Quantifying and Improving Environmental and Human Sustainability in Remote-Region Health Clinics, Australia

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Dr Steve Burroughs Foundation Limited provides support to improve the social, economic and wellbeing of Australian indigenous people whilst acknowledging their culture and spiritual connection to the land.
Australia overlayed onto the North American Continents of USA, Canada and Mexico
Remote Area of Australia in Yellow

Only 2% of Australia’s population lives in the yellow area.
Wanarn, Western Australia – Gibson Desert
Wanarn Logistics Transporting Goods and Tradesmen to Site
Climatic Zones – Existing Site & Future Sites for Monitoring 2017

- Future Sites 2017 for Monitoring: March, June and November
- Monsoonal
- Hot Dry/Drought
- Hot Winter Drought
- Desert Wanarn

Bureau of Meteorology

Organisers:

- Construction Industry Council
- HKGBC
- SBE Series
- CIB
- iisBE

International Co-owners:
Driving in the Northern Territory
Heading West Toward the Gibson Desert
Wild Camels and other Animals Causing Problems in the Desert
Arriving in the community of Wanarn, Western Australia
866 km (21 Hr West of Alice Springs
Indigenous Community of Wanarn population 200
Award Winning Wanarn Clinic
Budget Aus $1,857,000

Construction Cost:
Aus $9621 M²
Euro 6836 M²
USA $ 7418 M²
HK$ 57,275 M²
Inside Wanarn Clinic
Front Entrance/Treatment Room
Data Monitoring Locations

Monitoring the clinic to understand the performance of the building and the potential effects of the design decisions on the health and well-being of the eventual occupants.
Building Management Standards

- Profile systems
  - Temperature
  - Humidity
  - Volatile Organic Compounds (IAQ)
  - Energy Consumed

- Outcomes
  - Generate data that will allow sustainability gaps in buildings to be identified so that cost-effective solutions can be developed with particular reference to remote communities and geographical locations with similar characteristics.

- The generation of data that will enable the identification of IEQ levels that guide the setting of performance standards for both energy use and IEQ for existing and new builds.

- The study is expected to provide workable and reliable data that will inform and influence architectural practice and other disciplines with the education and knowledge required towards the planning and design of high performing buildings in remote regions under varying climatic conditions.
Indoor Air Quality Wanarn Clinic

VOC Warnings

- <1.0 ppm = Good, or "Green"
- 1.0 to <10 ppm = Marginal, or "Yellow"
- 10 ppm and higher = Poor, or "Red"

History for WanarnClinic

Range: 30d 14h 43min 44s
Data points: 908
Min: 63.8 ppb
Max: 985.7 ppb
Average: 127.07 ppb
Std.dev.: 98.184
Area: 93244.8 ppbh
Visible Area: 93244.8 ppbh
Example Data Being collected

Temperatures Reach 70°C
Thermal Imaging of the Clinic walls
Take in the Treatment Room on the West side of Clinic

External Wall Temperature

Corridor Wall Temperature

Internal Wall Temperature
Machine 2 Machine Transmission

Each Data Logger is monitoring 3 parameters: Temp/Hum/IAQ.

View, run and control the real time monitoring and data logging.

Wanarn Clinic Base Station

View real time monitoring

Dr Steve & PhD Student Monitoring Data

Department of Health & Outside Observers
Numbulwar Health Clinic
Northern Territory
New Network Developed M2M Virtual Private Network
Dash Board Display

Monitoring of the air con units & other units 1000’s K away
In remote Australia we don’t have BMS (building management systems)
We don’t have HVAC systems
We use split air con units running at maximum output 24x7
Thank you