civil

### Site Utilities

Site utilities will be available in the surrounding streets. The City of Pittsburg is currently designing the infrastructure for the district, which includes the accommodation of the the relocated utilities which presently cross the site. Points of connection and invert elevations will be determined when this information is available from the city. Preliminary utility calculations are provided in a tabular format below.

<b>DOMESTIC WATER CALCULATIONS</b>			
<b>Building</b>	<b>Total Building Domestic Water Fixture Units (WSFU)</b>	<b>Total Building Demand Flow Rate (gpm) Includes HVAC</b>	<b>Service Entrance Pipe Size (in inches)</b>
ECCC Courthouse	1,005	210 gpm	4"
		50 gpm (HVAC)	
<b>Total Domestic Water Demand</b>	<b>1,005 WSFU</b>	<b>260 gpm</b>	<b>4"</b>

<b>SANITARY SEWER CALCULATIONS</b>		
<b>Building</b>	<b>Total Building Drainage Fixture Units (DFU)</b>	<b>Service Entrance Pipe Size (inches) and Number of Building Connections</b>
ECCC Courthouse	420	6"
<b>Total Sanitary Sewer Demand</b>	<b>420 DFU</b>	<b>6"</b>

Note: Lower Level may be require a lift station.

<b>STORM DRAINAGE CALCULATIONS</b>			
<b>Building</b>	<b>Total Building Roof Area (square feet)</b>	<b>GPM/SF</b>	<b>Comments</b>
ECCC Courthouse	37,615 sf	0.021 = 790 say 800 gpm	
<b>Total Storm Drainage Demand</b>	<b>37,615 sf</b>	<b>800 gpm</b>	<b>Note: Does not include pavers and sidewalks to be tied into storm drainage system</b>

Note: Lower Level may be require a lift station.

<b>NATURAL GAS DEMAND</b>		
<b>Building</b>	<b>Domestic Hot Water Heating Natural Gas Demand in Btuh (Input)</b>	<b>HVAC/ Natural Gas Demand in Btuh (Input)</b>
ECCC Courthouse	N/A	1,500,000 Btuh
<b>Total Natural Gas Demand</b>	<b>1,500,000 Btuh</b>	

<b>FIRE SERVICE WATER DEMAND</b>			
<b>Building</b>	<b>Total Building Area in (square feet)</b>	<b>Fire Service Demand Flow (Per Density Curve) gpm</b>	<b>Service Entrance Pipe Size (inches)</b>
ECCC Courthouse	72,043 sf		6"
	22,950sf (future expansion)		
<b>Total Fire Service Demand</b>		600 gpm	6"

Fire flow includes 250 gpm for outside hose stream  
 General Note: The fire flow does not include site fire hydrants.

#### *Site Drainage and Grading*

The intent of the site design is to manage the storm water runoff on the site with a system of bio-swales which pick up the runoff from the impervious roof and parking areas. The intent is to slow down the runoff, to allow water to percolate into the soil, and to clean the water that enters the storm drain system in overflow conditions.

#### **Landscape Design**

The landscape design consists of a front plaza area rendered as an orchard with flowering trees in an area of decomposed aggregate, interspersed with linear seating elements. A still water feature will be design adjacent to the building area and reaching out into the front plaza. Minimal areas of turf will be employed in the design in keeping with the project sustainable goals. All the plants will be selected with the intent of reducing water consumption.

#### **Structural Systems**

The building includes a 3-story courthouse and a 1-story jury assembly area. The 3-story courthouse consists of a partial lower level, a full level one connecting to the jury assembly area, and a full level two. The jury assembly area will be separated from the courthouse with a seismic joint.

The building's gravity floor framing will consist of composite steel beams and light weight concrete-on-metal deck on all elevated levels and concrete slab on grade on the courthouse lower level and the jury assembly area level one. The building will be founded on spread and continuous footings. The lateral load resisting system will be steel ordinary braced frames in the transverse direction and steel eccentrically braced frames in the longitudinal direction.

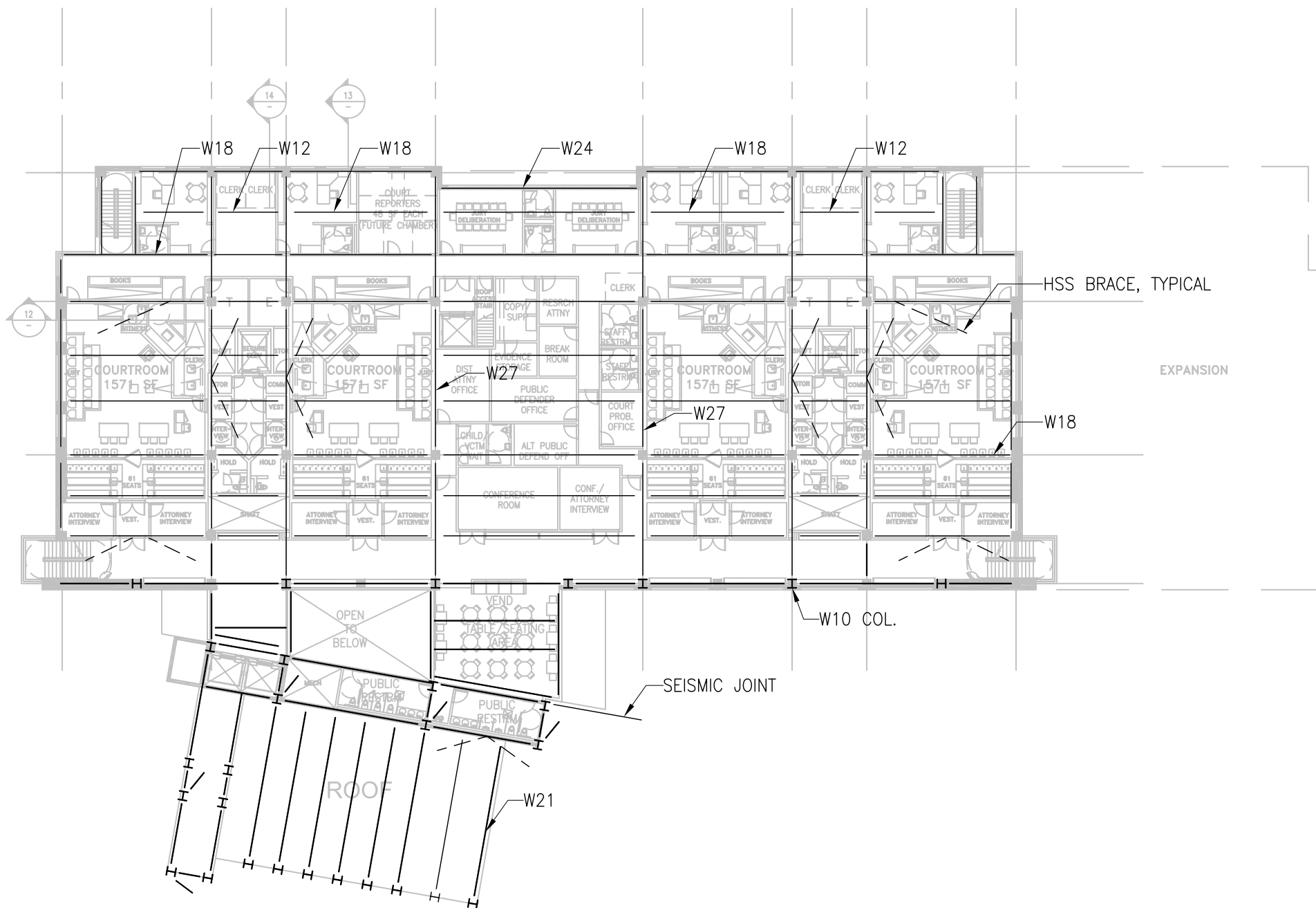
FLOOR ASSEMBLY:  
 3"X18 GA DECK WITH  
 3 1/4" LIGHT WEIGHT CONCRETE FILL

GRAVITY SYSTEM:  
 FLOOR ASSEMBLY IS SUPPORTED  
 BY STEEL BEAMS, GIRDERS AND  
 COLUMNS.

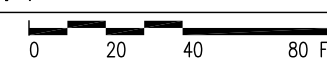
LATERAL SYSTEM:  
 STEEL ECCENTRICALLY BRACED  
 FRAMES IN LONGITUDINAL DIRECTION.  
 STEEL BRACED FRAMES IN  
 TRANSVERSE DIRECTION.

FOUNDATION SYSTEM:  
 SPREAD FOOTINGS AND  
 CONTINUOUS FOOTINGS.

ESTIMATED STEEL WEIGHT:  
 10 PSF.



1 TYPICAL FLOOR FRAMING AND STRUCTURAL SYSTEM DESCRIPTION  
 1/32" = 1'-0"



## **Building Design**

### *Exterior Cladding*

The exterior cladding for the majority of the building will be precast concrete panels. The concrete finish will be light colored with a high-albedo (reflectance of at least .3) finish and fairly smooth texture to minimize the collection of dirt. At the main entry, the south facing wall and the diagonal wall at jury assembly will be clad in limestone panels. Limestone will also be used as a sill and spandrel accent material around the building.

Exterior canopies at the main entry and the employee entry will be clad in aluminum sheet, with a Kynar coating in a light bronze metallic color.

The exterior glazing will be lightly-tinted, low-E double glazed. The exterior window system will be an extruded aluminum system with thermal breaks, finished with a high performance powder-coated finish in a light bronze metallic color. There will be a combination of recessed punched windows and curtainwall elements incorporating metal or glass spandrel materials.

Horizontal aluminum sunshading elements, integrated with the window system, will be provided at the south face of the building, to minimize the solar heat gain. The punched windows into the courtrooms on the east and west facades will have projecting vertical sunshades to minimize the direct beam sun penetration in morning and late afternoon hours.

The exterior cladding at the enclosed penthouse will be precast and cement plaster to match the main building cladding.

### *Roofing and Waterproofing*

The roofing system will be required to achieve a value of R-30. A white single-ply membrane roofing with a high-emissivity (.9 per ASTM 408), Energy Star rating will be provided for the facility. The roof insulation will be rigid insulation on top of the roof slab, with rigid insulation or lightweight concrete fill forming the crickets. The primary roof slope will be accomplished with the structural steel.

The roof over the jury assembly pavilion will be a green roof constructed using a modular system.

Waterproofing will be applied to the exterior face of the foundation wall. Although the water table is well below the lowest level, due to the bio-swales around the building special attention will be given to the waterproofing of certain lower level areas to prevent water intrusion.

### *Elevators*

The building will be served by 5 elevators – 2 - 3500 lb. passenger elevator serving all three floors and a 4500 lb. service elevator opening off the restricted corridor and serving all three floors. Two secure elevators will serve the holding areas on the upper floors, and open directly into the secure corridor on the lowest level. None of the elevators will serve the roof.

### *Stairs*

The project will have 4 exit stairs. There will be 2 primary architectural grade exit stairs which will also be used to facilitate the circulation of the public through the building, serving all 3 floors of the building. The other two exit stairs which open off the restricted corridor will also be used as communicating stairs by staff, but with a lower level of finishes. They will be provided with doors on hold opens to make them

more inviting for use. The rated enclosure on the lobby stairs will be either Won-doors, or a steel fire shutter.

### *Interior Partitions, Doors and Glazing*

Most of the interior partitions will be drywall on metal studs. Partitions in the lower level holding areas will be CMU. Holding areas on the upper floors will be a security metal system or VHI drywall assemblies.

Sound insulation will be added to partitions serving conference rooms and all private offices. Courtrooms, chambers, and large conference rooms will have full height acoustical partitions.

Doors will be solid core wood, with a transparent finish in office and laboratory areas on the upper floors of the building. Door frames will typically be aluminum. Doors located in close proximity to services areas, and serving mechanical, storage, and back of the house building commons area at the lower floor will be painted hollow metal with hollow metal frames.

### *Interior Materials and Finishes*

In general a seamless transition from the building exterior's character to the interior is the main focus on establishing the interior materials and finishes. The overall feel of the interior space is intended to be light filled and easily navigable. The main ground level circulation spine, running the entire length of the building, will benefit from natural day lighting and views obtained from running adjacent to the building's perimeter. Terrazzo flooring in the main public circulation area will offer textural and colorful opportunities as well as offer a very durable and long lasting flooring material. Terrazzo will also offer the opportunities to use recycled materials (glass, concrete, etc) as part of the materials over all composition. A majority of the public functions such as counters and meeting spaces will be located directly off the main public circulation area. With abundant natural daylight and views towards the Mount Diablo range, both employees and visitors will benefit from the building's orientation on the site.

All materials will be selected with functionality of spaces in mind. Sustainable/Green materials will be used as much as functionally and fiscally possible. Careful research on materials and their respective compositions will help achieve the USGBC Green Building Silver LEED Rating. Terrazzo will offer durability as well as high recycled material content and is a superb material to use for high traffic areas. Combinations of carpet tiles and broadloom carpet will offer visually stimulating foundations for office, courtrooms and chambers floors as well as offer materials with high recycled content. Most support spaces such as copy rooms, break rooms, etc will benefit from durable and sturdy materials like linoleum and composition rubber tiles.

Introduction of wood will be carefully deployed. The main public lobby will possibly introduce wood in the ceiling areas to bring a sense of warmth to the space. This technique also allows for the wood to be acoustical to maintain a balance between the harder more sound reflective surfaces such as glazing and terrazzo flooring. The wood species will consist of a sustainable combination of eucalyptus and dark walnut. The combination of these two contrasting woods will offer visual interest as they are deployed within the courtrooms. In addition to the contrast, the eucalyptus, even though it will come from certified and controlled forests, as well as the walnut, will pay homage to wood species that are ubiquitous within California.

The use of natural day lighting through skylights, clerestories and vision windows will help minimize and control the usage of artificial lighting within the building. Several lighting controls options can help turn lighting on and/or off during the course of the workday by simply sensing the amount of natural daylight levels. These are operations that are commonly integrated in LEED certified buildings. The main component of the artificial lighting systems will be suspended indirect pendant fixtures. The suspended indirect lighting will provide superior lighting quality as it will minimize direct glare on computer screens.

Indirect lighting, together with a combination of downward distributed and accent cove lighting will enhance the multi-ceiling levels commonly found in courtrooms.

Millwork will be custom designed to accommodate the functional requirements for each support area. All staff work areas millwork will be constructed of green yet durable and easy to maintain materials which will preclude wear and tear from public use or damage.

## **Heating, Ventilating, and Air Conditioning (HVAC) Systems**

The HVAC system and equipment will be selected and designed for energy efficiency, maintainability, and ease of operation, within the constraints of the project's available budget.

The heart of the HVAC system will be located at a rooftop penthouse. It was considered to locate the equipment in the basement, but the penthouse offers several advantages:

- For security reasons the environmental air intake louvers should not be located near grade, and extending them to the roof would require a shaft up through the building, consuming usable floor space.
- The boilers require a combustion air intake and exhaust flues, both of which are more easily accommodated at the roof.
- The cooling towers need to be located at the roof or at grade (not feasible).

In general, the HVAC systems will be designed to avoid "single point of failure". Equipment will be installed in pairs, so that the failure of one piece of equipment will not result in the loss of the entire system or sub-system. However, the HVAC system will not include redundant equipment. The HVAC system will not be sized to handle the possible future expansion.

The HVAC equipment at the penthouse will include the following:

- Two rotary screw chillers, approximately 100 to 120 tons capacity each.
- Two cooling towers with VFD's (variable frequency drives).
- Two chilled water pumps with VFD's, for variable flow pumping.
- Two condenser water pumps.
- Two gas-fired high-efficiency condensing-type heating water boilers, approximately one million btuh output each.
- Two heating water pumps with VFD's, for variable flow pumping.
- Air handling system, approximately 70,000 to 90,000 cfm.

As mentioned above, at this time we believe the most likely cooling plant scheme will consist of water-cooled chillers with cooling towers. The energy model will investigate other possible options such as:

- DX-cooling with air-cooled condenser
- DX-cooling with evaporatively-cooled condenser
- Air-cooled chiller
- Air-cooled chiller with thermal energy storage.

The penthouse air-handling system will be a built-up arrangement including multiple supply fans and relief fans, cooling coil, heating coil, MERV-13 filters (cartridge or bag type), and air-economizer dampers. Fans will be provided with VFD's for variable air volume (VAV). The outside air quantity will be continuously measured for building IAQ reasons. The air handling unit will be designed and specified to meet the applicable requirements of AOC's AHU criteria, dated 2/28/07. In general, the space above the ceiling will be used as a return air plenum.



The energy model will investigate different options for the fan and air distribution system:

- VAV terminal reheat (the base case)
- Displacement ventilation in courtrooms, jury assembly rooms, and lobbies
- Dual fan, dual duct VAV
- VAV terminal reheat, with a separate dedicated outside air system

The last two options can more accurately deliver the optimum amount of outside ventilation air to the various spaces, which could be beneficial for energy and IAQ reasons if the courtrooms have highly variable occupancy patterns. However, both options utilize two sets of fans and supply air distribution ductwork throughout the building, increasing the construction cost and requiring more ceiling clearances. The AOC will try to give the design team an accurate profile of expected occupancy in the courtrooms throughout the day, for use in the energy model.

It is anticipated that the jury selection room will be provided with its own air handling unit. Consideration shall be given to HVAC alternatives which also allow the traffic courtroom to operate after hours without conditioning other unoccupied portions of the facility.

#### *Building Management System*

The building management system will be the DDC (direct digital control) type. It will consist of a local area network with distributed stand-alone controllers, will be web-enabled to allow authorized personnel to gain access to the system from any personal computer via the internet, and will monitor and control all HVAC components for energy management and indoor comfort. The BMS system will be competitively bid among multiple vendors, and will be specified to meet AOC's "Preliminary Program - Generic Building Automation Systems" dated 3/1/07, or updated version if available. Room thermostats will be provided with occupant-interface features. The building engineer's workstation will be located as desired by the AOC, such as in an office in the basement.

#### *Miscellaneous HVAC systems*

- Each MDF and IDF room will be served by a VAV terminal unit, with a split-system AC unit as back-up. The AC units will be served by emergency power.
- Toilet rooms and janitor's closets will be exhausted.
- Inmate holding areas will be exhausted. Variable flow exhaust will be considered, based on CO2 monitoring.

The HVAC system, including the building management system, will be fully commissioned by the Owner's commissioning agent, to meet the requirements for the LEED prerequisite as a minimum, and perhaps to meet the requirements for LEED "enhanced" commissioning.

#### *Design Temperatures:*

- Outdoor Summer: ASHRAE 0.1%; 102 F db, 70 F wb
  - Outdoor Winter: ASHRAE 0.2%; 32 F db
  - Indoor Summer: 75 F db, except 70 F db in the MDF and IDF rooms
  - Indoor Winter: 70 F db
- 
- Indoor relative humidity will not be controlled directly, but should be in the range of 40 to 60% RH

## **Plumbing Systems**

### *Building Utility Service Connections*

The proposed new Courthouse will be connected to the building service utilities, 5'-0" outside the building. Refer to Civil Site Utility Drawings.

### *Building Utility Metering*

The building main water meter will be prior to the backflow assembly located outside the proposed Courthouse, refer to Civil Site Utility Drawings.

The gas meter will be located outside the proposed Courthouse, refer to Civil Site Utility Drawings

### *Sanitary Waste and Vent System*

All security and non-security type plumbing fixtures such as combination water closet/lavatory, toilets, lavatories, sinks, floor sinks, floor drains, service sinks and similar plumbing fixtures will be connected to the building sanitary waste and vent system. The system will discharge by gravity and tie into the building sanitary sewer system. Sanitary waste and vent piping will be cast iron no-hub pipe and fittings with heavy duty couplings.

### *Natural Gas System*

Natural gas will be brought to the building from the street by PG&E. Design team will coordinate gas demand and meter location with PG&E. Natural gas will be provided for HVAC equipment and water heaters if required.

### *Gray Water Reclaim System (Non-Potable Water)*

There will be no gray water reclaim system.

### *Roof Storm and Overflow Drainage System*

A separate storm and overflow drainage system, as required by code, will be provided for the building roof system. The building roof drainage system will be collected and discharged by gravity into tied into the site storm drainage system. Overflow drains will terminate 12" above grade at the exterior perimeter of the building. Storm and overflow drain piping will be cast iron no-hub pipe and fittings with heavy duty couplings.

### *Domestic Water Supply Systems*

The proposed new Courthouse will be connected to the City of Pittsburg water supply which will be the source of domestic water. The incoming domestic water service will be provided with an approved backflow preventor, refer to civil site utility drawings for location

It is anticipated that the city water is adequate and that a domestic water booster pump will not be required.

Domestic water will be supplied to all security and non-security lavatories, sinks, water closets, urinals, service sinks, water coolers, drinking fountains and showers.

All domestic and industrial water piping will be Type 'L' copper with wrought copper fittings and brazed joints. An alternate fitting option for piping 4-inches and smaller of copper press fittings will be evaluated during the design phase.

Pressure ranges at plumbing fixtures shall be as follows:

- Minimum: 25 psi
- Maximum: 80 psi

#### *Domestic Hot Water Supply Systems*

Domestic hot water will be generated using tankless point of use electric water heaters. Heaters will be a factory assembled and preset to temperatures as required. Temperature ranges at plumbing fixtures shall be as follows:

- 110°F hot water to Staff/Public lavatories and sinks.
- 110°F hot water to Staff showers.
- 105°F hot water to Lavatories in all holding cells.
- 110°F hot water to inmate showers.

All domestic hot water piping will be Type 'L' copper with wrought copper fittings and brazed joints. An alternate fitting option for piping 4-inches and smaller of copper press fittings will be evaluated during the design phase.

#### *Plumbing Fixtures*

All plumbing fixtures will be low-flow water saving type. Water-less urinals, dual-flush water closets and sensor operated lavatories, water closets and urinals will be considered during the design phase.

#### *Building Management System (Monitoring)*

The BMS will monitor critical plumbing systems such as:

- Equipment control panels (lift stations, for example).
- Low pressure incoming gas pressure.

#### *Sustainability*

It is the design intent to achieve 40% reduction in water usage for the new Courthouse.

## **Fire Protection**

### *Fire Water Service*

The proposed new Courthouse will be connected to the City of Pittsburg water supply which will be the source of fire protection water. The incoming fire water service will be provided with an approved backflow preventor and fire department connection, refer to civil site utility drawings for location

### *Automatic Fire Protection System*

A complete automatic wet-system and associated equipment will be provided for the new Courthouse in accordance with NFPA 13 and State Fire Marshal. Equipment, devices and valves for fire protection service shall be UL Listed or FM approved for use in wet pipe sprinkler systems. Each sprinkler systems will include electric valve supervision (i.e. valve tamper switches on all sprinkler control valves, connected to the various building fire alarm systems, and to the central/main fire alarm system). In addition, each sprinkler system will be provided with water-flow devices that will activate a fire alarm signal on the fire alarm system(s).

A clean agent fire suppression system and single interlock pre-action fire protection system will be provided for the MDF Room.

A fire department connection shall be provided.

It is anticipated that the city water is adequate and that a fire pump will not be required.

### *Fire Protection Piping*

Pipe shall be designed for 175 psi, non-shock, cold water working pressure, conforming to ASTM specifications.

Piping shall be black or galvanized steel:

Standard Wall: Overhead pipe used shall be black steel and shall comply with ASTM A 135. Galvanized pipe shall be used where exposed to atmosphere and for dry systems. Dimensions for all overhead pipe must be in accordance with the American Standard for Wrought Steel and Wrought Iron Pipe ANSI B36.10-1975 for pressure up to 300 psi. Schedule 40 pipe is considered "standard wall" pipe. Schedule 30 pipe is, acceptable in sizes 8-inch and larger. Standard wall pipe ends shall be welded, threaded, cut grooved or plain end. Or,

Thin Wall: Overhead pipe of the Welded and Seamless Type specified in ASTM A 53 used in welded systems shall have a minimum pipe wall thickness for pressures up to 300 psi as follows: Schedule 10 in sizes up to 5-inch; 0.134 inches for 6-inch; and 0.188 inches for 8-inch pipe. Pipe ends shall be roll grooved or welded in accordance with NFPA 13.

Threadable light wall piping shall not be used

### *Fire Sprinklers*

Sprinklers shall be standard orifice (1/2-inch), quick-response type. Temperature ratings shall be 135-degrees Fahrenheit in all areas except where higher temperature ratings are required by NFPA 13 and in communication rooms, electrical rooms, control rooms, computer rooms, mechanical rooms and telephone rooms which shall be 165-degrees Fahrenheit. Temperature ratings shall be 200-degrees Fahrenheit in elevator machine rooms.

## Electrical Systems Description

PG&E, the local electric utility provider, will provide high voltage cables in Owner-provided underground ductbank and manhole(s) to PG&E transformer. Design team will coordinate with PG&E for service size and, if required, location of remote electric meter. The service voltage to the new courthouse building will be 480Y/277V, 3Ø, 4 wire, grounded. The main switchboard, rated at 2,500A, 480Y/277V, 3Ø, 4 wire, will be located in the Main Electrical Room (approximate dimensions 20' x 15') on the lower level. It will be front accessible with fixed mounted circuit breakers; distribution sections will be group mounted circuit breakers. The house lighting panelboard and the house receptacle panelboard will also be located in the Main Electrical Room.

The building power distribution will be at 480Y/277V and 208Y/120V via a conduit and wire system and will be distributed as follows:

- 480V, 3-phase, 3 wire for all motor loads larger than ½ horsepower.
- 277V, 1-phase for fluorescent and HID lighting fixtures, and point-of-use electric water heaters.
- 208V, 1-phase or 3-phase for special equipment.
- 120V, 1-phase for receptacle outlets and motors ½ horsepower and smaller.
- No provision will be made for power other than 277/480V and 120/208V AC, 3-phase, 4 wire 60Hz.

There will be two branch electrical room risers, one to serve the west side of the building and one to serve the east side of the building. Each branch electrical room will have minimum dimensions of 8' x 10'. The electrical rooms will house 480Y/277V lighting panelboards, step-down transformers, and 208Y/120V receptacle panelboards. The step-down transformers will be energy efficient (NEMA TP1) type. Transformers serving electronics equipment and office areas will be energy efficient (NEMA TP1), K-13 rated type to accommodate harmonics currents, and downstream panelboards and branch circuits will have 200% rated neutral conductors.

A 480V distribution board will be provided for service to the elevators and a 480V motor control center and/or distribution board will be provided in the mechanical penthouse for service to mechanical equipment.

### *Critical Electrical Loads*

There are no provisions for an emergency/standby generator. Central battery inverter systems with capacity for 90-minute operation will provide continuous power for code required interior and exterior egress and exit lighting, as well as critical lighting in secure areas where staff and inmates will be in contact. HID lighting fixtures, if provided, functioning as egress lighting will be equipped with quartz restrike.

Since an emergency/standby generator will not be provided, the split-system AC units serving MDF and IDF rooms and the exhaust fans for inmate holding areas will be served by utility power only.

It is anticipated that the elevators will be hydraulic type and as such will be served utility power only.

There are no provisions for a centralized UPS distribution system. The fire detection and alarm system will be provided with battery backup, and it is anticipated that the telecommunications systems in the MDF/IDF rooms and the security systems will be provided with owner local UPS systems.

### *Branch Circuiting*

Branch circuit design will be based upon a maximum of 1,600 volt-amperes per 20 ampere, 120 volt circuit. A maximum of 6 duplex receptacles will be provided per circuit. A minimum of one quad receptacle will be provided on each wall of offices, conference rooms and copy rooms.

Branch circuit design will be based upon a maximum of 3,700 volt-amperes per 20 ampere, 277 volt circuit.

Branch circuitry to the electrified furniture system will be 4-circuit, 8-wire system (4-phases, 2-neutrals and 2-grounds). Each 4-circuit feed will serve a maximum of 6 workstations. In open office areas, consideration will be given to a floor power feed poke-through and a floor data feed poke-thru at given space intervals in the open office areas for future furniture reconfiguration.

### *Grounding System*

A central grounding system and equipment grounding will be provided. Copper-clad steel driven ground rods,  $\frac{3}{4}$ "  $\varnothing$  x 10'-0" long, and ground ring will be provided around the building perimeter. Ground busbars will be provided in all electrical rooms, MDF/IDF rooms, and security rooms. Switchboards, transformers, panelboards, wiring systems, etc. will be effectively grounded. Ground conductors will be bonded to cold water mains, ground rods, and building steel.

### *Lighting*

The lighting level will be designed in accordance with Illuminating Engineering Society (IES) recommendations. The interior lighting power density will be at least 15% less than that allowed by California Code of Regulations (CCR), Title 24 – Energy Conservation Regulations. The exterior lighting power density will be 80% or less than allowed by ASHRAE Standard 90.1 for exterior areas, and 50% or less than allowed by ASHRAE Standard 90.1 for building facades and landscape features.

The following lighting specifications will be followed:

- General lighting fixtures in offices, courtrooms and assembly areas will be fluorescent type with T8 lamps. Consideration will be given to the use of "super" T8 lamps.
- Task lighting fixtures in offices will be fluorescent type with T8 or T5 lamps, or LED type.
- General lighting fixtures in secure areas (holding cells) will be maximum or medium security, fluorescent type with T8 lamps and nightlight.
- Downlighting fixtures (compact fluorescent) will be used in selected areas.
- Incandescent lamps will not be used.
- Accent lighting will be provided at the main entrance.
- All fluorescent fixtures will be provided with electronic ballasts (10% or less total harmonic distortion).
- Exit signs will be LED type.
- Exterior lighting fixtures will be metal halide or high pressure sodium, cutoff type.

### *Lighting Controls*

A central lighting control relay system will be provided to automatically turn off all non-emergency interior light fixtures during non-business hours.

Light fixture control intent is as follows:

- Light fixtures in enclosed offices and conference rooms will be controlled by a combination manual light switch/occupancy sensor: bi-level Manual On, and time delay automatic Off.
- Light fixtures in open offices, courtrooms and assembly areas will be controlled by occupancy sensors.
- Task lights will be controlled by occupancy sensors.
- Light fixtures in restrooms, storage rooms and janitor closets will be controlled by a combination manual light switch/occupancy sensor: automatic On, and time delay automatic Off.
- Light fixtures in daylit areas will be provided with electronic dimming ballasts to automatically dim in response to photo sensors.
- Light fixtures in secure areas (holding cells) will be controlled by switches or touchscreen located at the Jailor Station.
- Light fixtures in other spaces will be controlled by local occupancy sensors and/or by the central lighting relay system.
- Exterior lighting fixtures will be controlled via photo sensors.

### *Fire Alarm System*

An automatic, addressable fire alarm system will be provided, consisting of the following:

- A main fire alarm control panel located in the Main Electrical Room.
- Termination cabinet at each floor connected to the riser.
- Ceiling mounted smoke and heat detectors in all electrical and mechanical rooms, electrical closets, elevator lobbies and return air ducts in accordance with code and as required by SFM.
- Speakers and strobe alarm stations will be provided along all egress routes, toilet areas, lobbies and other areas of assembly.
- A manual pull station will be provided at each exit.

The fire alarm system will be linked to the sprinkler flow switches and valve monitors. The FAS will have "open" system architecture capable of communicating with the Building Automation System (BAS).

### *Photovoltaic System*

Consideration will be given to the installation of a rooftop photovoltaic system. Up to 10,000 square feet of rooftop PV panels would be installed, which would be roughly equivalent to a 100kW system producing about 128,000 kWh of energy annually.

If a PV system is not provided, provisions will be made to allow for the installation of a future PV system. The roof will be structurally designed to be capable of supporting most PV panels, and the main switchboard will be furnished with a spare breaker to connect to a future PV system (the breaker can be replaced depending on the ultimate size of the future system).

### *Telecommunications System*

The building has been designed for ease of distribution of the telecommunications services. Two telephone closets per floor have been provided, which stack vertically throughout the building. The MPEO/MDF is located at the lowest level of the building, and will be sited appropriately for incoming service when the site utility plan is known. The main cable trays will run in an east/west direction over the restricted corridor between the judge's chambers and the courtrooms. Required infrastructure raceways and 120 volt power will be provided by the Electrical Contractor.

### *Security System*

The security system will consist of access control provided throughout the building. A number of exterior and interior locations will be monitored by security cameras from a station at the main building entry. Required infrastructure raceways and 120 volt power will be provided by the Electrical Contractor.