

What role does architecture play in the mental and physical wellbeing of prisoners?

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ABSTRACT

This research article examines the role architecture plays in prisoners' mental and physical health. It uses a case study methodology, looking at Halden Prison in Norway and ADX Florence in the United States of America (USA). It compares design intentions and specific features between the two and uses scientific journals to highlight which design approach is better suited to aid rehabilitation. I argue that a more holistic healthcare-led approach towards prison design will benefit the imprisoned and society, reducing recidivism rates and thus lowering the incarcerated population.

I also recognise that the judicial context of the two countries is vastly different, with drastically different methods, attitudes and approaches towards their imprisoned populations. The analysis acknowledges that prisoners' mental and physical health can be affected by many other factors such as pre-existing health conditions, socio-economic background, systemic racism and miscarriages of justice, among others, but argues that the built environment of prisoners will play a significant role.

Introduction

For years, the design of prisons was focused on sending a message to the general population. In 1829, British architect John Haviland designed Cherry Hill Prison (later renamed Eastern State Penitentiary) located in Philadelphia, Pennsylvania, at the time, the most extensive and expensive building in United States (US) history (Koolhaas, 2018). The cost of the prison was criticised even before construction was completed, with one particular element bearing most of the criticism: its castellated Gothic-style façade (Figure 1).



Figure 1. The castellated Gothic-style façade of Cherry Hill Prison, Carol M. Highsmith (2011).

Haviland defended the design of the façade as being critical to the architectural narrative of the intent of the building, stating:

The design and execution import a grave, severe, and awful character... The effect which it produces on the imagination... is peculiarly impressive, solemn, and instructive... The broad masses, the small and well-proportioned apertures, the continuity of lines, and the bold and expressive simplicity which characterise [*sic*] the features of the façade, are most happily and judiciously combined. (Johnston, 2000, p. 71)

Cherry Hill was designed around a radial model (Figure 2) and following the new 'Separate system', whereby prisoners were kept in separate cells (Figure 3) with individual exercise yards and only allowed out of their cells for infrequent bathing or medical emergencies.

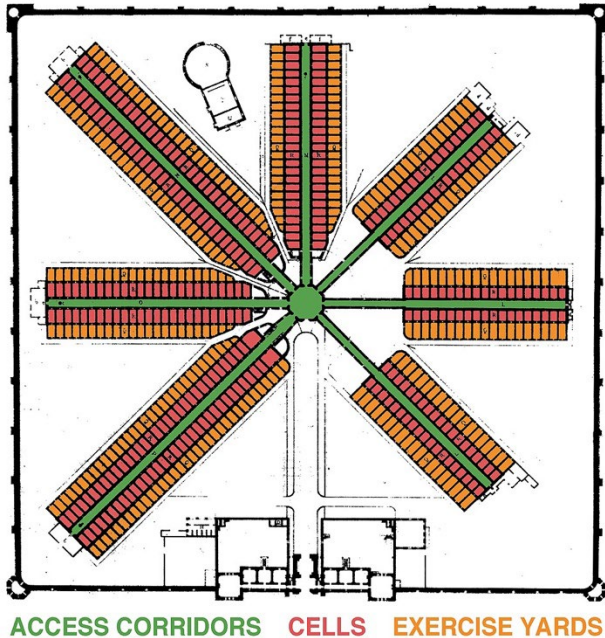


Figure 2. Eastern State Penitentiary (Cherry Hill Prison). Annotated Floor Plan in 1836, Myles Zhang, licensed under [CC BY-SA 4.0](#)

The design of Cherry Hill was extreme. To minimise human contact between the guards and other inmates, the prison's design employed some unusual design tactics; for example, in the early

phase of construction, the cells had no doors, only peepholes into the corridor. Prisoners were lowered into their cells from the guard's watch gantry above the individual exercise spaces. Additionally, the guards wore leather moccasins to creep up to the peepholes without the prisoners being aware.



Figure 3. One of the cells at Cherry Hill Prison, Adam Jones Ph.D., licensed under [CC BY-SA 3.0](#)

As a result, the prison became an international object of interest, having been visited in 1839 by as many people as Niagara Falls from places as far as France, Prussia and Belgium. In 1842, while touring the US, Charles Dickens visited Cherry Hill Prison. Upon witnessing the effects of the use of solitary confinement, he wrote in his travelogue *American Notes for General Circulation*: 'I believe that very few men are capable of estimating the immense amount of torture and agony which this dreadful punishment, prolonged for years, inflicts upon the sufferers' (Casella, 2010).

Within ten years of opening, it became apparent that the isolation of prisoners at Cherry Hill was causing serious mental health problems. Several reports written at the time appeared in the annual reports of the Prison Discipline Society, *The Journal of Prison Discipline and Philanthropy*, and other publications popular with scholars and social reformers, detailing the effects of solitary confinement on inmates (Charleroy & Marland, 2016).

Cherry Hill's design was admired by Joshua Jebb, who later designed the 'Model Prison' at Pentonville, London (Figure 4) (Koolhaas, 2018) and was the inspiration for many other prisons worldwide (University of Pennsylvania, n.d.).

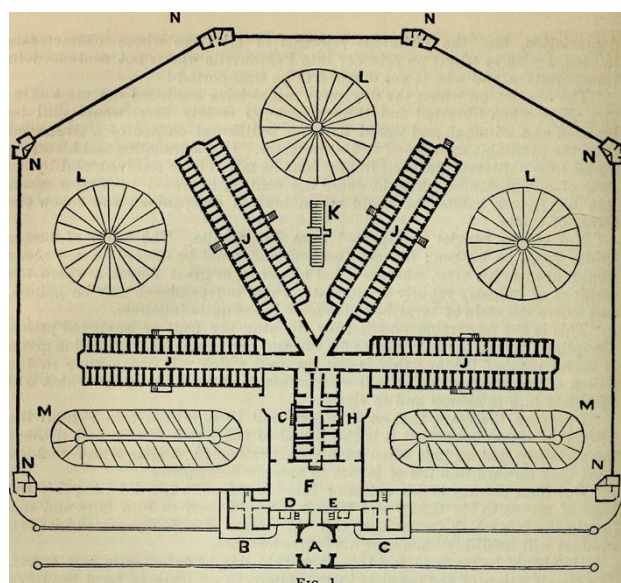


Figure 4. The floor plan of Pentonville Prison in London, whose architect, Joshua Jebb, was inspired by Cherry Hill. Image from Weale (c1854, p. 758).

From this early, somewhat extreme, example, prison architecture has developed and generally softened its approach. In recent years, mostly in countries that have moved away from a punishment-based system to a more rehabilitation-based system, humane prison design has tried to address some of these complicated issues through better design. The recently opened [Lilias Centre](#) is one example of a more humane custodial unit in Glasgow, Scotland. Although the implications of design and the quality of spaces have been studied

for a while, there remains a lack of political impetus to apply these findings to the incarcerated populations in most of the Western world.

Firstly, this article will examine two prisons in detail, almost ideological extremes, one in Norway and the other in the United States of America (USA). Using a case study methodology, particular features of their designs will be highlighted. Later, some of these design features will be explored in more detail, using scientific research to determine which approach is better. I fully acknowledge that the design of the prisons is only one small part of a plethora of the complicated contributing factors to prisoners' mental and physical wellbeing. However, this article will nonetheless address architecture's contribution to this complex issue.

Literature review

The research for this article is divided into four main areas:

- How architecture, in general, affects its users.
- The history of prisons and examples of carceral architecture.
- Current thinking from leading advocates in prison reform and their recommendations.
- Scientific research and medical journals that look at the effects of specific aspects on mental and physical wellbeing.

In *Happy by design: A guide to architecture and mental wellbeing* (Channon, 2018) and *The happy design toolkit: Architecture for better mental wellbeing* (Channon, 2022), Channon (2022) suggests a wide variety of design features, materials and approaches that can be applied to a wide range of built environment applications to help improve the users' experience, and by extension their mental and physical wellbeing. These books support the author's recommendations with scientific research and academic investigations. The books are a great source of inspiration and a starting point for additional research.

The research involved looking into the history of prisons and carceral architecture for a general overview of their history. *The human cage: A brief history of prison architecture* by Norman Johnston (Johnston, 1973) proved to be a helpful starting point for further research. However, the book's primary focus is on American prisons and their designs. Next, the book *Architecture of incarceration* (Spens, 1994) offers a more comprehensive overview of North American and Western European prisons from the mid-1800s to almost modern day and their histories, with floor plans and many drawings. From here, more focused research was done into specific prisons.

Yvonne Jewkes, a Professor of Criminology at The University of Bath and advocate for prison reform, is the lead author of *Designing 'healthy prisons for women: Incorporating trauma-informed care and practice (TICP) into prison planning and design* (Jewkes et al., 2019). In the article, Jewkes et al. (2019) offer a great insight into the current design strategies behind female prison design and suggest how things could be improved as we advance. They argue that trauma-informed care should be critical to designing and planning future prisons for women. Furthermore, the abundance of security paraphernalia and the structured administration of women's prisons is damaging and triggering to traumatised people. They say that the role of architecture in trauma-informed care is critical, as prisons need to be designed from the ground up so as not to cause further psychological damage to prisoners.

Moreover, implementing new working practices structured to help inmates in an old, ill-designed setting is akin to the analogy of 'putting lipstick on a pig' (Jewkes et al., 2019, p. 12). Jewkes et al. (2019) acknowledge that prisoners are not an easily relatable group to architects, as very few architects are likely to know an incarcerated individual or have first-hand experience of being imprisoned themselves. They also highlight that many architects specialise in designing certain types of buildings and that changing from a 'typical' prison design to something different might be difficult.

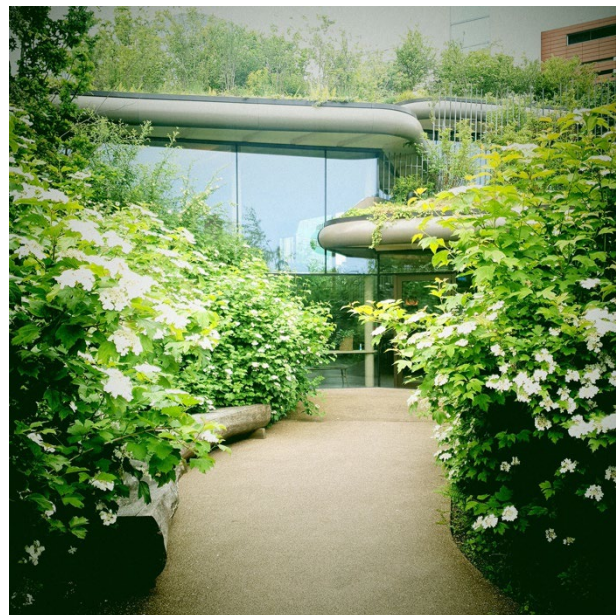


Figure 5. Yorkshire Maggie's, in Leeds, UK, designed by 'Starchitect' Thomas Heathwick, licensed under [CC BY-NC-SA 2.0](https://creativecommons.org/licenses/by-nc-sa/2.0/)

Finally, Jewkes et al. (2019) noted that there is not a waiting list of so-called 'starchitects' (a portmanteau of the words 'star' and 'architect') waiting for the opportunity to design prisons like there is to develop 'Maggie's Cancer Centres' (Figure 5). This might infer that there are fewer starchitects who are willing to take on prison design work.

Jewkes et al. (2019) also made many references to Limerick Woman's Prison (Figure 6), which, at the time of writing this article, was still in the planning stages but later opened in January 2023.

However, in an article published in *The Architects' Journal* (Jewkes, 2022), Yvonne Jewkes, who advised the Irish Prison Service (IPS) when commissioning the new facility and helped write the project brief for the new prison, offered her perspective on the new replacement facility before its completion.



Figure 6. An architectural rendering of the new Limerick female prison wing. Department of Justice, Louise Brangan, licensed under [CC BY-NC-ND](#) (Brangan, 2023)

Jewkes (2022, paragraph 1) writes about how the new prison has been designed to be ‘trauma-informed’, a ‘natural, healing environment, and a balm for the senses’. The architect Henry J Lyons has taken design cues from existing Maggie’s Cancer Centres. Jewkes highlights how certain architectural features are used to make the prison feel less like a prison. For example, the large windows have no bars on them, and the corridors are wavy and undulated, whereas the corridors in the old Limerick prison were long and straight; this led to blind spots on the corners, which could be triggering to some inmates. In addition, all the bedrooms (noticeably not referred to as cells) look out over a central curvilinear courtyard filled with mature trees, abundant planting and wooden benches.

Additionally, Jewkes (2022) laments the perception of these new ‘humane’ prisons and the part the wider press has to play. For example, a British tabloid newspaper once referred to Halden Prison in Norway as ‘Hotel Halden’ and compared it to a ‘more Scandinavian boutique hotel than class-A prison’ (Jewkes, 2022, paragraph 8). Jewkes argues that the lived experience of its inmates is far from that description.

Methodology



Figure 7. ADX Florence in Colorado, US (Federal Bureau of Prisons, c2010)

For the purposes of this article, from the many prisons initially considered for this study such as Wakefield’s New Hall, Armley in Leeds, Stirling, Scotland and Pentonville, London located in the UK; Cherry Hill (Eastern State Penitentiary), ADX Florence and San Mateo Correctional Facility in the USA; Cork City Gaol and Limerick Women’s, both in the Republic of Ireland and finally Halden in Norway, two were selected: ADX Florence in Colorado, USA (Figure 7) and Halden Prison in Østfold, Norway (Figure 8).



Figure 8. Norsk bokmål: The gate to Halden Prison, Østfold, Norway, Espen Franck-Nielsen, licensed under [CC BY-SA 4.0](#)

These two prisons were chosen for analysis because of their many similarities. For example, both are the highest-security penitentiary in their respective countries; both were built at a relatively similar time, within 20 years of each other – Halden opened in 2010 (Gentleman, 2012), and ADX Florence in 1994 (Identiv, 2022). Additionally, both have a

comparable number of inmates: 250 at Halden (Wang, n.d.) and 344 at ADX Florence (Identiv, 2022).

The two prisons will be analysed based on their layout and organisation, landscaping and outdoor space, materiality and interior design. These four aspects of their design were selected for comparison because the qualities of each can generally be ascertained from photographs. However, the specific design details of high-security facilities like these tend to be a closely guarded secret, or classified information in ADX Florence's case. As such, only superficial details can be analysed.

This article takes the form of a case study of each institution, using online images and widely reported information. Further to this, attention will be drawn to the various design aspects of each.

Following the case studies, specific areas and aspects of the design of each prison have been selected and analysed. Ben Channon's books, *Happy by design: A guide to architecture and mental wellbeing* (2018) and *The happy design toolkit: Architecture for better mental wellbeing* (2022) are used as a lens for what constitutes good design approaches for mental and physical wellbeing. This will include the highlighted aspects design approach which will be compared, and using scientific research, findings and journal articles, the more appropriate design solutions of the two will be highlighted.

Case studies

Halden Prison, Østfold, Norway

History

Halden Prison was opened in 2010 after ten years of design and construction at the cost of £138 million. It is home to 245 adult male prisoners and is the highest-security prison in Norway (Gentleman, 2012). It was designed by Erik Møller Architects & HLM Architects following an 'architectural competition initiated by the Norwegian Department of Justice and Statsbygg' (Leung, 2014,

paragraph 1), with the brief being centred around aiding rehabilitation through design to reduce recidivism (Leung, 2014).

Judicial context

Norway completely abolished the death penalty in 1979, having earlier banned its use in civilian crimes in 1905 (the Norwegian state has not executed a civilian since 1875) (Hansen, 1991). In addition, Norway abolished whole life prison terms in 1981, with the maximum prison sentence being 21 years in all but exceptional cases (Lufkin, 2018). This has led to an emphasis being placed on rehabilitation and reintegration rather than punishment.

Layout and organisation

The main functions of the prison by a typical inmate are divided into distinct buildings which are dotted around the Halden Prison site requiring inmates to 'commute' between buildings, mimicking life outside the prison. On the prison site there are two accommodation blocks, highlighted in blue on Figure 9, an education centre, highlighted in red and a building used for visitation, highlighted in purple.

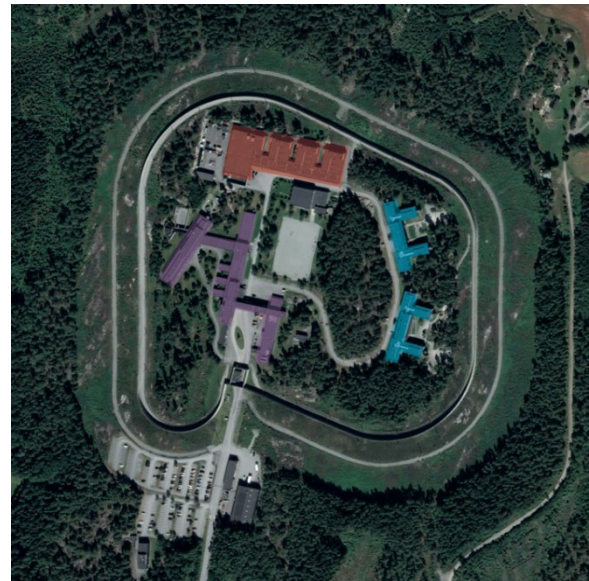


Figure 7. Aerial view of Halden Prison showing the different coloured buildings ©2022 Google/Maxar Technologies

Landscaping and outside spaces

Trees and plants from outside the prison continue into the grounds, helping to create a visual connection to the wider world (Wang, 2015). Trees and plants are also used to obscure the view of the perimeter wall (Figure 10).



[This Photo](#) by Unknown Author is licensed under [CC BY-ND](#)

Figure 8. Trees and plants obscure the view of the perimeter wall.

What is evident from the images presented in Samson's (2019) article is that outdoor furniture, like benches and picnic tables, allows inmates to spend time outside and socialise with other inmates. Similarly, the outside gym equipment helps inmates to spend more time outside and in nature while getting exercise. The trees help to obscure the wall and lessen the physiological harm caused by the permanent reminders of their loss of freedom (Samson, 2019). The architecture is not used to intimidate inmates, instead, all buildings are designed to be welcoming and comfortable spaces.

The prison spent 6 million Kroner (£640,000) on bespoke art pieces for the complex (Gentleman, 2012). This includes a statue and several 'Banksy-style' murals on the perimeter wall (Figure 11) and internal door ways.



Figure 9. Example of Banksy-style mural on perimeter wall created by stencil artist Dolk by Justis- og politidepartementet (2010), licensed under [CC BY 2.0](#)

Inmates are paid a weekly allowance if they spend a certain amount of time outside their cells and socialise with others. This may include, for example, playing chess or exercising outdoors (Gentleman, 2012).

Materiality

Halden is mostly constructed from materials that would be considered warm, natural, comforting and inviting. There is plenty of wood, cork and glass – the sort of materials that most inmates may be familiar with from home. These materials help absorb noises and allow daylight to flood the building.

Interior design – cells

Each cell consists of 10m² of living space (Gentleman, 2012), and large barless windows illuminate the small space with ample natural light

and allow inmates a good view of the calming woodland surrounding the prison (Figure 12). Analysis of the images in an article by Weller (2017) shows that a relaxing colour palette of pastel green and white is implemented in the cells.



Figure 10. A Halden Prison cell, Periergos (2011), licensed under [CC BY-ND 3.0 GR](#)

Cells also feature a substantial amount of storage space that allow inmates to store personal effects in their cells, while TVs provide in-room entertainment for inmates. TVs can be removed as a form of punishment. Meanwhile, en suites provide inmates with a personal and private bathroom space. The whole cell is designed to be anti-ligature with no potential ligature points.

Interior design – communal recreational spaces

Inmates at Halden are provided with facilities outside of their cells to enrich their daily lives, for example, inmates have access to a multi-faith prayer room.

Further analysis of the photographs in Weller's 2017 article in the World Economic Forum shows the extensive use of timber, for example, in the multi-faith prayer room. One image, in particular, shows two men sitting in quiet contemplation on wooden benches, with individual seats demarked by the inclusion of a red felt-like material, facing what appears to be a wooden altar in front of a decorative timber panelled wall.

Additionally, as the prison is located in a cold Nordic country, an indoor exercise space is deemed essential. It is equipped with a climbing wall, basketball hoops and a multi-sport floor (Figure 13).



Figure 13. Indoor exercise space at Halden Periergos (2011), licensed under [CC BY-ND 3.0 GR](#)

Interior design – communal spaces

Internal corridors in Halden are bright and airy (Figure 14), with large, barless windows, with views of the grounds beyond. Inmates can also make use of a 'visitation house' where up to three visitors can stay with an inmate at any one time.

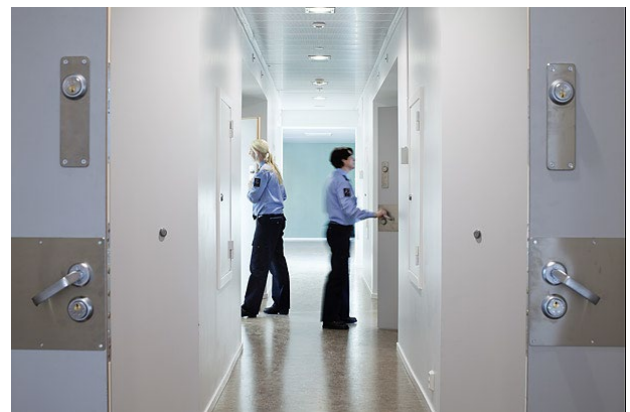


Figure 14. A corridor at Halden, lit by artificial and natural light, Periergos (2011), licensed under [CC BY-ND 3.0 GR](#)

The house is functionally identical to a house on 'the outside' and includes sharp knives, porcelain plates and access to condoms. Guards make regular drop-in visits to check in on the inmates and the visitors. Inmates with children can apply for the 'Daddy in prison' scheme, which allows children to stay in the visitation house for a couple of days once every

three months. To qualify, inmates must pass necessary safeguarding tests (BBC, 2019).

Cells form what could be described as a small ‘household’ with ‘housemates’; for every six cells there is a communal room and kitchen. Inmates are encouraged to cook for themselves and their housemates. This helps to foster a sense of community within the household and helps to reduce violence and tension between prisoners. The kitchens are generally reasonably well equipped, with most utensils you would find in a kitchen on ‘the outside’. This includes access to sharp knives and porcelain plates for those deemed to be residing in the least-risk household (Samson, 2019).



Figure 15. A guard's station between two households at Halden, Periergos (2011), licensed under [CC BY-ND 3.0 GR](#).

Households eat meals together and help with the housework and maintenance of their shared spaces. Each household has an assigned guard, with their own station within the household (Figure 15), but these stations are deliberately designed to be small and cramped. This feature forces the guard to mingle with the inmates and prevents a feeling of ‘us and them’ being created, which, in turn, helps to improve inmate and guard relationships. Inmates have access to a TV, games console and other more traditional games.

ADX Florence, Florence, Colorado, USA

History

ADX Florence was designed by DLR Group and LKA Partners (Zeiger, 2015) and opened in 1994 (Identiv, 2022). Costing £95 million to build (adjusted for inflation) (Solitary Watch, 2010), it is the USA's highest-security federal supermax prison and is home to around 344 adult male prisoners (Identiv, 2022). It is nicknamed ‘the Alcatraz of the Rockies’ (Weller, 2017, paragraph 21) due to its many inescapable design features and its location.

Judicial context

As a percentage of its overall population, the USA leads the world in the number of its own citizens it incarcerates at 0.7%; furthermore, while having only 5% of the global population, 21% of the world's prisoners are in US prisons (Wagner & Bertram, 2020). In addition, the death penalty is legal in 24 states (Death Penalty Information Center, n.d.), and one in seven, or 203,865, prisoners are serving whole life sentences (Penal Reform International, 2021).

Layout and organisation

ADX Florence, highlighted in red (Figure 16), is located within the Federal Correctional Complex at Florence, Colorado, alongside three other prisons, highlighted in blue, of a lesser security band.

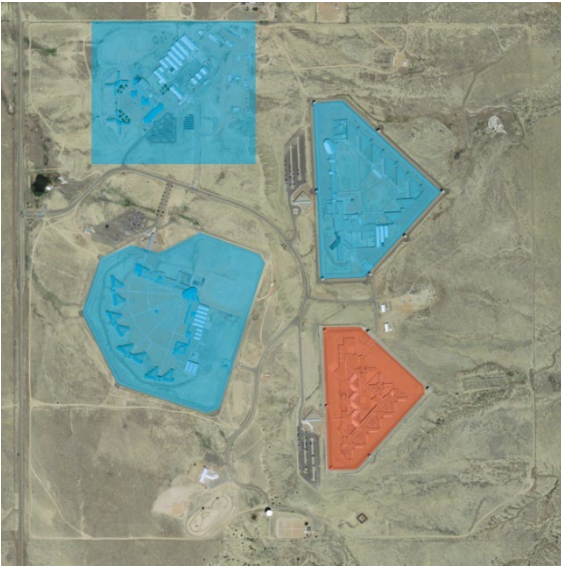


Figure 16. Aerial view of Federal Correctional Institution, showing location of ADX Florence, Colorado, USA ©2022 Google/Maxar Technologies

ADX Florence uses a radial layout; this layout is perfect for moving prisoners around efficiently but leads to prisoners spending very little time outdoors and confined to monotonous corridors (Figure 17).



Figure 17. Aerial view of ADX Florence showing radial layout ©2022 Google/Maxar Technologies

Exercise, housing and visitation are all confined to the same building.

Landscaping and outside space

The prison complex is surrounded by two fences topped with razor wire on either side of a 'no man's land'. Twelve manned circular gun towers surround the prison and guard dogs are used to patrol the perimeter. All vegetation is kept to a minimum and is well-trimmed, removing any possible hiding places for escapees (Figure 18).

Although the Rockies overlook the prison, as can be seen in the background of Figure 18, the few windows in the complex available to prisoners are designed to be angled away from any discernible objects. This makes it difficult for inmates to understand where they are in the complex (Identiv, 2022).



Figure 18. ADX Florence in the foreground with the Rockies visible in the background (US Bureau of Prisons, n.d.)

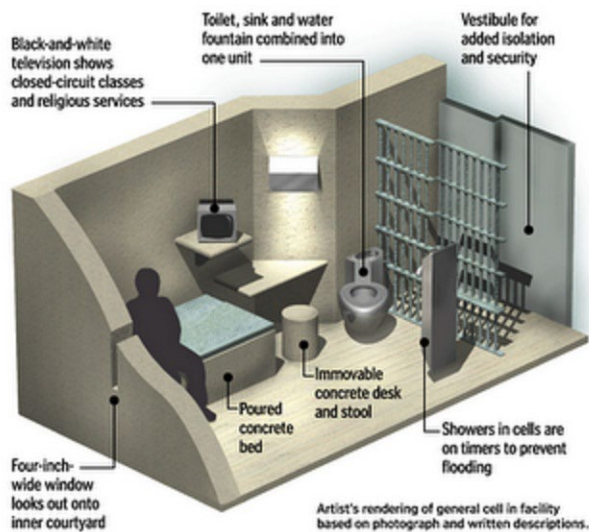
The inmates' every move is watched by guards (Identiv, 2022) and they are tracked at almost all times. CCTV cameras are everywhere except cells. Motion trackers and pressure pads are used to track the movement of people, and 1,400 remote-controlled doors restrict movement within the complex. Higher-risk inmates are placed in large cages within the exercise yard to exercise but still have leg restraints when not in their cells. Additionally, both outdoor exercise areas are covered with a metal mesh to prevent escapes.

Materiality

Analysis of photographs in Christina Sterbenz's 2015 article for Business Insider (Sterbenz, 2015) shows the construction materials used at ADX Florence, such as steel, concrete, linoleum and concrete; these would generally be considered cold, industrial and unnatural. Most inmates would not associate these materials with a homely environment. They block sunlight, reflect noises and are not visually pleasing. Noticeably, the prison also has few windows and is mainly lit by artificial lighting.

Interior design – cells

Each cell measures 3.5m by 2m, giving inmates 7m² of living space (Figure 19).



Size of the cell: 3.5m x 2m (7ft x 12ft)

Figure 19. ADX Florence cell design. Artist's view by RicHard-59, licensed under [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)

The window measures just 4 inches by 42 inches. It is deliberately designed to only give inmates views of brick walls and the sky. The only storage available to inmates is the small shelf, shown holding a TV in figure 19 above. The bed, stool, shelf and desk are all made from concrete poured in situ, making them immovable.

The toilet and sink are housed in a single unit in the middle of the room, and the shower, which is to the left of the window, has no curtain and is on a timer. The entranceway area to each cell is separated from the main area of the cell by bars (Figure 19).

Interior design – communal spaces

Hard, reflective surfaces bounce sound and light around the interior space. This can have an adverse effect on inmates as it can cause visual and audial discomfort and distress and may also lead to, or exacerbate, disorientation. Additionally, internal spaces have little or no natural light. There is an abundance of bars on internal windows, locks on doors and barred doors in corridors.

Inmates are separated from their visitors by a glass divider and use a phone to communicate with each other. The visitation booths are fitted with a concrete desk and stool that are fixed to the floor and immovable, similar to the furniture found in the cells.

Round-the-clock artificial lighting and a windowless environment give inmates no visual clues to the passage of time or seasonal changes. Cold, hard and noisy materials may serve to increase feelings of disorientation.

Analysis

Layout and organisation

The layout and positioning of buildings relative to each other can have a significant effect on our physical and mental health. As discussed, Halden Prison uses a campus layout, a deliberate design decision by its architects to get inmates to 'commute' between buildings in the morning and throughout the day, mimicking life outside the prison (VOX, 2019).

An added benefit of this design decision is that inmates are given no choice but to spend time outside and among nature. Multiple studies have shown the positive effects of spending time outdoors among nature, including improved

directed attention and concentration (Tennessen & Cimprich, 1995), improved impulse inhibition and reduced aggression (Hartig et al., 2003), improved mood (Nisbet & Zelenski, 2011) and decreased stress levels (Grahn & Stigsdotter, 2003).

Conversely, ADX Florence is laid out in the radial model. A radial layout is one of the most effective layouts for moving people efficiently, but this layout gives inmates no choice but to remain indoors and removes the passive time spent outdoors that an inmate from Halden gets by moving between buildings.

Research has reported that visual monotony in architecture has been shown to be psychologically damaging. Bond (2017) discusses a 2011 study by Colin Ellard (Professor of Cognitive Neuroscience at the University of Waterloo, Canada) and Charles Montgomery (author of *Happy city*). The study measured the responses from 134 participants during a walking tour of New York past buildings with varying façade designs (Ellard & Montgomery, 2013). They noticed that the participants were positively affected and engaged with visually complex and interesting façades but were negatively affected by simple, boring and monotonous façades. The findings reported that one store in particular, a branch of Whole Foods, located in Lower Manhattan, with a simple smoked glass closed-style façade, saw the participants' measured mood and arousal scores plummet (Bond, 2017).



Figure 20. Part of the façade design at Halden Prison. Photo by Unknown Author, licensed under [CC BY-NC-ND](#)

A campus design like Halden offers multiple advantages over other prison layouts, like ADX Florence's radial design. Prisoners who are calmer, happier, less aggressive and less likely to act on impulses are less of a danger to themselves and others. In addition, the added exercise inmates receive moving between buildings positively impacts their mental and physical wellbeing. Exercise and the surroundings it is completed in is something I analyse in more depth later.

Landscaping and outside space

The landscaping and outdoor space of the two prisons are very different. In addition to using a radial design, much of the outside space at ADX Florence is off-limits to inmates. The space allocated for outdoor exercise is visually unappealing, mentally unstimulating and keeps inmates caged to varying extents. The exercise space for the highest-risk offenders is indoors and only lit by artificial lighting. The largest outside space accessible to inmates is empty of planting, decoration, seating and no activities except exercise are catered for. A guard's gun tower overlooks the space, seemingly to act as a constant reminder to inmates of their presence.

A report into the state of the mental health of US prisoners published in 2017 by the US Department of Justice found that 14% of prisoners had met the threshold for serious psychological distress (SPD) in the previous 30 days. Of those prisoners who had met the threshold for SPD, 14% were written up or charged with assault within the same 30-day period. The same report found that prescription medication was the most common treatment type for prisoners suffering from SPD (US Department of Justice, 2017).

In stark contrast, Halden's outdoor space is used to get from building to building, as previously mentioned. The outside space mimics the natural flora and fauna that existed on the site before the prison was built; when viewed from above, the prison seems to blend almost into its context. Trees were planted in locations to deliberately obscure the

perimeter wall. The architects designed the prison so that it was never intimidating to prisoners (VOX, 2019). Outdoor facilities help inmates make the most of the outside space. Furniture, like benches and picnic benches, outdoor gym equipment, chessboards and art, allows inmates to socialise with other prisoners and pass the time.

Further to earlier points raised in my analysis of the overall layout and organisation of the prisons regarding the mental health benefits of simply being in outdoor spaces, studies have shown that the 'greenness' of outdoor space makes a significant impact. A study conducted in eight European countries in 2002–2003 involving over 6,500 participants showed that individuals living in a greener environment were more than three times more likely to be physically active, and this, in turn, lowered the participant's chances of being obese or overweight by 40% (Ellaway et al., 2005). In addition, many studies have shown the link between exercising and improved mental health. Exercise has been shown to improve mood, help manage stress, anxiety and intrusive thoughts and reduce the risk of depression (Mind, n.d.).

Materiality

The materials and colours of our built environments significantly impact our perception of that space. For prisons, being operational 24 hours a day, noise plays a significant role in the mental wellbeing of prisoners (Jerison, 1959). The choice of materials in prison can exacerbate or counter the issues caused by noise. Hard materials, like the steel and linoleum used at ADX Florence, combined with non-dampening soft furnishing, can produce an echoing environment. Softer materials, like the wood and cork used at Halden, combined with soft furnishing, help absorb excess sound. Excess noise and echoing environments are safety issues that can also affect the delivery of rehabilitation, as a warden explains in *Health and well-being in prison design*:

Noise levels can be used to mask aggressive inmate behaviour in the housing unit. When a flushing toilet

drowns out calls for help, the safety of my staff is in danger, background noise forces staff and inmates to raise their voices just to be heard. Raised voices increase tension, and the ability to maintain a safe environment is undermined... Noise can jeopardise the delivery of programming and treatment... To get results, we need to get through to inmates, and we cannot if we must compete with amplified noise levels in normal unit operations. (Urrutia-Moldes, 2022, p. 69)

The use of sound-absorbing materials is an effective way to mitigate the various noise-related issues that pose a danger to staff and inmates alike (Figure 21).



Figure 21. Soft furnishings are used in areas of Halden Prison. [Photo](#) by Unknown Author, licensed under [CC BY-SA](#)

Another material choice that has a significant effect on prisoners is glass. This is something I will address when analysing cell design later.

Interior design

Halden Prison believes inmates who socialise with other prisoners are happier and less volatile. They are encouraged to leave their cells and attend educational or recreational activities. As an incentive, they are paid 53 Kroner (£5.60) per day simply for spending time out of their cells (Gentleman, 2012). This money can be used in the on-site store 'Justisen' (The Justice) to purchase goods (Wang, n.d.). In comparison, some inmates at

ADX Florence spend up to 24 hours a day in their cells (Amnesty International, 2014). Due to these differences, the focus of the following discussion is on cell design in both prisons.

Cell design

The large, barless cell windows at Halden Prison offer inmates great views (Figure 12). Notably, the window designs of both prisons are significantly different. Halden has a large, barless expanse of safety glass, giving clear views of the green plant-filled grounds to inmates. This design choice is something the architects discussed in an interview with Jennifer Leung in 2014, stating: 'Nature is actively involved as a social rehabilitative factor in the architecture... the opportunity to follow seasonal changes helps to clarify the passage of time for the inmates' (Erik Møller Architects and HLM Architects, as cited by Leung, 2014, paragraph 1).

During an interview with VOX in 2019, lead architect at HLM Arkitektur Gudrun Molden added: 'The inmates felt they were in a diving bell... They were disconnected with time and space' (VOX, 2019, 01:50-01:59)

This can, however, have unintended consequences. Inmates at Halden have spoken of the torment of being somewhere that is so beautiful but unable to enjoy the freedom of spending time among it. In an article in *The Architects' Journal* Jewkes quoted an inmate of Halden as saying:

I can't walk in the woods. I just have to look at it. That's more painful, actually, because, you know, I miss the smell and the touch and how it affects me, it makes me calm... So, yeah, it's more like they put a meal in front of you, but say you can't touch it. (Jewkes, 2022, p. 16)

ADX Florence's cells have a window that, while also being barless, and made from safety glass, is only 4 inches (10cm) wide and 42 inches (105cm) tall and was deliberately angled to show inmates no distinguishing features. Inmates can only see walls

and the sky so that they cannot work out where they are in the complex and plan their escape (Identiv, 2022).

During a now famous experiment between 1972 and 1981, researchers looked at the post-operative hospital stays of patients who had a cholecystectomy (gallbladder removal). The researchers studied a group of 46 patients; 23 had a hospital room with an unobstructed view of a stand of trees, and the other 23 were looking at a brick wall. They found that the group with the view of the trees recovered quicker, were in better spirits and required fewer painkillers than those looking at the brick wall (Ulrich, 1984).

Giving inmates views of nature is a cost-effective way of improving the prisoners' mental and physical health and could reduce the need for expensive medications. Further, allowing prisoners to personalise their living space can benefit the prisoners' overall wellbeing.

For example, ADX Florence provides one concrete shelf for prisoners to store or display personal effects, with no magnet boards or similar for prisoners to display photos of loved ones. Halden provides a large magnet board for inmates to display photos, drawings and letters on, in addition to two storage cupboards.

During a 2010 study conducted by the University of Exeter's School of Psychology, participants in an office environment were allowed to customise their workspaces. Researchers found that this personalisation made the workers happier, physically more comfortable, feel more positive about their work and, as a result, 32% more productive (University of Exeter, 2010).

I would argue that allowing prisoners to personalise their cells could make them happier and more productive. Doing so would be a cost-effective measure.

Personal hygiene space

Another concern between the design of the two prison cells is that of privacy, particularly bathroom privacy. Halden's cell features a private en suite, similar to what is typical of a university dormitory room, giving prisoners privacy when washing and using the toilet. Conversely, ADX Florence's cell designs have a toilet, sink and shower in the main area of the cell, and the shower does not have a curtain.

The invasion of a prisoner's right to privacy is often cited as a necessary fact of life in prison. The safety and security of staff, inmates and the building take precedence over the prisoner's right to privacy. However, constant surveillance in an institutional setting was found to be detrimental to the mental health of inpatients at a psychiatric hospital. It was causing high levels of stress, fear and paranoia among participants. In a prison setting, this could lead to increased attacks on other inmates and staff, self-harm and suicide (Ingel et al., 2020).

Although privacy in prisons is a somewhat contentious and complicated issue, it could be argued that privacy, or the perception of privacy, could have a significant impact on the behaviour and mental wellbeing of inmates. If some inmates, such as those at Halden, are being treated in a more humanising and less degrading manner and can be trusted to have bathroom privacy, then why not all prisoners?

Discussion

Architecture is a physical embodiment of specific values, and as such, both prisons are designed completely differently to reflect the judicial context and approach of both countries. Looking at the two designs, the approaches of each architect are diametrically opposed.

Halden has been deliberately designed with the emphasis placed on the overall health and wellbeing of the prisoners in mind. Halden uses architecture

as a tool or aid to help rehabilitate the inmates before they are released into wider society.

Its societal and political context has influenced ADX Florence in much the same way. It has been deliberately designed to be as harsh and punishing as possible. ADX Florence uses architecture as a jurisdictional tool to punish the prisoner, much like a police officer's baton. ADX Florence shows how little prison design has evolved and developed in some areas. Cherry Hill was a horrific experiment that was a proven mistake (Charleroy & Marland, 2016). However, American prison designers have failed to learn from their mistakes and are hell-bent on punishing prisoners for purely ideological reasons. ADX Florence shares DNA with Cherry Hill but is designed with a contemporary palette of materials.

Study limitations

Due to the confidential nature of the intricacies of prison design, the amount of publicly available data, like floor plans, that is reproducible and not subject to stringent copyright protections, is limited. However, this article's limited word count and scope meant sufficient information was available in the public realm. If this research were to be expanded upon in the future, the inclusion of more information that is not readily available in the public sphere could be helpful.

Conclusion

In conclusion, this article started by examining the layout and organisation of two prisons; Halden and ADX Florence. Halden uses a campus-style design, whereas ADX Florence uses a radial design. A campus-style layout has many advantages over other layout schemes, with many areas of mental health positively impacted. Furthermore, the passive exercise that inmates receive simply from moving from one area of the prison to another is an added benefit. However, another issue that a radial design exacerbates is visual monotony and its harmful effects.

Next, the article discussed the differences between the two institutions' landscaping and outdoor space. More specifically, the quality and greenest of the spaces and the provisions for spending time in the outdoor space.

Halden has a variety of provisions like benches, chessboards and art and is noticeably generally more appealing than ADX Florence. The greenness of a space has been shown to affect the likelihood of people exercising dramatically, and exercising is widely considered beneficial to people suffering from mental health conditions.

Following landscaping and outdoor space, the analysis looked at materiality, its effects and how noise can cause particular issues in a carceral environment. For example, ADX Florence tends to use hard materials that help exacerbate a noisy environment. Halden uses some of the same materials as ADX Florence, but they have also used softer, sound-absorbing materials like wood and cork, which help to reduce noise and echoes (REF).

Finally, the analysis examined the interior design of the prisons, specifically the cells. The window design and approach to window design differ between the two. For example, ADX Florence has a very narrow, slit window angled in a certain way, whereas Halden has a large barless expanse of glass. The views from a window have been shown to affect patients' recovery time in a hospital. Next, the analysis looked at the personalisation of space and how this has been shown in studies to increase happiness, comfort, positivity and productivity. Finally, privacy was considered, and how a lack of privacy can affect a prisoner.

Ultimately, the architect and the space they design have almost immeasurable effects on inmates; the architecture is the entire world of these prisoners for many years. They have no control over where they reside, exercise and learn, so the quality of that space is of utmost importance.

Halden shows that the role of architecture in the mental and physical wellbeing of prisoners is

imperative. In taking a rehabilitation-focused stance, Norway has dramatically cut its recidivism rate in the last 20 years and used architecture as a tool to aid rehabilitation. Halden's design choices have obviously been influenced by research and scientific findings. If more countries were to take a similar approach, the number of prisoners could be reduced.

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