

123655

**U.S. Department of Justice  
National Institute of Justice**

This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the National Institute of Justice.

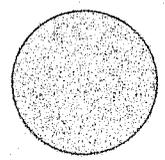
Permission to reproduce this copyrighted material has been granted by

Juvenile & Criminal International,  
Inc.

to the National Criminal Justice Reference Service (NCJRS).

Further reproduction outside of the NCJRS system requires permission of the copyright owner.

123655



# Juvenile and Criminal Justice International, Inc.

381 South Owasso Boulevard • Roseville, Minnesota 55113 • (612) 481-9644

*a non-profit agency providing survey, master plan and consultation services  
in correctional health care and corrections*

Joseph R. Rowan  
Executive Director

FEIN #51-0187430

## DESIGN, EQUIPMENT, CONSTRUCTION AND OTHER BLUNDERS

### IN DETENTION AND CORRECTIONAL FACILITIES

#### WHO IS TO BLAME?

- ° Design Professionals and Contractors
- ° Detention/Correctional Administrators and Planners
- ° Legislative Bodies
- ° Governmental Support Agencies
- ° Equipment Manufacturers

A NATIONAL SURVEY  
by Joseph R. Rowan

#### A. INTRODUCTION

Juvenile and Criminal Justice International (JCJI) sent a questionnaire to the heads of all 50 state departments of corrections and youth services and to a representative sample of jails built in recent years, asking whether any serious architectural or other "blunders" or cluster of errors had caused serious operational or life-safety problems in their facilities.

The results of this questionnaire were supplemented by on-site surveys of more than 175 jails, prisons and juvenile facilities conducted or directed by this author during the past eight years.

State departments of corrections and youth services and jails representing 41 states responded to the questionnaire with many "horror stories".

The need for this survey was prompted by two important concerns:

1. On-site surveys of detention and correctional facilities over the years revealed a number of design and construction problems which had a negative impact on operations and life-safety; and
2. A number of administrators of detention and correctional facilities told this author personally that faulty facility design and construction in the criminal justice field should be made public so that correctional administrators who might be considering the building of new facilities would be alerted and fewer mistakes made in the future, to the benefit of the taxpayer.

Some administrators said they blamed themselves in certain instances for not involving knowledgeable staff or for being ignorant of technicalities.

Other administrators said they were blamed for mistakes made by design professionals who needed to be monitored and held accountable for serious, preventable mistakes. The survey respondents' credibility is reflected in great part by the fact that a number of them volunteered that, as their agency's representative, the fault of many past problems lay with them.

This first-of-its-kind survey was funded totally by JCJI, with no government monies.

B. FINDINGS - REPORTS FROM THE FIELD

Some detention and correctional facilities were plagued with a number of the mistakes listed below. Although some of these are almost ludicrous, the long term effects have often been costly. Sometimes remodeling was necessary to improve functional operations.

One \$47 million jail had to correct 18 safety deficiencies which were brought to the jail's attention by three different consultants in their reports before the facility was opened. The jail was designed by an architectural firm which specialized in jail and prison construction for about 30 years.

Following are some of the more common mistakes made by architects, other design professionals and contractors in the design and construction of various detention and correctional facilities; many of these mistakes had a decidedly adverse effect on operations and/or life-safety, according to administrators or their representatives of the various state departments of corrections/youth services and jails.

Jurisdictions were assured that their answers would be pooled and individual identities kept confidential.

Planning and Design

1. Control centers so located that inmates and operations could not be observed:
  - ° 96 of 100 jail cells totally unobservable
  - ° Inability to observe both tiers
  - ° Long, unobservable cellblocks
  - ° "Donut-shaped" circular housing units with multiple blind spots
  - ° Lack of observation while operating cell/pod doors.

2. There was no ready access to plumbing, which was buried under a concrete slab; the concrete had to be jack-hammered for plumbing repairs.
3. Prison built over a spring, with no provisions to prevent flooding, resulting in constant maintenance problems.
4. Windows opening to the outside of the perimeter security.
5. An inter-com system which was not connected to the kitchen, yard, hospital, maintenance areas and towers.
6. Grid lay-in drop ceilings in maximum-security facilities; in one such facility, the control room was accessible from inmate areas.
7. Unrecessed smoke alarms and light fixtures, necessitating the cutting of concrete blocks after construction, to recess fixtures.
8. Security barrier breaches, allowing inmates access to the heating, ventilation and air conditioning system and roof areas.
9. Water accumulation and leakage on lower floors because floor drains were located above floor surface.
10. Panic buzzer system that excluded the school and social service areas.
11. Control tower location left numerous blind spots in yard and sallyport; the facility had to install closed circuit TV to provide observation.
12. Dark areas/hidden pockets which rendered inmates unobservable in certain areas because night lighting was grossly inadequate.
13. Too much light in cells at night, causing inmates difficulty in getting to sleep.
14. Prison site selected without sufficient analysis of soil, water, sewer and availability of gas and electricity; additional costs and construction delays resulted.
15. Failure to separate public access areas from non-public areas.
16. Failure to provide for direct observation of holding areas.
17. No floor drains in the inmate cell areas of a new, urban, eight-story jail; this was only one of 10 serious design errors, several pertaining to life safety.
18. Grossly inadequate storage and janitorial areas.

(over)

19. Tower searchlight handles, installed so high that short officers could reach them only by standing on a chair.
20. Extensive water damage to interior and exterior walls and ceiling because roof was improperly designed.
21. Shower rooms located and designed so that showering inmates could not be observed, requiring additional, costly staff supervision.
22. Observation of inmates obscured by:
  - ° stairways
  - ° columns
  - ° solid walls instead of glazed panels.
23. Poor acoustics and a high noise level caused by hard, sound reflective surfaces throughout the facility.
24. Perimeter towers (100 feet high) with no searchlights and no electrical line to hook up any light.
25. One service exit/entrance through which both garbage/trash was removed and food was brought in, contrary to public health regulations.
26. Inmate asphyxiated from burning mattress because holding cells were built without air vents [non-code mattress complicated the problem].
27. Sewer line broken by fence post installation.
28. Cell door entrance not wide enough for a stretcher.
29. No sallyport was included in the design of a secure facility's intake area or perimeter security.
30. Maximum Secure facility design included commercial, exposed fluorescent lighting in the high-risk segregation unit.
31. Thermostats for controlling heat and air conditioning were placed in closets!
32. A new swimming pool in a juvenile facility had to be re-designed and "dug up" because the equipment was the wrong size.
33. In one facility, the audio-visual monitoring system in the control center, the heating and air conditioning system, and the electrical door locks and alarm systems all had to be modified shortly after occupancy because they were grossly inadequate for the building design.

34. Although one control room was designed to observe four dormitories, the sight lines were so obscured that some areas could not be observed; this necessitated installation of CCTV for monitoring.
35. The glazed panels on the control center and holding area wall across from it were erected parallel to each other, producing reflections and shadows, thus obscuring the view of the booking officers. All outside light in that area had to be screened, at additional cost, to prevent shadows.
36. The poorly designed ventilating system failed to provide minimally adequate air change.
37. Medical/mental health area poorly designed for proper observation, necessitating additional staff supervision.
38. Visitors required to walk through the maximum security area because the visitation area is located in the middle of the jail, which is not a new generation type; this meant that inmates and visitors must intermingle and criss-cross in a common hallway.
39. The bondsmen's interview room is located outside the security perimeter. Vestibule doors used during interviews are interlocked. When the outer door is opened, sometimes by hitting the wrong button, inmates are provided a direct escape route.
40. Poor design caused water to drain down through the ceiling upon administration offices below whenever inmates flooded their toilets.
41. There was constant sewage backup and flooding because four-inch sewer pipes were installed instead of eight-inch pipes.
42. To provide reasonable supervision, the number of staff had to be nearly doubled (with resulting cost increases) because control centers as originally designed produced grossly inadequate monitoring of inmates.
43. Three security prisons within one state, each designed by a different architect, relied solely on manned guard towers for perimeter security, even though many security institutions, using state-of-the-art design, have eliminated manned guard towers. Each guard tower costs a minimum of \$100,000 annually for 24-hour coverage.
44. Anchoring of security grills and stair/ramp railings was so poor that inmates were constantly removing or loosening them.
45. Installation in 1986 of baseboard radiation heating with easily removable covers in cell areas.

(over)

46. Weight-lifting equipment adjacent to gym floor, causing damage to basketball court.
47. Installation of main telephone switchboard in central security control, resulting in officers occasionally having to act as "operators".
48. Outdoor exercise area located immediately adjacent to a public road.
49. A special appropriation of \$10 million had to be added to the original cost of one maximum security facility because the architect under-estimated the square footage.
50. Individual visitation rooms not properly sound-proofed, causing considerable distraction for visitors and inmates.
51. No floor drains and an insufficient number of fire exits in the design of the maximum-security area; also, fire extinguishers, placed on the cell area walls, were accessible to inmates.
52. In one facility, both the jail audio-visual monitoring system and the heating and air conditioning units were obsolete at the time of installation; further, the control center was located in the wrong place.
53. Death chamber located in the middle of the medical area.
54. Medications/food tray slot in door located one foot from the floor in maximum-security segregation area, and vision panel too small and high for nurse or officer to observe inmate taking medications.
55. No telephone in medical unit when institution opened; after one was installed, it could not be used to call outside.

Construction and/or Equipment

1. Doors in maximum-security section activated without cause and which would simply "pop open".
2. Glazing "popped out" because window frames were not properly anchored.
3. A high-tech computer system that "hasn't worked one day in three since the facility opened!"
4. Emergency electrical backup system functioned improperly.
5. Inadequate grilles over duct work, sheetrock walls and lay-in ceiling grid within maximum security perimeter.

6. Electrical outage caused by inadequate system for lightning protection.
7. Overheating and insufficient air movement due to ducted-only ventilation system (windows do not operate).
8. Air grilles which were removed by inmates in maximum security unit.
9. New but outmoded cell ceiling fans mounted on roof which required frequent oiling.
10. High-security (segregation) cell door installed in 1986 with plastic anchors which were easily tampered with.
11. Razor wire was improperly installed so that it could not withstand effects of wind.
12. Electrically-operated gates to main hall and bullpen which inmates could operate by hand to prevent closing.
13. It was discovered, upon opening the facility, that the closed-circuit TV system was not connected to monitors!
14. Residential-type materials, instead of heavy detention equipment were used in maximum security.
15. Inmates could jam and open doors, so entire cell door system had to be re-designed and replaced.
16. The environmental computer which regulated temperature and ventilation levels failed.
17. Inmates could remove security window screws because they were located inside the cell areas.

#### Fire Safety

1. Improperly located smoke detectors:
  - ° Near showers where steam activated them
  - ° Within easy reach of maximum-security inmates.
2. Fire code in new facility not met; significant modification was necessary before occupancy.
3. Central fire alarm panel was not located in a central, 24-hour control post.
4. Smoke detectors placed inside ducts violated state fire code.

5. Inadequate fire protection because construction was non-rated.

### Suicide

1. Windows and doors with bars in mental health unit sleeping rooms to which patients could attach nooses for attempting and committing suicide.
2. Standard commercial grade deflector fins installed in ventilation system in inmate areas, which inmates removed for weapons and to attach nooses in suicide attempts.
3. Windows with cross bars in residents' rooms in secure juvenile treatment facility used for suicide attempts.
4. Air grilles and exposed light fixtures in a new jail were covered with heavy wire mesh which had openings of three-quarters of an inch, allowing easy attachment of a suicide noose.
5. Modesty shields in the holding area of a large urban jail were built 12 cinder blocks high, from floor to ceiling, totally concealing any inmate using the toilet from officers in the booking area; the inmate could thus use the toilet as a step-ladder to attach a noose to the overhead air grille, whose openings were wide enough to affix a noose, or it could be the setting for undetected assaults.
6. Traditional steel beds containing holes in the bed bottoms were installed in the mental health unit of a correctional facility; the beds were used by two inmates in separate incidents to commit suicide; they attached the noose overhead to the holes in the bed bottom. (Note: Other facilities have reported this same method of committing suicide: the inmate lays on his back, runs the noose overhead and under his neck, then turns over on his stomach; he passes out, according to medical opinion, in 15 to 30 seconds; death by asphyxiation occurs in up to 12 or 13 minutes.)
7. Small (6" x 10") polycarbonate panels on the doors of the medical/mental health ward made it difficult for nurses and officers to adequately observe patients who were suicidal. Also, they were placed so high that some nurses had to stand on a stool to see into the room. (Note: Small door panels produce sensory deprivation, exacerbate depression and reduce communications between patient and staff. At least the upper half of doors in infirmaries and mental health units should be of glazing; further, front walls should be of glazing to provide full view of patients; privacy while using toilet facilities can be provided by construction of a modesty shield which complies with recommendations outlined in the Training Curriculum on Suicide Detection and Prevention in Jails and Lockups.)

8. After a suicide, the one-piece, non-collapsible clothing hooks attached to the cell walls had to be removed and replaced with ball-in-socket type collapsible hooks.
9. After a suicide, the permanent, non-breakaway water sprinklers in each cell of a new generation jail had to have cones placed over them to prevent nooses from being attached; also, inmates had set off the sprinklers, resulting in flooding.
10. After a suicide attempt in a new jail, where the cell doors and fronts were constructed of bars, the doors and fronts were closed off with detention screen from floor to ceiling.
11. Even though youths had individual rooms, a modesty partition was installed for privacy; a youth hung himself from it.

C. WHY SUCH POOR DESIGN, EQUIPMENT AND CONSTRUCTION PROBLEMS?

In the questionnaire, detention and correctional administrators were asked why they thought mistakes occurred in the design and construction of their facilities. The blame, they thought, lay in several areas:

1. **Architects and Other Design Professionals:**

- ° Frequently they had limited understanding of new design technology, specifically applicable to detention and correctional facilities. They were not aware of the "state of the art" in the correctional field.
- ° "Design professionals are unaware in many instances that our clients are destructive," said some respondents.
- ° They did not seek any input from experienced peer professionals or detention and correctional personnel who could have assisted the design professionals by providing know-how on programs, staffing and aspects of operational and facility requirements. (Caution: Experience alone does not guarantee that skillful, state-of-the-art assistance will be given; for example, one architectural firm with about 30 years of specialized experience in prisons and jails was responsible for 18 life-safety problems in one facility.)
- ° Too often architects want to design "pretty buildings" and lack appreciation for the simplicity of operation, ease of maintenance and durability required in a correctional facility. One "pretty" prison was described as an operational "nightmare" by one administrator.

- ° They want to follow a "humanitarian" approach, instead of emphasizing life safety. For example, many agencies answering the questionnaire stressed that many appurtenances were provided in the sleeping areas where a noose could be affixed for hanging, whereas suicide-resistant fixtures could have been installed initially at little or no additional cost.
  - ° "Poor cost estimates cause later changes in designs" was mentioned by some respondents.
2. **Correctional and Detention Administrators:** Many administrators frankly admitted that they did not involve their own experienced staff in contributing knowledge about the programs and operations which impact facility design, construction and operations. (Caution: Staff input doesn't always guarantee the right end-product; although staff input should always be sought, the owner-administration needs to insure that he gets the right advice.)
  3. **Legislative bodies** which have budgeted incorrectly in the first place, often cut already allocated funds, necessitating re-designing and eliminating of essential features; or who informed correctional administrators, in effect, that they [the legislative body] had "hired professionals" and didn't need input on design and construction matters from them [the correctional administrators ].
  4. **Governmental support agencies** which fail to monitor and inspect all phases of the projects, mostly from lack of technical knowledge and/or time; or perhaps from an inability to read detailed, working drawings. Although monitoring is important during all phases of the project, it is particularly crucial prior to the "signing off" period or acceptance of the project as complete and in accord with plans and specifications. By "ribbon cutting" time, it is too late.
  5. There is a tendency of agencies to contract the design and construction work to the lowest bidder, which often results in mediocrity, inexperience and "shabby work." If legally possible, bidding should be limited only to those contractors or providers who are qualified, as determined by a review of their records.
  6. **Contractors** may deviate from specifications, in part because they sometimes respond to pressure to get the building finished earlier than the contract deadline. A project management staff person, with a long-standing reputation for integrity, cited experiences in which "contractors take liberties when drawings are not clear." In other cases, "if there is not close monitoring, design specs are not followed." "Shoddy workmanship." was cited by a number of respondents.

7. **Vendors** oversell their products, or sell products not attuned to the criminal justice facility; some agencies in the survey said that new, untested products caused particular problems.
8. The disaster scheme is the combination of the architect and other design professionals who are unfamiliar with correctional facilities, and correctional personnel who were uninformed about architectural, mechanical and construction techniques, who do not share the knowledge they do have about programs, staffing and overall operations.
9. Some decisions regarding equipment reportedly are made during construction without involving specialty consultants.

D. WHAT IS RECOMMENDED?

Sometimes more than one aspect of the design and construction of detention/correctional facilities contained serious mistakes or "blunders." In most instances, respondents felt that it was possible to pin-point the cause of the mistake. Most of the following recommendations for avoiding "blunders" came from questionnaire respondents.

1. **Architects and Other Design Professionals** should:

- a. Diligently seek the input of knowledgeable correctional and detention personnel in all aspects of planning, design specification and construction. It is the obligation of design professionals to fully involve the agency.

Since many if not most criminal and juvenile justice administrators do NOT meaningfully involve their own staff in policy, program, procedure and facility changes in their ordinary day-to-day operations, design professionals are strongly encouraged to ask some leading questions or make statements indicating that they believe the users of the system/the line staff should contribute their ideas for a better end product. Pro-active architects and other design professionals may find that such action protects their reputation. In fact, it is a basic principle of the architectural and other design profession to seek user input.

- b. If architects have not been exposed to the criminal justice field, they should seek consultation from peers experienced in criminal justice architecture. Hire the best consultant!
- c. Give closer attention to new, developing methods and approaches for effecting greater efficiency in operational and life-safety measures, e.g., "suicide-resistant" architecture in high-risk areas. The fact that at least a few such facilities have been so designed and constructed is evidence that more can be constructed correctly in the first place - with lives saved as a direct result.

(over)

- d. Be qualified in every respect. This should be determined by users who review their "track record," staffing and sub-contractors they plan to use in various specialized areas - electrical, mechanical, etc. A satisfied customer generally is the best reference for a successful building. A bad reference from a dissatisfied customer means that design and construction blunders can be avoided by avoiding those with poor track records.

**2. Correctional/Detention Administrators should:**

- a. Involve own staff meaningfully in contributing their knowledge of programs, operations and facility needs so that a functional, efficiently operated facility can become a reality.
- b. Acquaint themselves with current state of the art in criminal justice facilities, so that they can effectively monitor architects and other design professionals who otherwise may design a "50-75-year old" new facility.
- c. Withstand pressure/advice from the legislative/financing body which insists that the design experts can do their job without interference, and that criminal justice administrators should "stay out of the picture."
- d. Aggressively assist the responsible governmental agency in monitoring all phases of design and construction so that design and construction, as originally planned, are carried out.
- e. When feasible, employ a program or project management firm or a construction manager.
  - (1) Program Manager: "Does everything" regarding management, supervision and monitoring of the project. Operates on a contract; advises agency on whom to hire; in exceptional cases may do the needs assessment or master plan study, but generally recommends who can do it. Has broader responsibilities than project manager.
  - (2) Project Manager: Helps to select architect and other design professionals after master plan is finished; supervises work done.
  - (3) Construction Manager: Begins his work after the architect has designed the facility; involved in cost estimates and scheduling; supervises/monitors construction phase.

**3. Legislative Bodies should:**

- a. Insist on having nationally recognized standards, guidelines and state of the art followed in the design and construction of facilities. Why should taxpayers have to pay for a new, 50-75-year-old facility which will be both operationally ineffective and cost-inefficient?
- b. Require correctional administrators and staff to share knowledge for all phases of planning, design specification and construction of the facility.
- c. Effect legislation that contracts not be awarded solely on the basis of the lowest bid; or provide guidance on the development of administrative rules to achieve the same objective.

4. **Governmental Support Agencies** should:

- a. Closely monitor all phases of planning, design specification and construction. Inspectors should be trained and required to spot shoddy and illegal work.
- b. Seek outside technical assistance whenever staff does not have the technical knowledge to do proper monitoring.
- c. Obtain assistance in the monitoring process from intended users of the facility.

5. **Contractors** should:

- a. Use experienced craftsmen who abhor "shoddy work."
- b. Adhere strictly to legally required specifications.
- c. Be immune to pressure to get job done early at the expense of "cutting corners."

6. **Vendors** should:

- a. Keep abreast of current state of the art regarding new developments in equipment design and manufacturing which affect life safety and operational efficiency. Likewise, design professionals have an obligation to recommend equipment which meets state of the art, life-safety and operational efficiency.
- b. Market only those products which have been tested and proven.

7. **Overall:**

First consideration should be the relationship between design and staffing (and programs); then, keeping in mind the concern for security, the facility should be designed around effective staff supervision.

8. The Right Combination - It CAN Be Done

Although the purpose of the survey questionnaire was to detect problems of detention and correctional facilities, the administrator of one large jail felt he should share some good experiences. He wrote:

- a. "Our facility has been in operation for 2½ years without our discovering any errors or problems as described."
- b. "Design was facilitated by cooperative efforts of the architect and consultants working in conjunction with facility administrators and users."

9. ADDENDUM

A recently built maximum-security prison found that its computer-operated cell doors "popped open" when lightning struck overhead! Specifications called for a special shielded electrical wire, but to save costs, unshielded wire was installed. The correctional administrator said, "Government tried to get by cheap and ignored the specifications, which were clearly spelled out." After the third electrical storm, part of the prison was taken off the computerized system in order to assure reasonable security. The system is under lawsuit.