7.2.2. Historical & Heritage Context

The area was originally used by Khoi pastoralists for cattle grazing before colonial occupation in 1652, with the confluence of the BLACK and LIESBEECK Rivers playing an important role in Khoi ceremonies.

In 1693 land along the LIESBEECK River was granted by the Dutch East Indian Company for the construction of a mill, subsequently to be known as MOLENVLIEKT. With the granting of land to the free burghers, the LIESBEECK Valley became the wheat producing area of the early Cape settlement, providing food to the castle and its citizenry. The first recorded land transfer was that of Valkenberg Farm in 1716. Molenvliet was sold in about 1725 and the mill on it (probably a water mill) replaced by the Oude Molen windmill, the first windmill in South Africa. It is believed that the mill was eventually destroyed by a vicious South-Easter. The farm however remained operational.

On the 4 July 1885, King Cetswayo, was captured by the British in Zululand and brought to the Cape. Because of conditions at the Castle he was kept as "state guest" at Oude Molen while awaiting transfer to England to meet Queen Victoria. While imprisoned at Oude Molen the British Princes Albert Victor and George Fredrick Ernest Albert visited him during their stay in Cape Town in 1881.
The premises were then used as military barracks until the 1920's, which saw the transfer and construction of the land for use as a coloured psychiatric hospital. It is referred to as such in the Cape Archives concerning the sale of Valkenberg to the City Council in 1943 (CAD3/CT 4/2/1/1/667).

7.2.3. Existing Context – Facilities and Activities

The following are a list of current on-site facilities and activities:

**ECONOMIC**: businesses include retailers of products, craft industries, artists, professionals and service providers such as restaurants, overnight accommodation and a riding school. These provide employment for approximately 300 people and constitute a potential commercial rates base to sustain the community.

**RESIDENTIAL**: majority of ± 70 tenants work and live on site.

**EDUCATIONAL**: includes the Gaia Waldorf School as well as various environmental educational programmes.

**INSTITUTIONAL**: includes the Robin Trust frail care and training centre as well as the high security mental health care facility Ward 20 of Valkenberg Hospital.
URBAN AGRICULTURE: small scale organic farming, composting and permaculture activities.

COMMUNITY SERVICES: A Youth Gardening Project and other community development support programmes for, in particular, young people from the historically disadvantaged neighbouring community of Maitland Garden Village.

ARTS & CULTURE: various small to medium enterprises in the arts and crafts industry as well as occasional cultural events.

RECREATIONAL: include a community hall, public swimming pool, riding school, etc.

ENVIRONMENTAL: conservation initiatives and organisations of various kinds optimizing the proximity to the Two Rivers Park area and associated wetlands which border the property.

LOCATION: strategically located at the confluence of the N1 and N2 feeding into central Cape Town and opposite the Pinelands railway station.
For a detailed list of all exiting structures on Oude Molen as of 21\textsuperscript{st} January 2007 see
\textit{Architectural Baseline Study: 0502\_A5\_5001 Existing Structures on Oude Molen}
7.3 Urban Design Brief

The urban design output is to provide a primary content and ordering principles for the spatial development framework, which informs the rezoning process. It constitutes the key elements towards a future development feasibility and further definition of spatial rights and responsibilities.

7.4. Urban Design Objectives

- The emphasis of the Urban Design proposal for the Oude Molen site redevelopment is to support the development of a sustainable integrated neighbourhood.

- The urban design is to provide great flexibility for a variety of uses while keeping the main focus on the human scale.

- A spatial equitable environment will be achieved through a balance between built form and open space under the parameter of responsible urban densification. The moderate response along the edges compliments the concentration of built form around a number of central urban cores.

- The legibility of public space is to become one of the core factors for the generation of positive identification for all inhabitants and users with their environment which is a precondition for the growth of a strong successful community.

- The urban mix is to focus on the provision of housing in line with Provincial requirements. The main portion of residential units is to cater for the lower income groups, thereby providing gap housing, rental accommodation, etc. The strategic location and size of the site lends itself to recognize the need to service this demand. (Refer to Annexure E for further detail.

- Oude Molen should provide a range of housing from lower ‘gap’ to middle income housing. Oude Molen is to become an example of a successfully integrated mixed income development allowing for economic advancement through systems such as specially designed innovative rent to buy schemes, etc.
- Oude Molen should become a living and learning example of a sustainably designed, mixed-use (residential, commercial, agricultural, educational, conservation) settlement with a socially integrated (richer, poorer, multi-cultural, and child-centred) community, setting the benchmark for other developments of 'integrated sustainable human settlements’ in South Africa.

It is important to note that the urban design principles contained in Annexure “E” are chosen to complement the objectives of this development as mentioned above. The spatial quality and physical form of the built environment depend profoundly on the understanding and implementation of these principles. This in turn results in the positive realization of Government policies in terms of our professional interpretation.

7.5. **Interpreting the Seven Senses**

As described in Section 5 above, the seven senses has played a significant role in arriving at formulating the “Medium Density, Mixed Use, Mixed Income” scenario as the preferred scenario. Here the overall responsibility of the urban design framework is to provide the most flexible and at the same time regulatory spatial system that supports and put into physical terms the seven senses. Each of the senses has had a direct and an embedded impact on the logic of the urban design system as with sustainability.

- **Sense of Justice**: equitable recognition of fundamental human needs; equitable access to opportunities and resources; rights based democratic and effective local governance.
  - The preferred scenario makes a number of key decisions in terms of distributing activities in such a manner that spatial and social justice is maximised.
  - The pedestrian system and movement patterns in the design both supports existing positive patterns, and encourages improved integration with the surrounds and within the various sub-precincts in the site as a whole. Justice is therefore interpreted spatially as the reduction of the extent of the impact of private realms which point toward exclusion, and viewing the site as having a catalytic potential on surrounding economically depressed areas such as Maitland Garden Village. Connecting the site therefore suggests a sense of equity in terms of access to public space.
  - Institutional buildings/places are provided with strategic infrastructure that is located closer to the sites of highest need. The site diagram locates the potential for a school to be located closer to the residential fabric on the north end of the site to encourage the
school, (in whatever form it may take) to respond directly to the local community and shorten walking distances for children.

- Opportunities for economic advance is also seen as an issue of justice, so dwellings located on conditions where the likelihood of exposure to passing foot and vehicular traffic with expendable income are to be seen as entrepreneurial opportunities with mixed used residential conditions.

- The relationship to the natural landscape and the preservation of the natural system is seen as one form of justice, and the layout pays particular respect to the landscape in terms of how the urban design articulates intentions for massing and type of activity, with a strategic bias towards an increased sense of public as one approaches the wetlands and associated river system.

- The preferred scenario makes a number of key proportioning decisions in terms of in such a manner that spatial and social justice is maximised within the context of other concerns.

- **Sense of Limits:** renewable and efficient energy; zero waste; connectivity via sustainable and public transport; efficient use of available land; sustainable building and building materials and methods; sustainable water usage; re-use of treated sewerage.

- Contained within the addendum are a number of indicators of specific architectural strategies that can be potentially applied to the site to ensure that that there three levels of action towards renewable and efficient energy. They are firstly a basic infrastructure level in terms of encouraging a closed system, second the level of architectural interventions both at a passive and active scale- which is till subject to development, and thirdly, an understanding of the type of site/social activities which contribute to the reduction of the footprint of the site such as encouraging urban agriculture, local education and work opportunities and maximising outputs from various processes into potential system inputs.

- The urban design layout encourages sustainable public transport by arguing for bicycle lanes within the site itself, consolidating the train station into potentially and transport interchange with an appropriate taxi rank. It goes further by setting out an appropriate density of dwelling unit, and suggests a re-examination of the parking requirement given the great ease of access to existing systems. The urban design is also generous in terms of providing sidewalk widths that can incorporate bus shelters etc.

- Efficient use of available land is interpreted in the design in the following terms: it sets out clearly to prioritise the overall character of the site, various existing activities are either reduced in extent, located in more ideal locations and in some instances actively
discouraged from continuing. For example the woodlot operation, represents not only a particular hazard and verges on industrial activity, but takes a significant portion of land which could potentially serve the housing need in more effective manner. Given that a sustainable neighbourhood living lifestyle is the core theme of the development, it is not an efficient land use activity when viewed from that perspective. Other similar reduced activities include the extent of the existing west paddock which effectively limits the residential fabric and reduced the potential for economically productive frontage for mixed use dwelling on Alexander road. This activity has been relocated closer to the east end of the site, where there are higher synergies between the landscape and the ‘value add,’ of on site equine activities.

► Building heights and setbacks etc have been taken in mind to enforce an appropriate limit in terms of density and relative density. The word relative is used insofar as the development will have a significantly higher residential density to the surrounds, but not so much that that development is too alien to the context, or that the sheer number of people contributes to poor social cohesion and intimacy which is key from a governance perspective to the success of the development. There is an ideal balance captured in the urban design between the pax number and specific cultural and social indicators on the site, understanding however that in time, as relationship between increased densities in surrounding softens there are opportunities over time to likewise shift upwards in density.

- **Sense of Place:** health, well-being and soulfulness; safe places; integrated communities via mixed socio-economic groups, mixed land use and special reference to woman and children.
  
  ► Courtyards and pause spaces that provide privacy will be interspersed amongst more public spaces. The spaces will specifically be designed to create a balance between safety and independence. For example, children’s play areas will be clearly visible so that neighbourhood “eyes” can continually survey them.
  
  ► On an urban design scale, places of soul are interpreted as places of identity. It is important that human beings have connection to their environment both physically and psychologically, through buildings that provide indoor and outdoor flow. This is achieved by creating a sense of place and by attempting to capture the *genius loci* (spirit of the place) through an architecture that responds to the historic, cultural and geographic contexts.
- **Sense of History**: valuing cultural diversity via a sense of community, participatory culture, healing and memory and acknowledging traditional belief systems; celebrating places where history is reflected.

  - The provision of the manor house and the identified historical buildings as having a museum potential demonstrates an attitude to formalising the historical potential of the site.
  - The existing hospital blocks tell a very particular narrative relating the history of health care and though the buildings will be refurbished their presence is a testimony to the built form and history.
  - The design incorporates a heritage square, a section of the development where economic activities in support of the unveiling of history and rooting into everyday and current life takes place.
  - Generous communal external space for activities such as the ritual slaughter and other historical and cultural activities is provided for, these are also seen as spaces of storytelling and celebration.
  - The site is named Oude Molen because of the old windmill, and there is the potential to create an architectural intervention which captures wind energy for various purposes (including as a technology showcase) in a contemporary fashion. This intervention and space allocation contributes to this sense in a special way.
- **Sense of Prosperity**: growing local economy, greater equity and fair trade; local and sustainable food supplies, markets and agricultural value chain.

  The urban design does not in itself have the primary responsibility that will dictate the exact nature of economic production on site. Suffice to say the urban design currently does create a framework that provides the most amenable context for economic activity in favour of small to medium businesses and entrepreneurial activity of a limited scale. This is to ensure that the most number of ‘actors,’ can participate in the benefits without the presence of an overarching economic filter which siphons off the collective. In simple terms the land parcels are sized and the block buildings orientated such that the presence of a consolidated supermarket or shopping mall is mitigated, in lieu of less controlled communal business system of higher social complexity and variety.

  The creation of an on site market space, with a potential for a food garden supports the branding of the site as a locus of organic food production which potentially could stimulate the local economy.

  The design allocates a food garden in the heart of the site and in the public realm; this places a real focus on the market in terms of importance, and encourages a more free local market as this space is conceived as a communal asset not to be sold to an individual developer.

  Opportunities to maximise incidental trade is also maximised by arguing for a different massing and architectural strategy for major access points into the site. Building infrastructure on the corners therefore supports higher flexibility of form and even in terms of height these ‘corner buildings,’ become architectural billboards attracting the eye and providing a sense of orientation into the site as a whole. This again is to capture unintentional financial streams of the passer-by, as well as intentional economic activity.

- **Sense of Nature**: enhancing biodiversity; reverence for life; working with eco-systems rather than against them.

  The urban design is guided by and is in agreement with the spirit of the TRUP Strategic Development Framework which seeks to ensure that the delicate balance between the natural system and the built environment is maintained. Whilst it is clear that the existing natural system is highly gentrified through decades of insensitive interventions, this is not an excuse or opportunity to create a urban system whereby this is exacerbated.

  The design makes specific provision to be in accordance with NEMA and other legislation, for example not building within the fifty year
flood plain, and creating a sufficient buffer zone between built form and sensitive ecosystems.

The design supports another level of spatial intervention in way of an appropriate public park, where limited access and appreciation of nature does not impact negatively on the green system. This respectful contact with nature, via boardwalks for example in sensitive areas, by its very nature creates a reverence for the natural system without excluding people in totality. This respectful engagement is a better strategy than the total exclusion of people which can contribute to a lack of understanding and in the long run threaten the natural landscape.

Biodiversity is encouraged by maintaining as far as possible:

- The presence of various tamed animals on site, ducks, chickens, horses etc.
- Encouraging the removal and recycling of invasive plant species regardless of their aesthetic value unless there are heritage issues to be considered
- Eradicating agricultural practices from the land use proposal as a principle for further development.

- **Sense of Viability**: While not a sense or a sustainability principle, it was deemed necessary to evaluate scenarios on the basis on their feasibility or viability.

The viability argument is at the core of the realisation of the process and whole development. Essential to the comprehension of the project is that one views the site as a test case to show best practice in terms of social governance, architectural and urban design articulation and mixed use, interclass interaction on both a social and economically productive level. The design offers the best opportunity for this arrangement without alienating the imperatives of integrated communities and advocating an overt bias to the ‘profit motive.’ The design seeks both in the land use proposed, the distribution of scale and activity to suggest that the classical definition of viability needs to be broadened from the purely empirical tools of financial engineering towards an argument for equity at all possible scales.

The design through its considered approach to infrastructure demand and outputs is a best fit towards a balance between capital and running costs, thus supporting a more viable balance between target market buying power and the value of the product. However as the project is one of demonstration, capturing the value of the development in terms of awareness and therefore being able to interpret the virtual and real cost and viability is an ongoing process.
The urban design framework by its very nature provides the right level of flexibility for further engagement in terms of viable business practices without them spatially compromising the balance. The design however does not replace and never will, an appropriate analysis and brute strategy to inform the precise nature and mix of potential onsite and or related business practices. This will include issues such as subsidies, institutional financial arrangements, and possible offsets and internal cross subsidisation by individuals and organisations. The social process has revealed potentially novel methods for the integration of the site into local economies, and the internal dynamic of financial flows in support of a closed system by recognition of sweat equity etc is also a point of investigation.
7.6. **Urban Design Layers**

The complex system of that is the make up of the preferred option for Oude Molen can be broken up into various elements or ‘layers’ in order to better express & interrogate basic ordering principles. These layers represent a ‘part’ of a functioning ‘whole’, and need to be viewed as part of an interconnected system. It is important to note that for the whole to work the most efficiently each part may have to compromise on its optimal expression.

7.6.1. **Core Project Elements**

The core elements of the Conceptual Sustainable Development Framework (CSDF) for Oude Molen include:

EXISTING MULTI-STOREY BUILDINGS: conversion of the existing multi-story buildings into mixed-use facilities, with commercial use on the ground floor and residential use on the upper stories;

EXTENSION AND DENSIFICATION OF THE EXISTING MULTI-STOREY FOOTPRINT via the construction of new buildings with a similar mixed-use function and a complementary architectural design;

COMMERCIAL SPACE: the establishment of two dedicated commercial clusters along Alexander Road

HISTORIC MANOR HOUSE: the conversion of the existing historic Manor House into a major cultural centre, depicting the rich historical and cultural diversity of the site;
INSTITUTION/HEALTH CARE: the potential relocation of the Robin Trust (or other)* into a new building located in the northern institutional precinct where it can be protected from the hustle and bustle of the Village without feeling excluded;

LEARNING FACILITY: the relocation of the Gaia Waldorf School (or other)* into the infill buildings adjacent to the institutional precinct & opposite the public open space;

RESIDENTIAL: between 300 and 600 socially integrated residential units are envisaged, located on the northern and southern boundaries and along Alexander Road;

FARM: retention, and extension, of the existing farming area, incorporating the vacant land adjacent to Ward 20;

PUBLIC CORRIDORS AND HEIRARCHY OF OPEN SPACE: a corridor of intensive and dense commercial and recreational activities that runs from the current entrance through to the proposed extension of the farm;

WARD 20: relocation of the patients to Valkenberg West or some other facility, and the construction of new double storey semi detached housing;

PUBLIC TRANSPORT: with a major focus on public transport and anticipating high pedestrian traffic, connectivity to Pinelands station as well as the narrowing, not widening, of Alexandra road will be considered;

INFRASTRUCTURE: completion of a Comprehensive Infrastructure Plan (CIP) which will include on-site solutions, resolving problems, such as the already overloaded bulk sewer system, and with zero impact on the natural environment (underground water supplies, wetlands, and rivers).

*What the current design framework makes clear is the provision of a land use framework that allows for a great flexibility for the ultimate identity of the tenants; potential and existing. As such key actors on the site such as the Gaia Waldorf School and the Robin Trust, can efficiently be accommodated within a determined institutional and educational precinct that affords opportunity for a broader pool of tenants, or consolidation of current tenant activities. The proximity of these land uses closer to the Maitland Village will also encourage the interconnection of the site with a real social and local need.
The massing at Oude Molen was sculpted along a concept of a series of interconnected courtyards. The courtyards provide; shelter from the elements, a sense of identity and character that differs across the site.

The design is constructed from 3 main elements:

**Spine:** A structured ‘spine’ of buildings, off which hangs a string of courtyards lines the eastern portion of the site

**Hard Courtyards:** The spine gives form to string of sheltered hard courtyards lying north south across the site. The built form prevents the channelling of the prevailing winds through the site as well as setting up a series of specialised spaces with different characters. The courtyards in the residential areas are paved areas, to slow vehicular traffic and reinforce the vision of a pedestrian priority zone. Portions of the courtyards are used for residential parking at night and as residential squares during the day. Meanwhile the courtyard to the commercial precinct is larger, less intimate. Parking & access are given higher priority.

**Open Courts:** Lying to the west of the spine is a series of open courts. These are formed partially from the existing buildings with infill buildings which extend the courts, with all new buildings to the northern & southern portions of the site. The west end of the courts are open towards the panoramic views of the Palotti Wetlands, Devils Peak & The Table Mountain National Park beyond. These courts are purely pedestrian spaces.
Existing buildings and landscape elements that did not contribute to the urban environment, that are in poor condition and have little heritage or environmental value have been proposed to be demolished or removed.

The majority of the buildings on site have been recommended to be kept & conserved. The new built fabric has been placed sensitively to enhance the ‘Historic Core’ without disrupting the vistas towards Devils Peak.

The southern & northern portion of the site is nearly all new fabric, allowing for the buildings to be orientated east - west to maximise solar infiltration.
7.6.4. **Land Use Mix**

The land use mix & layout was driven by a number of factors. The main principals are outlined below:

**Unique character**: Oude Molen has a convoluted history which has found expression in the unique character of the site. The proposal builds on the memory of its past. The importance of heritage serves an orientation point for identity and nation building in a post-colonial context. This coupled with its superb environmental location relating to the local built and natural landscape demands a particular emphasis on appropriate space making as a defining element for structuring space, and sustainability forming a structuring principle for the performance of the elements and the site as a whole.

**‘Microcosm’** Oude Molen is seen as a ‘Microcosm of a city’. The concept is to create a varied tapestry of inter dependant uses. Oude Molen will be a place to live, work, relax, create & experience. There are cultural facilities, local food production, training & education, retail, office, restaurants, waste recycling plants on site – and so a full spectrum of the city is contained within the 14 ha. Sustainable neighbourhoods are such because of a concerted drive towards “closed system dynamics at a number of various scales,” the model of urban development being an open system inflicts a number of external effects on the economic, social and infrastructural context which is inherently unsustainable.
Active edges with shops, café’s or service providers are allocated along public roads. These active edges can articulate themselves with colonnades and arcades in order to create a positive interface between buildings and Alexandra Road.

Mixed use buildings are placed around the public and range from community convenience centre with active interface towards the park to office buildings and residential buildings

Within the residential precinct there is the possibility of retail opportunities at strategic locations. The general street interface in residential precincts is envisaged to have entrances, terraces or ‘stoeps’ directly onto the residential streets as small buffer zones.

**Interconnectedness.** Although the desire for the site is that is should be less reliant on external resources, the success of the proposal is how the scheme connects to the surrounding communities. It is bordered by low & middle income residential neighborhoods, a light industrial precinct, health facility, office park & a wetland area. Connectedness occurs at different strata, high spatial permeability for legibility of public space that supports passive surveillance opportunities to enhance community policing and ease of social interaction is on level; the other being an interconnectedness of employment opportunity, and entrepreneurship potential. The site is a catalyst for action and supporting local economic development opportunities for the public.
7.6.5. **Building Heights & Density**

There is a cascading strategy for building height across the site, with the highest buildings on the east lining Alexandra Road reducing in height towards the wetlands to the west. This offers the highest potential for new urban form that is in keeping with the contextual character of the site, and minimise potential negative impacts of the new development. Urban development that is ‘over scaled,’ in residential areas can have significant impacts on community identity and ultimately threaten the success of the scheme as an intentional sustainable neighbourhood.

The 3 storey hard edge along Alexandra Road shields the internal semi private courtyards from the prevailing south easterly winds as well as deflecting a lot of the heavy traffic noise. The massing reinforces the street façade and contains the view corridor along Alexandra Road.

The semi detached units lining the northern edge of the site are 2 storeys high, to blend into the 1 storey context of Maitland Garden Village. This intermediate height will facilitate the integration of the sustainable neighbourhood into the relatively low scaled existing urban fabric.

The massing rises to 4 storeys to the south eastern boundary, to visually contain Oude Molen against the 6 storey scale of the adjacent Nashua Building. The 4 storey blocks will not negatively reduce the natural light into the central public open space as they are positioned on the southern portion of the site.
The entire western boundary of the site is envisioned to have a maximum 1 storey height for new buildings; however the preference is to keep this portion of the site as clear as possible of built urban fabric, due to the proximity of the wetlands, and the cultural landscape.

The image below shows the existing buildings in grey & the maximum building envelop for the new buildings in brown
The site is particularly noteworthy for its natural assets, and the success of a holistic design will be heavily dependent on the design's ability to accommodate:

- a sense of place, space and wellbeing,
- Pedestrian friendly and conducive to the elderly and young enjoying the precinct,
- Exposure to well defined space that shields from the harshest elements,

Creating a hierarchy of spaces that range from streetscapes to public pockets and courtyards, to communal urban agricultural elements, to limited and small access to private open space. The correct balance between these elements is key to the success of encouraging a civic and hence communal sense of space, as opposed to suburban conceptualisation of space.
The view corridors form an essential aspect of the historical layout of the site, maximising the relationship to the natural context, and the building mass painstaking and rigorously restrains the building elements in order to maintain the genius loci of the site. Psychological connection with the site, and the natural environmental is a key intangible feature of the site which critically enhances the potential and value of the precinct as a whole. As such the preservation of view corridors enhances the public value of the asset and appreciation of the natural environment, which is in keeping with the ethos of a sustainable neighbourhood.
7.6.8. Access, Pedestrian Routes & Transport Linkages

The residential precincts and mixed use courtyard precincts have a strong pedestrian orientated streetscape. High traffic access roads are situated at the edge of the development serving retail, office and industrial precincts.

The pedestrian connectivity to public transport, i.e. railway station is very good. There will be additional bus and taxi drop off points.

Pedestrian corridors are introduced which are based on the old hospital layout. These corridors are independent from the vehicular road network. They serve as pedestrian connections and tie the precincts together. These corridors add to the human scale of the development as they are reserved for pedestrians (and bicycles) and will be formed as a sequence of Public Open Space network.
There are eight proposed access points to the site, so that the property can become fully integrated into the surrounding road network and built fabric.

There are two types of these public passages proposed, a 16m wide road which allows for parallel parking, and a 12m wide road type which is the secondary residential access system. Both widths are sufficient for tree planting. There is a balance between the tightness of streets to create a sense of intimacy on the one hand and on the other the importance of street spaces that also function as mediating public spaces that connect major courtyards and vistas. Costing modulation in terms of the nature of surface specification, geometries and extents will be interrogated as part of the strategic business plan for the development.

The design highlights pedestrian traffic as the primary mode of internal movement and the road widths accommodate provision for bicycle movement without conflict with occasional vehicular and pedestrian movement. The importance of a local green transport system that is steered by the city and province will have a positive impact on the Alexander road interface.

For detailed parking ratios please see Annexure B.

The residential precincts integrate a certain amount of affordable housing which leads to a motivation for a lower parking ratio than standard. Mainly surface parking and a portion of semi-basements are proposed.

The model of ‘time shared’ parking between different land-uses will maximize efficient use of parking provision.
7.6.9. Orientation

Where possible new buildings have been orientated along the east west axis in order for the main facades to face north. This allows for the maximum use of solar energy to heat the building in winter as well as maximises the benefit of passive solar lighting. Floor plates were kept to a maximum depth of 12m to reduce reliance on artificial lighting & ventilation.
7.7. **Conclusion**

The current urban design forms a primary interpretation of the preferred scenario and the professional consultants’ position on the ordering elements which drive a clear and cogent design process and product. In addition it forms the basis upon which other consultants shall contribute and embed the detailed aspects of the development thereon.

It is essential to note that the technical and financial engineering is absent from this body of work, and it is expected that the final Spatial Development Framework will reflect the effects of this process.
8. **INFRASTRUCTURE DESIGN**

Sustainable infrastructure design will be the backbone of successful implementation and realization of the sustainable urban neighbourhood development vision of Oude Molen. It will play a key role in demonstrating the long-term financial viability of the project. In this regard, the infrastructure design will be key in keeping down the anticipated sharp rise in the operational and management costs for energy, water and waste services rendered at household and neighbourhood levels in future.

The infrastructure design illustrations below are images setting out in basic principle the intentions for the site, and seek to provide a quick tool for understanding the in-depth studies that will be undertaken upon Provincial endorsement for the preferred scenario. The following diagrams do not set out specific targets, but demonstrates ideal performance flows of a ‘close-loop’ system.

**8.1. Energy Generation**

The Oude Molen eco-village has an 11kV grid connection with a capacity of 800kVA on a shared ring with various other consumers. A conventional type of electrical network to support the proposed development (considering the various scenarios) would require doubling the existing electrical capacity at an enormous cost.

To prevent this, a more sustainable energy service approach must therefore be adopted, utilizing a mixed portfolio of energy services and the diagram below indicates the typical energy flows.
From a sustainable energy service viewpoint, one must take cognisance of the fact that consumers are essentially interested in the outcome of the provision of energy services (ie. such as lights, hot water, welding etc), and to some degree on the quality of the energy services but not generally in the energy carrier itself.

The optimisation of such a system can only be achieved by managing the utilisation and production of the energy.

From the diagram below, it can be seen that energy generation and utilisation at the Oude Molen eco-village would typically consist of the following:

1. Solar heated water panels.
2. Passive solar design for the heating and cooling of the building.
3. LPG used for cooking and supplementation of the solar heated panels during inclement weather.
4. Electricity supply from the grid as well as possible fossil fuel generation during peak periods.
5. Wind generation off site which will connect onto the national grid.

The solar panels for water heaters would typically be centrally situated and feed approximately six units with an LPG or electrical back up facility.

Wind generation could be installed off site in a suitable environment and the electricity generated fed back via the national grid. This electricity could be
supplemented by a combination of grid electricity and localised generator sets for peak load relief.

Normal cooking would probably be by means of a combination of LPG stoves (cooking plates) and microwave ovens.

The architectural design of the units will be such that solar energy will be utilised as the primary source and LPG and electricity as a secondary source of energy.

8.2. **Water & Nutrient Cycle**

Oude Molen eco-village sits within a development urban area. The existing surrounding infrastructure has no further capacity for receiving wastewater. Further development of the Oude Molen eco village would require an expensive upgrade of the existing main sewer and pump station, or on-site treatment, e.g. in a package plant. Furthermore, sustainability principles require the closing of water and nutrient cycles, i.e. though engineered recycle schemes. Oude Molen is also intended to act as a place of learning/demonstration. This context suggests on-site treatment of wastewater, and reuse of water and nutrients.

The urban agricultural portion is small relative to the envisaged size of the community, the amount of food that would be ingested, and the nutrients in wastewater originating from human urine and faeces. This situation leads to an imbalance of nutrient, where the supply to urban agriculture would be more than its demands. This can be addressed through better nutrient management, which involves source separation of urine, toilet water and grey water. Urine contains 80% of the nitrogen, 70% of the potassium and 50% of the phosphate (all three important nutrients to remove from a wastewater perspective, but also important plant nutrients). Black water (toilet water) contains urine, and therefore these same nutrient, but in much more diluted forms, and contaminated with human pathogens. Grey water contains low levels of nutrients, and some organic material and pathogens. Separate collection and management of these flows therefore allows recycle to be practiced with much greater flexibility.
Urine can be treated to form magnesium and potassium phosphate salts, which can be removed from water and which are ready to use slow release fertilizers. Where this is more than the requirements on site it could be sold into the neighbouring urban environment for gardening. The treated urine effluent may still contain pollutants and will be integrated with the main blackwater/mixed water system, which will be a biological nutrient removal process. This process removes nutrients to within the DWAF general authorisation standard which allows the water to be used for irrigation, or safe discharge into the receiving water environment (i.e. Black river) when there’s no need for irrigation (e.g. some winter months). This nutrient removal process at the same time removes organic matter from wastewater. In this scenario, biogas production is considered ineffective, but the inert organic material produced in the treatment process will be recovered as compost. Other problems with biogas involve gas scrubbing, which is too expensive at this scale. Some grey water (baths/showers/basins) will be removed for biological treatment and disinfection to allow recycle as toilet flush water, according to the requirements for flushing. Retrofitting of existing buildings to accommodate source separation may cost wise be prohibitive. Some mixed wastewater will be allowed for in the design of the actual system, which will depend on the actual size and activities of the community.

From a population density point of view, none of the three spatial distribution options suggested for Oude Molen leads to a closed water and/or nutrient balance with regard to potential recycle options. From the point of view of wastewater treatment, this requires nutrient export and some more high tech processes. From the point of view of capital cost and operation and maintenance, the denser the community is then, the more affordable the treatment becomes on this scale.
If the wastewater and nutrient cycle were to inform the decision making process, it would suggest a portion allocated for urban agriculture not less than 4ha, with a maximum population density. Urban agriculture should involve mostly greenhouses where year-round growth can be achieved, as nutrients are available year-round. Urine based fertilizer could be sold and used in Pinelands gardens. Wastewater would be treated for either irrigation (greenhouses, possibly nearby driving range) or discharge to river.
8.3. **Solid Waste**

Cape Town’s land fill sites are rapidly reaching capacity, therefore in order to reduce the amount of waste produced by Oude Molen it is envisioned there will be an on site waste separation system. This would allow organic waste to be reused on site via a biogas digester. Separated glass, paper & cans could be used in the craft industry on site or forwarded to external recycling plants.
9. RELEASE MECHANISM AND OWNERSHIP MODELS

Going ahead with the development proposal proposed above is ultimately dependent upon and premised on the future ownership model and release mechanism for the site. It is, therefore, of paramount importance that the PGWC, current owner of the land, decides on the most appropriate ownership model and release mechanism. This will give the necessary clarity and certainty needed to go ahead with the development proposal.

To this end, the following relevant ownership models and release mechanisms can be considered:

9.1 Private Development

Public ownership of the property is being transferred into private ownership of the property via a traditional tendering procedure to a single developer or group of developers to design and construct the infrastructure and top structures. Ensuring that the site is being developed according to the sustainable development vision and guiding principles contained in this document can be achieved via a written agreement that the winning bid will develop the site according to the letter and spirit of Strategic Development Framework (SDF). To this end, the winning bid should not only go to the highest bidder, but should give due consideration to the bid which demonstrates most successfully to an independently appointed selection committee how the SDF vision and plans for this site as a ‘sustainable neighbourhood development’ will be achieved.

9.2 Public Entity

Transfer of the property – land and top structures – goes to a yet to be established public entity, for example a Section 21 Company. Such public entity enters into a partnership with the PGWC with a TOR to facilitate a community-public-private-partnership. This partnership will be run by a Board constituted by representatives of each of these stakeholders and chaired by a neutral chairperson. The Board will, in terms of the TOR, have the necessary discretion-making powers to decide on what portions of the land and/or top structures should be sold off for profit and which portions should be retained for social housing purposes. Any profits made from private deals should be used to cross-subsidize the social housing component. The generation, flows and management of all monies / funds should be PFMA compliant. The Board will report directly to the relevant Minister and will brief the Minister on progress made during monthly meetings.

9.3 Development Company (DevCo)

The establishment of a DevCo takes place with the purpose of securing the development rights, raise capital and manage the contracting process. To this end, the DevCo can be created by and owned by the PGWC. The management of the DevCo can be done by the Public Entity mentioned in 6.2 above. To this end, the DevCo will report directly to the Board of the Public Entity and will submit monthly...
written reports to the Board on progress made as well as any problems and/or hindrances experienced in delivering on its mandate.

**9.4 Operations and Management Company (OpsManCo)**

The establishment of a OpsManCo takes place with a view to govern and manage the site during the development period. It will cease to exist when a new governance structure has been appointed or elected by the future tenants and inhabitants of the site. To this end, the OpsManCo can be created and managed by the Public Entity mentioned in 6.2 above. The Public Entity will issue the OpsManCo with a written mandate to, inter alia, to manage the site, to facilitate and/or provide financial support to SMMEs to stimulate economic opportunities and activities in the area, as well as to negotiate and enter into an agreement with the CCT on rates and taxes rebates for municipal services (e.g. waste collection) not rendered / supplied to the site. The OpsManCo will ensure that all money flows will be conducted via an audited Trust account and will generally be MFMA compliant. The OpsManCo will have the discretionary powers to decided which of its functions should be outsourced to specialists and which activities could be undertaken by itself.

**9.5 PGWC Constructs and Designs**

Another option is for the PGWC to design and construct the infrastructure under the auspices of a clearly mandated team of officials and consultants. In this case, the PGWC will then tender out to developers/contractors different components of the site for top structure investment and (re-)development.
10. WAY FORWARD

10.1. Key issues

10.1.1. PGWC Scenario Endorsement

The PGWC endorse the recommended preferred scenario it would allow the professional team to report that back to the multi-stakeholder forum and to proceed with the public participation process and zoning application.

To this end it is proposed that representatives of PGWC engage with this document and the professional team to agree to most appropriate scenario. Written support from PGWC for the preferred scenario is required for the multi-stakeholder group.

10.1.2. Budget Approval

A revised budget was previously submitted to include a full EIA and specific specialist studies. This budget approval is required to allow the public participation process to commence and is currently delaying the conclusion of the zoning application as it is on the critical path.

10.1.3. Task Group

There is a need for a provincial task group to meet on a regular basis to make key decisions about some of the principles to be contained in the SDF and the zoning application and to negotiate these with the City of Cape Town.

10.1.4. Release Mechanism and Ownership Models

Robust discussion is required to finalise a suitable release mechanism to allow work on this to commence. It is proposed that the Task Group is the forum for this discussion and for it to commence with the implementation work.

10.1.5. Local Economic Modelling

Work on Oude Molen has largely been focused on the social process and the spatial development of scenarios. Critical to Oude Molen’s success is ensuring that the future Oude Molen as part of the wider precinct community is empowered to sustain themselves economically and to prosper. Local Economic Development planning and modelling for an integrated Oude Molen, Maitland Garden Village, Alexandra Hospital and neighbouring precincts such as Pinelands, Observatory and Mowbray needs to be incorporated with the spatial planning work to enable the long-term viability and success of the this whole area.

The Development Bank of South Africa has shown an interest in funding this work, and the application is in process. This work should however be started immediately to be integrated with the spatial planning and it is proposed that the PGWC bridge this funding to allow this work to proceed.
10.1.6. **Neighbourhood Development Programme (Department of National Treasury)**

The National Department of Treasury has approved the Oude Molen project to receive technical assistance and possibly an infrastructure grant in terms of it’s Neighbourhood Development Program (NDP). The structure of this program is however such that funding is made available to Local Authorities. The City of Cape Town is familiar with the Oude Molen project and it’s approval for the NDP funding. Officials from CoCT have agreed in principle to sign an agency agreement with PGWC to facilitate the flow of these funds.

Immediate work is therefore required to finalise such an agreement with the City.

It is important to note that the NDP has a focus on precinct planning and local economic development and leveraging private sector funding. The technical assistance grant from the NDP must therefore have a wider focus than the Oude Molen site and must therefore include the surrounding communities and properties. The area surrounding the TRUP would naturally form the study area for this work potentially including Maitland Garden Village, Alexandria Hospital, Transnet’s Railway Yards, the River Club and Falkenberg West.

10.2. **Action required**

The following actions are required:

10.2.1. **Endorsement of the preferred scenario.**

10.2.2. **Approval of the revised budget.**

10.2.3. **Formation of a task group to undertake:**

- Make in principle decision about bridging the DBSA and NDP funding and allow the local economic development work to proceed.
- Make decisions about a release mechanism and to implement the preparatory work needed to enable this.
- Formulate and agree an agency agreement with CoCT to enable the NDP funding to flow to the project.
- Assist the professional team with negotiations with the CoCT around some of the planning issues such as reduced parking ratios.
11. **Annexure**

11.1. *Annexure A: Scenario Weighting & Consensus*
11.2. **Annexure B: Scenario Evaluation**
11.3. **Annexure C: Sustainable Energy Guidelines**
11.4. **Annexure D: Urban Design Scope of Service**
11.5. **Annexure E: Urban Design Guiding Principles**