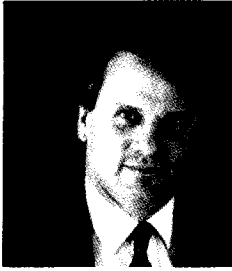


## COMPARISON OF A UK & USA PRISON (STARTLING RESULTS)



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### ABSTRACT

This paper provides an analytical comparison of two prisons, one in the UK and one in the USA. Whilst the number of prisoners housed is broadly comparable, the UK facility required *twice* the number of square feet per prisoner, and each square foot cost *twice* as much to construct in the UK. Obviously there are good explanations for these dramatic differences in size and cost of the two facilities; some are technological and some are philosophical. Both these aspects will be analysed in the paper.

### INTRODUCTION

The study of the two prisons, Dougherty County Jail, Georgia, USA and Doncaster Prison, Yorkshire, England, was carried out as part of a commission for the National Audit Office, the UK Parliamentary watchdog and value-for-money auditor. The study, undertaken in London, was carried out personally by the co-authors. Whilst we have referred to Doncaster being in the UK, it actually falls under the administration of England and Wales (Scotland and Northern Ireland being separately administered) and the statistics are based on populations for England and Wales only rather than the UK as a whole.

### THE TWO PRISONS

#### UK

Doncaster Prison is a 720 inmate category B all male local prison. Category B relates to "medium security" containment in the USA. The design for Doncaster is on the "new generation" concept which emanated originally from the USA (Her Majesty's Prison Service undertook a study tour of the United States in 1986 which resulted in the adoption, in the UK, of the US "new generation" concept). Doncaster provides fairly typical facilities for a UK prison, albeit on a relatively small site (12 hectares, approximately 30 acres) close to the City of Doncaster. As, however, the prison was envisaged to be occupied by 66% remand (pre-trial) prisoners, the full workshop facilities were omitted with enhanced vocational training facilities added in lieu. The house blocks are built on the ground and three upper floors (four including mechanical space) and most of the other buildings are on two or three levels. The design for Doncaster was commenced in 1985 and eventually put out to bid on a British Government contract (GC Works 1, Edition 2) including a full Bill of Quantities. Construction began in October 1990 with a 36 month construction period.

#### USA

Dougherty County Jail, Georgia, USA was built to house 650 maximum and medium security inmates, both male and female. The facility has, however, been designed so that it can be enlarged to house 850 inmates by the addition of 1 house block (the

ancillary facilities being sized to accommodate the expanded prison of 850 places). Dougherty has also been designed on the “new generation” principles. As well as local prisoners, the facility has been designed to accommodate both State and Federal prisoners on a commercial basis (i.e. renting/leasing prison places to the other Authorities). As with Doncaster in the UK, Dougherty is designed to house remand or pre-trial prisoners (up to 50% of its population). Unlike Doncaster in the UK, Dougherty is on a relatively large site (22 hectares, over 54 acres) in a rural environment; consequently most of the construction is at ground level. Dougherty County Jail represents a fairly typical prison in the USA as far as facilities provided and standard of specification/design are concerned. The design period at Dougherty, at 11 months, was considerably less than that at Doncaster (5 years) and construction began on site in March 1992 with a 20 month construction period.

#### THE EXTENT AND SIZE OF THE FACILITIES PROVIDED

Here we analyse the differences in physical size of the real estate between the two facilities.

- There is no separate segregation or punishment unit at Dougherty in the USA; rather inmates are initially placed in an Observation Unit from which it is decided where to house them (i.e. a more lenient or harsher regime) within the prison. These observation cells are included in the US prison population count. If prisoners transgress during their stay they are returned to the Observation Unit for re-allocation. At Doncaster in the UK there is a separate “seg” unit, where prisoners are placed for transgressions, totalling some 11,000 square feet and this is *not* included in the UK population count.
- The indoor physical recreation facility at Doncaster in the UK is considerably more sophisticated than at Dougherty in the US - it could be considered almost non-existent at Dougherty! 23,000 square feet (sf) more in the UK than in the US.
- Medical facilities at Doncaster in the UK exceed those at Dougherty in the US by some 26,000 sf. In the US they have clinic and first aid facilities but send inmates out to local hospitals for serious illness.
- Whilst providing similar facilities, the kitchen

and associated stores at Doncaster in the UK are twice the size of those at Dougherty in the US - 17,000 sf.

- There is a huge reception/discharge/administration unit at Doncaster in the UK which is some 25,000 sf bigger than that of Dougherty in the US.
- At Doncaster in the UK there is a separate visitors block. Visitors and prisoners are brought together in this 36,000 sf facility. At Dougherty in the US visits are much more limited and occur in the house blocks.
- Amenity/education facilities at Dougherty in the USA are almost non-existent. The philosophy at Dougherty appears to be that inmates cannot be reformed or trained in a prison environment - merely incarcerated and provided the opportunity of self improvement without professional assistance. At Doncaster in the UK some 65,000 sf of classrooms and educational workshops are provided.
- Single cells are slightly larger at Dougherty in the US than at Doncaster in the UK. However, the differing regimes for inmates in the US, ranging from single cells to dormitory accommodation, mean that the overall accommodation for prisoners in house blocks is considerably larger at Doncaster in the UK by some 100,000 sf. Doncaster also provides much more “association” or leisure space within the houseblocks.
- There are all sorts of facilities provided at Doncaster in the UK which have no place at Dougherty in the US - a Visitors Centre (2,000 sf), a Staff Social Centre (7,000 sf), a workshop unit (10,000 sf) and “farms and gardens” (gardening facilities for the prisoners) - 3,000 sf.

Table A details the differences in facilities provided at the two prisons; whilst the measurements may not be exact, it shows the substantial differences.

The new generation prison philosophy dates from the 1970's and 1980's when the “podular” facility was promoted. This facility would involve smaller groups, 25 or fewer, rather than the large single jailblocks previously built. This smaller group of inmates could interact on a more personal level, lowering the rate of stress and disturbances that would occur. The security personnel could directly oversee the inmates and have more contact with them. This would allow for better supervision

**TABLE A**

**ANALYSIS OF EXTENT & SIZE OF FACILITIES**

*(square feet have been adjusted pro rata for 720 prisoners with ancillary facilities sized for 850 prisoners)*

<b>Build Element</b>	<b>Doncaster, UK</b>	<b>Dougherty, US</b>	<b>Difference</b>
Segregation Unit	11,215	-	11,215
Indoor Physical Recreation	30,105	7,000	23,105
Medical	36,600	10,000	26,600
Kitchens	31,875	14,355	17,520
Reception/Discharge/Administration	36,600	11,000	25,600
Visitors' Facilities	36,600	(with house blocks)	36,600
Amenity & Education (separate from house blocks)	64,730	-	64,730
House Blocks (including association or leisure space)	310,000	206,865	103,135
Visitors Centre (outside the perimeter)	2,480	-	2,480
Staff Social Centre (outside the perimeter )	7,200	-	7,200
Secure (ie mesh enclosed) External Corridors	28,330	12,695	15,635
Farms & Gardens	2,950	-	2,950
Works Service Unit	10,745	-	10,745
Visitors/Employee Entry	35,415	23,120	12,295
<b>TOTALS</b>	644,845 =====	285,035 =====	359,810 =====

because the inmates would be less likely to break rules and the interaction between inmate and staff would foster a more "co-existing" environment. This would in turn lower medical costs for the inmates and the staff and would reduce initial construction costs because items such as steel sinks could be replaced with porcelain. Also, staff turnover would reduce and thus the training costs would decrease as would the number of staff required for inmate supervision.

It would appear that whilst the "new generation" prison philosophy has been adopted by the UK, they have not taken on general US penal policy and US prison management philosophy and as a result tend to build considerably larger facilities. Doncaster in the UK comprises some 644,000 sf compared to 285,000 sf at Dougherty in the USA.

#### SPECIFICATION, DESIGN, CONSTRUCTION AND COST OF THE FACILITIES

There are some significant differences in the costs of the facilities on a square foot basis. As with the size of the facilities provided, this is brought about by a huge difference in the philosophy of incarceration as well as in the efficiency of the procurement of construction.

- The perimeter fences, more expensive at Doncaster in the UK - in situ reinforced concrete as compared to open mesh at Dougherty in the US. Armed guards can patrol outside the perimeter at Dougherty and it is easier to shoot through open mesh than through reinforced concrete!

- All of the walls on the various buildings, both internal and external, are built of reinforced concrete at Doncaster in the UK but out of blockwork in the US.

- Roofs at Dougherty in the US are flat with an eaves feature, whereas at Doncaster in the UK they are fully pitched.

- At Doncaster in the UK windows are broad but secured with manganese steel bars; at Dougherty in the US there are narrow slit windows (which a man or woman could not crawl through) with no bars.

- Despite air conditioning being provided at Dougherty, with only ventilation at Doncaster, costs are some \$10/sf more in the UK! One of the reasons for this is that each building at Doncaster in the UK is separately and discretely serviced.

- Electricals in the UK seem to cost a lot more than in the US with no particular explanation - another \$10/sf.

- The whole set up and organisation of the contract in the UK is more expensive. This may have something to do with the overall philosophy towards construction. In the US the design is fully carried out before the project is put out to bid but in the UK (certainly in the past anyway) there seems to be a huge propensity for costs to overrun the original bid price. This costs a staggering \$30/sf more in the UK than in the US.

The detailed cost/sf comparisons are provided in Table B

Taking all into account, then, Doncaster Prison in the UK comes out at \$179/SF and Dougherty in the USA at \$91/sf - it costs \$88/sf more (twice as much) to build in the UK than in the USA. Bearing in mind that more than twice the amount of square feet per prisoner was built in the UK, this is quite dramatic!

#### A DEFINITION OF VALUE ENGINEERING

"The systematic application of recognised techniques which identify the function of a product or service, establishing a monetary value for that function and providing the necessary function reliably at the lowest overall cost."

#### SOME OF THE REASONS FOR THE DISPARITIES IN SIZE AND COST OF THE FACILITIES

In the UK it is believed that prisoners can be reformed and become productive members of society. As such, the British Government is willing to invest material and personnel resources towards achieving that result. Officials and the general populous in the US believe that harsh punishment will cure some offenders and will be a deterring example to others contemplating crime, and if not a deterrent, at least the criminals will have been punished. This is an adequate result in the US where "an eye for an eye/a tooth for a tooth" philosophy still has much currency. The majority of Americans believe that as a rule, criminals are unreformable. Therefore, the only effective crime deterrent is to pound the fear of punishment into them. In all fairness, it should be mentioned that violent crime is much more prevalent in the US; most individuals and their families have been victims of crime and this wish for punishment

**TABLE B**  
**AN INDICATION OF COST DIFFERENCES \$/sf**  
*Doncaster positive, Dougherty negative (...)*

	Element	Description of Difference	Approximate Cost Difference/SF
1.	Preliminaries	<ul style="list-style-type: none"> <li>• More sophisticated site set-up and greater contractor personnel at Doncaster (dealing with variations, etc)</li> <li>• Contractor's claim - none envisaged at Dougherty</li> <li>• Bid Bond at Dougherty, not at Doncaster</li> </ul>	14.16 17.76 (0.32)
2.	Site	<ul style="list-style-type: none"> <li>• Perimeter fence - concrete at Doncaster, open mesh at Dougherty</li> </ul>	2.80
3.	Concrete	<ul style="list-style-type: none"> <li>• Methane protection required at Doncaster only</li> <li>• Strip footings at Dougherty versus piles at Doncaster</li> <li>• Predominantly ground floor construction at Dougherty versus elevated at Doncaster</li> <li>• External walls; in situ concrete and brick faced at Doncaster, pre-cast concrete at Dougherty</li> <li>• All concrete floors screeded at Doncaster, not Dougherty</li> </ul>	0.96 1.84 3.04 5.52 1.92
4.	Masonry	Accounted for in item 8 below	-
5.	Steel	NAD	-
6.	Carpentry	NAD	-
7.	Roof	<ul style="list-style-type: none"> <li>• Roof construction &amp; finish; full pitched roof at Doncaster, predominantly flat with eaves feature at Dougherty</li> <li>• Glazed skylights and clear storeys at Doncaster only</li> </ul>	2.32 1.12
8.	External doors/windows	<ul style="list-style-type: none"> <li>• Windows in secure and non-secure areas; manganese steel with bars at Doncaster, extremely narrow slit windows with no bars at Dougherty</li> </ul>	5.44
9.	Partitions & Finishes	<ul style="list-style-type: none"> <li>• Internal block walls at Dougherty versus in situ concrete at Doncaster</li> </ul>	11.60
10.	Stairs & Accessories	<ul style="list-style-type: none"> <li>• Metal grillage in staircases for anti-suicide at Doncaster only</li> </ul>	0.16
11.	Equipment	<ul style="list-style-type: none"> <li>• Central kitchen equipment</li> <li>• Serveries in House Blocks at Doncaster, food served off trolleys at Dougherty</li> <li>• PE/Recreational/Educational; more sophisticated at Doncaster</li> </ul>	NAD 1.12 0.64
12.	Lifts	<ul style="list-style-type: none"> <li>• Lifts in UK only</li> </ul>	(0.24)
13.	Mechanical	<ul style="list-style-type: none"> <li>• A/C at Dougherty versus ventilation only at Doncaster (including central plant at Dougherty versus local at Doncaster)</li> <li>• Cell sprinklers at Dougherty, not at Doncaster</li> </ul>	10.00 (0.72)
14.	Electrical	<ul style="list-style-type: none"> <li>• Unexplained - just more expensive at Doncaster</li> </ul>	10.32
15.	Electronics	<ul style="list-style-type: none"> <li>• Alarms more sophisticated at Dougherty; centrally controlled electronic locks, etc.</li> </ul>	(1.60)
		<b>TOTAL</b>	----- <b>\$87.84/SF</b> <b>(£54.90/SF)</b>

Notes

\$1 = £0.625

NAD = No appreciable difference

should be seen in that context. People in the US are afraid of criminals and have every right to be afraid for their own safety.

In the UK, it seems that prisoners are viewed as people and therefore deserve certain amenities and comforts. The US is not burdened by such "misconceptions". Prisoners are viewed as somewhat subhuman and as such are not deserving of comforts. In fact, only those comforts are provided which are viewed to be necessary to prevent widespread discontent and disruptive behaviour. Again, it is felt in the US that if the punishment is harsh enough the individual will turn away from crime to a productive, wholesome life.

Bricks and mortar design philosophy, in other words technology, have as much cost impact on the two prison systems being compared as does philosophy. That an additional 105,000 sf is devoted to the heating and ventilating systems at Doncaster versus the HVAC system at Dougherty is a prime example. In the US, analysis has shown that a central mechanical plant with piped chilled or hot water to the various spaces on campus are much cheaper first cost and maintenance cost than separate systems serving each major space or building. In addition to the order-of-magnitude savings by purchasing bigger equipment, its installation costs are less because services to operate the machinery are centralised and usually close to the delivery source. Operating costs are less not only because the larger equipment is inherently more efficient than several smaller machines but also manpower for their maintenance is less. And then there is the cost of the space housing said equipment. At Doncaster, not only was there 105,000 sf more space provided, but this space was elevated four floors above grade with the inherent penalty in the structural system to carry such loads. This location again adds to maintenance costs (the plant space at Doncaster is in the roof space created by the pitched roofs, so it might, we suppose, be argued that it is taking up space which was anyway created). At Dougherty, the central plant is located at grade which is easily accessible to staff and for the delivery of parts and tools necessary for maintenance. This is VE/VA at work.

Another example of VE is the different perimeter protection schemes employed at the two prisons. Using the chainlink fence with razor wire at its top provides perimeter security at a low, if not the lowest, cost. It affords the additional advantage of full vision by security personnel at grade. In fact, the perimeter of prison compounds is often patrolled

by security guards in vehicles riding a narrow path around the compound. The veneered reinforced concrete walls at Doncaster plus an additional wire fence provide no more security and cost several times more.

The partitioning systems, both interior and exterior, are another example of good value engineering application. In the UK, interior and exterior walls and spaces occupied by prisoners are built of reinforced concrete. In the US, this construction is reinforced unit masonry. The cells of such unit masonry being filled with concrete makes the wall, practically speaking, as secure as the reinforced concrete wall. The cost is considerably less primarily because the cost of forming has been eliminated. The function has been provided at a much lower cost.

A comparison of windows reveals a similar result. It was realised on both sides of the Atlantic that windows offered a frequent escape route. In the UK, they maintained the same window proportions and design and covered it with a very expensive security bar system. In the US, they identified the minimum dimension which the adult human skull could pass through and made the maximum opening width in their windows smaller. Savings were realised in two ways: expensive bars were not required to restrain prisoners; and the quantity of expensive windows was considerably reduced (of course the 'slit' windows in the US do not provide nearly such a nice environment as the broad louvred windows in the UK - back to penal philosophy!). Where skylights were included in the Doncaster Prison to improve ambience, they were not even given serious consideration in the Dougherty County Jail due both to their costs and to their security risk.

Roof design and construction at Doncaster prison responded somewhat to a fear of helicopter-assisted escapes but primarily responded to the local Planning Council and a fixation on traditional architectural concepts. At Dougherty, a gesture was offered towards the same traditional architecture in the form of a false mansard. The cost differences are obvious.

The source of different structural configurations and their cost implications are less clear. Doncaster was a multi-storey facility and had to be constructed on piles because of it. Dougherty was primarily a one (1) storey facility and was constructed on spread footings. It is likely that these decisions resulted primarily from land area availability as opposed to

design or operational philosophy. This assumption can not be confirmed. The four storey configuration may be from an aesthetic consideration on the part of planners and designers in the UK plus their desire to provide gardens and a more pleasing campus atmosphere.

The extreme cost in mechanical and electrical systems experienced in the UK must primarily be related to major differences in design philosophy, although codes and installation practices will help in pushing up these costs.

Probably the single largest cost difference between these projects is related to differences in the two design and purchasing mechanisms. At Dougherty in the US, bid documents were submitted to contractors as virtually complete construction drawings and specifications. Lump sum, all inclusive bids were then received from the contractors and changes (variations) were small compared to the overall project cost. At Doncaster in the UK, design documents did not reach the construction issue level at tender, but were to a design development level, quantified by a Quantity Surveyor. The incomplete state of the documents guaranteed variations, and lots of them! These numerous variations led to claims for prolongation of the contract, loss and disruption. Whilst the design team on Dougherty USA had some 11 months pre-bid, the team at Doncaster had almost five years and double the fees!

SO DOES IT WORK?

It is certainly not the task of this paper to provide an in-depth analysis of the UK and US penal policies. However, a few statistics never did any harm (lies, damned lies and statistics!).

	<u>USA</u>	<u>ENGLAND/ WALES</u>
<u>TOTAL POPULATION</u>	257,985,000	51,620,500
Prison popula- tion (Jan '96 in the UK & 1993 for the USA)	364,680	51,951
Percentage of prisoners to total population	0.5%	0.1%
Percentage of prisoners who are re-offenders	80%	53%
Occupancy rate (i.e. how full are the prisons)	97%	91%
Occurrence of riots	22/year	0.5/year <i>(Pro rata two thirds again as frequent in the USA)</i>

As the UK moves towards US penal policy (there is almost continuous discussion about increasing the harshness of the regimes, and they are even introducing 'boot camps' in the UK) it will be interesting to keep an eye on the statistics. Will harsher US style regimes mean more prisons, and if they do will the UK be able to build them for the sort of costs incurred in America?