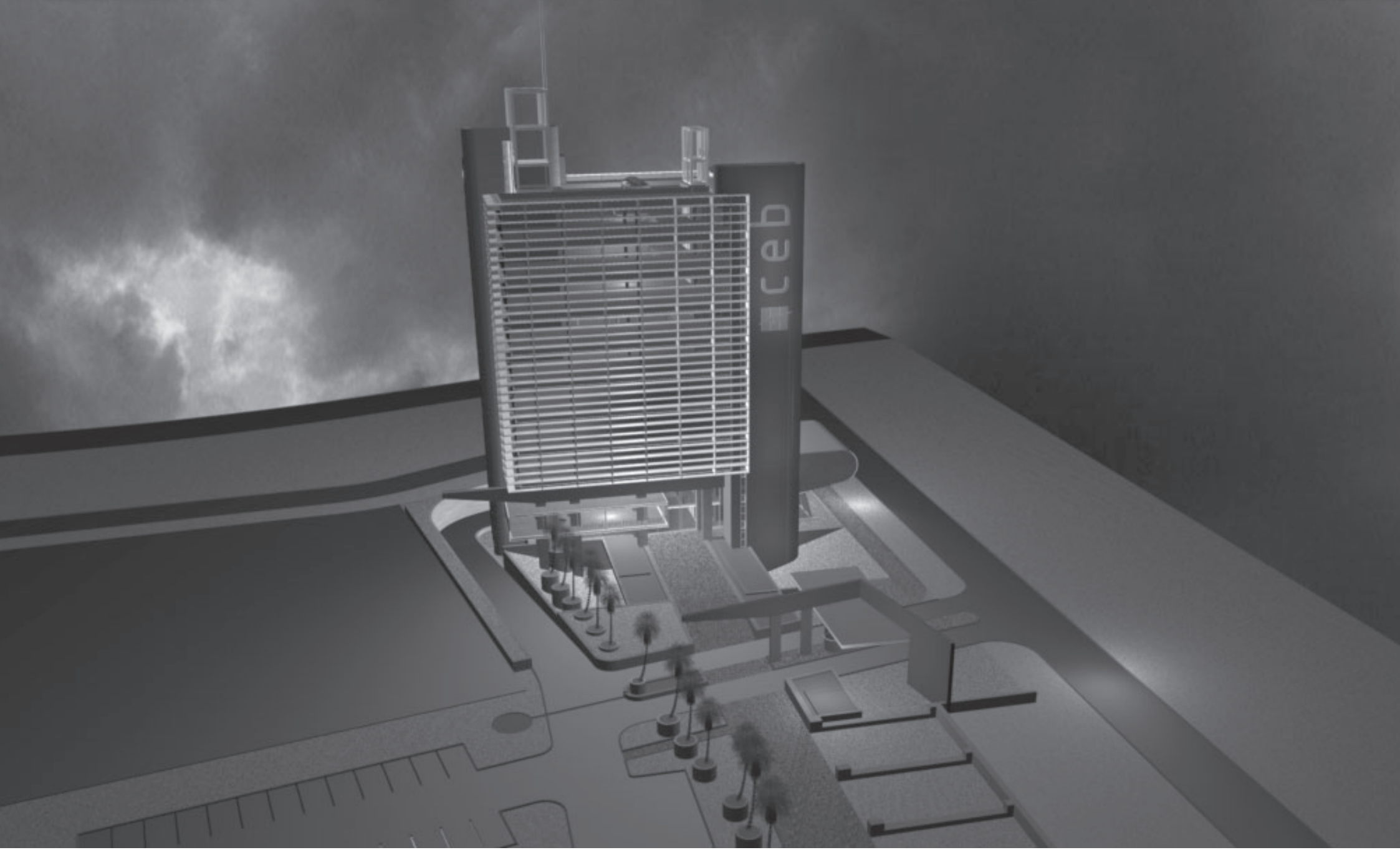
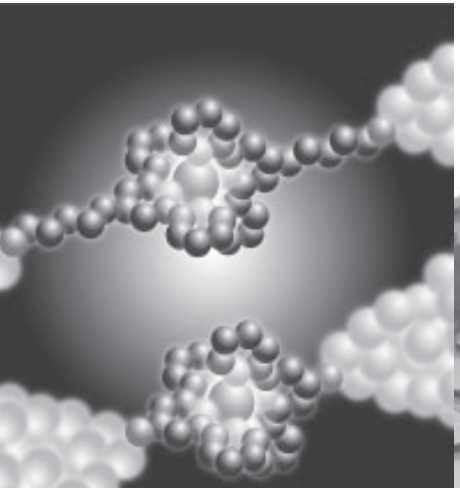
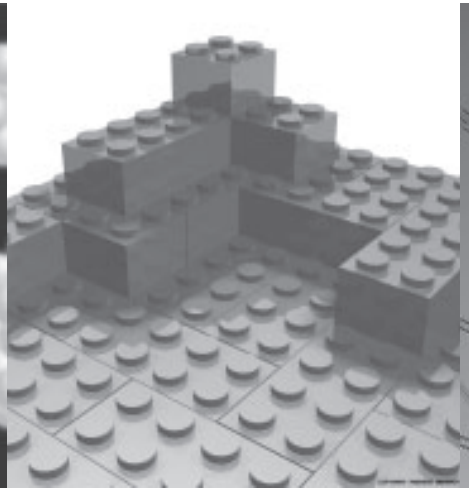


CENTRAL ELECTRICITY BOARD – HEAD OFFICE AT EBENE – STAGE 2 REPORT



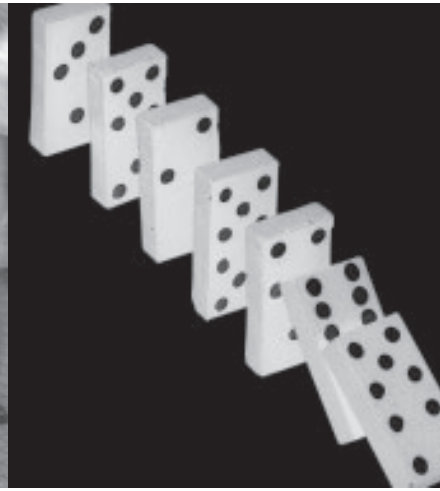
potential energy



architectural energy

industrial energy

kinetic energy



latent energy

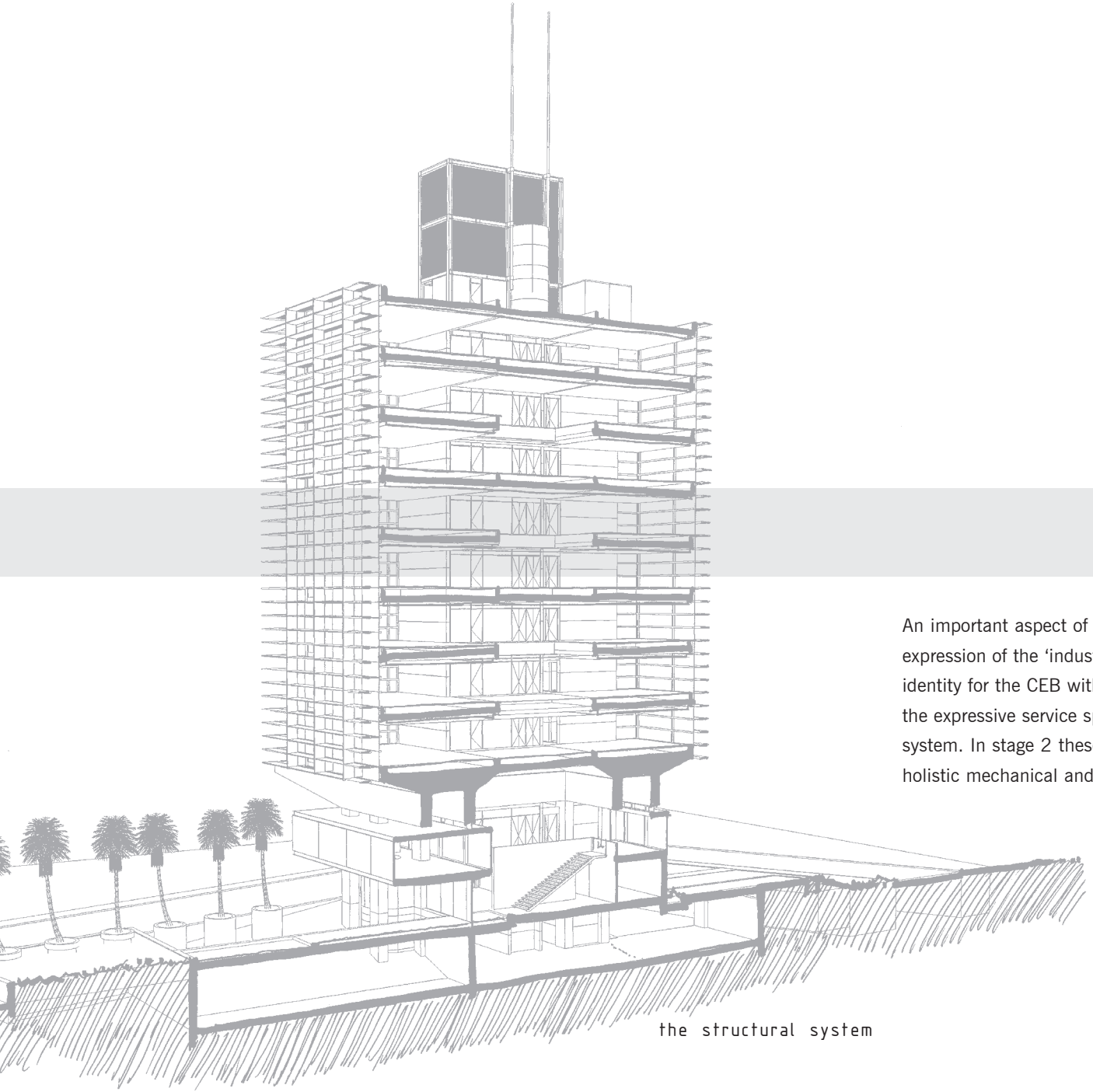
introduction...

evolving the glowing 'lantern'

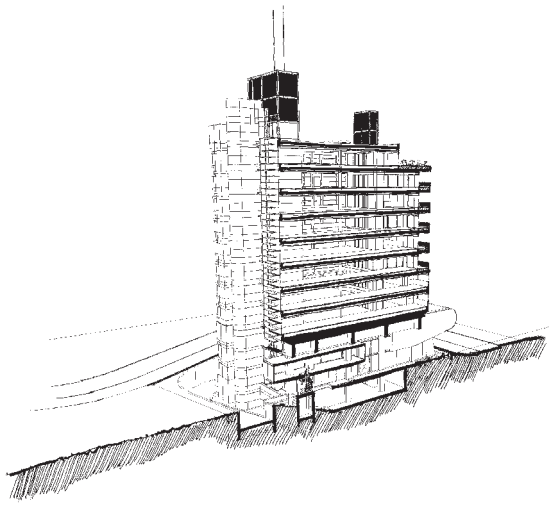
The second stage design development for the CEB Head Office at Cybercity has focused on evolving and strengthening the design concepts conceptualized in Stage 1.

The core principles of expressing the various 'energies' inherent with the building and the functioning of the CEB itself, remain as the dominant guidelines for resolving the more pragmatic aspects required in stage 2.

Following these principles is essential to ensure that the original architectural iconography and language developed in the previous stage is not compromised to accommodate the functional aspects of the building, and that all decisions made in the second stage development help to enrich and strengthen the initial concepts.



the structural system



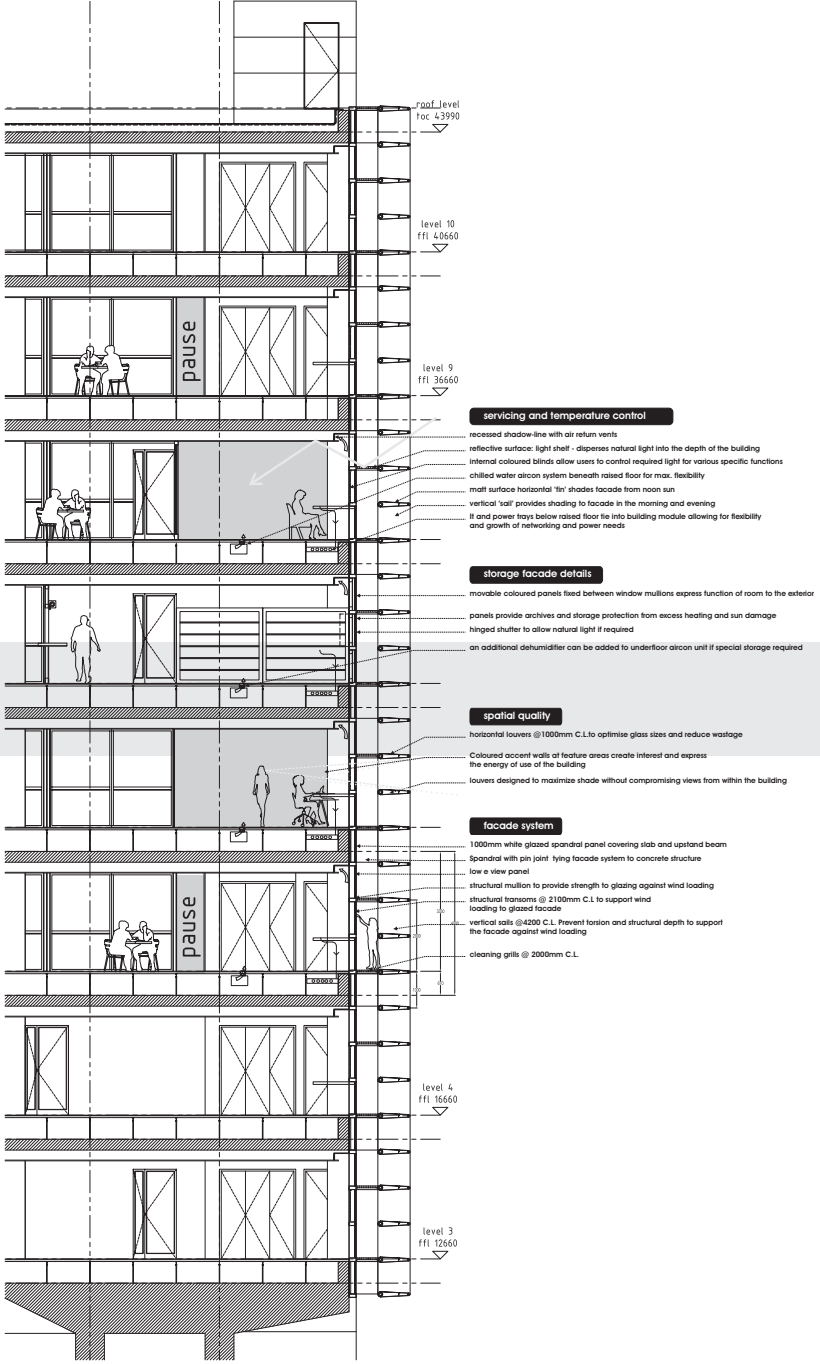
industrial energy...

services concept report

An important aspect of the architectural language envisaged for the Head Office is the expression of the 'industrial energy' of the building as a means for creating a distinctive identity for the CEB within Cyberbity. In stage 1 this desire manifested itself conceptually in the expressive service spine and service cores, exposed viewing lifts and hi-tech façade system. In stage 2 these elements have been critically examined and rationalized to create a holistic mechanical and structural solution.

- Structure

The three components of the 'machine' – free-form base, homogenous tower and accent pinnacle – have resulted in a dynamic structural system. The rational reinforced concrete frame on an economic grid of columns for the upper floors of the 'lantern' is to be carried by a series of architecturally expressed transfer beams to large central columns in the base. The stair and toilet cores add the necessary stiffness to the tower to deal with rotational forces caused by wind.



The most significant development of the structural system in stage 2 has been the evolution of the double glazed louvered façade system.

In keeping with the original concept of a homogenous glazed 'lantern', the facade glazing acts independently from the structure. It passes in front of the concrete structure in a series of glazed view and spandrel panels and spans from floor to floor.

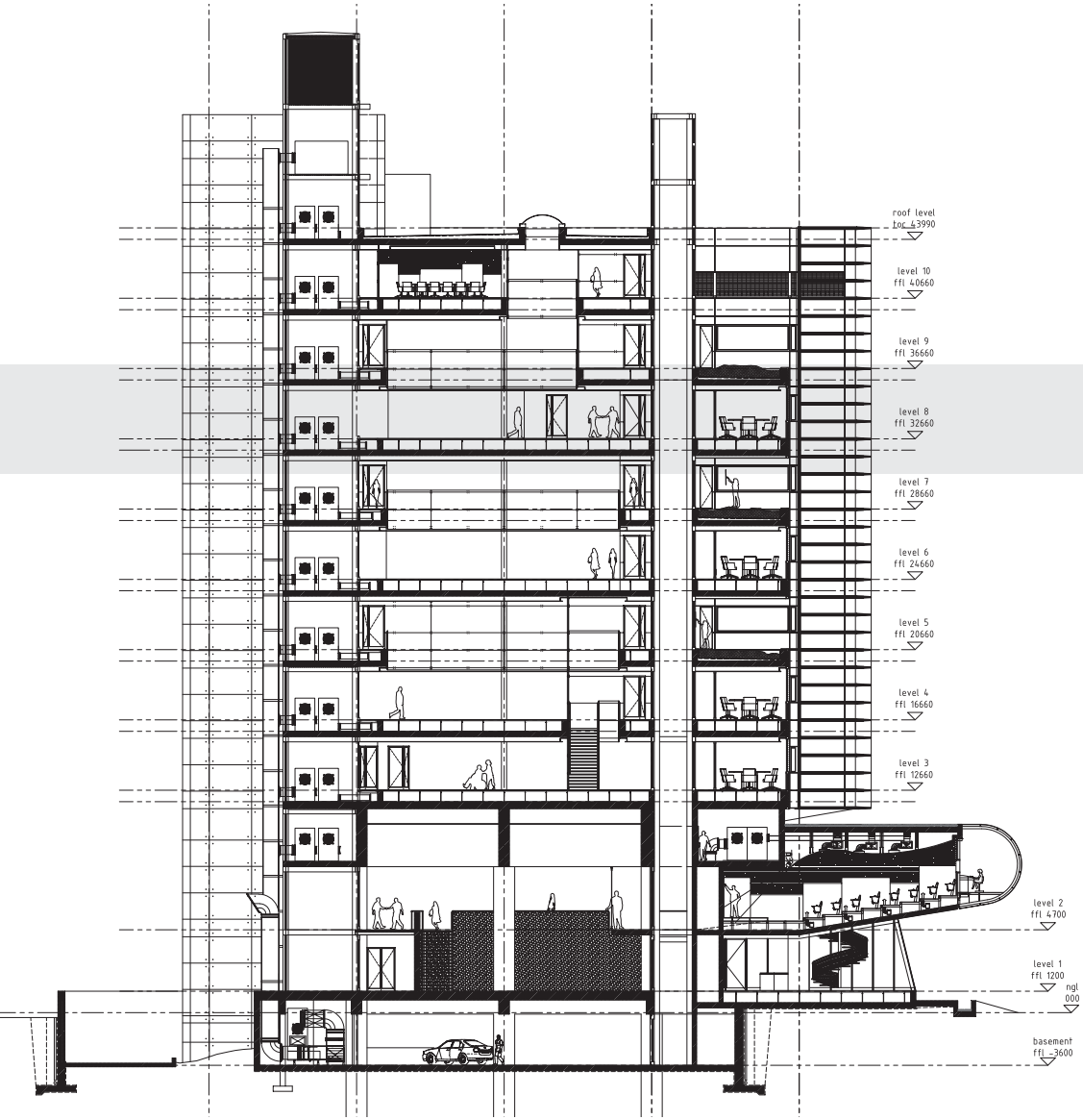
facade system

In the previous submission the louvers were envisaged as a separate element shading the glass curtain wall. However, due to the extreme wind loading in cyclone conditions, the glazing system and shading louvers have instead been designed as a single, holistic, structural entity. The vertical and horizontal shading fins become the primary structural elements for the façade, supporting and strengthening the glazed system behind. The vertical fins occur at 4.2m centres, together with window mullions at 2.1m centres. The vertical fins are spaced away from the glazed façade by a metal grid at 2m intervals, which allows for window and sunscreen cleaning, and further reduces the mullion span to half the floor-to-floor height. Opening sections occur at intervals to permit access to these grids.

The horizontal fins occur at 1m centres resulting in an economic glazing module and minimising the size of mullions. They have been designed to maximize horizontal shading and minimize glare, without compromising views from within the building. Most importantly, the resulting glazing size enables the use of an economic performance glass. The possible use of an 8.76mm clear low e laminated annealed structurally glazed unit, based on two sheets of 4mm glass with a double PVB and the low e coating on the inner surface will be investigated, but at this stage the inner glass we have allowed for is a 6mm sheet making a 10.76mm unit.

The comprehensive shading and low e glass will add significantly to passive thermal control, and assist in reducing the running costs of air conditioning. However, despite the improved functionality of the façade as an integrated system, the essence of the façade as an exciting architectural solution, from both an internal (maximizing views, natural light, spatial quality) and external (unique icon, hi-tech imagery) aspect, remains as the overriding visual & experiential effect.

The expressive central service 'spine' conceptualized in the first stage remains the primary means of vertical mechanical and electrical services co-ordination. The mechanical plant is centralized and concealed in the basement level to minimise structural load, reduce noise and eliminate structural vibration. This also allows for easy and efficient access for maintenance personnel and service vehicles to the plant areas, without having to enter to the building itself.



mechancial and electrical services

- Air-conditioning

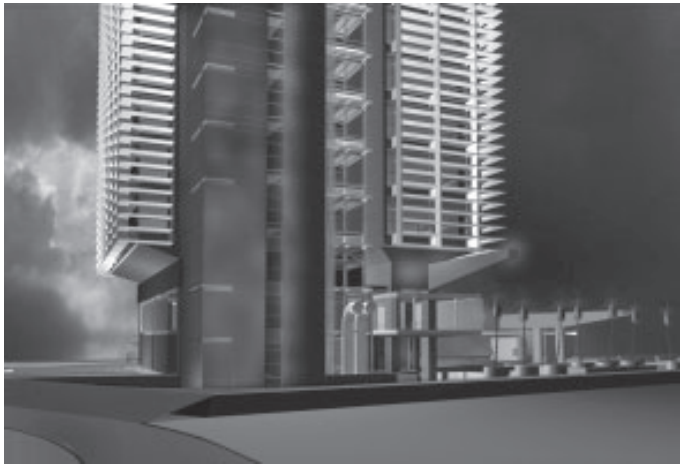
A chilled water system is envisaged as the air-conditioning system for the tower. The chiller plant will be located in the basement, with cooling towers located in the 'pinnacle', which provide cooling to a primary air handling unit at roof level. The primary unit will supply pre-cooled, dehumidified air to a secondary air handling unit on each floor. The secondary units will provide the additional cooling and dehumidification required for each floor. The excellent shading, provided by the innovative façade solution, permits the use of a single zone ring reticulation in the raised floor. Return air taken is taken through the ceiling plenum and excess air is bled off to the toilets and lobby. The chilled water ring main is further augmented by the provision of valve tapping points at ± 3m intervals. The provision of these valves will permit the addition of dedicated fan coil units as required. For example, fan coil units along the western perimeter can accommodate the additional heat load in the afternoons, as well as allowing areas with specialized accommodation requirements (such as meeting rooms and boardrooms) to be cooled on demand. Fan coil units can also be provided in areas where equipment loading is high (server room, etc.). This hybrid system provides for long term energy saving and maximum flexibility over time. Condensate drainage to the wet cores will be allowed for in the raised access floor.

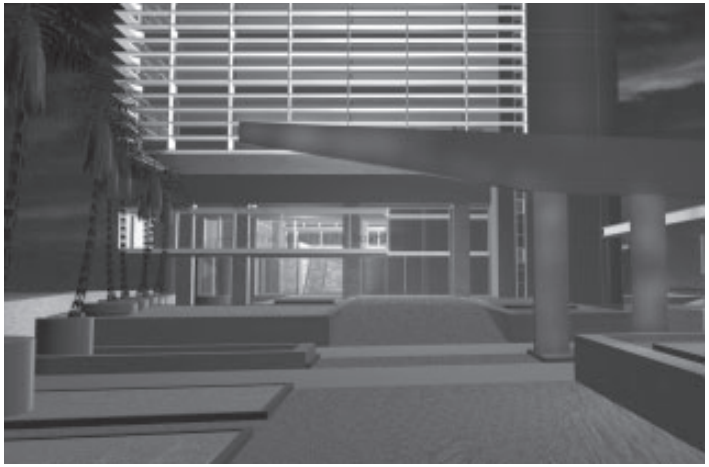
- Fire protection system

Sprinkler tanks and pumps are located in the basement, together with booster pumps for domestic water storage. Each floor has a hydrant and two hose reels located at the fire exits. A dedicated fireman's lift is also provided – this lift doubles up as a service lift for each floor. The floor voids have a single fire baffle through the centre of the building and vertical penetrations are fire sealed. The central double and triple volumes of the open plan are kept well within permissible volumetric tolerances. Smoke detection and sprinklers will be located in the ceiling volume, whilst dry pipe systems will be used for sensitive areas, such as document, server and patch rooms.

- Raised access floor and ceiling void

The provision of the raised access floor ensures total, long term flexibility and provides the potential to adapt to ever changing technological advancements. In the context of the Cybercity, the ability to adapt to latest technology and global trends is essential. Power, data (it and communication) and air supply systems are co-coordinated within the raised floor, to optimize planning flexibility. The possibility of a wireless networking system can also be accommodated, depending on the specific requirements of the CEB. A wireless network will obviously provide the greatest flexibility for use and expansion, as it will allow for people to network and meet in spaces other than those dedicated to work. For example, a terrace can become a more relaxed meeting area for brainstorming new ideas, or a client meeting can occur in the canteen whilst enjoying a small meal. The systems in the raised floor are further co-ordinated with services within in the ceiling void, such as lighting, security, any public address requirements and air return inlets.





architectural energy...

expressing the inherent energy of architecture

The core architectural concepts expressed in the building in stage 1 - hi-tech imagery, landmark, branding and machine-like icon - have been refined and rationalized through the development of the structure and mechanical services discussed in the previous section. This stage has also looking at refining the palette of materials and colour, as well as evolving the 'industrial' texture of the 'machine'.

- Material concept

The external envelope of the building has been designed to incorporate robust and durable materials. The use of raw materials such as off-shutter concrete, aluminum and glass not only contribute to the desired 'machine aesthetic', but are also low maintenance, which in turn benefits life cycle costs.

Through a dynamic composition of these limited materials and colour, the resulting tower is an exciting three-dimensional object that complements its hi-tech context and function.

- The base

The base of the tower incorporates the material palette of the tower in a more robust, public interpretation. The energy of the concrete structure becomes the primary expression in the base, with the 'heavy' supporting 'legs' structuring the spatial experience. The other ground floor accommodation responds to the lighter louvers above, and expresses itself as a number of playful and poetic objects that lightly clip onto the 'legs'.

- Auditorium

The sculptured form of the auditorium expresses creative energy. The cantilevered beams of the auditorium are left exposed to express their integration into the dynamic concrete structure. The remainder of the auditorium is clad textured aluminum panels to express the visual 'lightness' of the body of the auditorium as it clips onto the structure.

- Call and messenger centre

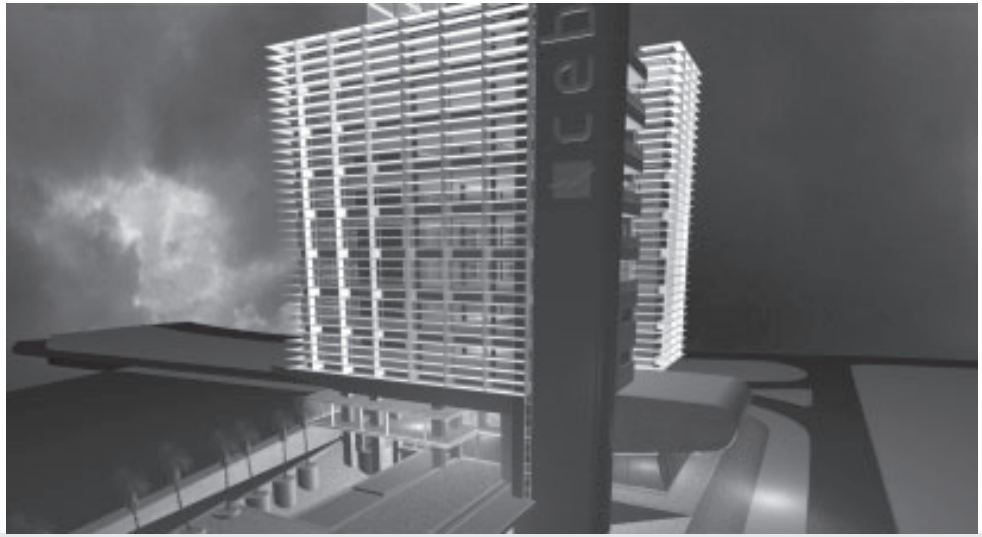
The call centre and messenger center floating near the entrance expresses the importance of the service driven ideals of the CEB by expressing their function on the exterior of the building through a structurally glazed glass box. The glass box also becomes a billboard for signage for pedestrian traffic.

- Canteen and Kitchen

The canteen on the second level uses the same language of the call centre and it sits above the off-shutter concrete wall of the kitchen.

- Cores and structure

The two cores clad in red aluminum panels not only brace the concrete structure, but through their dramatic use of colour, visually tie the composition of components together. The choice of red is intentional, as it is the colour with the most 'powerful' presence and therefore contributes to the visual 'energy' of the three-dimensional form. These two cores in turn become red clad beams at the transfer level of the tower to further enhance the structural energy and excitement of the structural system.



- The tower

The dramatic 'lantern' has been enhanced through its structural integrity. To maintain the visual effect of the 'transparency' of the glass box, the spandrel panel is an opaque glass element which can be lit from behind in order to strengthen the image of a homogenous glass 'lantern' at night.

The introduction of coloured internal blinds, louvers and dry walls in the various different spaces, results in a dynamic, 'living' façade that begins to express the ever changing internal use and activity through the transparent glass box to passersby.

- The 5th elevation - landscaping

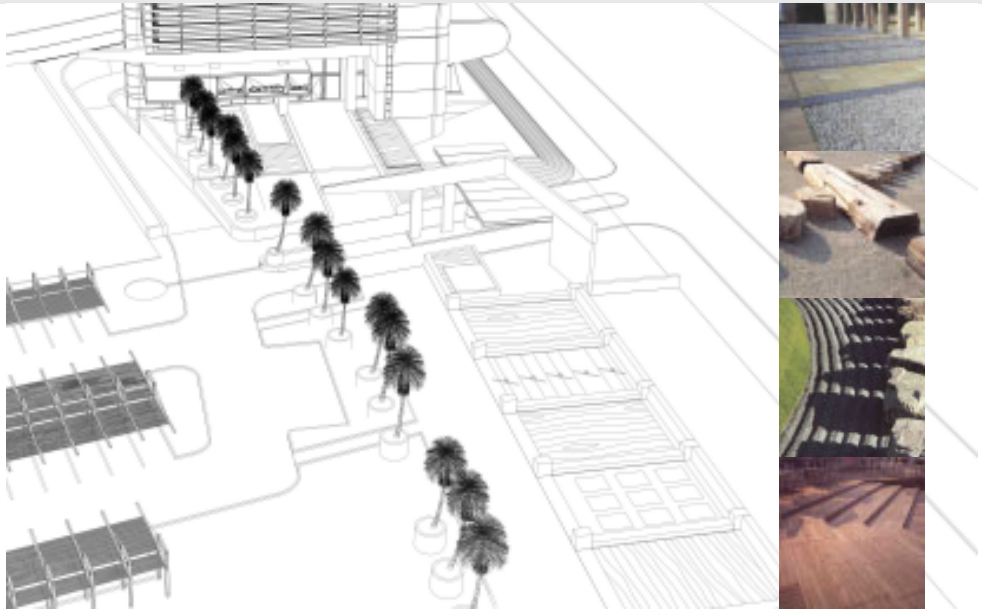
In a tower building, the surrounding landscape becomes as essential a design component as one of the elevations of building itself. The river and mountains to the north are examples of the 'ideal' 5th elevation.

For this reason, emphasis has been placed on the resolution of an exciting and captivating landscaping concept that can be enjoyed both at ground level and visually by the inhabitants of the building.

The landscape design responds to three key elements with specific identities that enhance the outdoor environment and create areas where people can relax and enjoy the beauty of their surroundings:

1. 'internal' landscape – planting on terraces
2. hard landscape – paved areas
3. soft landscape – gardens and green areas

These three landscapes types will be treated as 'jewel boxes' within the precinct to show case the CEB and the indigenous Mauritian landscape.



- The terrace

The canteen terrace combines the hard paved outdoor eating area with soft planting, water and bamboo screen 'walls', to create a pleasant secure outdoor environment for staff. Plants for this area will be chosen for their visual and aromatic qualities structured in ribbons of colour, texture and smell.

- The forest

The 'forest' surrounding the parking area will be achieved by replanting indigenous trees and plants, protecting and shading the cars. Additional carport structures will also be provided. The forest will help to soften the effect of the parking, and turn what is often an eye sore into a beautiful, natural component of the 5th elevation

- The 'energy gardens'

The six energy gardens form the spine of the site and flank the pedestrian promenade to the building's entrance. The gardens are conceived as stylized representations of the various ways and means of creating energy and power. These gardens will be designed as individual artworks, to be experienced from both a pedestrian and elevated level. They will Local artists and landscape architects can be commissioned to contribute to the design of these unique elements. These energy garden's become a showcase for the CEB and an important 'billboard' and marketing feature for passing traffic.

work...

think...

move...

relax...

serve, store...

kinetic energy...

Entrance:
The entrance of a building is its civic and public interface, it is the one's first impression of a building. The scale and sculptural quality of the base of the building and entrance promenade create a sense of expectation and in the lobby of the building there must be a sense of arrival.

It is in this light that the lobby becomes an opportunity to create a unique statement grounding this building to it's Mauritian and cyber city context. a hewn black basalt wall forms the main feature of the space and its richness is contrasted by a light porcelain floor. Timber panels and floor finishes to the upper floor bring warmth and richness to the palette.

Tower:
The energy of the users is ultimately affected by their working environment; therefore the creation of an exciting and efficient office space was seen as one of the most important design development criteria for this phase. The space planning, atmosphere and legibility of spaces were developed in a number of ways:

1. The circulation has been rationalised, optimising usable space and creating a legible office environment.
2. Where possible the positioning of meeting rooms, HOD offices and pause rooms are in the same position on different levels to help legibility and orientation in the building.
3. The structural and glazing facade module have been rationalised and structure the position of internal partitioning, ceiling grids, raised floor panels and services.
4. Open plan offices and "hubs" of activity and energy in the building are given predominant by placing them within double volume spaces, or overlooking them and allowing them to 'breathe'.
5. The finishes to office spaces have been developed to create a fitting atmosphere for the various functional requirements of the spaces. Hierarchy, character and individual expression were coupled with economic and holistic concerns, resulting in a standard palette of finishes which is neutral and transcends short term fashion ideas. Key areas of greater importance and prominence will be accented through colour and signage.

Spaces across the different departments were rationalised as a "kit of parts" and divided into a number of room types which will have similar finishes. The finishes vary across departments through the use of colour, and hierarchically through quality of finish.

Work:
Open plan, cellular, HOD
Floor: 1.2x1.2m modular raised floor with carpet finish
Walls: glass partition walls
Dry walling
½ height partition walls
Ceilings: 600x600 acoustic ceiling panels with plaster board bulkheads.
Window blinds: coloured louver blinds

Think:
Auditorium, meeting rooms, training room, boardroom:
Floor: carpet
Wall: plywood panels and slotted super wood panels with acoustic backing.
Ceiling: skimmed plasterboard ceiling

Move:
Reception and lift lobby:
Floor: highly trafficable material – tiles
Walls: decorative plaster and signage
Ceilings: decorative ceiling panels

Relax:
Canteen, mess and pause areas
Floor: tiles
Walls: paint/tiles
Ceilings: decorative ceiling panels

Gardens:
Low shrubs and climbing plants

Terraces:
Floor: Tiles
Balustrade: galvanised steel

Serve:
Electrical, fire equipment, mechanical, server, communications network
Floor: studded vinyl tiles
Walls: glazed partitioning
Ceilings: none

Store:
Archives, libraries, stores, documentation rooms
Floor: studded vinyl tiles
Walls: dry walling
Window treatment fixed and hinged coloured aluminium panels.

The design response to the 'kinetic' energy of the building is essential in creating an environment that will be socially sustainable.

master plan showing complete build-out

- Lateral expansion

The training school and recreational centre mentioned in stage 1 will be facilitated as a secondary lateral expansion along the main circulation axis towards the east. These faculties will be integrated into the 'energy' gardens as pavilion structures within a landscaped setting. It is essential that these faculties respond to the concept of the fifth elevation, and that their roofscapes are designed and detailed accordingly. Further architectural guidelines for these pavilions will be developed to ensure that they complement and respect the language, form, scale and proportion of the tower. It is envisaged that they will incorporate the language of the base and gatehouse, thus connecting them visually. Controls will also be placed on the height of these pavilions to ensure that the iconic integrity of the tower remains as the dominant expression of the precinct.

latent energy...
integrating phased expansion

- Vertical expansion

The tower is already at the maximum height as allowed by the Cybercity Guidelines and therefore no further vertical expansion can be accommodated. Although no vertical expansion has been suggested during the competition stages, the possibility of a second tower within the precinct has been considered. A second smaller 'lantern' located at the north eastern corner of the site would dramatically complete the main east-west circulation axis, and create a dynamic, vertical emphasis within Cybercity.

- Parking expansion

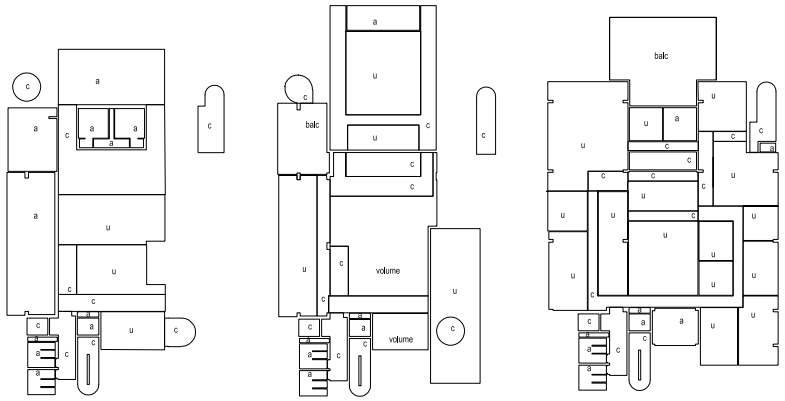
The numbers of parking bays provided in phase 1 were based on the Cybercity guidelines (1 car per 150m^2 of gross floor area) and additional bays were provided to cope with interim growth. Should additional bays be required the landscaped parking can be expanded eastwards into the man-made forest.

conclusion...

The second stage design development has looked at evolving the original concept and rationalizing the services and planning.

Whereas the previous stage focused more on the intellectual expression of an 'energy-inspired machine', the second stage has looked at the integration of these abstract principles with the objective pragmatics of space planning and service provision.

The resultant 'machine' thus incorporates the commercial necessities of an efficient, contemporary office building with the exciting and ambitious desires of the client to build an icon of international standards within the Cybercity precinct.



Although every effort has been made in this stage to reduce the gross floor area in stage 1, the gross floor area still exceeds the area allowed. The design development in stage 2 has resulted in a solution that optimizes useable area and reduces circulation area. However, we are confident that an interactive design development period with the client and quantity surveyor will be able to resolve this issue in such a way as to ensure that a solution can be achieved that does not unnecessarily compromised the architectural vision.

area schedule...

	Net Floor Area										
	Usable	% of gross area	Circulation	% of gross area	Ancillary	% of gross area	Partitions	% of gross area	Gross Floor Area	Balconies & planters	Volumes
Basement	0.00	0.0%	26.28	8.1%	278.00	85.7%	20.00	6.2%	**324.28**	0.00	0.00
Level One	369.06	60.0%	129.68	21.1%	89.07	14.5%	27.49	4.5%	**615.30**	0.00	6.70
Level Two	379.95	62.6%	112.36	18.5%	62.36	10.3%	51.89	8.6%	**606.56**	36.33	156.42
Level Three	618.24	70.3%	143.65	16.3%	80.97	9.2%	36.09	4.1%	**878.95**	4.21	9.86
Level Four	589.38	68.6%	147.56	17.2%	85.76	10.0%	36.78	4.3%	**859.48**	4.21	29.33
Level Five	448.12	63.1%	152.50	21.5%	85.66	12.1%	24.35	3.4%	**710.63**	115.64	64.25
Level Six	585.09	68.0%	157.52	18.3%	84.02	9.8%	33.50	3.9%	**860.13**	21.35	9.86
Level Seven	425.78	60.1%	166.23	23.5%	84.02	11.9%	32.22	4.5%	**708.25**	116.46	64.25
Level Eight	551.00	64.1%	190.19	22.1%	84.84	9.9%	33.67	3.9%	**859.70**	21.35	9.86
Level Nine	492.91	67.7%	131.62	18.1%	85.19	11.7%	18.21	2.5%	**727.93**	64.25	96.78
Level Ten	411.18	60.4%	160.43	23.6%	85.19	12.5%	23.80	3.5%	**680.60**	119.53	41.43
TOTAL	4870.71	62.2%	1518.02	19.4%	1105.08	14.1%	338.00	4.3%	**7831.81**	503.33	488.74