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**GREEN**

## **IN PUBLIC HEALTH FACILITIES CONFERENCE REPORT**

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## 1. INTRODUCTION

South Africa is showing signs of proving that we are capable to build infrastructural public health facilities that are sustainable, energy efficient and environmentally friendly as it can be seen from the completed projects.

I was introduced to the world of engineering in public health facilities few years ago and never imagined that sustainability and green technologies design could be my greatest interest to ensure that our communities are served in an environment that is engineered to be environmentally friendly and energy efficient.

In 2011, I organized a workshop for inspectors, engineers and architects from Western Cape Department of Public Works (WCTPW): Health Facilities Directorate and Western Cape Government Health Department facilitated by Richard Palmer who was my sustainability mentor at that time. The purpose behind was to hear from the expert himself as a collective government technical team and use the information to better ourselves so that we can deliver environmentally friendly service delivery.

In August 2013 , I organized the first “Green Building Design for Health Facilities Conference” in which the private sector was invited to participate as well. I applied for sponsorship to various companies as we all know that the government needs to do as much as it can to save funding for service delivery and fortunately Samsung sponsored the event.

The event focused on the available methods between the public and private sector to provide energy methods which could assist Eskom’s request to save 10% of electricity usage as they increased annual electricity costs by +8% annually due to crisis they are facing. This implies that all public health facilities will also pay additional electricity bill hence alternative engineering and architectural methods should be implemented. The event was held successfully and can be accessed on the following link:

[http://www.youtube.com/watch?v=vxS3COyl\\_UY&feature=em-uploademail](http://www.youtube.com/watch?v=vxS3COyl_UY&feature=em-uploademail).

In 2014 October, I organized another conference sponsored by Trane Company and inspired by the Western Cape Government’s campaign to go 110% Green. The Green Building Design for Health Facilities Conference continued as “Going Green in Public Health Facilities Conference” and the theme was “Technical Strategies Towards Greening Public Health Facilities”.

The purpose of the conference was to equip attendees with awareness and knowledge to help carry forward the vision to improve our public health facilities, using successful and sustainable green principles methods. The Conference was rated as points earned Continuous Professional Development (CPD) by South African Institute of Architects (SAIA), South African Federation of Hospital Engineers (SAFHE) and the Consulting Engineers of South Africa (CESA).

The Western Cape Government has taken steps to ensure that sustainability and environmental friendly is at the core decision making during strategic planning for better service delivery. Hence during public health facility planning and design approaches, green principles are considered important. The conference was more focused on technical methods which have been proven to work locally and also to carry the previously held conference to a higher level and find the way forward jointly sharing knowledge between private and public sector.

I invited the Gauteng Department of Infrastructure Development to share their approach to ensure that public health facilities are sustainable and energy efficient. The conference was a success and can be viewed on the following link:

<https://www.youtube.com/watch?v=O1mEMVNqXGU> or <http://concrete.tv/video/item/2406-going-green-in-public-health-facilities>

## 2. CONFERENCE PROGRAMME

The conference programme was planned carefully to ensure that presentations are relevant to the attendees professional work in the engineering, building, architectural and quantity surveys disciplines. The programme planning key aspects were presented in relation to the 110% Green initiative in the Western Cape and the public health facilities engineering and architectural approaches.

The programme structure was discussed by highly qualified experts and experienced individuals and it is great to report that the presentations met the attendees expectations. Trane Company sent their experienced engineer from Dubai. The presenter kept in mind South Africa's local engineering design approaches and the presentation was exceptionally well received by the delegates. The following is a table structure of the topics presented.

COMPANY/ ORGANIZATION	COMPANY/ORGANIZATION	TOPIC
Trane	Wael Deeb	Energy Efficiency Systems in Healthcare Facilities
CSIR/SAFHE	Tobias van Reenen	Infection & Air Quality Control
ACHASM	Peter Dobson	Health & Safety in Healthcare Facilities Construction
Western Cape Government	Andrew Cunninghame	Energy Consumption in Public Healthcare Facilities
Aurecon	Martin Smith	Sustainable Healthcare Facility Design
Western Cape Government	Dr Laura Angeletti du-Toit	Infrastructure & Engineering: Progress and Challenges
CABMED	Johan Coetzee	Medical Gases Design/Installations/Standards
SABS	Pieter Haasbroek	Energy Efficiency ISO-50001
SERBCO	Dewald Burzynski	Energy Efficiency & Plastic Piping
ESKOM	Wayne Fortune	Energy Savings on Commercial Markets
Gauteng Government	Oliver Chimusoro & Hector Iglesias	Infrastructure & Engineering: Green Technologies & Health Facilities
Ecospecifier	Lizette Swanevelder	Green Building Materials Ratings

## 3. CONFERENCE DISCUSSIONS & RECOMMENDATIONS

The last session of the conference was comprised of panel of experts who presented and answered questions from delegates. The following are some of the points which were raised and clarified:

- Further detailed analysis of the whole green design approaches needs to be revised in order to ensure that all issues are addressed.
- SANS needs to be amended to be more relevant to healthcare facilities.
- Designing efficient systems require a good maintenance throughout the life cycle of the installed equipment.

- Energy and water savings needs to be addressed from the onset when design starts and not treated as add-on's.
- Natural ventilation is to be used in most areas in the healthcare facilities except in the sensitive areas such as theatres and TB health facilities.

#### 4. DESIGN QUESTIONNAIRES FEEDBACK

The delegates in attendance were tasked to give their feedback at the end of the conference. After reading the entire submitted Design Questionnaire (DQ), 90% of them found the conference to be well structured, very informative and of a high standard and the other 10% found it to be informative and good. Delegates found the conference to be better than the previous one held in 2013.

The following are some of the points highlighted from the DQ's:

- Green Building technologies have been around for years, therefore, South Africa is in a position to implement sustainable solutions through basic approaches such as natural ventilation.
- Good architectural design using green building principles will reduce heat loads and less energy usage from HVAC systems. This requires involvement of HVAC engineers in the early stages of the building design. Multi-layering of risk profiles in healthcare design and in maintenance requires all design professionals to work together from concept stage. Thus designs could be within risk envelope, and maintenance contacts as shown on plant room name plates.
- Although we have National Building Regulations (NBS) Standards, each new design should be done individually to best suit the building requirements hence best engineering practices should apply.
- Presentations context are very informative as they addressed specific aspects we are directly facing and highlighted detailed design strategies which could be implemented for healthcare facilities.
- It is important to ensure that maintenance staffs are well trained for optimal equipment performance, in case of filter replacement, maintenance plan should be adhered to.
- It is important to consider locally manufactured product as it has been shown that more deep rooted problems lies with the installation or maintenance of the imported products. This however, impacts all aspects of the project.
- Health Departmental presentations showed what is achieved and what is possible, this initiatives shows steps to improve public health facilities to be greener.
- Good passive design and material selection should result in cost effective and technically energy efficient healthcare facility.
- Considerable data was presented on air flow rates. Discussions confirmed that this is an example where South Africa should follow its own expertise. Contention was between outdoor air vs treated recirculated indoor air.

- Fee scale for consulting services was counter-productive as it did not incentivise consultants to design energy-optimised systems. Considerably more interaction between designers and suppliers would reduce cost and complexity of health care facilities.
- It was stated that thermal and fire computational flow dynamics were increasingly becoming rational design tools. This resulted in a debate about “square” versus “horizontal” ward layouts. This debate included financial projections (LCA) for such layouts. The dominant factor was that each individual health care facility presented its own design limitations where building shape and geographical orientation are dominant in energy conservation.
- Regarding national technical specifications for equipment used in health care environment, it was mentioned that some 44 solar water heaters were SABS mark holders, whilst the heat pump draft was ‘out of comment at present. An appeal was made for conference delegates to make themselves available for the SABS’s Technical Committee Energy Performance of buildings.
- Overriding compliance should be obtained for pressure vessels i.e adjusting operating set points to conserve energy would need briefing of maintenance staff with oversight of professional engineer.
- Details were provided regarding energy-efficient aircon systems. It was stated that up to 50% of energy could be saved on operation cut-offs, as shown by the list of hospital performance handed out at the conference.
- Control and verification experts services are available which can quantify savings. This could motivate budget provision for energy-savings initiatives.
- Similarly, it is possible to obtain 3<sup>rd</sup> party confirmation of Life Circle Assessment (LCA) used to include ranking of actual environmental impact of energy saving strategies and materials. These rankings could be provided in a report – again usable in budget provisions.

## 5. THE NEXT STEP

As indicated at the end of the conference, there will be another conference to be held in 2015, dates to be finalized. The conference broader structural flow is as follows:

- The Western Cape Government (WCG) Health Department and Public Works: Health directorate jointly with the Gauteng Government (GG) will be presenting the progress towards greening public health facilities, details to follow.
- The other seven remaining provinces will be invited to attend the conference and discuss progress and challenges they are facing in terms of engineering and architectural approaches towards greening public health facilities.
- Singapore health ministry will be presenting on their governmental strategies to ensure that their public health facilities are more energy efficient and advise us on the way forward to deliver more environmentally friendly healthcare facilities. This will be an opportunity for the provincial health ministries to connect with the Singapore health ministry to explore ideas and improve our green design approaches towards greening our public health facilities.

The Singapore public health ministry will be advising us on the how's strategies needed to be implemented to upscale the current green target in accordance to our local standards and specifications. Besides the attendance of the Singapore public health ministry representatives in the 2015 conference, the following health ministry engineers and architects will also be invited:

- SADEC countries
- BRICS countries
- Dubai Healthcare City

The 2015 conference will be of a higher technical level due to the themes to be discussed and presented and due to attendance of international experts. As South Africa is one of the emerging countries, this position us to successfully lead by example in the African continent through our design approaches while also sharing our knowledge and learning from others.

The SADEC countries governmental engineers and architects specializing in public health facilities maintenance and projects will be invited. In order to show the other African countries our progress and lead by example in the BRICS countries, there will be awards within Public Health Facilities in search of the best constructed South African health facilities within the technical context for best practices on architectural and engineering applications. The following defines the criteria and more details will follow early 2015.

1. A South African private hospital engineering team that plays a technical advisory role to its chosen public hospital engineering team for the facility to be more energy efficient, environmentally friendly using proposed locally available energy efficient methods. Evidence must be presented through a report.
2. A South African Private or Public Health Facility Management team for implementing best & greener human behavior practices through the staff members to save electricity without interrupting electricity demand to the hospital, evidence must be presented.
3. A Provincial Health Department Infrastructure Delivery team for planning and executing using South African National Public Works Green Building Policies, SABS, Green Building Principles Strategies, innovative greener and environmentally friendly methods using the best locally available methods to improve the quality of patient's life through engineering and architectural practices. This requires evidence of initiatives implemented within the organization and must be indicated in the report.
4. A Provincial Public Works Department Health Facilities Delivery team for delivering the best engineering and architectural practices, proven track record for maintaining constructed public health facilities through sustainable methods is also required.
5. Best designed Community Day Centre-CDC.
6. Best designed Community Health Centre-CHC.
7. Best designed Emergency Centre.
8. Best designed Public Hospital.

## 9. Best designed Private Hospital.

The healthcare facility must be able to prove to be well engineered hence technically best in South African climate conditions in the following green principles requirements:

- Energy efficiency (2012-2014) energy building performance record is required
- Water Efficiency
- Environmentally Friendly
- Sustainability
- Infection & Air Quality Control
- Climate Change
- Waste
- Transportation
- Community
- Green Town Planning

The above must be supported by the best engineering and architectural practices applied during the project and the following is required:

- Evidence of professional code of conduct in accordance to local professional bodies such as SAIA, ECSA, CESA, SACPCMP, etc.
- Architectural and engineering best locally available practices.
- The South African local standards; SABS, National Building Regulation (NBR), latest specifications applied, etc.
- All the installed green technologies must have been proven to work and evidence of innovation is required.

Each public healthcare facilities size, will have three top finalist before the conference and delegates will be given opportunity to choose the best CHC, CDC, EMC and Hospital in South Africa. The chosen facilities will get an award which will be signed by the National minister, premier of that particular province and the Head of Department of Public Works. More details to follow early in 2015 January.

## 6. CORPORATE SUPPORT

The following organizations and companies have given their support to this conference as it adds value to greening our public health facilities.



