INTRODUCTION

The number of offenders has amplified due to the population increase [1-3]. Therefore, the pressure on prisons to accommodate more has also increased. In the light of the fact that women prison in Jeddah housed various cultures off foreigners, who are accused of drug abuse, adultery, alcohol, and other crimes [4, 5]. The prisons became unsuitable for Saudi female inmates, who resemble only about 1 % of the general female population [6]. Thus, Saudi inmates are very much affected and influenced by foreigners in their behaviour and attitude according to the mix of population, especially in the housing compounds and common sleeping area. The existing situation is not coping with modern thoughts in the school of scientific punishment nor in the arrangement of spaces and the relationship between physical and social spaces.

On the other hand, there are a number of issues and conditions related to the programming and design of facilities for female offenders. Many physical design features are also relevant to male population. However, a number require different design solutions when planning for females. Programs are generally quite different from those found in male institutions, some of which include life skills, parenting, and art therapy. Female facilities should provide for less violent inmates [7, 8]. A population majority of females who are single parents who require child care skills, a population of females who were physically and/or sexually abused as children, as well as an increasing number of pregnant females who require prenatal and postnatal medical care. Therefore, education, domesticity and therapy found expression in cottage-style prisons for women.

CASE STUDIES

Four outstanding case studies are being analysed, focusing on their concept philosophy, architect, site criteria, function and form, program and space distribution. The Panopticon Prison is the first case study and it is discussed in two forms; the basic design of The Panopticon Prison in Arnhem, the Netherlands, 1880-1886; and a modified one which is Pelican Bay State Prison in California, United States, 1989. The second case study is Central Ontario North Correctional Facility, Penetanguishene, Canada. Another case is Thomson Correctional Center, Chicago, Illinois, USA, 2001. Last but not least, a detailed case study is needed to fill in gaps in the program requirements, which is Curran Fromhold Reception and Detention Facility, Philadelphia, PA, 1995. Each project has its own philosophy and unique character; when their reflections are combined together, they will serve as models for Jeddah Briman Prison.

The Panopticon Prison, Arnhem, The Netherlands, 1880-1886

One well known onison of basic Panopticon design is the Panopticon (Koepegevangenis) in Arnhem, Netherlands, which is built in 1880-1886 for solitary confinement, with an observation tower in the centre (Figure 1). It was recently-renovated in 1995. The Panopticon is a type of prison building designed by the English philosopher and social theorist Jeremy Bentham in 1785. It is widely known and commonly associated with his name, although it was originally his Brother Samuel’s invention.

The concept of the Panopticon, however, had its genesis many years earlier and many hundreds of miles away, at Gruchie, in Russia. Jeremy Bentham’s brother, Samuel went to Russia in 1780, where he worked for several years for Prince Potemkin, the favorite of Catherine the Great. It was at this time that Samuel Bentham, an inventor and engineer of genius, devised the Panopticon, to be constructed on the principle of central inspection, as a means of facilitating the supervision of large numbers of workers [9, 10].

The concept of the Panopticon design is to allow an observer to observe (opticon) all (pan-) prisoners without the imprisoned being able to tell whether they are being watched; thereby conversing what one architect has called the “sentiment of an invisible omniscience”, and thus giving the wardens the so called “power of mind over mind”. Bentham may have derived the idea from the plan of a military school in Paris designed for easy supervision, but more probably from a circular building designed by his brother Samuel who arrived at it as a solution to the complexities involved in the handling of large numbers of men. Moreover, the rehabilitatory aspect of the Panopticon penitentiary draws on and develops Bentham’s favorite themes of reform and improvement of the human condition [9, 10].
The Pelican Bay State Prison in California, United Scares, 1989
Another famous prison of the Panopticon design is The Pelican Bay State Prison in Del Norte County California, United States (Figure 2). Pelican Bay opened in 1989, principally to house the growing population of maximum-security and high-security-risk inmates in the California prison system. It is original designed to house 2,550 prisoners, as of 2006, Pelican Bay houses 3,301 prisoners, nearly all of whom are classified as Level IV maximum-security.

The design, which looks more like a castle, is divided into two main buildings; The "general population" building holds Level IV prisoners, and the Security Housing Unit (SHU), a super max-type control-unit facility where prisoners identified as gang members, prisoners with history of violence, crimes or serious rules violations within prison are imprisoned [11, 12].

Central Ontario North Correctional Facility, Penetanguishene, Canada
The Central North Correctional Centre is the first privately-operated correctional center in Canada (Figure 3). Its mission is to deliver quality correctional services and better value to customers through modernism, flexibility, and cost effectiveness. The center offers a variety of core and volunteer rehabilitative programs including on site education department [13, 14].

Zeidler Roberts Partnership Architects is the company responsible for the design of this prison. Ellis-Don Construction Ltd. Was awarded the design build contract for the construction of this maximum security prison in Penetanguishene, Ontario, the second of three projects in Phase One of the Adult Infrastructure Renewal Program administrated by the Ontario Realty Corporation.

The design and construction of this facility was done over an 89 acre site. Central Ontario North Correctional Facility is located far away from the downtown city, in an area surrounded with plenty of trees. It created its own surrounding roads and fences all around and within. The site can be reached from an intersection of two roads into the parking area and reception center.

Thomson Correctional Center, Chicago, Illinois, USA, 2001
Thomson Correctional Center is an Illinois maximum-security prison located in Thomson, Illinois (Figure 4). The prison was completed in 2001 but remains largely empty. The prison could be converted into a super-maximum-security facility by the federal government of the United States to house detainees from Guantanamo Bay, Cuba [15, 16].

The prison is located roughly 150 miles west of Chicago. The site is in a rural area within three roads. Main roads and fences were created all around the project to maximize security. The site is approached through secondary roads created that lead to parking and main gate [15, 16].

Curran Fromhold Reception and Detention Facility, Philadelphia, PA, 1995
The architect of the project is DMJM Design, an AECOM company, is a leading full-service architectural and engineering design firm with more than 3000 professionals. The site area is about 20.5 acres (82960m²-871200ft²) (Figure 5).

The project consists of 24 min zones that comprise the housing quarters for inmates, administration building, guards’ quarters, as well as a fully equipped medical center. The housing units allow the inmates all necessary in-door and out-door functions. Moreover, a separate compound includes central warehousing, maintenance, food preparation and central laundry [17].
SPACE PROGRAM

The space program of the project is divided into two areas which is unbuildable and buildable area. The unbuildable area contains landscape and parking. The buildable area includes control and observation tower, reception center and public lobby, and inspection, the meeting-with-family center (inmate visitation), hearing and investigations zone, executive administration wing, intake and discharge areas, female security administration and command center (custody operations), master control center and communications zone, women housing compound, the multi-functional facility area, religious services (mosque), sports center and recreation, service and support facilities, and healthcare facility. The proposed space program of the project is tabulated in Table 1.

Table 1. Space Program

<table>
<thead>
<tr>
<th>Zones</th>
<th>Percentage (%)</th>
<th>Area (m²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control and Observation Tower</td>
<td>0.1</td>
<td>45</td>
</tr>
<tr>
<td>Reception Center and Public Lobby, and Inspection</td>
<td>0.58</td>
<td>265</td>
</tr>
<tr>
<td>The Meeting-with-Family Center (Inmate Visitation)</td>
<td>10.78</td>
<td>4950</td>
</tr>
<tr>
<td>Hearing and Investigations</td>
<td>0.28</td>
<td>130</td>
</tr>
<tr>
<td>Executive Administration Wing</td>
<td>0.93</td>
<td>430</td>
</tr>
<tr>
<td>Intake and Discharge Areas</td>
<td>0.68</td>
<td>315</td>
</tr>
<tr>
<td>Female Security Admin. and Command Center (Custody Operations)</td>
<td>0.35</td>
<td>162</td>
</tr>
<tr>
<td>Master Control Center and Communications Women Housing Compound</td>
<td>0.12</td>
<td>56</td>
</tr>
<tr>
<td>The Multi-Functional facility Religious services (Mosque)</td>
<td>61.93</td>
<td>28454</td>
</tr>
<tr>
<td>Sports Center and Recreation Service and Support Facilities</td>
<td>8.43</td>
<td>3875</td>
</tr>
<tr>
<td>Healthcare Facility</td>
<td>1.28</td>
<td>666</td>
</tr>
</tbody>
</table>

Sum Percentage and Area of all Zones 100 45948

+6% constructer 2756.88
+30% circulation 13784.4
+10% HVAC system 4594.8
+40% Unbuildable Area 18379.2

Total Area for Project 85463.28

SITE SELECTION AND ANALYSIS

The site analysis serves as an input for the design and construction of Jedda Women Prison. The analysis investigates the site context according to location and topography, natural factors including climate and noise pollution; urban and cultural factors showing accessibility, circulation, and traffic flows, views to and from site, important landmarks; and determines the size of site.

The project property, women prison existing site, is about 49,960 m² located at the corner of Jeddah Braiman prison whole site (Figure 6). The project context block is located in the Southeast of Jedda, in an area called “Braiman”. The block is bounded on the west by Al-Amir Mecab main road and a residential compound; on the east by a large vacant land; on the north by the “Internal Security Forces Housing Complex”, and on the south by residential districts and some commercial buildings facing Al-Shaikh Abdulaziz Bin Baz road.

Figure 6. Existing site [18]

Figure 7 demonstrates the site climate analysis. The site climate is directly influenced by Jedda’s location. It has a tropical climate, mild in winter and hot and humid in summer. Summer lasts 8 to 10 months, with temperature moderating in November. Winter is comparable to the spring and summer seasons of resorts on the Mediterranean Sea. As a coastal city, the humidity is high during the summer season when it is affected by humid and hot air coming from India. Humidity is reduced during winter as the area is influenced by the effect of a moderate air mass coming from North Africa. Therefore, the sun directions through the seasonal climates at K.S.A. should be considered wisely at design stage and that would reflect on the section, the openings, pedestrian pathways and parking areas.

Prevailing winds come from the North West and tend to be moderate, though can be more active when cold fronts occur during the winter season, Southern winds sometime blow during spring and autumn seasons as a result of the thermal depression of Sudan, and are often accompanied by thunderstorms and rains. Rain is very scarce, mostly light showers accompanied by thunderstorms, usually falling during winter and spring. As the result, building design and orientation should consider the wind velocity and direction. The design of the openings and their location is affected by wind as well.

There are other forms of pollution include noise and air pollution, which produces from vehicles. Greenery and landscaping seems to be unplanned, and spread out unevenly, creating some areas more visually appealing than others. There are two landmarks found near the site’s property. One landmark is “The Star Roundabout”, which is located towards the Southwest of the site. Looking towards Northwest, another landmark is obvious which is Observation Tower of the “Internal Security Forces Housing Complex”.

Therefore, building orientation should take the context and neighbours in consideration. Attractive points in the site and locations of aesthetic value should be determined so that designers could take advantage of them by orientating the building toward them and by creating quality viewing angles. The project is recommended to respect important views, respect the scale of neighbouring buildings, and create new inner views.

A negative point is that the facility overlooks one main road and is close to residential neighbourhoods. This issue will be a major consideration in design for security and safety reasons, and could be solved by having a long distance and set back from public road to maximize security and provide privacy for the neighbouring buildings. Another problem is the high water cable of the soil condition, which requires digging deep to reach a good base for footings.

The new suggested site by the Director of Jedda Prisons, Mr. Kamil Al-Hazmi is located on South Madinah Highway, Asfan Dist (Figure 8). The site is adjacent to Daliban area South, and North
east of Durrat-Al-Arous. Available Plot Area is 225000 m²; Project Plot Area is 85000 m²; 65% Open Space 55250 m²; and total built up area is 150000 m².

Figure 7. Site climate analysis

Figure 8. Proposed site location [19]

ZONING AND PROJECT DESIGN
More than a prison program is needed to turn a person’s life around. The redevelopment of Briman Prison in Jeddah needs to be thought of in terms of the life style of prisoners mentally, socially, academically, and medically. Nevertheless, since some of the prisoners were noticeable for suffering from transmittable and contagious diseases, fully operative medical health services is to be added to the prison redevelopment program due to the lack of public medical facilities provided in areas close to Braiman. Figure 9 and Figure 10 demonstrate the site zoning and master plan for the proposed site location.

Figure 9. Site zoning

Figure 10. Master plan

CONCLUSION
This project outlines the rapid development and co-accommodates all new and yet essential technologies together with modern theories on human behaviour and psychology that show consistency with theories in the school of scientific punishment and rehabilitation. This will soften severe punishments in relation to Islamic rulings, and cake care of female convicted felons in an attempt to meet with the ultimate goal of criminal punishment remedy and reform. The proposed space program covered several important zones and the site location is evaluated. This project provides the alternatives by drawing the plans and devoting efforts to establish a modern prison with all the elements of a decent Islamic modern life for females, a prison that is consistent with the broad lines, the modern policy of punishment and its different aspects in a safe, clean, humane environment; to prepare inmates for re-entry into society.

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