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# Provision Of Access For Persons With Disabilities In Selected Sports Stadiums In Ghana

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***Abstract***

*Prior to the enactment of the Persons with Disability Act 715 in 2006, Ghana had four stadiums; the Kumasi and Accra Sports Stadiums were built in the nineteen fifties and sixties but refurbished around 2006 when the Sekondi-Takoradi and Tamale Sports Stadiums were built. The main aim of this study is to determine the accessibility of these four stadiums to spectators who are Persons with Disabilities (PWDs). Facilities at these stadiums were audited to determine their compliance with accessibility legislation, standards, guides, codes etc. The results showed that although the latter-built stadiums were slightly more accessible to PWDs, all four stadiums were generally not very accessible. This study provides vital data to policy makers for the future design, construction and management of stadiums in Ghana.*

**Keywords: Accessibility, Persons with Disabilities, Stadiums, Universal design. Act 715**

## 1. INTRODUCTION

In recent years, demands for universal accessibility and inclusion within stadiums, most notably in professional football, have propelled themselves to the forefront of the political and public–private debate, most notably in Australia/New Zealand, Spain, Britain, and the United States of America and this trend is expected to continue (Kitchin

et al., 2022). In 2017, the Equality and Human Rights Commission (EHRC), of Great Britain brought attention to a number of the serious challenges that have been encountered by handicapped individuals throughout the years. Persons with disabilities (PWDs) "are still being regarded as second-class citizens," according to David Isaac, the Chair of the EHRC (EHRC, 2017, page 5). Accessibility has become such a focal point that it has even permeated the realm of professional sports and significant events. The "new generation of sports consumers," which includes people with disabilities and older persons who have access requirements, are demanding that more and more event holders and National Sports Organizations (NSOs) establish their social validity and credibility (Paramio-Salcines and Llopis-Goig, 2019).

There are a lot of accessibility studies and audit access studies that can be found in the literature on the built environment in Ghana and their findings have confirmed the widespread perception that the vast majority of public facilities are inaccessible to PWDs (Danso et al., 2019, Tudzi et al., 2017, Ashigbi et al., 2017, Yarfi, et al., 2017). Unfortunately, virtually none of these studies were on recreational facilities like parks, stadiums and playing grounds. In Ghana, Sports Stadiums are used not only for recreational events like football, athletics, boxing and other sports disciplines but also used for a range of social activities such as Independence Day celebrations, Church Services and Political Rallies where thousands of people gather. This study is therefore conducted to evaluate the degree of accessibility for persons with disabilities in the four main sports stadiums in Ghana which were constructed before the enactment of Act 715 in 2006. They are the Accra, Kumasi, Tamale and the Sekondi -Takoradi Sports Stadiums and will subsequently and collectively be known as Pre-Act 715 Stadiums. The research objectives are: to identify the parameters/elements that facilitate the accessibility of sports stadiums, to evaluate the level of accessibility of each of the stadiums, determine the areas in stadiums that need retrofitting in order to provide better accessibility to users and make recommendations for future design, construction and management of stadiums in the country.

## 2. LITERATURE

### 2.1 Disability And The Built Environment

On June 23, 2006, the Parliament of Ghana passed the Persons with Disability Act, 2006 (Act 715) which has been considered a remarkable landmark in Ghana's human rights discourse because it gives the hope that it will improve the life of PWDs to enable them become part of mainstream society. Among other things, the Act sought to provide “the right to a family life and right to participate in social, creative or recreational activities; the prohibition of differential treatment for residential purposes, the right to the same living conditions as persons without disability when persons with disability are placed in special institutions; no exploitation, abuse, discrimination or disrespect to

persons with disability, appropriate facilities when involved in court proceedings; and access to public places" Years after the passage of the Act, the dream of an inclusive built environment in Ghana remains a mirage ( Danso et al., 2019). An inclusive built environment is one that is favourable to the full involvement of people with disabilities and their enjoyment of equal chances. In point of fact, a barrier-free built environment is a goal that has international appeal owing to the vast number of people living with disabilities around the globe (Yau and Lau, 2016). Despite this, the inaccessibility of the built environment has remained one of the primary types of discrimination that people with disabilities continue to face (Larkin et al., 2015). It was argued by Yau and Lau (2016) that disability should be seen as a social construct, and that problems resulting from disabilities should be centred on the environment's failure to accommodate the needs of people with disabilities (PWDs), rather than a defect that exists within individuals that need to be fixed or rectified (Danso et al., 2019).

Bernama (2009), also stated that, the term "disabled people" refers to "persons with physical, mental, and intellectual impairments that impeded them from fully participating in a normal fashion in the communal way of life." According to the findings of a large number of researchers, the inaccessibility of the environment may have a detrimental impact on the well-being of impaired persons (Putnam et al., 2003; Darcy and Harris, 2003). Architectural barriers that restrict access for people with disabilities have been identified as a cause of a change in social status, isolation, limited economic opportunities, unhealthy lifestyles, dependence, choice restriction, discrimination, and a lower quality of life for disabled people (Rivano-Fischer, 2004). Furthermore, these barriers make it difficult for people with disabilities to enter and exit buildings and facilities and provide challenges when attempting to utilize the amenities that are housed inside such structures. When handicapped persons are out in public, an inaccessible setting may make them feel vulnerable, which can lead to stress, poor self-esteem, and embarrassment (O'Hara, 2004; Iwasaki and Mactavish, 2005). Therefore, public buildings and facilities should be constructed using barrier-free design because this promotes integration and free access through a safe and practical plan that can be utilized by all individuals, including those who have a visual or hearing impairment, parents who bring baby strollers, wheelchair users, and elderly individuals. People who are handicapped have the ability to immerse themselves in mainstream social and economic activities and participate in them without the fear of being excluded or treated unfairly if there is easy accessibility. In order to successfully integrate barrier-free design into the architecture cities, it is helpful to have a few precedent studies available to use as references.

To provide acceptable and optimal accessibility for successful usage by persons with disabilities, it is vital to have codes, guidelines and rules to assist building processes and advise designers on universal design (Yarfi et al., 2017). The straightforward usage is made possible by the universal design, and the legal guarantees detail the optimal

circumstances for making the most of available space (Machado & de Oliveira, 2021). Despite the fact that there are specific guidelines for designing accessible features for individuals with reduced mobility, these guidelines have often been inadequate to meet the expectations for PWDs to utilize such areas (Yazigi et al., 2015)

## 2.2 Accessıbılıty In Stadıums

According to the Department of Economic and Social Affairs (2014), by the year 2050, it is anticipated that approximately 6.25 billion people will be living in urban centres, of which 15% will be people with disabilities. The process of urbanization has the potential to serve as a catalyst for attaining inclusive and long-term sustainable development for everyone. Physically impaired persons who participate in athletics may reclaim their self-worth, foster the growth of healthy mental attitudes, come to grips with their impairment, and achieve social reintegration (Gupta et al., 2007). However, our built environment and the infrastructure that is now accessible include environmental barriers that prevent persons with disabilities from using it. This includes stadiums. Access and inclusion have been a subject of discussion in a variety of situations due to a rising legal and cultural expectation that individuals with disabilities be included fairly in all aspects of citizenship (Darcy et al., 2014). These have included engaging in sports and recreational activities (Darcy & Dowse, 2013).

Accessibility seeks to provide safe, independent access to and use of buildings and their surroundings for all people. Thus, by including the notion that individuals with reduced mobility are also included in the context of displacement and approach to the desired object or location, all projects create favourable conditions when taking an interest in people with limitations to reaching their planned destinations, whether accompanied or not and with or without the help of others (Yazigi et al., 2015). People who suffer from a wide range of impairments have traditionally been exempted from participating in mainstream athletic activities and even from entering sporting venues, whether in the capacity of a spectator or an athlete (Abells, 2008). The Olympic Games and the Paralympic Games provide high-profile, well-resourced, and frequently green field development opportunities that could showcase the effective design and delivery of accessible and inclusive event infrastructure. Examples of these types of events include the Olympic Games and the Paralympic Games (Darcy et al., 2014). This lack of inclusion affects both athletes and spectators, to the extent that it is difficult for them to access our sports and recreational infrastructure, specifically, sports stadiums.

In more recent times, the introduction of specific policy initiatives, some of which are statutory and others of which are implemented by independent national governing bodies of sport, has helped to advance their legitimate inclusion, where this can reasonably be accommodated. [Case in point:] the 2016 Rio Olympics (Harada, 2009). Hassan et al. (2012) state that concerns such as equality of access, disability

discrimination, and the utilization of sports for developmental objectives have been brought to the forefront, and as a result, the visibility and personal agency of otherwise excluded groups have improved significantly.

## 3. METHODOLOGY

This research was in two stages; a literature review of academic papers, legal/regulatory rules, and over 20 national and international standards, building codes and guides, etc. (which will subsequently be collectively referred to as Standards) to determine parameters that are required in an accessible stadium. Secondly, a checklist was designed using these parameters and this was used to audit the facilities of four stadiums. The checklist underwent a pilot test with a multi-disciplined professional who is a Civil Engineer, Building Technologist, and Academic with over 30 years of experience. During the audit, each checklist item was measured and evaluated using guidelines from the various standards reviewed in the study. The audit involved the professional's verification of the items on the checklist by observing, measuring and evaluating the shortlisted factors to determine the existence or absence of issues that may hinder or prevent the use of the stadiums' facilities by PWDs. During the field research, observations on the difficulties and the risks involved in the use of the facilities were documented and later discussed with a team of eight final-year students, designated as the accessibility group (participants) and who were divided into groups of two that finally carried out the actual survey in the four stadiums in 2022. In a similar audit access study, Abdul Rahim (2008) stated that the participants, together with the experienced researcher(s), are the essential expert group for the effective completion of an audit study since the two groups usually played critical roles in the research by ensuring that the audit was carried out as intended.

45 accessibility parameters were initially generated from the Standards but were later whittled down to 32 because some of them were not relevant in the Ghanaian context. The 32 parameters were rated on the Likert scale with a score between 1 to 5 based on their availability, adequacy, state, condition and level of compliance with the Standards reviewed: 1 = Poor/Facility is not provided; 2 = Satisfactory/Most requirements are not met; 3 = Fair/Equal number of requirements complied and not complied; 4 = Good/Most requirements are met; and 5 = Excellent/All requirements are met. Jamaludin and Abdul Kadir (2012) used this scale in a similar study. The Statistical Package for Social Sciences (SPSS) and MS Excel 2016 using the Mean Score Ranking (M), Standard Deviation (SD) and Relative Importance Index (RII) were employed to analyse the data received from the audit. The mean scores provided the central tendencies for each variable whiles the standard deviation provided the level of spread of the stadium ratings. A score of 3 was considered Fair on the Likert scale so in treating the mean scores (M) which were to 2 decimal places, $M \leq 2.50$ were considered below Fair and therefore

uncompliant with the Standards, 2.50 < M > 3.50 were considered as Fair and M ≥ 3.50 were considered to be above Fair.

The data from all non-compliant parameters were further subjected to Failure Mode and Effect Analysis (FMEA) to measure the severity of the accessibility flaws detected in the stadiums, thus enabling the development of actions for their mitigation. This method was used in a similar study on university buildings by Machado and de Oliveira (2021). The values assigned to each defect were based on the data collected from the facilities by the participants in the survey. The values were then computed and categorized according to the Risk Priority Number (RPN), which represents the value resulting from the multiplication of the three following factors as presented in Table 5 severity (S), occurrence (O) and detection (D), each varying from 1 to 10.

**Table 1 FMEA LEGEND**

| **Occurrence** | | **Detection** | | **Severity** | |
|---|---|---|---|---|---|
| Unlikely | 1 | High | 1 | Barely noticeable | 1 |
| Very small | 2 to 3 | Moderate | 2 to 3 | Of little importance | 2 to 3 |
| Moderate | 4 to 6 | little | 4 to 6 | Moderate | 4 to 6 |
| High | 7 to 8 | Very little | 7 to 8 | Severe | 7 to 8 |
| Alarming | 9 to 10 | Unlikely | 9 to 10 | Very severe | 9 to 10 |

Risk Priority Number (RPN): Low: from 1 to 100 Moderate: from 101 to 300 High: from 301 to 1000. Source: (Machado & de Oliveira, 2021)

## 4. RESULTS AND DISCUSSIONS

### 4.1 Access Parameters Required For The Sports Stadiums

A profile of the four Pre-Act 715 Sports Stadiums is presented in Table 2 and the grouping of the 32 accessibility parameters into six thematic areas is shown in Table 3.

**Table 2 THE PRE-ACT 715 SPORTS STADIUMS (Authors Construct)**

| | **STADIUM** | | | |
|---|---|---|---|---|
| | **Accra Sports Stadium (ASS)** | **Kumasi Sports Stadium (KSS)** | **Tamale Sports Stadium (TSS)** | **Sekondi-Takoradi Sports Stadium (STSS)** |
| **Other Names** | Ohene Gyan | Baba Yara | Alhaji Aliu Mahama | Essipong |
| **Date of Initial Construction** | 1962 | 1957 | 2006-2007 | 2006-2007 |
| **Dates of Major Renovations** | 1976-77, 2006-2007 | 1971, 1976-77, 2006-2007 | NIL | NIL |

| | | | | |
|---|---|---|---|---|
| **Type** | Multi-purpose; mainly football and athletics | Multi-purpose; mainly football and athletics | Multi-purpose; mainly football and athletics | Multi-purpose; mainly football and athletics |
| **Capacity** | 40,000 | 40,528 | 20,000 | 20,000 |
| **Home to Football Club** | Hearts of Oak, Great Olympics | Asante Kotoko, King Faisal | Real Tamale United | Eleven Wise, Hasaacas |
| **Other Events Hosted** | Political rallies, religious gatherings, other social and recreational events, etc. | Political rallies, religious gatherings, other social and recreational events, etc. | Political rallies, religious gatherings, other social and recreational events, etc. | Political rallies, religious gatherings, other social and recreational events, etc. |

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*Table 3 PARAMETERS USED FOR ACCESSING THE FOUR PRE-ACT 715 SPORTS STADIUMS (Adopted from Accessible Stadia, 2003)*

| SN | THEMATIC AREAS AND PARAMETERS | DDA | Part M | Green Guide | BS 8300 | Task Force Report | NADS Audit | DRC Code | FAPL | FF/FT Leaving the Trackside | FF/NADS Guide to Grounds | DETR | Accessible Stadia | Tokyo 2020 Accessibility Guidelines | Accessible sports facilities | Accessibility guide (International Paralympic Committee) | Access for All V.01 | Accessible Sports Stadia Design | General Facilities for the disabled guidelines | National Building Code of Nigeria | Act 715 (2006) | Ghana Building Code | Ghana Disability Guide | Code of Federal Regulations Method | Football Stadia Improvement Fund, 2003 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | OUTSIDE THE STADIUM | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 1 | Transport and Access to the Stadium | | | | | | | | | • | | | • | • | • | | • | • | | | • | | • | | • |
| 2 | Car Parking | | • | • | • | • | • | • | | • | • | • | • | • | • | • | • | • | • | | • | | • | • | • |
| 3 | Access Routes | | • | • | • | | • | • | | • | | | • | • | • | • | • | • | | | • | | • | • | • |
| 4 | Providing Information | | • | • | • | • | • | • | | | | | • | • | • | • | • | | • | • | | | • | • | • |
| B | ENTERING THE STADIUM | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | Ticket Outlets | | | | | | • | • | | • | | | • | • | • | • | | • | | | | | • | | • |
| 6 | Access into the Stadium | | • | • | • | | • | • | | • | | | • | • | • | | • | • | | | | | | | • |
| 7 | Designated Entrances | | | | | • | • | | | | | | • | | | | • | • | | | | | • | | • |
| 8 | Entrance Doors and Lobbies | | • | | • | • | • | • | | | | | • | • | • | • | • | • | • | | | | • | | • |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| C | CIRCULATION AREAS | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | Vertical Circulation – Passenger Lifts | | • | | • | • | • | • | | | | | • | • | • | • | • | • | | • | | • | • | • | • |
| 10 | Vertical Circulation – Stairs and Ramps | | • | | • | • | • | • | | | | | • | • | • | • | • | • | • | • | | • | • | • | • |
| 11 | Horizontal Circulation within the Stadium | | • | | • | • | • | • | | | | | • | • | • | • | | • | • | | | | • | • | • |
| D | VIEWING AREAS | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | Number of Spaces | | | | | | | | | | | | | | • | • | • | • | | | | | | | • |
| 13 | Location of Viewing Areas | | | | | | | | | | | | | • | • | | • | • | | | | | • | | |
| 14 | Quality of Viewing Spaces/ Flexible Seating | | | • | | • | • | • | | | | | • | • | • | | • | • | | | | | | | |
| 15 | Sightlines | | | • | | • | • | • | | • | | | • | • | • | • | | • | | | | | | | • |
| 16 | Fully Enclosed Viewing Areas | | | | | | | | | | | | | | | | | | | | | | | | |
| 17 | Alternative Events | | | | | | | | | | | | | | | | • | | | | | | | | • |
| 18 | Supplying Match Commentaries to Viewing Areas | | | • | | • | • | • | | | | | • | | • | • | • | • | | | | | • | | • |
| 19 | Hearing Augmentation | | | | | | | | | | | | | • | • | • | • | • | | | | | • | | • |
| 20 | Floodlight / Scoreboard | | | | | | | | | | | | | | • | | | | | | | | | | |
| E | LEAVING THE STADIUM | | | | | | | | | | | | | | | | | | | | | | | | |
| 21 | Exit Routes | | | | | | | | | | | | | • | • | • | • | • | | • | | • | • | • | • |
| 22 | Emergency Evacuation – Sources of Guidance | | | • | | • | • | | | | | | • | • | • | • | • | • | • | • | | • | • | • | • |
| 23 | Horizontal Escape | | • | | • | • | • | • | | | | | • | | • | | • | • | | • | | • | • | • | • |
| 24 | Refuges | | | | | | | | | | | | | | • | | • | | | | | | • | | |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 25 | Vertical Escape – Evacuation Lifts, Wheelchair Stairlifts | | • | | • | • | • | • | | | | | • | • | • | • | • | • | | • | | • | • | • | • |
| 26 | Vertical Escape – Stairs, Ramps, Handrails and Signage | | • | • | • | • | • | • | | | | | • | • | • | • | • | • | | • | | • | • | • | • |
| 27 | Alarm Systems | | • | | • | | | | | | | | • | • | • | • | | • | | • | | • | • | | • |
| F | OTHERS | | | | | | | | | | | | | | | | | | | | | | | | |
| 28 | Staff and Stewards | • | | • | | • | • | • | | • | | | • | • | | | | | | | | | | | |
| 29 | Restaurants and Bar Areas/Refreshment Outlets | • | • | | • | • | | • | | • | | | • | • | • | • | • | | | | | | • | • | • |
| 30 | Directors' Boxes, Executive Boxes and Hospitality Suites | • | | | • | • | • | • | | | | | • | | • | | • | • | | | | | | • | • |
| 31 | Press and Media | • | | | • | • | • | • | | | | | • | | • | • | • | • | | | | | | • | • |
| 32 | Toilets for Ambulant Disabled Spectators | | | • | | • | • | • | | • | • | | • | • | • | • | • | • | | • | | • | • | • | • |

### 4.2 Accessıbılıty Of The Selected Stadıums

#### 4.2.1 Accessibility Of Parameters Of Stadiums

Nine out of the 32 parameters (Transport and Access to the Stadium; Access Routes; Access into the Stadium; Horizontal Circulation within the Stadium; Number of Spaces; Alternative Events; Floodlight/Scoreboard; Refuges; and Vertical Escape – Evacuation Lifts. Wheelchair Stairlifts) had $M \geq 3.50$ and $0 \leq SD \leq 0.577$ were considered to be above Fair and therefore compliant with the provisions of the Standards (Table 4). Generally, all the four stadiums did not only have good road networks and transportation systems from various parts of their respective cities, but also had acceptable access routes around the stadiums and adequate access to the stadiums. However, dedicated entrances for PWDs to the stadiums were absent. Table 4 of The Green Guide (2018) requires that 150 plus 3 per 1000 above 20,000 wheelchair spaces be provided for stadiums with seated capacities of 20,000 to 40,000. This means that the four stadiums should each have between 150-210 wheelchair spaces. Furthermore, the four stadiums are all multi-purpose; apart from recreational events like football, athletics, table tennis, boxing etc., they are also used for a range of social activities such as Independence Day celebrations, Church Services and Political Rallies. They are also fitted with functioning scoreboards and floodlights and have sufficient spaces for refuges during emergencies. Adequate ramps and Evacuation Lifts are present in all four stadiums.

On the other hand, 13 out of the 32 parameters (Car Parking; Providing Information; Ticket Outlets; Vertical Circulation – Passenger Lifts; Fully Enclosed Viewing Areas; Supplying Match Commentaries to Viewing Areas; Hearing Augmentation; Emergency Evacuation – Sources of Guidance; Vertical Escape – Stairs, Ramp, Handrails and Signage; Alarm Systems; Staff and Stewards; Directors' Boxes, Executive Boxes and Hospitality Suites; and Toilets for Ambulant Disabled Spectators) had $M \leq 2.50$ and $0 \leq SD \leq 0.577$ were considered to be below 2.50 and therefore uncompliant with the standards. Failure Mode and Effect Analysis (FMEA) was further used to analyse these 13 non-compliant parameters in section 4.3. The remaining ten parameters with $2.50 < M > 3.50$ and $0 \leq SD \leq 0.957$ were considered to be in fair condition.

#### 4.2.2 Accessibility Of Thematic Areas Of Stadiums

The accessibility of the thematic areas in the stadiums is shown in Table 4 and most accessible of the six thematic areas in the four stadiums is Outside the Stadium (M = 3.25 and SD = 0.957) followed by Circulation Areas (M = 3.17 and SD = 0.764). This is due to the

relative ease with which PWDs can connect by transport to the various stadiums that from most locations in their respective cities. Access routes are generally satisfactory and adequate car parks are provided

**Table 4 Accessibility Of Parameters Of Stadiums**

| SN | THEMATIC AREAS AND PARAMETERS | STADIUMS | | | | | | Ranking | |
|---|---|---|---|---|---|---|---|---|---|
| | | ASS | KSS | TSS | STSS | M | SD | | |
| A | **OUTSIDE THE STADIUM** | **3.25** | **3.00** | **3.50** | **3.25** | **3.25** | **0.957** | | **1st** |
| 1 | Transport and Access to the Stadium | 5 | 5 | 4 | 4 | 4.5 | 0.577 | 1st | |
| 2 | Car Parking | 2 | 2 | 3 | 3 | 2.5 | 0.577 | 3rd | |
| 3 | Access Routes | 3 | 3 | 4 | 4 | 3.5 | 0.577 | 2nd | |
| 4 | Providing Information | 3 | 2 | 3 | 2 | 2.5 | 0.577 | 3rd | |
| B | **ENTERING THE STADIUM** | **2.75** | **2.50** | **3.00** | **3.00** | **2.83** | **0.625** | | **4th** |
| 5 | Ticket Outlets | 2 | 2 | 2 | 2 | 2.0 | 0.000 | 4th | |
| 6 | Access into the Stadium | 3 | 3 | 4 | 4 | 3.5 | 0.577 | 1st | |
| 7 | Designated Entrances | 3 | 3 | 3 | 3 | 3.0 | 0.000 | **2nd** | |
| 8 | Entrance Doors and Lobbies | 3 | 2 | 3 | 3 | 2.8 | 0.500 | **3rd** | |
| C | **CIRCULATION AREAS** | **3.00** | **3.00** | **3.33** | **3.33** | **3.17** | **0.764** | | **2nd** |
| 9 | Vertical Circulation – Passenger Lifts | 2 | 2 | 3 | 3 | 2.5 | 0.577 | 3rd | |
| 10 | Vertical Circulation – Stairs and Ramps | 3 | 3 | 3 | 3 | 3.0 | 0.000 | **2nd** | |
| 11 | Horizontal Circulation within the Stadium | 4 | 4 | 4 | 4 | 4.0 | 0.000 | 1st | |
| D | **VIEWING AREAS** | **3.00** | **3.00** | **2.89** | **2.89** | **2.94** | **0.808** | | **3rd** |
| 12 | Number of Spaces | 4 | 4 | 3 | 3 | 3.5 | 0.577 | 3rd | |
| 13 | Location of Viewing Areas | 3 | 3 | 3 | 3 | 3.0 | 0.000 | **4th** | |
| 14 | Quality of Viewing Spaces/ Flexible Seating | 3 | 3 | 3 | 3 | 3.0 | 0.000 | **4th** | |
| 15 | Sightlines | 3 | 3 | 3 | 3 | 3.0 | 0.000 | **4th** | |
| 16 | Fully Enclosed Viewing Areas | 2 | 2 | 2 | 2 | 2.0 | 0.000 | 7th | |
| 17 | Alternative Events | 4 | 4 | 4 | 4 | 4.0 | 0.000 | 1st | |
| 18 | Supplying Match Commentaries to Viewing Areas | 2 | 2 | 2 | 2 | 2.0 | 0.000 | 7th | |
| 19 | Hearing Augmentation | 2 | 2 | 2 | 2 | 2.0 | 0.000 | 7th | |
| 20 | Floodlight / Scoreboard | 4 | 4 | 4 | 4 | 4.0 | 0.000 | 1st | |
| E | **LEAVING THE STADIUM** | **2.57** | **2.57** | **2.86** | **2.86** | **2.71** | **0.990** | | **5th** |
| 21 | Exit Routes | 3 | 3 | 3 | 3 | 3.0 | 0.000 | **3rd** | |
| 22 | Emergency Evacuation – Sources of Guidance | 2 | 2 | 2 | 2 | 2.0 | 0.000 | 6th | |
| 23 | Horizontal Escape | 3 | 3 | 3 | 3 | 3.0 | 0.000 | **3rd** | |
| 24 | Refuges | 4 | 4 | 4 | 4 | 4.0 | 0.000 | 1st | |
| 25 | Vertical Escape – Evacuation Lifts, Wheelchair Stairlifts | 3 | 3 | 4 | 4 | 3.5 | 0.577 | **2nd** | |
| 26 | Vertical Escape – Stairs, Ramps, Handrails and Signage | 2 | 2 | 3 | 3 | 2.5 | 0.577 | 5th | |
| 27 | Alarm Systems | 1 | 1 | 1 | 1 | 1.0 | 0.000 | 7th | |

| F | OTHERS | 2.20 | 2.40 | 2.40 | 2.40 | 2.35 | 0.898 | | 6th |
|---|---|---|---|---|---|---|---|---|---|
| 28 | Staff and Stewards | 1 | 1 | 1 | 1 | 1.0 | 0.000 | 5th | |
| 29 | Restaurants and Bar Areas/Refreshment Outlets | 3 | 4 | 2 | 2 | 2.8 | 0.957 | 2nd | |
| 30 | Directors' Boxes, Executive Boxes and Hospitality Suites | 2 | 2 | 3 | 3 | 2.5 | 0.577 | 3rd | |
| 31 | Press and Media | 3 | 3 | 3 | 3 | 3.0 | 0.000 | 1st | |
| 32 | Toilets for Ambulant Disabled Spectators | 2 | 2 | 3 | 3 | 2.5 | 0.577 | 3rd | |
| | **TOTAL SCORE (OUT OF A TOTAL OF 160)** | **89** | **88** | **94** | **93** | | | | |
| | **% SCORE (OUT OF A TOTAL OF 160)** | **55.6** | **55.0** | **58.8** | **58.1** | | | | |

at the venues. The car parks however were all without designated and signposted parking bays for PWDs as required by the Standards (Berkshire Accessibility by Design, 1991; BS 8300, 2009). Although three out of the seven parameters in these two thematic areas (Outside the Stadium and Circulation Areas) had M ≥ 3.5, they still were not very accessible; Car Parking, Provision of Information and Vertical Circulation - Passenger Lifts under these thematic areas had M = 2.5 and were non-compliant with the provisions of the Accessibility Standards. The Car Parks, especially those at ASS and KSS had no designated bays for PWDs, irregular surfaces covered with loose aggregates and open drains (Figs. 1 and 2). Also, the four stadiums

*Figure. 1 Car Park covered with loose gravel (ASS)*

*Figure. 2 Car Park with no bays for PWDs (KSS)*

generally, did not have adequate signage, although the few that were provided were positioned at the appropriate heights, had the appropriate font size and style with sufficient visual contrast between the font and background and were adequately illuminated as required by Solidere (2004). However, there were no tactile signs and braille incorporated into the signage to assist the blind.

Although each stadium had an average of two passenger lifts, they were located at the VIP stands which had no links with other stands in the stadium especially the designated stands for the PWDs. These lifts were not regularly maintained and often out of service.

Generally, the most inaccessible thematic areas in the four stadiums are Leaving the Stadium (M= 2.71 and SD = 0.990) and Others (M = 2.35 and S.D = 0.898). Emergency Evacuation – Sources of Guidance, Vertical Escape – Stairs, Ramps, Handrails and Signage and Alarm Systems each had M ≤ 2.5. The four stadiums virtually had no Alarm Systems to warn and guide PWDs during emergencies. That partly accounted for the high death toll in the May 9, 2001 disaster where over 126 abled-bodied spectators lost their lives in the worst-ever stadium disaster in Africa at the Accra Sports Stadium ("Wikipedia," 2022). The situation would have been more catastrophic if PWDs had been present in their numbers in the stadium on that day. Staff and Stewards, Directors' Boxes, Executive Boxes and Hospitality Suites and Toilets for Ambulant Disabled Spectators all had M ≤ 2.5. The provision of Staff and Stewards, Director's Boxes, Executive Boxes and Hospitality Suites were virtually non-existent in all stadiums and where present were not designed for PWDs. Section 4.1 of The Green Guide (2018) avers that effective safety management requires the employment, hire or contracting of stewards in order to assist with the circulation of spectators, prevent overcrowding, reduce the likelihood and incidence of disorder, and provide the means to investigate, report and take early action in an emergency. In carrying out these duties, stewards should always be aware of, and ensure the care, comfort and well-being of all categories of spectator. Furthermore, the Director's and Executive Boxes are required for owners of clubs and VIPs etc. who might be disabled. Although Hospitality Suites in the form of hotel rooms were designed and constructed at the STSS and TSS, they were not completed and without furnishings and could therefore not be used. While the state of some of the toilets are satisfactory, the number required and their proximity to the PWD stands were not acceptable.

### 4.2.3 Inter-Stadium Comparison

The mean scores and standard deviations were used to rank and compare the accessibility of the four CAN 2008 stadiums (Table 5). The analysis showed that, TSS was ranked the best stadium followed by STSS (Figs. 3 – 4). They had the mean scores of 2.94 and 2.91 respectively and standard deviations of 0.840 and 0.856 respectively. However, KSS was the worst performing stadium among the four CAN 2008 stadiums with M and SD values of 2.75 and 0.95 respectively. The results also indicated that TSS came first in four out of the six thematic areas and second and third in the other two. On the other hand, KSS ranked last in four out of the six thematic areas and came first and second in the other two. From the

foregoing, it can be concluded that although TSS and KSS came first and last respectively in the rankings, there is very little to choose among them since the difference in their mean scores was just 0.19. Furthermore, the level of accessibility in all the four stadia is below fair (3.00).

**Figure. 3 Electronic Score Board at STSS**

**Figure. 4 Access route to STSS**

**Table 5 Inter-Stadium Comparison**

| PARAMETER | Mean | SD | Rank |
|---|---|---|---|
| **Outside the stadium** | | | |
| TSS | 3.50 | 0.577 | 1ST |
| STSS | 3.25 | 0.957 | 2ND |
| ASS | 3.25 | 1.258 | 3RD |
| KSS | 3.00 | 1.414 | 4TH |
| **Entering the stadium** | | | |
| TSS | 3.00 | 0.816 | 1ST |
| STSS | 3.00 | 0.816 | 2ND |
| ASS | 2.75 | 0.500 | 3RD |
| KSS | 2.50 | 0.577 | 4TH |
| **Circulation areas** | | | |
| TSS | 3.33 | 0.577 | 1ST |
| STSS | 3.33 | 0.577 | 2ND |
| ASS | 3.00 | 1.000 | 3RD |
| KSS | 3.00 | 1.000 | 4TH |
| **Viewing areas** | | | |
| ASS | 3.00 | 0.866 | 1ST |
| KSS | 3.00 | 0.866 | 2ND |
| TSS | 2.89 | 0.782 | 3RD |
| STSS | 2.89 | 0.782 | 4TH |
| **Leaving the stadium** | | | |
| TSS | 2.86 | 1.070 | 1ST |
| STSS | 2.86 | 1.070 | 2ND |
| ASS | 2.57 | 0.980 | 3RD |

| | | | |
|---|---|---|---|
| KSS | 2.57 | 0.980 | 4TH |
| **Others** | | | |
| KSS | 2.40 | 1.291 | 1ST |
| TSS | 2.40 | 0.957 | 2ND |
| STSS | 2.40 | 0.957 | 3RD |
| ASS | 2.20 | 0.957 | 4TH |
| **OVERALL** | | | |
| TSS | 2.94 | 0.840 | 1ST |
| STSS | 2.91 | 0.856 | 2ND |
| ASS | 2.78 | 0.906 | 3RD |
| KSS | 2.75 | 0.950 | 4TH |

### 4.3 Analysıs Of Faılures In The Accessıbılıty Of Stadıums Usıng Faılure Mode And Effect Analysıs (Fmea)

The data from the 13 non-compliant parameters were further subjected to FMEA to measure the severity of the accessibility flaws detected in the stadiums, thus enabling the development of actions for their mitigation (Table 6).

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**Table 6 FMEA OF ACCESSIBILITY PROBLEMS DETECTED IN THE STADIUMS**

| SN | Parameter | Potential Failure Mode | Potential Effect(s) of Failures | Potential Failure Mechanisms | Indexes | | | | Recommended Actions |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | S | O | D | RPN | |
| 1 | Car Parking | Absence of designated bays and signages | Spots for people with disabilities are not guaranteed | No Legislation at the time of design and construction; Absence of good practices manual; Lack of experience in similar projects. | 9 | 7 | 1 | 63 | Designated, accessible and signed parking bays must be provided at the car parks |
| | | Number of spots lower than 2% of the total | Needs not completely met | | 7 | 8 | 2 | 112 | The number of accessible parking bays should meet the requirements of the standards. |
| | | Insufficient width of the parking aisle | Deters usage | | 6 | 8 | 2 | 96 | Width of accessible parking bays must be adequate |
| | | Non-standard flooring | Reduction of user safety and comfort | | 6 | 8 | 1 | 48 | Car park surfaces should be hard, uniform and non-slip and all open drains sealed; |
| | | Absence of drop-off areas | Deters usage and risk of accidents | | 9 | 7 | 2 | 126 | Drop-off areas must be provided at public transport stops such as bus stops |
| 2 | Providing information (Figs. 5 - 8) | Absence of accessible maps | Reduction of autonomy; Orientation difficulties; non-identification of access routes and accessible facilities. | Failure in the project's supervision; No Legislation at the time of construction | 8 | 8 | 3 | 192 | Accessible spaces and facilities must be identified by the international symbol of accessibility; Directional signs should be added to indicate clearly the location and function of accessible spaces and facilities; Signs that do not comply with the above design requirements should be modified or replaced. |
| | | Bathrooms not signalized | Reduction of autonomy | The project was not standardized; | 5 | 7 | 2 | 70 | |
| | | Escape routes not signalized | Risk of accidents; Hazards due to lack of warning | | 5 | 7 | 5 | 175 | |
| | | Elevators/platforms not signalized | Facilities for spectators with disabilities are not guaranteed | | 6 | 7 | 5 | 210 | |
| | | Stairs not signalized | Risk of accidents; Hazards due to lack of warning; Reduction of autonomy | | 6 | 6 | 5 | 180 | |
| | | Absence of tactile flooring | Risk of accidents; Hazards due to lack of warning; Reduction of autonomy | | 9 | 9 | 2 | 162 | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Absence of braille signs | Reduction of autonomy | | 9 | 9 | 3 | 243 | |
| 3 | Ticket Outlets | Incorrect Size | Needs of people with disabilities not completely met | No Legislation at the time of and design of construction | 4 | 8 | 1 | 32 | Retrofitting of facilities to make at least one signed entrance per facility accessible to a wheelchair user; An audio induction loop may be fixed in the ticket office subject to suitability of application. |
| | | No distinct accessible entrance; Only turnstile entrances | Risk of accidents; Reduction of autonomy, Hazards due to lack of warning | | 9 | 8 | 1 | 72 | |
| 4 | Vertical Circulation – Passenger Lifts (Figs. 13 – 14) | Insufficient and dysfunctional lifts | Reduction of autonomy; Deterred or prevented use by PWDs; Needs of people with disabilities not completely met | No Legislation at the time of design and construction; Lack of experience in similar projects; The project was not revised by expert professionals; | 6 | 5 | 1 | 30 | Additional lifts should be added and the lifts should be regularly maintained. |
| | | Absence of tactile signs; | Risk of accidents | | 4 | 8 | 4 | 128 | Lifts should be fitted with braille signs |
| 5 | Fully Enclosed Viewing Areas | Absence of fully enclosed viewing areas for disabled spectators (Figs. 9 - 12). | Risk of accidents; Spots for disabled spectators not guaranteed | Lack of experience in similar projects; The needs of disabled people are not known; No Legislation at the time of design and construction | 7 | 8 | 2 | 112 | Non-reflective glass-enclosed areas must be provided to keep out the elements of the weather such as rain and direct sunshine. Commentary must be provided in the space for the blind and partially sighted spectators. |
| 6 | Supplying Match Commentaries to Viewing Areas | No commentary to viewing areas | Discourages patronage by visually impaired PWDs; Reduction of autonomy | The needs of people with disabilities are not known; The project was not revised by expert professionals; | 8 | 7 | 1 | 56 | Match commentary should be provided for spectators with visual impairments with provision for a headphone socket connection to designated seats and/or wheelchair spaces. |
| 7 | Hearing Augmentation | Inadequate hearing augmentation equipment | Inability of individuals with hearing impairments to hear match commentaries, announcements and other auditory signals | Damaged or outdated equipment, insufficient number of devices; Absence of devices | 8 | 7 | 2 | 112 | Radio or audio induction equipment should be deployed to relay commentaries run by professional |

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|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | commentators to any person equipped with a necessary earpiece or receiver. |
| 8 | Emergency Evacuation – Sources of Guidance | Absence of accessible maps and appropriate signs | Deters usage; Risk of accidents; Reduction of user safety and autonomy | No Legislation at time of construction | 8 | 8 | 5 | 320 | Provision of accessible maps and exit signs for evacuation and escape |
| | | Absence of staff and stewards | Lack of support and guidance during emergencies | | 8 | 6 | 4 | 192 | Recruitment of appropriate staff |

**Table 6 Fmea Of Accessibility Problems Detected In The Stadiums (Contd.)**

| SN | Parameter | Potential Failure Mode | Potential Effect(s) of Failures | Potential Failure Mechanisms | Indexes | | | | Recommended Actions |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | S | O | D | RPN | |
| 9 | Vertical Escape – Stairs, Ramps, Handrails and Signage (Figs. 15 – 16) | Absence of accessible maps; Absence of signs: Steps and escape routes not signalized. | Risk of accidents; Reduction of user safety and autonomy; Deterred usage | Lack of experience in similar projects; No Legislation at times of construction; Absence of a good practices' manual | 7 | 8 | 5 | 280 | Provision of accessible maps and exit signs for evacuation and escape |
| | | Handrails absent or present on only one side of ramps or stairs | Risk of accidents; Reduction of user safety and autonomy; Deterred usage | | 7 | 6 | 2 | 84 | Staircases and ramps must be provided with a continuous handrail on each side |
| | | High risers and high slope ramps | Risk of accidents; Reduction of user safety and autonomy | | 7 | 5 | 2 | 60 | Height of risers and slope of ramps should meet the requirements of BS 8300. |
| 10 | Alarm Systems | Alarm systems are either absent, present in inadequate numbers or poorly maintained | Increased risk of equipment failure or malfunction during emergencies | Lack of regular maintenance; inadequate staffing for maintenance and repairs | 7 | 4 | 6 | 168 | Establishing regular inspection and maintenance schedules and adequate staffing for maintenance and repairs |
| | | Alarm systems do not cover all areas of some stadiums, leaving some PWDs unaware of emergencies | Failure to alert all individuals in the stadium of an emergency, puts them at risk | Inadequate placement of alarms, barriers blocking access to alarms | 9 | 5 | 6 | 270 | Warning systems must include an evacuation signal, announcements over the public address systems and visual |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | instructions on electronic scoreboards |
| 11 | Staff and Stewards | Insufficient number of staff and stewards | Inability of PWDs to receive necessary directions, assistance and support | Inadequate staffing, poor scheduling | 8 | 9 | 3 | 216 | Adequate staffing and scheduling to ensure the availability of staff and stewards |
| 12 | Directors' Boxes, Executive Boxes and Hospitality Suites | Steps not signalized; Escape routes not signalized | Reduction of autonomy; Risk of accidents | The Project was not standardized; Lack of experience in similar projects; The project was not revised by expert professionals; No Legislation at the time of design and construction | 6 | 6 | 2 | 72 | Accessibility and positioning of restrooms, arrangements for spectating, catering, car parking and access routes must be factored into the provision of Directors' and Executive boxes and Hospitality suites. The facilities at TSS and STSS should be completed and furnished. |
| 13 | Toilets for Ambulant Disabled Spectators (Figs, 17 – 20) | Inadequate number of facilities; poorly maintained; or inappropriately located | Risk of accidents Reduction of comfort | Lack of experience in similar projects; The project was not revised by expert professionals; No Legislation at the time of design and construction | 7 | 9 | 3 | 189 | Retrofitting to provide sufficient accessible space inside restrooms, with all fixtures and fittings being within easy reach; One accessible WC per 15 wheelchair spectators must be provided and should be as close as possible to the disabled seating area. |
| | | Absence of signs; Steps not signalized | Reduction of autonomy | The project was not revised by expert professionals; No Legislation at the time of design and construction | 7 | 6 | 2 | 84 | In seating areas, tactile signs must be used in restrooms to assist blind and partially sighted spectators |
| | | Poor design and positioning of appliances | Reduction of autonomy | The project was not standardized | 3 | 3 | 3 | 27 | Toilet seats, bidets, shower seats and bath-tub seats are required to be |
| | | | | | 5 | 4 | 4 | 80 | |

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|---|---|---|---|---|---|---|---|---|---|
| | | Faucets with inappropriate activators; Flush valve requires more strength than recommended to be activated | Deters usage; Reduction of autonomy | | | | | | mounted at the same height of the wheelchair seat, i.e. between 0.45m and 0.50 m above floor level; |
| | | Washrooms without grab rails or with incorrectly positioned grab rails | Deters usage; Reduction of user safety and autonomy | No Legislation at times of construction; Absence of a good practice manual; Lack of experience in similar projects | 3 | 5 | 2 | 30 | Grab bars are manufactured in various dimensions and shapes. They can either be wall-mounted or floor-mounted. Retractable bars are also available. |

Source: Authors Construct (2023) Adopted from Machado & de Oliveira 2021


*Figure. 5 Signage for disabled access route (ASS)*

*Figure. 6 First Aid Centre (ASS)*


*Figure. 7 Signage directing spectators to seats. (ASS*

*Figure. 8 A symbol indicating the presence of stairs*

*at the changing room (KSS)*

*Figure. 9 Electronic Score Board at STSS*

*Figure. 10 Area reserved for PWDs in front of the yellow seats (ASS)*

*Fig. 11 Reserved Space for the disabled (ASS) Users (SSS)*

*Fig.12 Seating Area for Wheelchair*

*Figure. 13 Lift Entrance with standard width for directional wheelchair users at KSS*

*Figure. 14 Accessible lifts area with signage at TSS*

*Figure. 15 Ramped access to Stadium entrance (ASS)*

*Figure. 16 A wheelchair user accessing a ramp (TSS)*

*Figure. 17 WC for PWDs with grab rails (SSS)*

*Figure. 18 WC for PWDs with no grab rails (KSS)*

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*Figure. 19 Standard height wash hand basin handle for PWDs at KSS*

*Figure. 20 Standard height door for PWDs (KSS)*

## 5. CONCLUSION AND RECOMMENDATIONS

A systematic analysis has been conducted to achieve the aim of the study. This study is one of the first on the accessibility of recreational facilities (stadiums) in Ghana and a unique characteristic of the study was that the four stadiums studied were constructed over a wide epoch of time where the existing ones were refurbished and additional new ones were built before the passage of Act 715. Furthermore, FMEA which is an emerging method for the analysis in this area of research was employed to study the deficiencies in the design, construction and management of these stadiums as far as accessibility issues are concerned. The results indicate that although the four stadiums were largely inaccessible to disabled persons, the newly constructed stadiums were slightly more accessible to PWDs. Several deficiencies that could be classified as physical, architectural, technological, legislative, and maintenance barriers were unearthed. Some remedial works and adjustments must be made in the stadiums if the goals set by the Government of Ghana and the UN through the enactment of Act 715 and SDG goal No. 11 respectively are to be achieved. SDG 11 seeks to make cities and human settlements inclusive, safe resilient and sustainable. The disability-related target of this SDG is to create accessible infrastructure that is affordable. From the collected and analysed data, the following recommendations are made to improve accessibility to the stadiums for PWDs.

- Physical barriers such as uneven surfaces and open drains at car parks, absence of accessible entrances, high risers on stairs, etc. will require retrofitting for their removal.
- Architectural barriers: Some Architectural and Engineering Consultants lack expertise in Universal design. These consultants need retraining through Continuous Professional

Training by their professional bodies to gain insight into new trends in accessible designs. The need for periodic meetings and feedback on the success or failure of the project's implementation in promoting the accessibility of the facilities should be emphasized. Consistent reporting on defects and successes has the potential to lessen the likelihood of future problems in such facilities. Another suggested change was the formation of a group to examine projects, with a primary focus on removing any unsuitable component that would impede disabled people's ability to use the stadiums appropriately. When applied during the design phase, this filter can prevent the need for subsequent adjustments, which increases construction costs and duration. Furthermore, it was clear that, in order to address the demands of persons with disabilities, it was essential to provide technical training to all individuals involved in the projects from inception to completion. All treatment solutions, when integrated, can ensure the improvement desired by both the working team and stadium users.

- Technological Barriers: Management of the stadiums should make use of ICT to provide electronic and similar devices for spectators who need hearing augmentation, commentary at their seated areas, alarm systems for warning during evacuations, additional television or scoreboard screens to provide information to the hearing-impaired persons, etc.
- Legislative Barriers: Ghana has the required legislation in Act 715 of 2006. What is needed is enforcement by the various stakeholders. Disability Groups should also be consulted for input during the design and construction of such facilities and future designs should be well-vetted against vigorous disability standards before construction.
- Maintenance Barriers: Some facilities such as Lifts and Toilets in the stadiums were often dysfunctional and out of use and some car parks had potholes. The provision of Accessibility standards and Maintenance manuals to the management of the stadiums under the National Sports Council coupled with regular maintenance will ameliorate the problem and prevent the total breakdown of facilities.
- The current study was on Pre-Act stadiums and so future studies should examine whether the Act had the desired effect on the design and construction of stadiums in the country after the introduction of the Act. Studies should also be conducted to solicit the perception of stadium users like spectators and sportsmen who patronise the stadiums on their accessibility to PWDs.
- Further studies should be carried out on Post-Act 517 Stadiums in the country to see whether the Act had had any effect on the accessibility to the stadiums. Furthermore, the

views of other users of the stadiums such as sportsmen and spectators should be factored into future studies.

New stadium projects should incorporate these recommendations to ensure that fully accessible facilities are included in the Client's brief and through each design, statutory approvals and construction stage.

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