

**Justice Center Building HVAC Upgrades**  
HVAC ASSESSMENT & HVAC UPGRADES

**RENOVATION**

Owner/Client:

Multnomah County  
401 N Dixon Street  
Portland, OR 97227-1865  
Mark Gustafson (503) 248-3322

*Project Start:* February 1997  
*Project Finish:* February 2002  
*Facility Type:* Hi-rise Complex  
*Building Age:* Built 1987  
*Construction Cost (Total):* \$1,510,000  
*Construction Cost (EESI Portion):* NA  
*Engineering Fees:* \$169,270  
*Project Size:* 445,000 square feet

EESI Staff Involved: Fred Shaub, John Balaam, Pete Sanford, Ron Phelps, Tim Thatcher, Jim Cook, John Wallin, & Connie Kenning.

Project Description: Provide mechanical and electrical engineering design services for HVAC assessment to improve indoor air quality (IAQ) and ventilation comfort. Provide design upgrade of HVAC system from this assessment to improve IAQ and meet current code and ventilation standards.

The Justice Center is a 16-story building containing offices, police, courts, and detention facility with a total of 384 cells. EESI provided engineering services to re-evaluate the design intent of the HVAC system and redesigned HVAC system based on assessment and recommendation to meet current occupancy comfort needs and IAQ code requirements.

Design included:

- Increasing outside air for double bunking of jail cells.
- Terminal boxes, duct work, and diffuser changes due to remodeled areas or warm, cold, and under ventilated areas.
- Control strategy upgrade with DDC upgrade.
- Decommission non-compliant domestic hot water exchanger.
- Re-calculations for air & hydronic balancing required for heating & cooling comfort
- Revise domestic (service) hot water piping for maintaining close temperatures per standards set by "American Correctional Association."
- Re-balance isolation cells and verify compliance with CDC and OSHA ventilation requirements.
- HVAC design upgrade for better IAQ's for intake cells. Includes heat recovery.
- Design of crime lab exhaust system for chemical storage cabinets.
- Design of ventilation system for DNA lab.

The project involved two major projects and several specific remodels and renovations such as the new DNA Lab and double bunk ventilation upgrade.

The first project involved re-evaluation of air distribution and an air balance firm (TAB) hired to re-balance the entire facility to current code, occupancy and industrial standard for comfort air flow.

The second project involved a mechanical contractor to do HVAC modifications to accomplish an energy efficient and comfort improvements co-incident with the TAB firm.

One of the major improvements was a re-vamp of the five floors of inmate cells which includes research for proper summer and winter air flows for comfort and code compliance for odor control of cells with toilets. Original system had return air and carbon filter system (expensive to maintain and not effective for odor control). New system had reduced air flow rates and a 100% OSA system with heat recovery and VFD on fan for summer and winter change in air flow quantity.

**Justice Center Building  
PLUMBING UPGRADES**

**RENOVATION/REMODEL**

Owner/Client:  
Multnomah County  
401 N Dixon Street  
Portland, OR 97227-1865  
Gail Hochhalter (503) 248-3322

Project Start: October 1999  
Project Finish: April 2003  
Facility Type: Hi-rise Complex  
Building Age: Built 1987  
Construction Cost \$415,000  
Engineering Fees: \$37,415  
Project Size: 445,000 square feet

EESI Staff Involved: Fred Shaub, John Wallin, Pete Sanford, and Ron Phelps.

Project Description: Involved two projects:

- ( Design of new sewer system for high rise building including new City main.
- ( HVAC design for the Transfer Holding Area remodel project.

The Justice Center is a 16-story building containing offices, police, courts, and detention facility with a total of 384 cells.

The sewer system design included separate waste line for jail cells with in-line macerators to prevent items flushed by inmates from reaching City sewers. The plumbing revisions also eliminated the flooding problems on the lower floor courtrooms.

The HVAC design for the Transfer Holding Area remodel was done to compensate for the wide fluctuations of personnel occupying the Transfer Holding Area while complying with CDC ventilation requirements and saving heating and cooling costs.