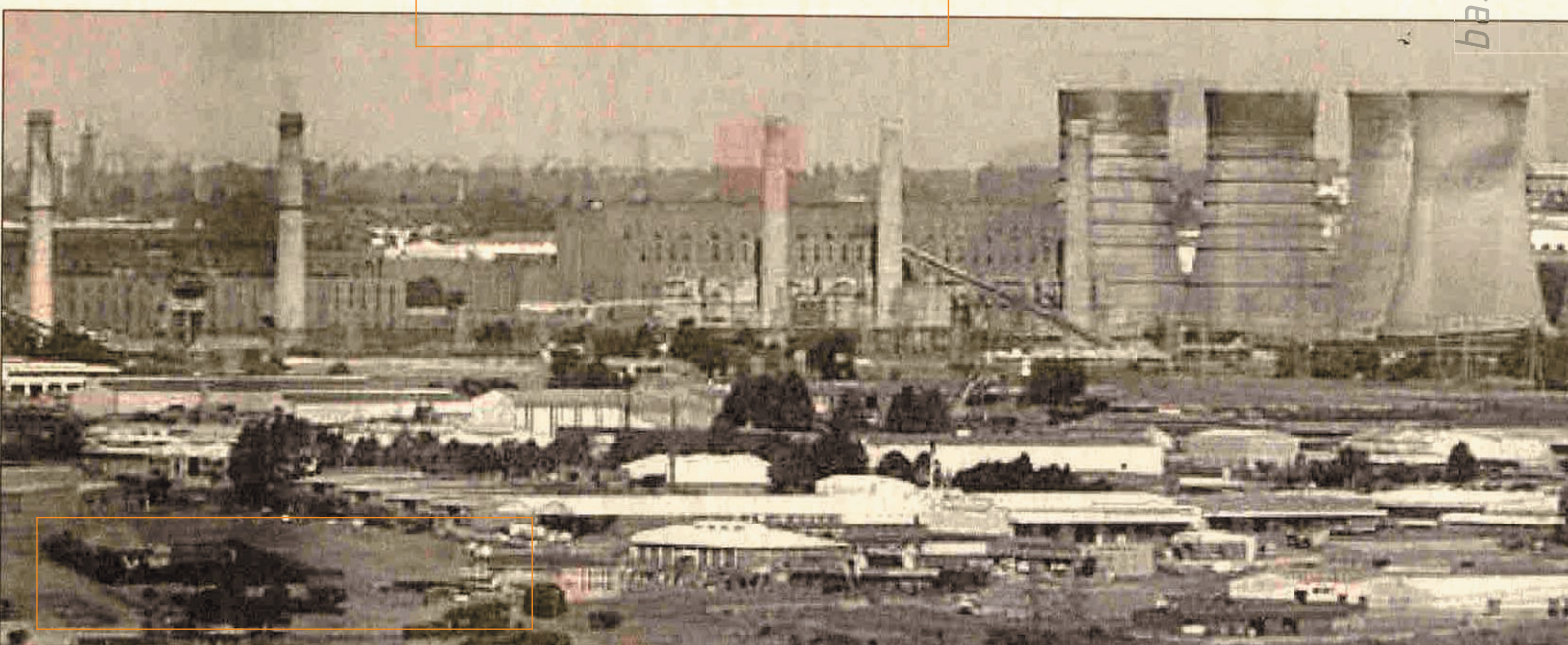


>>>3. Baseline Study\_

baseline study  
baseline study  
baseline study



## Baseline Study\_\_

*This chapter seeks to outline the aspects that need to be addressed as to ensure a result that is successful in responding to its economic, environmental and social milieu in with focus on sustainability issues. The format derives from the RIBA Environmental Manifesto and the Sustainable Building Assessment Tool [Gibbert, 2002, CSIR]. Although these factors are discussed as an individual chapter, it should be noted that most of these decisions were already incorporated in the initial concept phase and evolved from there. Several factors mentioned in this study often contradict the aspirations of others, which had key influences on the design process. For a full understanding of the intentions and eventual resolutions, reference should be made to the technical investigation and drawings.*

## >>3.1 SOCIAL RESPONSE\_\_

*In the pursuit of sustainable development this intervention into the built environment not only improves the quality of life but also uses all available means to eliminate waste, curb pollution and conserve energy and natural resources. The proposal aims to achieve an appropriate density for its location. The potential for a mixed development on the site has been realized. It will make a significant contribution to the economic and social well-being of the community. It is proposed that the design process will, from the start, be a collaborative enterprise involving all the design professions. The proposed development will contain areas of public access and create new pedestrian routes. The development will be in harmony with the wider built environment.*



fig. 3.2\_\_

>3.1.1 Occupant comfort



*Thermal comfort\_ From inception stage great consideration was given to passive climatic systems in the building. The high comfort level required, where large parts of the building have programmes such as auditoria and conference facilities, proved to be unattainable. A HVAC system will be introduced to accomplish the required thermal comfort levels during peak summer and winter conditions. This 'mixed mode' system will result in design conflicts mainly because the HVAC system needs to operate in closed and insulated conditions vs. the maximum ventilation required for the proposed stack system to function. Required thermal massing and insulation should not oppose the proposed vital inside/outside connections and views in some key areas of the building. Noise control and acoustic principles will also be influenced.*

*Heat must be able to be flushed out during night to start the mornings at a lower temperature and thereby maintaining favorable levels for longer. The dust associated with passive ventilation must be minimized, especially in the exhibition rooms.*

*Areas such as the basement, atrium and residential components will rely simply on passive climatic systems.*

*Lighting\_ The project aspires to have maximum natural light penetration without the associated heat gain. This will also reduce heat gain induced by artificial lighting. Light penetration into the conference rooms and auditoria must be diffused to minimize glare and must be controllable as not to inhibit projections of presentations. Basement lighting poses a grand problem and will interfere with the proposed function of the square. Nighttime lighting must far exceed mere safety considerations and aspire to promote evening activities and 24 hour use. Unlike Gestapo safety orientated lights, illumination will be bounced off surfaces to eliminate glare and ensure a comfortable and approachable building. Key elements of the project such as the Jacaranda tree, square and entrance will be lit as focus points. Projections on selected facades are proposed. These will be clarified in the design essay.*

Fig. 3.3

baseline study  
baseline study

*Views\_ From onset the inside/outside connection was branded as important. Views to promote surveillance and to reassure users forms part of this. Displaying the activities inside the building through translucent and semi-translucent facades can prohibit the formation of 'dead' walls and displays activity that creates interest from the participators of the square. A view through the building on the atrium axis is encouraged. This is however through east and west facades, which needs extensive shading or mass.*

*Views from the residential units should be unobstructed as this is a significant attraction of city living.*

*Units should be so positioned and recessed that the residents enjoy privacy at their request. They must be able to observe without relinquishing their privacy.*

*Noise\_ Considering that the site is in a city context, and in view of the programme, noise control is acknowledged as a central concern. First, the positioning of the scheme within the framework has minimized the noise generators. It has been sited adjacent to a quieter square that will function as a sensory meditation like green space rather than an activity and retail filled square that relies on a big turnover of noisily people and activities to be deemed successful. Further it has been positioned away from the busy Schoeman Street and rather borders the quieter Greef Street and small Voor Street. Vehicle noise will be the main source of disturbance. An essential characteristic of such sources is that they are not generally under the control of those affected by their noise. It is therefore essential to assess the likely level of external noise to which a proposed building is to be subjected. If this is done early enough in the design*



fig. 3.4\_

process, the scheme can be economically produced to alleviate the effects of the noise. [Adler, D. 1999.] As long as it is relatively constant and immediate noise is eliminated, distant road and city noise can actually work to your advantage, as it now acts as ambient noise. As noise is defined as the difference between the measured sound and the ambient noise, an increase in ambient noise will reduce the impact of the blast of sound considered as noise. Measures to control noise may pose contradictory to proposed views and ventilation proposals. These aspects need to evolve together towards a solution. Conference rooms and auditoria need to be treated for acoustical performance. This will dictate elevation, form and materials used. The noise generated within these spaces must be contained. Noise will also be a problem when the passive ventilation system is in use. The air can be passed through attenuators, which will change the sound waves into heat. This will however restrict the airflow, which will make the stack ventilation futile. This may work in the exhibition and office areas where more noise can be tolerated and attenuators reduced.

*Indoor Outdoor connection\_* Due to the climatic and acoustic control that

*needs to be exercised in conference rooms, the relation to the exterior has been traditionally depressed. This project searches to conquer these limitations. Connections will be made through views, particularly where green spaces can be enjoyed. A physical connection is anticipated with the Jacaranda mimosifolia and outside spaces will be accessible through openable screens and glass panels. Vertical planters, acting as screens, as well as extensive indoor and rooftop planting aims to integrate outside spaces. Residents will be able to participate in the cityscape by way of roof gardens and accessible rooftops.*

### *>3.1.2 Inclusive Environments\_*

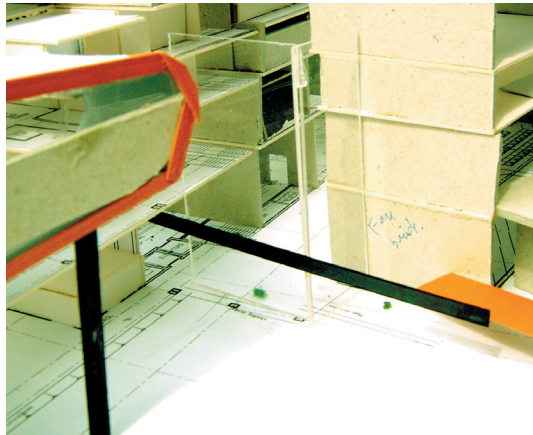
*Transport\_* The center is near a taxi and bus drop-off proposed in the framework. It entertains a parking basement that forms part of the super basement anticipated in the framework, which provides for vehicular access and the physically challenged. The center could have a transport service from airports, Gautrain stations and various hotels. The much-awaited helipad proved to be extravagant.

*Entrance and circulation\_ The main entrance has been located to make it accessible from the square. The center is also directly accessible from the parking basement. A compromise involving the number of entrances and the effort given to security should be attained. The centre promotes usage by physically challenged people. The main vertical circulation is situated next to the entrance. Vertical circulation elements are linked by bridges, which become a visual element. Great care should be taken to keep the residential entrances and circulation separate. Residential circulation must enable the moving of possessions, ensure privacy and escape during fire. Residents should have street as well as basement entrances with allocated parking bays.*

*Ablutions & kitchen\_ Enough abluion should be provided for users, visitors and the physically challenged, keeping in mind that peak usage times will occur as a result of the programme. The positioning of these should be considered as not to impede future progammes of the building. They must also be arranged to minimize the number of stacks required for services. This may prove difficult in the residential units where layout possibilities are minimized. Residential abluion together with kitchens should form a service block. A large kitchen located in the west of the center will serve a restaurant and catering for conference facilities and other events. This will also require gas supply, storage along with service and delivery access. A second smaller kitchen will form part of a smaller restaurant located on the square.*

### *>3.1.3 Participation and control\_*

*Environmental control\_ Most conference spaces will be provided with sliding screens or glass panels that which can open up entirely to the outside, allowing variation with outside connections and control over passive ventilation. A ventilation stack, doubling as a trombe wall must be operable to allow for passive ventilation*



*fig. 3.5\_*

or heat dissipation in chilly weather. The HVAC system must accommodate individual control as a person's climatic comfort spectrum is extended if there can be participated in climate control. Future use may involve multiple tenants, which must be able to be billed separately for energy usage. Occupants must have control over light entering spaces to accommodate visual presentations. Innovative technology in projectors may be of assistance in this regard.

User manual/training A computer operated Building Automated System (BAS) will make use of advanced technologies to ensure peak performance of the HVAC and lighting systems. A trained operator will be able to provide manual input when the system is dysfunctional. It must be possible to monitor and control the system from a remote location by use of the Internet, minimizing site visits. In conference facilities and auditoria, various options will be communicated on control panels concerning lighting, ventilation, and the acoustic result of opening operable screens. Personal of the centre must be trained to assist and advise on these operations.

Social spaces The external of the building will be designed to empower the sensory square with appropriate activity as to make it an exterior social space as envisaged in the framework. The atrium of the building together with the programme is sociable in nature. In the atrium there should be interplay of social spaces varying in levels of intimacy. Gathering rooms and foyers will buffer conference and auditorium facilities from the more public concourse. A collective rooftop green space for residents may be disregarded for private spaces due to the layout restrictions and exclusive nature of some units. The response to Greef Street as social space is limited in view of the lack of activity and movement anticipated here. This is designed to be easily rectified by the interplay of the restaurant and possible attachable activities facing the street when future movement patterns may change.

Health and safety The centre will form a integral part of the safety and security aims of the region with regards to 24 hour activity and 'eyes on the street'. The mixed-use nature of the building will extend its usage into the night and will, together with the residential accommodation, provide passive

fig. 3.6



surveillance. Entrances have been reduced to enhance control. Residents will be granted access through card sliding doors. This will also be the case concerning restricted and personal spaces. A system where the conference attendee is provided with a card that gives him access to pre loaded spaces proved to be excessive and conflicting to principles considered as key during concept stage. The center will enjoy security control at entrances during operating hours, which will be continued by the collective security patrol for the area at night. An alarm system will announce a breach of security and alert the authorities. The area will be well lit, keeping comfort and glare issues in mind. Closed circuit television surveillance is proposed in the framework. This venture has proved very successful in reducing all intensities of crime and misconduct.

Indoor air quality\_ The quality of the air will largely depend on the outside air quality. When the HVAC system is in use air will be passed through a filter to remove particles. Air quality in the exhibition space will pose a problem during passive ventilation. The use of a filter will restrict free air movement and render the stack inept. Capturing particles with water will be investigated. By treating the immediate outdoor air through extensive planting more favorable levels can be achieved. Planting can act as a buffer between openings and carbon monoxide gas produced by vehicles. The basement will have to be well ventilated to flush out CO fumes.

fig. 3.7

## Veiligheidskameras kom in middestad en Sunnyside

RAPPORT, 11 JULIE 2004

LOUIS OELOFSE  
Pretoria

Veiligheidskameras behoort voor einde vanjaar in Pretoria aangebring te word in 'n poging om misdaad in die stad bekamp.

Die Tshwane-metrorand het verlede maand 'n tender aan die maatskapy Cue-incident toegeken ná jare se struwelinge, wat 'n hofsake en politieke sekwente insluit.

Die Tshwane-metropolisie is tans besig om plekke in die Pretoriase metropool uit te wys waar toekringkameras aangebring gaan word.

Mnr. Mel Vosloo, woordvoerder van die metropolisie, se daar sal aanvanklik gefokus word op plekke wat as misdaad-brandpunte uitgewys is. Dit sluit sekere gebiede in die middestad en Sunnyside in.

“Ons gaan aanvanklik 76 kameras op strategiese plekke aanbring. Die kamera-netwerk sal dan jaarliks uitgebrei word sodat dit uiteindelik die hele Tshwane dek.”

Die installering van die kameras en die oprigting van 'n beheerkamer sal na verwagting in September begin en die kameras sal laat in November in gebruik geneem word.

Die installering van toekringkameras word beskou as een van die hoofredes vir die opletting in die Johannesburgse middestad en het misdaad in die stad drasties laat daal. Dit het ook die vervoering van misdadigers baie makliker gemaak. Soortgelyke projekte is reeds in Durban en in Kaapstad aan die gang.

In 2000 is 'n toetsprojek in Pretoria het misdaad in Sunnyside met 20% afgeneem ná die installering van enkele kameras.

Die projek is reeds in 1996 vir die eerste

keer deur die stadsraad van Pretoria oorweeg, maar die samestelling van munisipaliteite, bevoegde oorgerymdhede in die toekomsting van tenders en binnegegote tussen politieke partye het die inwerkstelling daarvan tot vanjaar vertraag.

Vosloo se daar was egter ook goeie dinge wat gevolg het uit die sloerdery. “Die tegnologie het die laaste jare aansienlik verbeter. Van die kameras wat ons nou wil aanbring, kan tot vier straatblokke dek.”

Daar word ook gekyk na tegnologie wat dit moontlik sal maak om die kameras gereeld te skuif sodat misdadigers nie altyd weet waar die kameras is nie.

Intussen het die Demokratiese Alliansie in die Tshwane-metrorand die afgelope week opnuut gewaarsku dat die raad hom weer kan vasloop teen hoftprosedures oor die tenderproses.



### >>3.2 ECONOMICAL RESPONSE\_\_

*The proposed development will make a significant addition to the amenity of the wider area and aims not to pose any threat to the amenity of its immediate neighbours.*

#### >3.2.1 Local Economy\_\_

*Local contractors\_\_ The use of a local contractor to ensure that the monetary turnover ends up in the Trevenna and western Sunnyside area is futile in a city context. Regional contractors will rather be appointed on the basis of their commitment to black economic empowerment and good corporate governance. Not traditionally famous for its steel mills and construction companies, the Trevenna area can rather generate local labour for construction. Labour intensive construction techniques that require minimal skill and quick training, will be proposed and elements in the building designed accordingly. Local artists will be empowered with assignments to design and manufacture elements in the project. The sensory square relies on temporary installations of land art and sensory installations that will provide many commissions to landscape architects*

*and artists in the future of the project. The atrium in the building will also gratify such installations. This venture will support the construction industry in its aim of promoting sustainable design and construction practices across the industry*

*Repairs and maintenance\_\_ Low maintenance materials are maximized to ensure that initial costs won't be multiplied in future. This will mainly compose of concrete and brickwork. Labour intensive techniques may result in a high maintenance factor and consequently a sense of balance should be strived for. In most cases low maintenance components will lead to greater outlay of capital costs. A sensible decision can be made once lifetime cost cycles of materials and elements are investigated over the buildings anticipated lifespan.*

*Disruption and downtime\_\_ A backup power system in the form of a generator will be switched on as soon as a power failure is experienced. A UPS system will allow unremitting operation of electronic equipment and will prevent any memory loss. Together with the generator, this system should be accessible for repairs and should be so positioned that it possible*

to hoist them out. Vertical access from the delivery yard is proposed, enabling a gantry to lift it out. All operable systems, including ventilation, will be superseded by manual operation.

*Adaptability and Flexibility*\_\_ The use and function of initial spaces are designed to be flexible for future adaptation. Services should form a core or strip where future programmes will be able to clip on. Multiple entrances must be possible in future. The adaptability of

the HVAC system has already been noted. It should be able to level the stepped floors of conference rooms and auditoria. The underlying basement may proscribe differently and consequently these should not be sited above it. Some elements will be deliberately designed as stubborn, following the position taken in the design discourse. Residential units must be expandable by means of attachable rooms. It may be possible that the residential component



fig. 3.8

function as a hotel in future.

*Internal partitions\_\_ Division of spaces will be by means of moveable, adaptable walls or heavy stage curtains with acoustic qualities. Acoustic Stackable panels that can be maneuvered to enlarge or divide gathering spaces should suit acoustic requirements*

*Vertical dimension\_\_ Vertical dimension of the whole project should be in line with the framework. Dimensions of inner volumes are elevated as a result of acoustic influence, sightlines and to trap hot air. Large assembly of people necessitates great vertical dimensions to ensure comfort. A proposed operable screening device restricts residential elevation.*

### *>3.2.2 Services\_\_*

#### *Ongoing Costs*

*Sharing and monitoring of costs\_\_ Partnerships between constituents of the development will have proportional obligations concerning upholding and running costs of public spaces, shared parking basements, security and surveillance. A body will monitor these*

*and other costs.*

### *>3.2.3 Capital costs\_\_*

*Use of existing\_\_ The only existing structure is the historic Oosteind school. This building will be re-used and will entertain a social programme as discussed in the context study. The remnants of a partially demolished house to the north are inadequate for use.*

*Plate efficiency\_\_ Throughout the proposed structures incorporated by the framework, buildings are required to be devoted to built to lines and height recommendations to achieve goals set on an urban scale. This ensures efficient densification and consequently plate efficiency.*

*Ratio of capital to ongoing cost\_\_ Lifetime cost analysis may persuade leniency towards greater initial capital outlay. This must be included in as a factor together with available funds projected against risk assessments. Operating and maintenance costs will be reduced through discussed material use.*

>>3.3 ENVIRONMENTAL RESPONSE  
This project is committed to the principle of sustainable development which raises the quality of life and serves the goal of achieving global equity in the distribution

of the Earth's resources whilst conserving its natural capital and achieving significant and sustained reductions in all forms of pollution especially emissions of greenhouse gases.

baseline study  
baseline study  
baseline study



fig. 3.9

### >3.3.1 Waste\_\_

The opportunity to recycle materials will be explored. A public recycling repository is intended next to the service and delivery zone. Sewerage will connect to the municipal connection. Municipal waste removal services will confiscate regular waste where it may be recycled on a larger scale. The unanticipated production of toxic waste will be disposed of in a safe and approved manner.

### >3.3.2 Site\_\_

*Brownfield site\_\_* The site is used for building rubble and served as a base for the construction of the DTI Campus. The landscape needs to be rehabilitated.

*Neighbouring buildings\_\_* All buildings have access to sunlight. Steps would be taken to ensure that the development will not adversely affect the micro-climate, for example by draughts or funneling of wind. Most of the bordering buildings are yet to be constructed and will be designed and evolve in concert with one another as well as with the framework.

*Ecosystems\_\_* Previously the site was part of the sports facilities of the Oost

*Eind School. Presently the site is covered by dirt roads and building rubble. The new development seeks to create a more tangible ecosystem, with considerable landscape input in the form of courtyards. The space around the existing Jacaranda tree will function as habitat for various fauna and flora. Gabion planters will accommodate habitation for small species.*

### >3.3.3 Materials and Components\_\_

*Embodied energy\_\_* Materials with low embodied energy would be preferred. Different materials necessitate different maintenance and assembly procedures, which may reverse its beneficial nature. It is therefore recommended that these decisions should be taken in light of lifetime energy input cycles of the materials. Major environmental pollution occurs during the manufacturing of cement. Stackable blocks, gabion walls, and rammed earth walls and floors require no or low amounts of cement. Although the building structure consists of concrete, these should be included. Water consumed during manufacturing processes and transport implications should also be considered.

*Construction processes\_\_ Excavation intended for the parking basement will exclude the area considered necessary for the well being of existing trees. Areas planned to function as courtyards and squares will not be excavated, to enable healthy vegetation and reduce runoff. All ozone-depleting chemicals in terms of manufacture and system operation, including HCFCs. Will be avoided.*



fig. 3.10\_\_

*Recycled/ reclaimed materials\_\_ Excavated rocks and building rubble will be used in gabion walls. Excavated soil and clays will contribute to rammed earth walls. Current building rubble contains large amounts of concrete and will be sent through an on site crusher to be used as aggregate for paving and nonstructural elements.*

### *>3.3.4 Water\_\_*

*Grey water\_\_ Grey water will be filtered and cleaned and then stored. A solar powered pump will circulate the water to be used for flushing toilets, washing and irrigation. The sewerage will form part of the municipal system.*

*Rainwater\_\_ Rainwater will be harvested, filtered and stored and then used for irrigation, evaporative cooling, circulation of the grey water and thermal massing.*

*Water use\_\_ Water efficient devices will be included and resourceful irrigation methods practiced. Water harvesting will minimize municipal water use. All new planting will be indigenous, minimizing water requirements. A full-grown Jacaranda will be kept however, as it has historical importance and maintain a sense of place.*

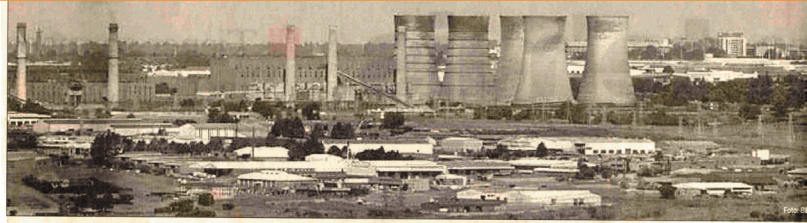


fig. 3.11\_

## Kragkrisis in SA

□ Soggens, saans die ergste □ Hou gevaar in vir myne

### >3.3.5 Energy\_

*Government should be encouraged to give practical support to the development of renewable energy systems, in particular to subsidize the widespread installation of*

*solar cells, as happens in other advanced economies*

*Location\_ The center is close to a transport node.*

*Ventilation system\_ A passive system will work on the basis of cross ventilation and suction induced by a chimney stack. A HVAC system will assist during peak climatic conditions.*

*Heating and cooling\_ Heat gain will be through northern sunlight and a closable chimney stack. Massing will radiate absorbed daytime heat at night.*

*Evaporative cooling will be investigated, but may draw on too much water. A HVAC system will assist during peak climatic conditions. A Building Automated System (BAS) will calculate the most economical source of air intake for the HVAC system.*

*Appliance and fittings\_ Low energy devices will be used. A building automated system will avoid unnecessary energy expenditure.*

*Renewable energy\_ Consideration will be given to the production of on-site electricity from renewable sources.*