# Toward Inclusive Design Applications in Recreational Spaces for People with Disabilities in Egypt

# تطبيقات التصميم الشامل فى المناطق الترفيهية لاجل ذوى الاحتياجات الخاصة فى مصر

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## ملخص البحث :

يعيش عدد كبير من ذوي الاحتياجات الخاصة في البلدان النامية، وغالبا ما تكون الفئة المهمشة وفي فقر مدقع. انهم يتعرضون للتمييز والعراقيل التي تحد من مشاركتهم في المجتمع. حوالي ١٠ إلى ١٢٪ من إجمالي عدد السكان في مصر يعانون من أنواع مختلفة من الإعاقة. وهم يواجهون القيود التي تمنعهم من حياة طبيعية، بالاضافة لصعوبة وصولهم للمناطق الترفيهية ما يسبب فقدانهم للطاقة الايجابية , ولذلك يفقدون دوافعهم لتحدي الاعاقة. للمعماريون دورهم فى مساعدة ذوي الاحتياجات الخاصة في التمتع بالأماكن الترفيهية والوصول إليها رغم إعاقتهم. والهدف من هذا البحث هو إرضاء الاحتياجات الترفيهية وتطلعات ذوى الاحتياجات بتصميم المساحات الترفيهية التي يمكن الوصول إليها، توفير التكامل بين المجتمع مع الافراد باختلاف قدراتهم في بيئة آمنة ترضى الجميع. وهذا البحث مبنى على تحليل أمثلة عالمية لمناطق ترفيهية ممهدة لاستيعاب كافة القدرات البشرية، ودراسة استراتيجيات التصميم الشامل المشتركة في الأمثلة، ومن ثم عقد المقارنة بين الاستراتيجيات العالمية والمتطلبات التي تم تضمينها في قانون المصري، للوصول لنتائج يمكن أن تحقق خطوة نحو تمهيد الأماكن الترفيهية للأشخاص ذوي الاحتياجات الخاصة.

## Abstract:

A disproportionate number of persons with disabilities live in developing countries, often marginalized and in extreme poverty. They face discrimination and barriers that restrict them from participating in society. About 10 to 12% of the total populations in Egypt are suffering from different types of disabilities. They face restrictions that prevent them from normal life, and then they lose their motivation for challenging their disabilities. Besides that, there are problems about accessing entertainment spaces to keep their positive energy. Architects have their role to help people with disabilities to enjoy accessible recreational spaces although their disabilities. The aim of this research is to satisfy the disabled people' recreational needs and aspirations to design an entertainment spaces which is accessible, provide an integration between community with different abilities in a safe pleasing environment for all. This research will analyze examples of inclusion in recreational spaces in deferent countries, study universal design strategies that are common in these examples, then with making comparison between international strategies and the requirements which are included in the Egyptian Code, Conclusion can be achieved as a step toward accessible recreational spaces for people with disabilities.

## Keywords:

PWDs (People with Disabilities), Recreational spaces, Accessibility, Community Integration and The Egyptian code requirements for construction.

# 1. Introduction:

During the last decade, disability is increasingly considered as a human rights issue. Disability is also an important development issue with an increasing body of evidence proving that persons with disabilities experience worse socioeconomic outcomes and poverty than normal persons. Despite the magnitude of the issue, both awareness of and scientific information on disability issues are lacking. There is no agreement on definitions and little internationally comparable information on the incidence, distribution and trends of disability. There are few documents providing a compilation and analysis of the ways countries have developed policies and responses to address the needs of people with disabilities. (Murray, 2013)

According to The World Bank that works for a world free of poverty, one billion people, or 15% of the world's population, experience some types of disability, and disability prevalence is higher for developing countries. (The World Bank, Apr 04, 2016) Globally, World Health Organization (WHO) understands disability as an interaction between health conditions and contextual factors, both personal and environmental. (World Health Organization, 2001).

According to WHO, Disability is the umbrella term for impairments, activity limitation and participation restrictions referring to the negative aspects of the interaction between an individual with a health conditions and that individual's contextual factors (environmental and personal factors). (World Health Organization, 2011)

Egypt is considered to possess the best statistics on persons with disabilities (PWDs) in the Arab World. Despite this, most independent observers agree that the Government of Egypt grossly underestimates the numbers of its disabled population. In 1999, the Egyptian Ministry of Planning reported that there were approximately 1.1 million PWDs in Egypt, representing 1.7% of Egypt's population of 63 million at that time. In 2005, the World Bank conducted an extensive household survey in Egypt and found that PWDs numbered between 2.7 million to perhaps a high of 7 million, check Figure 1. (Disability, 2015)

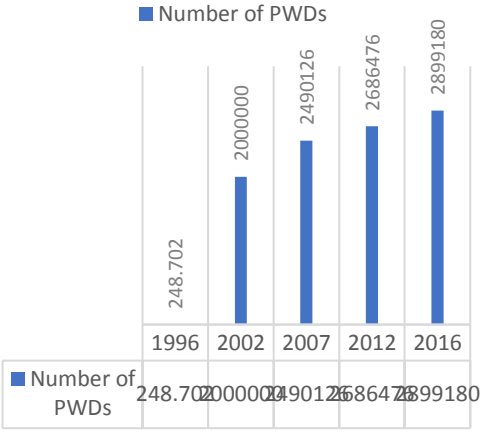



*Figure 1: Shows the Exponential increase of PWDs*

Persons with disabilities in Egypt have long been marginalized because of many reasons as poverty, difficult in employment, social stigma and discrimination, lack of reliable information and opportunities in education. (Hakim & Jaganjac, 2006) All these problems are related to the accessibility, then resections prevent them and lessen their positive energy, so research's focus is on accessibility of recreational spaces.

# 2. Methodology:

In an attempt to highlight the role of the architect in the inclusion between community and PWDs in recreational spaces, a number of cases studies will be analyzed. In order to ensure that relevant and appropriate projects cases are selected, specific criteria were used in the selection process as follows:

a. The projects, in particular, should be established by the government and is defined as a national park.
b. The projects should meet the minimum requirements of Americans with Disabilities Act (ADA).

Taking these criteria into consideration a systematic search through various National Parks, eight parks were found to match them sufficiently as mentioned in table 1 below.

*Table 1: The Three Selected parks*

| | |
|---|---|
| **Park.1** | Pukeahu National War Memorial Park |
| **Park .2** | Bryce Canyon National Park |
| **Park .3** | Ocqueoc Falls Bicentennial Pathway |

# 3. Accessibility Strategies Analyzing:

## 3.1. Park (1):

***3.1.1. General Information:*** Pukeahu National War Memorial Park is established by the Ministry for Culture and Heritage, located in 15, Buckle Street, Mount Cook, and Wellington, New Zealand commemorates more than 300,000 New Zealanders who died for country (Manatū Taonga, the Ministry for Culture and Heritage, 2015).

***3.1.2. The purpose of the park:*** place where people can gather on major ceremonial occasions, but is also a place where people can visit on any day of the year.

3.1.3. ***Accessibility Strategies:***

### 3.1.3.1. Accessible Entrance

Figure 2 observes the map of Pukeahu National War Memorial Park and specify inclusion in landscape design to enter the park.

The access to park for is going South up Taranaki St. or North down Taranaki St. The bus routes that this accessible bus stop is located on are 10, 11, 18, 21 and 47. (Manatū Taonga, the Ministry for Culture and Heritage, 2015).

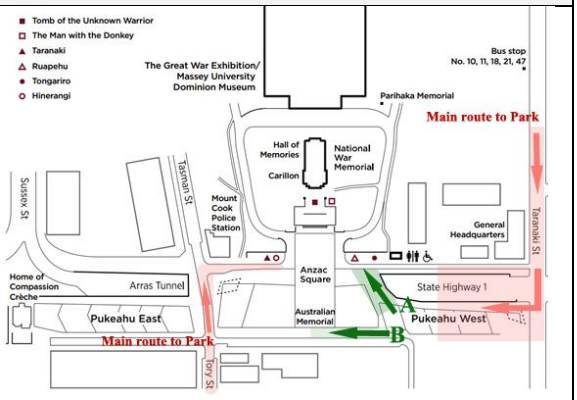



*Figure 2: Map of Pukeahu National War Memorial Park*

**A. Fixed ramps to the main entrance**

Ramp access up to park from Taranaki & Tory st, both for pedestrians, wheelchairs and slow moving vehicles as in Figure 3.

**B. Main stair**

Another normal access to the Tomb of the Unknown Warrior and Hall of Memories is via stairs from the park or via the ring road.

*Figure 3:The fixed ramp to main entrance is located above Arras Tunnel*

### 3.1.3.2. Accessibility inside the park

**A. Accessible Routes**

- The accessible route within the site has a minimum width of 1200mm.
- Any permanently fixed objects are detectable by a person using a cane for visually impaired people, as it clear in Figure 4.


*Figure 4: Accessible Routes inside park*

**B. Steps and ramps**

- Through the topography of landscape, there are different type of accessing between ramps and few steps with handrails to be easy to deal with, check Figure 5.

*Figure 5: Steps and ramps through landscape*

### 3.1.3.3. Accessible Services

**A. Sensory options**

- All surfaces within the park are easy to access & slip resistant.
- Tactile indicators are not installed on the accessible route.
- Figure 6 obtains one of routes turn that has another texture to warn blind and wheelchair users.

*Figure 6: Tactile slip resistant pavements*

**B. Parking**

Two accessible car parks beside the Tomb are not official, but can be used by people with mobility parking permits when not in use by dignitaries attending official functions.

**C. Braille Signposts**

- Braille or tactile methods are used to help indicate location.
- As in Figure 7, along routes, there are braille signposts, which are stocks for leading blind and visually impaired. (wellington.gov, 2014)

**D. Accessible Toilets**

- There are two fully accessible toilets on the accessible route, towards the Taranaki Street end of the park.
- The accessible toilet is 2300mm wide x 3600mm long.
- The washbasin is not reachable from the toilet seat.
- The toilet seat lid can act as a backrest.

There is a sign with good contrast print and Braille above the toilet indicating it will flush automatically as hands are washed or once door is unlocked, check Figure 8. (Wellington GOV, 2016)


*Figure 7: A braille signpost*

*Figure 8: Perspective of the Accessible Toilets*

## 3.2. Park (2):

***3.2.1. General Information:*** Bryce Canyon is established by The American National Park Service, located in southwestern Utah, United States. The park is characterized by an enormous array of oddly shaped "hoodoos," unique erosional formations whimsically arranged and tinted with a variety of subtle colors. (National Park, 2015).

***3.2.2. The purpose of the park:*** According to the website of the park, there is no place like Bryce Canyon; there is the largest collection of hoodoos in the world. In this special land, there are many activities to do like (Camping- Horseback riding- Photography).

***3.2.3. Accessibility Strategies:***

### 3.2.3.1. Accessible Entrance

One of the main goals of the national park service is to make all park in USA suitable for all people. That includes Bryce Canyon although it's hard landscape. it aims:

- Increasing the ability Bryce Canyon to serve visitors with disabilities.
- People with varying abilities and their families will be included in the ways that visitors access park experience parks.

| | |
|---|---|
| **A. Visitor Center** | • Two moderately sloping ramps lead from the parking lot to the Visitor Center.<br>• The building is equipped with a fully accessible auditorium with a 22-minute captioned film. Restrooms have fully accessible stalls |
| **B. Shuttle Buses** | • Optional shuttles are fully accessible and operated. Buses stop at the Visitor Center, Bryce Canyon Lodge, North and Sunset Campground, and Bryce, Inspiration, Sunset, and Sunrise points. Guided bus tours to the southern viewpoints are also offered twice daily in summer. (National Park Service Geologic Resources Division, 2013) |

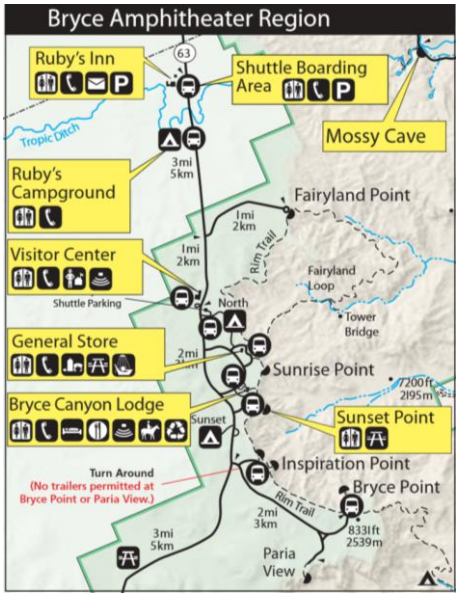



*Figure 9 :The Upper part of the park's map*

### 3.2.3.2. Accessibility inside the park

**A. Accessible Circulation**

- Because of the hard topography of the park, it was necessary to design an accessible circulation to give a chance for more visitors to enjoy the nature there.
- Figure 10 shows the south part of the park after the entrance zone, it is clear that there are two paths Nature Bridge is a suitable access for people with different abilities to enjoy the special view.
- In this figure, the continuous line represents the accessible route circulation and the dashed line represents the other route through mountains, which is not accessible. (National Park Service U.S., 2011)

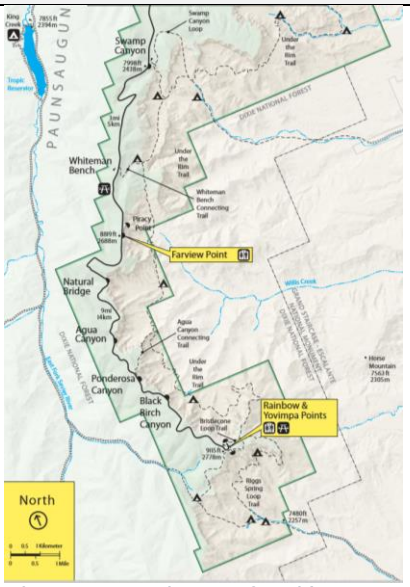



*Figure 10: south part of park's map*

**B. Nature Bridge**

- To overcome the hard topography of the park, the Nature Bridge was built to give visitors more options besides walking through mountains.
- Nature Bridge is a suitable access for people with different abilities to enjoy the special view, as shown in Figure 11.

*Figure 11: Accessible Nature Bridge*

**C. Accessible Routes inside**

- There are special routes for wheelchair users and for cycling activities, which have slip resistant materials, as in Figure 12.

*Figure 12: slip resistant Routes*

**4. Accessible Routes between Mountains**

- In specific zones that can be modified, Limited areas are graded to permit wheelchair user to get in between mountains, as in Figure 13

*Figure 13: Routes between Mountains*

### 3.2.3.3. Accessible Services

**A. Accessible Elements**

- All the Interactive elements are in the convenient height for wheelchair users, with total height of 1.2m.
- Figure 14 and Figure 15 are examples of accessible elements like Water Refill Stations and tactile arts. (Jewell, 2016)

Figure 14: Water Refill Stations

*Figure 15: Stephen T. Mather plaque, Center is tactile art*

**B. Accessibility in Viewpoints Service**

- Most viewpoint parking lots provide handicapped parking spaces and ramps for visitors in wheelchairs. If you tire easily, you may want to have assistance to and from some overlooks as elevations range between 2,440 and 2,777 meters.
- The Access Guide of Bryce Canyon Park Provides information about the accessibility of the viewpoints and which is good access and which is not recommended.

## 3.3. Park (3):

***3.3.1. General Information***: Ocqueoc Falls Bicentennial Pathway in Michigan, United States is established by Michigan Department of Natural Resources, contains one of the few waterfalls in the lower peninsula of Michigan. ((DNR) Michigan Department of Nature Recourses, 2014)

***3.3.2. The purpose of the park:*** Visitors of all abilities can experience the first universally accessible waterfall.

### *3.3.3. Accessibility Strategies:*

#### 3.3.3.1. Accessible Entrance

- Access is possible by ramp with soft slob, paved trail connects from the parking. Figure 16 shows The Entrance ramp with 1: 8 slop which is less that the maximum standard slop (1: 12).

*Figure 16: Entrance ramp*

#### 3.3.3.2. Accessibility inside the park

**A. Accessible Routes**

Routes in the Pathway match the requirements of ADA (Americans with Disabilities Act ):

- Minimum width of routes is 1.2m.
- The ground surface extends more than 305 beyond the inside face of handrails.
- The provided clearance is 760 wide above the ground surface beyond the railing.
- Figure 17 is one of the accessible sloping routes that matches the ADA requirements.

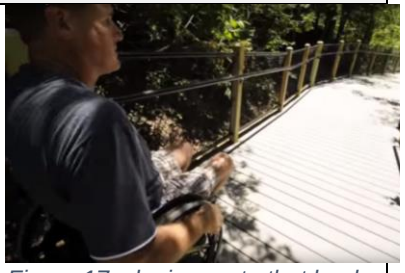
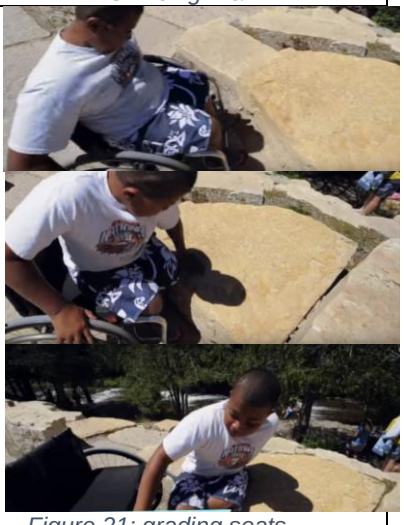


*Figure 17: sloping route that leads to waterfall*

| | | |
|---|---|---|
| **B. Accessible Steps** | • As the pathway is sloping to the waterfalls, It has accessible steps of stone that makes them slip resistant and have a short height of risers to help wheelchair user to interact safely with it.<br>• As shown in Figure 18 is an experience of one of wheelchair user's visitor approve the process of passing steps. |  <br>*Figure 18: Steps with short risers* |
| **C. Climbing Walls** | • Accessible ramp paralleling the wooded embankment, a tiered climbing wall with strategically placed transfer stations allows anyone of any age to enjoy this new challenge.<br>• Visitors have multiple means of navigating the bluff, check *Figure 19* (Michigan Department of Natural Resources ،2015) |  <br>*Figure 19: using climbing wall* |
| **D. Overlook Land** | • To absorb all abilities, pathway provides an accessible land of overlook the nature around the pathway, review Figure 20. (M.C. SMITH ASSOCIATES, 2015). |  <br>*Figure 20: Overlook Above Climbing Wall* |
| **E. Transfer Station** | • At the end of the ramp is a transfer station a series of tiered flat rocks that allow someone to transfer from a wheelchair, down the rocks, to the water's edge and into the water. Along the path is a platform to allow for viewing of the falls.<br>• Figure 21 is an experience of a wheelchair user, grading seats allow him to move independently into convenient height seat. |  <br>*Figure 21: grading seats* |

### 3.3.3.3. Accessible Services

| | |
|---|---|
| **A. Accessible Toilets:** | • A Braille panel between the toilets indicating the services within.<br>• Doors and sliders have an automatic sensor lock button situated on the wall just inside with both Braille and large print.<br>• No need to touch the button to lock the door as the system senses hand movement |

## 4. Egyptian code for outdoor spaces and buildings design for PWDs Analyzing: (Housing and Building Research Center ،2005)

| 4.1. Entrances and gates: | 4.2. Ramps: |
|---|---|
| • Entrances and gates must be near the parking lot and bus stations.<br>• At least one entrance should has the same level of curb or provides accessible ramp.<br>• In case of Turnstiles, there should be hinged door beside it for PWDs.<br>• The minimum width of door is 1m. | • The maximum slop of any ramp is 1:12 with minimum width 1.5m.<br>• Handrails should be provided with 0.80m height and extended 0.30m before and after the ramp. |
| **4.3. Routes:** | **4.4. Furniture:** |
| • The minimum width of the route is 1.5m and the maximum slop is 1:20.<br>• The route floor should have a tough texture without barriers. | • Furniture should have different texture f.<br>• It should be far from routes at least 100:200m. |
| **4.5. Floors:** | **4.6. Toilets:** |
| • Max slop of any ramp is 1:12 with min width 1.5m.<br>• In case of sand or grass, paved route should be provided to enable PWDs. | • At least one accessible toilet should be provided. |

## 5. Discussion

By analyzing of case studies concerning main requirements that included in the Egyptian code, it will be a comparison in Table 2 of (Entrances, routes and service):

*Table 2: Comparison between case studies & Egyptian code*

| | | Pukeahu National War Memorial Park | Bryce Canyon National Park | Ocqueoc Falls Bicentennial Pathway | Egyptian code |
|---|---|---|---|---|---|
| Accessible Entrance | Stairs | One stair (secondary) | No Stairs | No Stairs | Stairs (Main Entrance) |
| | Ramps | The main Entrance | The main Entrance | The main Entrance | Secondary Entrance |
| | Bus stations | Station provides accessible buses | Station provides accessible buses | - | accessible buses not valid |
| Accessibility inside the park | Accessible Routes | Minimum width: 1.2m, any fixed objects are detectable | special routes for PWDs with slip resistant materials | Minimum width: 1.2m, handrail extends 0.30m before and after | The min width 1.5m &max. Slop: 1:20. The route has tough texture without barriers. |
| | Accessible Steps | Stairs are not accessible because there are ramps | Topography is hard, so bridge is provided | Short height of risers helps PWDs to interact safely. | - |
| | Transfer Station | - | - | allows moving independently From wheelchair down the seats. | - |

| | | Pukeahu National War Memorial Park | Bryce Canyon National Park | Ocqueoc Falls Bicentennial Pathway | Egyptian code |
|---|---|---|---|---|---|
| Accessible Services | Accessible Toilets | Two accessible separated toilets Accessible Toilets include sensory options for all disabilities | accessible toilets in all view zones Accessible Toilets include sensory options | Two accessible separated toilets Accessible Toilets include sensory options for all disabilities | At least one toilet The requirements are about dimensions only, no sensory option is mentioned in the code |
| | Accessible Elements | Furniture accessible with wheelchair user | Elements with convenient height for PWDs, (1.2m). | Flat rocks that allow someone to transfer from a wheelchair | Furniture has different texture to be distinguished. be far from routes at least 100:200m |
| | Sensory options | Braille Signposts Braille or tactile methods are used to indicate location | Tactile Arts & elements with rough texture | - | Sensory options are not valid |
| | Parking | Two accessible places in the parking lot | All parking lots are accessible | - | Necessary to provide accessible parking near entrances |

## 6. Conclusion:

From the above discussion, it is found that the Egyptian code meet the minimum requirements in general, but there are other strategies didn't mentioned there are important and there are main differences in design priorities, that reflects on the recommendations of the research from comparison results:

**A. Accessible Entrances:**

- Ramps are not the main Entrance, so one ramp may not absorb the convenient number accessing parks, especially at festivals.
- The necessary of providing accessible public transportation is not mentioned in the code.

**B. Accessibility inside the park:**

- Accessible routes standards are matching these are designed in case studies.
- Accessible Steps: there is no recommendation about the stairs or steps to be accessible.
- Transfer Station strategy is not mentioned in the code.

**C. Accessible Service:**

- Number of toilets in code is less than that in case studies.
- Furniture feathers are the same in case studies.
- Sensory options are not mentioned in the Egyptian code.
- Accessible Parking standards are matching these are designed in case studies

The results enable upgrading Egyptian code for outdoor spaces and buildings design for PWDs. In addition to that, research recommends to create system of supervision for Egyptian National Parks to insure the design quality.

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