

# Correctional News

## Facility of the Month -- July/Aug 2004

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### Desert Dream

*Sheriff Joe Arpaio's construction team says their cost-effective mega-jail in Phoenix, Ariz., is the most advanced in the world.*

*By Morgan Jones*



**Photo Credit: Doug Switzer/Durrant**

Maricopa County's new 620,000-square-foot mega-jail is as innovative and cost-effective as you might expect from a sheriff renowned for his no-frills approach. A tent city for inmates. Deterring theft of jail underwear by dyeing it pink. Now add the most advanced jail system in the world to Sheriff Joe Arpaio's resume.

Food will be delivered to inmates from an advanced, off-site food factory that commercial manufacturers might envy. Las Vegas casinos were the inspiration for the advanced video-visitation

switching system. And the new steel-panel system used to erect the jail cells was so innovative and cost-effective; two companies adopted the concept as a standard product offering.

"The construction team started with Sheriff Joe and his no-frills philosophy," says Capt. Charles Johnson, division commander of the New Jail Construction Unit. "He wanted constitutionality and he wanted innovations so the jail wouldn't be obsolete in 10 years. At the same time, he wanted a culture of safety, efficiency and cohesion."

Designed by HOK/Durrant, the four-story, \$137 million 4th Avenue Jail holds more than 2,000 inmates and includes 13 elevators of varying sizes. Each of the 18 housing units includes four retherm docking stations that plug into heated food carts, delivered daily by semi-truck from the new central food plant, and auxiliary medical services are available on each floor.

The first floor serves as Maricopa County's new 87,000-square-foot central intake station, designed with close attention to adjacencies to make the booking process faster and safer.

**PROJECT DATA**  
**4TH AVENUE JAIL, MARICOPA COUNTY, ARIZ.**

**Type: Booking/Maximum-Security Detention**

**Construction Cost: \$91,070,500**

**Number of Beds: 2,068**

**Area: 541,517 s.f.**

**Start: July 2001**

**Projected Completion: October 2004**

**Project Team**

**Owner/Operator: Maricopa County / Maricopa County Sheriff's Office**

**Owner Representatives: Jim McFadden / Capt. Charles Johnson**

**Architect: HOK/Durrant**

**Program Manager: Hunt Jacobs**

**General Contractor: McCarthy Construction**

**Security Detention Contractor: Norment Security/Trentech**  
**Security Electronics and Communications Engineers: Buford Goff & Associates Inc.**

**Access Control/Digital Video Integration: ASSI**

**Detention Furnishings Contractor: Kanche & Associates**

This maximum-security facility is run entirely by touch screen. Dedicated to staff-efficiency, the jail also includes three courtrooms, fully-computerized booking, NAFIS palm print scanners, Iridian IriScan technology for both staff and inmate access, a steel-lined central control room, and more than 700 cameras, digitally recorded at 30 frames per second.



**Security mesh fully segregates this 72-bed unit by two halves, monitored by a single control room on the mezzanine.**  
**PHOTO CREDIT: Sgt. Artur Fay**

Anyone who wants to get a truly complete picture of this new jail system, of which 4th Avenue is just one part, should tour the facilities during the American Correctional Association's January 2005 conference. Visiting Phoenix is the only way to see this monument to staff- and cost-efficiency. (And, yes, Sheriff Joe is keeping his famous tent city open.)

### **COMPRESSION**

In 1998, Maricopa County taxpayers passed a \$900 million sales tax increase for the construction and operation of jails.

The measure passed with 72 percent of voters in favor of rebuilding the jail system, a testament to Sheriff Arpaio's media savvy.

With more than 9,000 inmates, this is the fourth largest jail system in the United States, up from 6,100 inmates only five years ago. The original plan covered two city blocks, but HOK/Durrant was able to squeeze the facility into one 4.5-acre city block, first by extending the walls of the facility to the sidewalk.

"We were able to compress that building and make it as efficient as possible to get it down from a high-rise building to a mid-rise building," says Scott Bohning of Durrant, the architect

of record. "That equated to a lot of savings in overall construction costs and material and life safety systems."

Bill Prindel of HOK, the associate design firm, investigated a steel panel system being used to construct cells in the Pacific Northwest. The panels were only 2-inches thick, which would save considerable space compared to 8-inch concrete masonry wall units (CMU). But the fiberglass-filled panels sounded clanky.

"With Trussbilt taking the lead, we looked for other ways of attenuating the sound. One option was putting expanding foam in between the panel skin. We looked at three or four options," recalls Prindel. "And then, to everyone's surprise, the concrete-grout method seemed to be not only best in terms of sound attenuation, it was also the cheapest scheme." Perforated ceiling panels diminish reverberation.



**The 4th Avenue Jail runs the edge of the sidewalk on all sides. The V-shaped wall of glass block brings ventilation and light to the otherwise windowless interior.**

The team came up with an L-joint to lock the panels together while a U-bracket at the bottom holds the panels in place and traps moisture. Easy to transport and store, the thin-wall cell panels look like stacked doors in the construction staging area. Two workers can carry and install the lightweight panels because the concrete grout is poured into the wall after installation.

"The wall panel lends itself to multi-story work," says Bohning. "If we had built those with CMU, we would need truckloads of it showing up right when we were doing superstructure development. The thin-wall panels don't have to come on site until the superstructure is completed, and we were able to bring them in at a more convenient time."

As Durrant President Frank Roberts explains, the cell walls chase the superstructure as it goes up. "You have this unencumbered space to get your fixtures attached and mounted. That's a speed gain for the tradesmen," says Roberts, noting the thin panels took 30,000 square feet off the project.

Trussbilt is now manufacturing the steel-and-concrete-grout panel as TrussWall. In addition, Norment, which worked with Trussbilt on 4th Avenue as security detention contractor, is using the panel for a new, pre-furnished cell system, marketed under the MaxWall brand name.



**The new 87,000-square-foot intake area is six times larger than the existing booking center.**

In conjunction with bringing down the height of the building, architects worked to blend the jail with Phoenix's downtown warehouse district by creating a brick façade. Public appeal was important because the jail is on a sidewalk route to Diamondback Stadium.

"The brick was an element we used that looks like a warehouse," says Prindel, who worked on the project with lead designer Bill Valentine, HOK's president. Special brick forms take advantage of the Arizona sunlight, creating varied shadows throughout the day.

A V-shaped, glass-block treatment rises three stories to provide light and ventilation to an otherwise windowless interior and also illuminates the streetscape at night. "Every time Sheriff Joe sees me, he says the outside of the jail is too pretty," muses Capt. Johnson.

## **DETAIL INTENSIVE**

The existing Madison Street Jail, located across the street and slated for renovation, was only built to handle 90 to 110 bookings a day and was averaging 380 daily bookings. Just as the 4th Avenue Jail runs to the edges of a 4.5-acre city block, so does the intake area on the first floor.

At 87,000 square feet, the new intake and release center is built to handle 1,200 bookings a day with holding cells to secure 157 detainees. The various cells hold one, four, 16 or 25 inmates, not to mention the negative-pressure cells. "We have four holding cells for psychotic inmates, with padded cells and floor-grate 'china' toilets that flush automatically," Johnson says, kicking some ice into the grate.

Capt. Johnson's goal was to reduce the amount of time an arresting officer spends in booking to five minutes, getting them back on the streets quickly. He anticipates inmates will be booked in less than 20 minutes, down from 45 minutes.

"The inmates move in one direction, similar to a car assembly line," says Prindel of detainees on the booking pathway. "You want to make sure the pieces you're bolting on to the car are in the right sequence, and that you're not painting the car too soon or too late."

The sallyport has large bi-fold door at both ends and can hold 23 police vehicles and five full-size buses without impeding flow. Moving inside, Johnson begins to point out the numerous small touches found throughout the 4th Avenue Jail. For instance, the cement benches in the initial holding area have bars separating each seat space. Not handcuff bars; these bars prevent inmates from lying down, minimizing detainee squabbles over seating.



**A special tactics team was brought in to test the strength of the steel cell mockups.**

Nearby, there's an eyewash station to get pepper-sprayed arrestees back in shape for booking. Over there, a money-handling machine resembling an ATM; Maricopa County is responsible for an annual \$21 million in cash and coins held for those carrying money when arrested. The counting machine will count both paper money and coins in any order.

"That money is usually counted four times, which is time consuming," says Johnson. "The machine even checks for counterfeits."

The booking path forms a horseshoe. At medical triage, nurses begin the identification process. Four large holding rooms at the center of the horseshoe have interlocking doors on either side. This way, officers can confine an inmate group at the beginning of the process or, using the door opposite, a group further down the pathway.

Beneath the intake area is the basement property storage room, which includes steel SpaceSaver property shelves with the capacity to hold 5,200 bags of property. Property is delivered via an electronic dumbwaiter, and three HEPA-filters keep the space from getting musty.

Under Arizona law, arrestees must appear before a magistrate within their first 24 hours. To meet this time frame and minimize transportation costs, intake has two courtrooms for initial appearances, open at all times. The IA courts are Spartan, cinderblock affairs with plastic Norix benches. Inmates address the judge from behind a simple iron bar in the shape of an upside-down 'U.'

### Product Data

**Cell Wall Panels: Norment/Trussbilt**  
**Exterior Finish: Phoenix Brick/Sun Valley Masonry/Edward Construction (metal siding, aluminum panes)**  
**Roofing: Young Builders Roofing**  
**Floor/Wall Tile: Dekel Tile (Dal-Tile), Armstrong, Roppe**  
**Chopper Pumps: Sewage Ejectors**  
**HVAC: Conwest/Climatec/Mcquay**  
**Penal Plumbing: University Mechanical/Willoughby**  
**Detention Accessories: Norment/Trussbilt Stainless Steel Access Doors: Trussbilt**  
**Retherm Coolers: Burlodge**  
**Lobby/Court Benches: Norix**  
**Dumb Waiter (Property): Matot Ambassador**  
**Access Readers: Iridian IriScan**  
**Video Visitation: Multi-Media Telesys**  
**Security Door Pneumatic Line System: Airteq**  
**CCTV: Bosch (Philips)**  
**Monitors: Philips**  
**UPS: Powerware/Exide**  
**Diesel Back-Up Generators: Cummins**  
**Touch Screen System: Wonderware Software - Norment Security/Trentech**  
**Touch Screens: Elo**  
**Intercom: Harding Instruments**  
**Card Access: Momentum System (Hirsch Electronics)**  
**Personal Alarm System: (Hardwired System with PLC)**  
**DVR: Nice Digital Recording**  
**Security Cell Door Controls: Omron PLC**  
**Security Cell Doors: Trussbilt**  
**Security Locks: Assa Abloy**  
**Security Glazing: Trentech**  
**Security Windows: Trussbilt**  
**Polycarbonate: Lexan (Modern Plastics)**  
**Security Screens/Fencing: Able Steel / Atlas Welding**  
**Weapons Detection System: Heimann Systems**  
**Security Sprinkler Equipment: Roadrunner**  
**Security Fire Equipment: Roadrunner**  
**Smoke Detection System: Arizona Fire**

The feat is in the way the courts fit into the booking process. Booking information is automatically printed in the court, giving the magistrate important booking information and profiles, including any threats against a victim.

Victims can watch proceedings from a viewing room off the public lobby through either two-way or one-way glass. Visitors can watch court proceedings on video monitors in the lobby, keeping them out of the court. Windows to take jail bonds also abut the lobby.

"We have redesigned how we do booking," Johnson says. "We also developed a prototype booking system using drop-down touch screens and loaded all the court codes and the Arizona revised statutes. For example, if you want to know what the code is for the destruction of native habitat, all you have to do is type in the word 'habitat,' or just type the letter 'H'."

Information need only be entered into the paperless booking system once. "Since someone has already gone to the work to fill out the form, why shouldn't we capture that information?" Johnson's team was careful to omit information that the arresting agency might require, but means nothing to the booking station, such as the place of arrest.

"I hate the term 'smart technology,'" says Johnson. "We looked at stuff and said, we're not going to accept what's out there. Here's what we want."

## INNOVATION

Cost-efficiency is best exemplified by Maricopa County's new 146,000-square-foot Food Factory, designed by DLR Group and completed last year (see [Correctional News, Sept./Oct. 2003](#)). It is the largest non-commercial cook-chill center in the world. With a bakery, cannery, curing facilities, and 36,000 square feet of freezer space, the automated food-processing center can produce 40,000 meal trays per day.

Able to take advantage of bulk food deals at a moment's notice, the Food Factory has drastically reduced food costs. "We have no kitchen within 4th Avenue," says Durrant's Boehning. "Food comes via semi-truck delivery every night."

As many as nine trucks will deliver meals in carts already loaded with trays. Dedicated elevators transport food to 4th Avenue's large coolers on all four floors, then used carts from the previous day are loaded back on the trucks. Used carts are stored in a special basement cooler to delay the deterioration of food scraps.

At a multi-story, maximum-security facility such as 4th Avenue, the emphasis is on keeping inmates in the housing units. There are retherm units in each of the dayrooms to heat the food. "Using time and motion studies, we sized the elevators to fit eight carts and facilitate a time schedule to feed the inmates, moving all those carts between dinner and breakfast."

Indeed, the 4th Avenue Jail is only one part of an impressive new jail system, featuring a video-visitation system (VVS) capable of handling 6,000 visits per month. The Estrella Support Building brings video visits to the tent city, while the largest installation is at the soon-to-open Lower Buckeye Jail (LBJ). ([Correctional News](#) will feature LBJ, designed by DLR Group, in our Jan./Feb. 2005 issue).

The visitation system for all three facilities is comprised of 126 visitor video-visitation terminals and 323 terminals for inmates. According to the manufacturer, Multimedia Telesys Inc. (MTI), this is the world's largest VVS.

"The intent is to link the facilities on a one gigabyte Internet LAN so the courts can call directly into the cellblock and do arraignments," says Tom Hesse, MTI's president and CEO. "They also need to bring in 250 primary courts, 750 public defenders, and 1,000 parole officers."

The system is slated to be incorporated with an Integrated Criminal Justice System. Future plans call for the system to incorporate remote visitation online and setting up visiting booths around the county, at libraries perhaps. Behind the effort is a switching system worthy of a Las Vegas casino.

Hesse says he acquired an Indian gaming license to familiarize himself with casino switching systems. No longer installing at casinos, he brings what he learned to the corrections industry with his own digitally-based manufacturing floor to produce both the systems and booths. "We got to see some great technology, and we modified those systems for prisons and jails," says Hesse.

"We're not a PBX or standard LAN system, where we clip the highs and lows," he explains. "We have the same type of hybrid digital matrix switch as the Bellagio Casino, which is fully redundant, meaning we have a processor for each application, video, audio and interfacing. It's where the technology will be for the next 20 years."

The booths at 4th Avenue vary slightly from those at the tent city support building and LBJ, configured in an interlocking formation of V-shaped booths to save space. Hesse says some installers make the mistake of fitting the booth to the terminals, rather than the visitor.

"We only need 15 inches for the electronics, but the booths are designed to give us 45 inches of space, which accommodates two visitors," says Hesse, who worked with Durrant on the design. Fourth Avenue's 38 visitor booths are stainless steel, which won't rust and is easy to polish.

MTI's viewing screens have a 3/8-inch Lexan full-strike polycarbonate screen with a hermetically-sealed "scratch shield," more easily replaced if defaced than the polycarbonate which, while impact-resistant, can be scratched. To keep objects off the units, they slope at 18 degrees. Sloping also aids drainage, important because the units can be hosed down.

"The officer can schedule a visit by hitting an enter button, the visit goes to the mainframe, the mainframe sends it back on the county LAN to our controller for that jail," says Hesse. "We know where the message came from, we know the inmate's cellblock. Our controller then takes on the responsibility of that scheduled visit. The Jail Management System notifies the prisoner and gives them a movement slip, and sends the information to an officer via a printer in the cellblock."

If that isn't enough: "Movement slips are in both English and Spanish."

## **SECURITY**

The services distributed evenly on every housing floor are extensive. In addition to the main clinic in the basement, each floor has a satellite medical station with two nurses, three exam rooms, a clean laboratory, and an inmate toilet. Chapels on every floor accommodate 50 inmates.

There are 18 typical housing units. Each unit has 72 double-bunked cells with eight VV booths. Other features within the units include two dayrooms, and two recreation yards, two handicapped accessible cells, two classrooms, two multi-purpose rooms, and two contact-visitation rooms.

Dual spaces in the housing units allows them to be split with floor-to-ceiling security mesh, so actually there are two 36-bed units with in every 72-bed unit, facilitating more selective segregation. These two half-units are monitored by a single control room perched above on the mezzanine level, looking more like an outdoor prison tower moved inside a jail.

"The elevator on the mezzanine floor, where the officers go to access the control room, has a solid steel door that covers that elevator," Capt. Johnson says. "Not only does he have to open up the back door, but he also has to open the elevator door. We made the floors as secure as possible, so if the inmates do take control of the floor, there's nowhere for them to go. I can't talk about all our security provisions, but believe me, there are some surprises if anybody tries to escape."

Housing the most violent inmates are the specialized close-custody isolation cells on the fourth floor. Inmates are segregated from officers and other inmates as much as possible through a novel design with two cells sharing a recreation room, each cell with its own shower.

A vestibule with interlocking doors serves as each cell's security foyer, a little bigger than a public phone booth. In fact, the vestibule has an individual phone. The secure entry space gives officers added distance in delivering food, accommodates contact visits with attorneys, and provides a small table for inmate dining.

Multimedia Telesys added a unique video visitation application to the close-custody cells by creating units on wheels. The waist-high mobile units feature a microphone, speakers and 20-inch monitor attached by a 50-foot umbilical cord, wheeled in by officers and locked into the vestibule for visitation.

As the 4th Avenue Jail nears its opening date, Capt. Johnson is sorry to see Maricopa County's construction program reach its final phases. The New Jail Construction Unit is a self-confessed obsession. He'll retire when it's over, he says, though Sheriff Joe has offered him the position of jail commander.

Charlie Johnson is also something of a mystic. During construction, he would dream of small details in the building program, and found his dreams often presaged problems on site. "Everybody thought I was crazy, but they would look and say I was right," he says. For the punch list, he is now staying in a close-custody cell to ensure he can follow up on the details.