



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

# APOIO

Towards Integrated Urban Education in Pretoria

A Multi-Functional Vertical Primary School in Pretoria

by Dewald du Plessis

Study Leader: Marianne de Klerk  
Studio Master: Arthur Barker

Submitted in partial fulfilment of the requirements for the degree  
Magister in Architecture (Professional)

Department of Architecture, Landscape Architecture and Interior Architecture  
Faculty of Engineering, the Built Environment and Information Technology

University of Pretoria  
November 2010

The production of this document would not have been possible without the loving support of my parents, Tjaart and Henriëtte du Plessis

I would like to express my thanks to the following people who either kept me motivated, inspired me or influenced me in some way during my studies:

Marianne de Klerk and Arthur Barker  
(for their continues support, motivation and inspiration)

John and Irma Deppe

Tjaart and Lizette

All of my family

All of my friends



The Apollo Project investigates the recent establishment of numerous private educational institutions in the inner city of Pretoria. It identifies the need for adequate urban educational facilities and explores the use of existing buildings as schools. An existing educational cluster is identified at the eastern edge of the inner city, defined by Church, Du Toit and Pretorius Streets, and Nelson Mandela Drive. This city block and the ones surrounding it contain numerous primary, secondary and tertiary educational institutions in a predominant industrial/automotive precinct.

An urban design framework is proposed for the precinct. It is envisioned that the precinct may be developed as a mixed-use urban educational campus. Within the existing city block and the urban framework proposal, the Apollo Centre, located on the corner of Church-and Du Toit Street, is selected for an adaptive re-use intervention. The proposed use is an urban primary school.

The Apollo project investigates current pedagogical trends, which informed a concept that is largely defined by the idea of contextual learning within a vertical structure. Transparency and integration of education with the urban environment is at the core of the proposal. The traditional notion of horizontal education is explored in a vertical manner.

The existing structure is analyzed and a position taken regarding the adaptive re-use process that informs the design. Precedent Studies include existing schools within the inner city of Pretoria as well as local and international schools.

The process of converting the Apollo Centre into a primary educational facility, that shares its resources on a cross-programming basis, is explored in a series of proposals. The numerous explorations are considered in their various aspects, as well as their relationship to the whole, which then leads to a final design proposal. Key areas of the proposed Apollo Primary School will finally be resolved technically. A conclusion summarizes the author's thoughts on the result of the project.

# Abstract



Drawings by students of DANSA International College



<b>01 - Chapter 1</b> Introduction	02
<b>02 - Chapter 2</b> Context	10
<b>03 - Chapter 3</b> Pedagogical Philosophy	22
<b>04 - Chapter 4</b> Concept	30
<b>05 - Chapter 5</b> Existing Structure	36
<b>06 - Chapter 6</b> Adaptive Re-Use	48
<b>07 - Chapter 7</b> Precedent Studies	56
<b>08 - Chapter 8</b> Brief Development	66
<b>09 - Chapter 9</b> Design Development	72
<b>10 - Chapter 10</b> Technical Development	104
Conclusive Summary	144
Bibliography	146

# Content



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA



## 01 Introduction

### Figure 1.1

Students from Berea Park School, 2009

### Figure 1.2

Students from Berea Park School, 2009

### Figure 1.3

Students from Berea Park School, 2009

### Figure 1.4

Berea Park School, 2009

### Figure 1.5

Confidence College, 2009

### Figure 1.6

Greenwood College, 2009

### Figure 1.7

DANSA International College, 2009

### Figure 1.8

Founders Community School, 2009

### Figure 1.9

Princefield Trust School, 2009

### Figure 1.10

Haywood College, 2009

### Figure 1.11

Christian Progressive College, 2009

### Figure 1.12

University of South Africa (UNISA), <http://www.ileadbookkeeping.co.za/bookkeeping-courses-unisa-pretoria.html>, 7 October 2010

### Figure 1.13

Distribution of Educational Institutions (PTA), Department of Geology, University of Pretoria, Edited by Author, April 2010

### Figure 1.14

Traveling routes towards the city of Pretoria from its surrounding townships and informal settlements, Google Earth, Edited by Author, April 2010

### Figure 1.15

Influx of students from the Arcadia and Sunnyside residential precincts, as well as Pretoria Station in the south and Belle Ombre Station in the north,

Google Earth, Edited by Author, April 2010

### Figure 1.16

Typical transportation modes used to travel into and around the city of Pretoria, Author 2010

### Figure 1.17

Playgrounds (inadequate recreational space), 2009

### Figure 1.18

Classrooms (inadequate natural lighting and ventilation), 2009

### Figure 1.19

Library (no provision made for the storing of books), 2009

### Figure 1.20

Phase 1 - BLUE, Author 2010

### Figure 1.21

Phase 2 - GREEN, Author 2010

### Figure 1.22

Phase 3 - RED, Author

### Figure 1.23

Phase 4 - YELLOW, Author

### Figure 1.24

Phase 5 - TURN 1, Author

## 02 Context

### Figure 2.1

Eastern precinct of inner city Pretoria, 2010

### Figure 2.2

Map of the Republic of South Africa, [http://www.nationsonline.org/maps/south\\_africa\\_map.jpeg](http://www.nationsonline.org/maps/south_africa_map.jpeg), Edited by Author, 26 April 2010

### Figure 2.3

Map of Gauteng Province, [http://www.tshwane.gov.za/streetmaps/Gauteng\\_Province\\_A4.pdf](http://www.tshwane.gov.za/streetmaps/Gauteng_Province_A4.pdf), Edited by Author, 26 April 2010

### Figure 2.4

Map of Tshwane Metropole, [http://www.tshwane.gov.za/streetmaps/Tshwane\\_regions.pdf](http://www.tshwane.gov.za/streetmaps/Tshwane_regions.pdf), Edited by Author, 26 April 2010

# List of Figures



### Figure 2.5

Diagrammatic Analysis of Pretoria, Department of Geology, University of Pretoria, Edited by Author, April 2010

### Figure 2.6

Panoramic view of the city of Pretoria from a rooftop within the precinct investigated, 2010

### Figure 2.7

Educational Institutions within precinct investigated. Specific block of intervention also identified, Department of Geology, University of Pretoria, Edited by Author, April 2010

### Figure 2.8

Bird's Eye View of Existing Urban Fabric in Precinct, Author 2010

### Figure 2.9

Industrial / Automotive building types in precinct, 2010

### Figure 2.10

Industrial / Automotive building types in precinct, 2010

### Figure 2.11

Industrial / Automotive building types in precinct, 2010

### Figure 2.12

Industrial / Automotive building types in precinct, 2010

### Figure 2.13

Urban Analysis of Existing Precinct, Author 2010

### Figure 2.14

Urban Framework Proposal for Precinct, Author 2010

### Figure 2.15

Pedestrian orientated routes, introduction of green structure, continuous street facades and excessive signage, Author 2010

### Figure 2.16

Extended sidewalk space, and parallel parking, Author 2010

### Figure 2.17

Covered sidewalk space, Author 2010

### Figure 2.18

Off-street basement parking, Author 2010

### Figure 2.19

Pedestrian crossings, Author 2010

### Figure 2.20

Different floor materials, street furniture, and signage, Author 2010

### Figure 2.21

Aerial photograph of block containing intervention, Edited by Author, <http://gis.tshwane.gov.za/website/Tshwane/Internet/viewer.htm?>, 27 April 2010

### Figure 2.22

Proposed Demolishment Plan, Author 2010

### Figure 2.23

Proposed Development Plan, Author 2010

## 03 Pedagogical Philosophy

### Figure 3.1

Students of DANSA International College, 2010

### Figure 3.2

Cartoon illustrating the effect of excessive tests, [http://sitemaker.umich.edu/356.dominguez/files/test\\_cartoon.jpg](http://sitemaker.umich.edu/356.dominguez/files/test_cartoon.jpg), 22 April 2010

### Figure 3.3

John Dewey, [http://www.lib.uchicago.edu/e/spcl/centcat/fac/images/faculty\\_img18\\_lrg.jpg](http://www.lib.uchicago.edu/e/spcl/centcat/fac/images/faculty_img18_lrg.jpg), 22 April 2010

### Figure 3.4

Montessori Education, <http://www.ecps.us/images/pages/N415/Maria%20%20Children%20Big.jpg>, 22 April 2010

### Figure 3.5

Montessori Education, Standing (1966: p.127), 2010

### Figure 3.6

Montessori Education Standing (1966: 127), 2010

### Figure 3.7

Waldorf Education, [http://www.jweekly.com/images/upload/z\\_photos\\_2009/k10\\_09\\_09/BAshalom2.jpg](http://www.jweekly.com/images/upload/z_photos_2009/k10_09_09/BAshalom2.jpg), 22 April 2010

## 04 Concept

### Figure 4.1

View of urban context from DANSA International College classroom window, 2010

### Figure 4.2

From 'horizontal' to 'vertical' education, Author 2010

### Figure 4.3

DANSA International College, within a typical urban context, 2010

### Figure 4.4

Sub-urban vs Urban Context, Author 2010

### Figure 4.5

Open Air schooling, [http://www.rferl.org/content/Afghan\\_Insurgents\\_Attack\\_Soft\\_Targets/1187012.html](http://www.rferl.org/content/Afghan_Insurgents_Attack_Soft_Targets/1187012.html), 7 October 2010

### Figure 4.6

Traditional classroom (Menlo Park High School), 2010

### Figure 4.7

Diagram indicating how the educational process should become transparent for the students, as well as general public, Author 2010

### Figure 4.8

Diagram indicating how the traditional education process reach a critical point where 'real life' and education meets, Author 2010

### Figure 4.9

Diagram indicating how the educational process and 'real life' becomes integrated and not necessarily ever reach a critical point, Author 2010

### Figure 4.10

Various alterations are visible on the facade of Berea Park School. The structure was originally used for warehousing purposes, 2009

### Figure 4.11

Diagram indicating how an adaptive re-use scenario is established by applying a new use to an existing building, Author 2010

### Figure 4.12

Purpose built educational structure (Menlo Park High School), 2010

### Figure 4.13

Typical example of an educational supportive function (PostNet), 2010

### Figure 4.14

After hour educational activities (Princefield Trust School), 2010

### Figure 4.15

Relationships between public facilities (CSIR: 2009), 2010

### Figure 4.16

An example of an Educational facility cluster (CSIR: 2009), 2010

### Figure 4.17

Compatibility Matrix (CSIR: 2009), 2010

## 05 Existing Structure

### Figure 5.1

Bird's Eye view of the Apollo Centre, Author 2010

### Figure 5.2

The Apollo Centre on the corner of Church and Du Toit Street, 2010

### Figure 5.3

Vehicle orientated Church street forms the northern boundary, 2010

### Figure 5.4

Du Toit Street (western boundary), 2010

### Figure 5.5

Service road and vacant warehouse (southern boundary), 2010

### Figure 5.6

Possible future connection, Author 2010

### Figure 5.7

Church Street (northern boundary), 2010

### Figure 5.8

Two-storey educational structure (eastern boundary), 2010

### Figure 5.9

Proposed demolition and creation of pedestrian walkway, Author 2010





**Figure 5.10**

Birds-eye view of site boundaries (1), Author 2010

**Figure 5.11**

Birds-eye view of site boundaries (2), Author 2010

**Figure 5.12**

Birds-eye view of site boundaries (3), Author 2010

**Figure 5.13**

Birds-eye view of site boundaries (4), Author 2010

**Figure 5.14**

3-Dimensional structural composition of the Apollo Centre, Author 2010

**Figure 5.15**

Ground Floor Plan (Scale 1:500), Author 2010

**Figure 5.16**

Birds-eye view of Ground Floor, Author 2010

**Figure 5.17**

Main entrance to the Apollo Centre from Church Street, 2010

**Figure 5.18**

Various retail functions located on the Ground Floor, 2010

**Figure 5.19**

Vehicular entrance to the Apollo Centre from Du Toit Street, 2010

**Figure 5.20**

Upper Basement Floor Plan (Scale 1:500), Author 2010

**Figure 5.21**

Lower Basement Floor Plan (Scale 1:500), Author 2010

**Figure 5.22**

Birds-eye view of Lower Basement Floor, Author 2010

**Figure 5.23**

Parking bays located in-between existing columns, 2010

**Figure 5.24**

Mechanically ventilated basement cavity walls, 2010

**Figure 5.25**

Transformer room, 2010

**Figure 5.26**

First Floor Plan (Scale 1:500), Author 2010

**Figure 5.27**

Birds-eye view of First Floor, Author 2010

**Figure 5.28**

First Floor partially cantilever over pedestrian walkways below, 2010

**Figure 5.29**

Light weight steel cladding, 2010

**Figure 5.30**

Double volume spaces on both sides of concrete service core, 2010

**Figure 5.31**

Second Floor Plan (Scale 1:500), Author 2010

**Figure 5.32**

Birds-eye view of Second Floor, Author 2010

**Figure 5.33**

Double volume spaces that are connected to the first floor, 2010

**Figure 5.34**

Mechanical ventilation room on northern platform, 2010

**Figure 5.35**

Exterior second floor area (first floor rooftop), 2010

**Figure 5.36**

Upper Floor Plans (Scale 1:500), Author 2010

**Figure 5.37**

Birds-eye view of Upper Floors, Author 2010

**Figure 5.38**

Concrete columns periphery, 2010

**Figure 5.39**

Suspended ceilings, 2010

**Figure 5.40**

Tinted, glazed sunscreen panels fixed to concrete overhangs, 2010

**Figure 5.41**

Rooftop Floor Plan (Scale 1:500), Author 2010

**Figure 5.42**

Birds-eye view of Rooftop Floor, Author 2010

**Figure 5.43**

One-and-half-storey elevator room above service core, 2010

**Figure 5.44**

Unsafe periphery with hollow brick columns ending

in stubs, 2010

**Figure 5.45**

View down Church Street from the rooftop space, 2010

**Figure 5.46**

Typical Section of the Existing Apollo Centre, Author 2010

## 06 Adaptive Re-Use

**Figure 6.1**

Berea Park Independent School, 2009

**Figure 6.2**

Existing structure within city block of intervention, 2010

**Figure 6.3**

Existing structure within city block of intervention, 2010

**Figure 6.4**

Existing structure within city block of intervention, 2010

**Figure 6.5**

Basic options for adaptation, Kincaid (2002: 12)

**Figure 6.6**

The Apollo Centre, 2010

**Figure 6.7**

Berea Park School, 2009

**Figure 6.8**

Aerial Photograph of Berea Park School, Google Earth, Edited by Autor, October 2010

**Figure 6.9**

Lion Bridge Building (classrooms and staff accommodation), 2009

**Figure 6.10**

Main pedestrian entrance (previously shop fronts), 2009

**Figure 6.11**

IT-lab (different previous usage visible in background), 2009

**Figure 6.12**

Drywall partitioning is used to sub-divide the warehouse into classroom spaces (minimum natural

lighting and ventilation), 2009

**Figure 6.13**

Drywall partitioning used to create classroom spaces, 2009

**Figure 6.14**

Steel supports inserted for wooden flooring above, 2009

**Figure 6.15**

Multi-purpose indoor gathering space, 2009

**Figure 6.16**

DANSA International College, 2009

**Figure 6.17**

Aerial Photograph of DANSA International College, Google Earth, Edited by Author, October 2010

**Figure 6.18**

Main pedestrian entrance from Schoeman Street, 2010

**Figure 6.19**

Reception on the second floor (alteration in background), 2010

**Figure 6.20**

IT-lab (alteration visible in background), 2010

**Figure 6.21**

Typical classroom with an abundance of northern light, 2010

**Figure 6.22**

Typical classroom with an abundance of northern light, 2010

**Figure 6.23**

Views of the urban context is constantly visible, 2010

**Figure 6.24**

Gathering space on ground floor (previously retail activity), 2010

**Figure 6.25**

Landau Public Library at night, [http://lamott.de/display.php?large\\_id=759&project\\_id=69](http://lamott.de/display.php?large_id=759&project_id=69), 11 October 2010

**Figure 6.26**

The alteration clearly distinguishes the old and new on the elevation with different materials. The scale of the alteration has been done in a sympathetic way to the existing, [http://lamott.de/display.php?large\\_](http://lamott.de/display.php?large_)



id=759&project\_id=69, 11 October 2010

### Figure 6.27

Horizontal wooden-slats provides shading for the interior, [http://lamott.de/display.php?large\\_id=759&project\\_id=69](http://lamott.de/display.php?large_id=759&project_id=69), 11 October 2010

### Figure 6.28

The added brise-soleil is offset from the main structure, with a metal grille inserted in-between as a fire escape, [http://lamott.de/display.php?large\\_id=759&project\\_id=69](http://lamott.de/display.php?large_id=759&project_id=69), 11 October 2010

### Figure 6.29

A play of old and new, and heavy and light materials is created on the interior, [http://lamott.de/display.php?large\\_id=759&project\\_id=69](http://lamott.de/display.php?large_id=759&project_id=69), 11 October 2010

## 07 Precedent Studies

### Figure 7.1

Open Air School in Amsterdam, <http://www.flickr.com/photos/roryrory/2627656346/>, 28 July 2010

### Figure 7.2

Rooftop playground of the Beekman Hill International School, New York, Minutillo (2010: 105), 2010

### Figure 7.3

Partially covered rooftop playground, <http://www.cabe.org.uk/case-studies/hampden-gurney?photos=true&viewing=2488>, 28 July 2010

### Figure 7.4

Typical floor plan layout, <http://www.oecd.org/dataoecd/62/21/36931159.pdf>, 28 July 2010

### Figure 7.5

Protected rooftop playground, Minutillo (2010: 105), 2010

### Figure 7.6

Gymnasium on 6th floor, Minutillo (2010: 105), 2010

### Figure 7.7

Vertical composition of school, Minutillo (2010: 105), 2010

### Figure 7.8

Personalized working platforms cantilevering into the central atrium, Hertzberger (1991: 23), 2010

### Figure 7.9

Group working areas seen from the exterior, Hertzberger (1991: 133), 2010

### Figure 7.10

Central communal staircase as versatile and interactive space, Hertzberger (1991: 214), 2010

### Figure 7.11

Spatial composition of structure, Hertzberger (1991: 213), 2010

### Figure 7.12

Stepped parapet next to staircase overlooking central space, Hertzberger (1991: 186), 2010

### Figure 7.13

Openable section between two classrooms, Hertzberger (1991: 224), 2010

### Figure 7.14

View of the Open Air School with its outside learning spaces on the upper levels, <http://www.flickr.com/photos/roryrory/2627656346/>, 28 July 2010

### Figure 7.15

View into the school from street level, [http://www.artificeimages.com/gbc/images/cid\\_aj1335\\_b.jpg](http://www.artificeimages.com/gbc/images/cid_aj1335_b.jpg), 28 July 2010

### Figure 7.16

Typical floor plan layout, Hertzberger (1991: 247), 2010

### Figure 7.17

Aerial view of the Akragon and Technikon, Verstegen (2009: 65), 2010

### Figure 7.18

Main building and connecting area, Verstegen (2009: 67), 2010

### Figure 7.19

Cross-section of the main hall, Verstegen (2009: 66), 2010

### Figure 7.20

The structural form expresses and compliments its function, <http://travel.webshots.com/photo/1412022673055379087fazQcl>, 28 July 2010

### Figure 7.21

The transparent facade makes the interior activities visible, <http://www.d-light.nl/images/nieuwsimages/>

vk\_educatorium1.jpg, 28 July 2010

### Figure 7.22

Bold expression of the brick clad theatre, [http://www.mimoo.nl/images/11072\\_1.jpg](http://www.mimoo.nl/images/11072_1.jpg), 28 July 2010

### Figure 7.23

Sectional Drawing, [http://www.greatbuildings.com/cgi-bin/gbc-drawing.cgi/Engineering\\_Building.html/Leicester\\_Sect\\_A\\_\(SE\).jpg](http://www.greatbuildings.com/cgi-bin/gbc-drawing.cgi/Engineering_Building.html/Leicester_Sect_A_(SE).jpg), 28 July 2010

### Figure 7.24

View from campus showing 45 degree angled glazing protruding from heavy brickwork on secondary tower, [http://www.flickr.com/photos/joseph\\_beuys\\_hat/2384393601/](http://www.flickr.com/photos/joseph_beuys_hat/2384393601/), 28 July 2010

### Figure 7.25

Different lighting techniques and glazing colors reinforce the architectural intentions, <http://abduzeedo.com/architect-day-oma>, 28 July 2010

### Figure 7.26

Part of the main circulation route is expressed on the transparent facade by the extrusion thereof, <http://architecturelab.net/2008/07/20/an-obsessive-compulsion-towards-the-spectacular/>, 28 July 2010

### Figure 7.27

Plan of 'unravelling' trajectory, Brensing (2004: 54), 2010

### Figure 7.28

Architectural Concept: Trajectories 'zigzagging' around a cube, [http://www.architecture-page.com/assets/images/content/prj\\_oma\\_emba/HW1.jpg](http://www.architecture-page.com/assets/images/content/prj_oma_emba/HW1.jpg), 28 July 2010

### Figure 7.29

A timber clad skin conceals the main circulation volume, [http://www.miesarch.com/index.php?option=com\\_mipress\\_anterior&lang=en&offset=1200&cerca=&autor=-1&officina=-1&tipologia=-1&classificacio=-1&pais=-1&edificio=-1](http://www.miesarch.com/index.php?option=com_mipress_anterior&lang=en&offset=1200&cerca=&autor=-1&officina=-1&tipologia=-1&classificacio=-1&pais=-1&edificio=-1), 28 July 2010

### Figure 7.30

Sectional Drawing showing differing floor heights, Verstegen (2009: 90), 2010

### Figure 7.31

Main circulation volume with 'bridges' connecting both sides, <http://blog.nayima.be/2008/10/>, 28 July 2010

### Figure 7.32

Technical Classroom, Verstegen (2009: 90), 2010

### Figure 7.33

Bredero School Building, Verstegen (2009: 239), 2010

### Figure 7.34

Kitchen, Verstegen (2009: 241), 2010

### Figure 7.35

Sketch Design by Van Gameren en Mastenbroek, Verstegen (2009: 240), 2010

## 08 Brief Development

### Figure 8.1

Staff of DANSA International College, 2010

### Figure 8.2

Urban dwellers, 2010

### Figure 8.3

Primary school children, 2010

### Figure 8.4

Tertiary students from Tshwane North College, 2010

### Figure 8.5

Potential Clients, 2010

### Figure 8.6

Minimum Space Norms and Standards of Small Primary School Prototype, DOE (2008)

## 09 Design Development

### Figure 9.1

Rubik's Cube, <http://pizzaseminaruwo.blogspot.com/2010/03/solving-rubiks-cube-using-group-theory.html>, 14 October 2010

### Figure 9.2

Existing Structure, Author 2010

### Figure 9.3

Proposed Functional Zoning, Author 2010

### Figure 9.4



Functional Zoning (model by author), Author 2010

**Figure 9.5**

Exploration sketches, Author 2010

**Figure 9.6**

Horizontal to vertical schooling in a mixed-use environment, Author 2010

**Figure 9.7**

Different relationships between the public and private realms, Author 2010

**Figure 9.8**

Internal vs External circulation, Author 2010

**Figure 9.9**

Different ways of treating vertical circulation, Author 2010

**Figure 9.10**

"In-between" spaces that exist between two levels of varying height, Author 2010

**Figure 9.11**

A vertical environment containing a rich mix of interior and exterior spaces, Author 2010

**Figure 9.12**

Shifting similar spaces at different levels could lead to playful facades, Author 2010

**Figure 9.13**

Proposed 3-Dimensional structure, Author 2010

**Figure 9.14**

3-dimensional image, Author 2010

**Figure 9.15**

Model by author, testing different rooftop usage variations, 2010

**Figure 9.16**

Exploration of rooftop usage, Author 2010

**Figure 9.17**

North Eastern corner of the Apollo Centre structurally opened (model by Author), 2010

**Figure 9.18**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.19**

Model by author, 2010

**Figure 9.20**

3-Dimensional section, Author 2010

**Figure 9.21**

Sectional explorations, Author 2010

**Figure 9.22**

Layering of all the floor plans lead to x-ray like images, Author 2010

**Figure 9.23**

Model by author, 2010

**Figure 9.24**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.25**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.26**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.27**

Proposed structure within the proposed context, Author 2010

**Figure 9.28**

Proposed structure within the proposed context, Author 2010

**Figure 9.29**

Proposed pedestrian arcade connecting Church and Pretorius Street, Author 2010

**Figure 9.30**

Ground Floor, Author 2010

**Figure 9.31**

First Floor, Author 2010

**Figure 9.32**

Second Floor, Author 2010

**Figure 9.33**

Third Floor, Author 2010

**Figure 9.34**

Typical Upper Floor, Author 2010

**Figure 9.35**

Rooftop, Author 2010

**Figure 9.36**

3-Dimensional section, Author 2010

**Figure 9.37**

Conceptual addition of auditorium to the upper levels, Author 2010

**Figure 9.38**

Addition of auditorium over pedestrian arcade, with recreational space on its rooftop, Author 2010

**Figure 9.39**

Wrapping the recreational space around the existing structure, Author 2010

**Figure 9.40**

New vertical circulation on northern facade, Author 2010

**Figure 9.41**

3-Dimensional section, Author 2010

**Figure 9.42**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.43**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.44**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.45**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.46**

Proposed ramp to auditorium over pedestrian arcade, Author 2010

**Figure 9.47**

Proposed running track around the building, Author 2010

**Figure 9.48**

Proposed staircases within existing double volumes, Author 2010

**Figure 9.49**

Proposed running track around the building, Author 2010

**Figure 9.50**

New vertical circulation with central atrium, Author 2010

**Figure 9.51**

Proposed rooftop gathering space, Author 2010

**Figure 9.52**

3-Dimensional sections of proposed structure, Author 2010

**Figure 9.53**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.54**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.55**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.56**

Proposed auditorium with indoor sports hall on-top, Author 2010

**Figure 9.57**

New vertical circulation and rooftop recreation area, Author 2010

**Figure 9.58**

Proposed western screen, connecting two levels, Author 2010

**Figure 9.59**

Proposed staircases within existing double volumes, Author 2010

**Figure 9.60**

Proposed circulation for lower floors, Author 2010

**Figure 9.61**

Proposed service screen and rooftop greenhouse, Author 2010

**Figure 9.62**

Model by author, 2010

**Figure 9.63**

Sectional explorations, Author 2010

**Figure 9.64**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.65**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.66**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.67**

Proposed urban amphitheater, Author 2010



**Figure 9.68**

Proposed transparency of indoor sports hall, Author 2010

**Figure 9.69**

Proposed new system for vertical circulation, Author 2010

**Figure 9.70**

Proposed multi-purpose indoor sports hall, Author 2010

**Figure 9.71**

Proposed western screening and solid edge, Author 2010

**Figure 9.72**

Proposed classroom environments, Author 2010

**Figure 9.73**

Proposed new circulation for lower floors and potential future connection area, Author 2010

**Figure 9.74**

Proposed educational greenhouse/nursery, Author 2010

**Figure 9.75**

Model by author, 2010

**Figure 9.76**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.77**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.78**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.79**

Proposed public interface to arcade, Author 2010

**Figure 9.80**

Sculptural concrete work overhead, Author 2010

**Figure 9.81**

Natural light playfully entering the multi-purpose hall, Author 2010

**Figure 9.82**

More natural light allowed to reach pedestrian arcade, Author 2010

**Figure 9.83**

Proposed back of stage, Author 2010

**Figure 9.84**

New vertical circulation at lower floors, Author 2010

**Figure 9.85**

Opening of structure to widen pedestrian route, Author 2010

**Figure 9.86**

Social seating that edges communal gathering space, Author 2010

**Figure 9.87**

New concrete staircases in existing double volumes, Author 2010

**Figure 9.88**

3-Dimensional Section, Author 2010

**Figure 9.89**

3-Dimensional Section, Author 2010

**Figure 9.90**

3-Dimensional Section, Author 2010

**Figure 9.91**

3-Dimensional Section, Author 2010

**Figure 9.92**

3-Dimensional Section, Author 2010

**Figure 9.93**

3-Dimensional Section, Author 2010

**Figure 9.94**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.95**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.96**

3-Dimensional image of proposed structure, Author 2010

**Figure 9.97**

New public interface and semi-transparent auditorium, Author 2010

**Figure 9.98**

Sloped seating area offers views from inside outward, Author 2010

**Figure 9.99**

Proposed ramp for students to entrance on first

floor, Author 2010

**Figure 9.100**

Western screening of lower floors, Author 2010

**Figure 9.101**

Cantilevering glass boxes and stepped parapets, Author 2010

**Figure 9.102**

Rooftop basketball court, Author 2010

**Figure 9.103**

Eastern screening of open-air learning spaces, Author 2010

**Figure 9.104**

Existing glazed sunscreen panels, Author 2010

**Figure 9.105**

Proposed rooftop greenhouse/nursery, Author 2010

**Figure 9.106**

3-Dimensional Section, Author 2010

**Figure 9.107**

Ground Floor, Author 2010

**Figure 9.108**

First Floor, Author 2010

**Figure 9.109**

Second Floor, Author 2010

**Figure 9.110**

Third Floor, Author 2010

**Figure 9.111**

Fourth Floor, Author 2010

**Figure 9.112**

Typical Upper floors, Author 2010

**Figure 9.113**

Rooftop, Author 2010

**Figure 9.114**

Section of proposed structure, Author 2010

**Figure 9.115**

Section of proposed structure, Author 2010

**Figure 9.116**

Existing building adjacent to the Apollo Centre, Author 2010

**Figure 9.117**

Building proposed for demolition, Author 2010

**Figure 9.118**

Introduction of pedestrian arcade, Author 2010

**Figure 9.119**

Existing pedestrian interface of the Apollo Centre, Author 2010

**Figure 9.120**

Proposed area of intervention, Author 2010

**Figure 9.121**

Proposed new pedestrian interface, Author 2010

**Figure 9.122**

Existing eastern facade and proposed pedestrian arcade, Author 2010

**Figure 9.123**

Proposed area of intervention, Author 2010

**Figure 9.124**

Proposed multi-purpose auditorium over pedestrian arcade, Author 2010

**Figure 9.125**

Existing western and southern facades, Author 2010

**Figure 9.126**

Proposed areas of intervention, Author 2010

**Figure 9.127**

Proposed new circulation areas on the southern facade, Author 2010

**Figure 9.128**

Existing rooftop of proposed auditorium, Author 2010

**Figure 9.129**

Proposed area of intervention, Author 2010

**Figure 9.130**

Proposed rooftop playground and roof covering, Author 2010

**Figure 9.131**

Existing upper floors proposed for classroom areas, Author 2010

**Figure 9.132**

Proposed areas of intervention, Author 2010

**Figure 9.133**

Proposed exterior double volume areas, Author 2010



**Figure 9.134**

Existing upper floors with double volumes proposed, Author 2010

**Figure 9.135**

Proposed area of intervention, Author 2010

**Figure 9.136**

Proposed vertical gardening screen on eastern side, Author 2010

**Figure 9.137**

Existing rooftop of the Apollo Centre, Author 2010

**Figure 9.138**

Proposed area of intervention, Author 2010

**Figure 9.139**

Proposed Natural Sciences Room for the rooftop space, Author 2010

**Figure 9.140**

Ground Floor, Author 2010

**Figure 9.141**

First Floor, Author 2010

**Figure 9.142**

Second Floor, Author 2010

**Figure 9.143**

Third Floor, Author 2010

**Figure 9.144**

Fourth Floor, Author 2010

**Figure 9.145**

Fifth Floor, Author 2010

**Figure 9.146**

Sixth Floor, Author 2010

**Figure 9.147**

Seventh Floor, Author 2010

**Figure 9.148**

Eighth Floor, Author 2010

**Figure 9.149**

Ninth Floor, Author 2010

**Figure 9.150**

Tenth Floor, Author 2010

**Figure 9.151**

Rooftop Greenhouse/Nursery, Author 2010

**Figure 9.152**

Bird's eye view of model showing structural com-

position of first three floors of the proposed altered structure, Author 2010

**Figure 9.153**

View of model from the corner of Church and Du Toit Street, Author 2010

**Figure 9.154**

Bird's eye view of model from a north western direction, Author 2010

**Figure 9.155**

Bird's eye view of model from a south-eastern direction, Author 2010

**Figure 9.156**

View of model from Du Toit Street, Author 2010

**Figure 9.157**

Proposed pedestrian space at Church Street interface, Author 2010

## 10 Technical Development

**Figure 10.1**

3-Dimensional view of the proposed structure, Author 2010

**Figure 10.2**

Lower Basement Level, Author 2010

**Figure 10.3**

Upper Basement Level, Author 2010

**Figure 10.4**

Ground Floor, Author 2010

**Figure 10.5**

Bird's eye view of Ground Floor, Author 2010

**Figure 10.6**

Entrance to the Apollo Primary School, Author 2010

**Figure 10.7**

Informal urban performance area, Author 2010

**Figure 10.8**

Church Street pedestrian space, Author 2010

**Figure 10.9**

Cnr. Church and Du Toit Street pedestrian space, Author 2010

**Figure 10.10**

Entrance to Basement from Du Toit Street, Author

2010

**Figure 10.11**

Reception Area with social staircase to First Floor, Author 2010

**Figure 10.12**

Visitor Waiting Area with viewport to main staircase, Author 2010

**Figure 10.13**

Culinary School with circular windows to urban context, Author 2010

**Figure 10.14**

First Floor, Author 2010

**Figure 10.15**

Bird's eye view of First Floor, Author 2010

**Figure 10.16**

I-Beam steel structure tied to building and supports floors above, Author 2010

**Figure 10.17**

I-Beam steel structure tied to building with corrugated iron sheets to form western screening device, Author 2010

**Figure 10.18**

I-Beam steel structure tied to building with corrugated iron sheets to form western screening device, Author 2010

**Figure 10.19**

Circular windows create gathering places with social staircase to second floor, Author 2010

**Figure 10.20**

I-Beam column structure support floors above with social staircase to second floor, Author 2010

**Figure 10.21**

The space beneath the social staircase on the western side opens up with views to the cooking school below, Author 2010

**Figure 10.22**

The space beneath the social staircase on the eastern side connects to the ground floor reception area, Author 2010

**Figure 10.23**

Auditorium stage, Author 2010

**Figure 10.24**

Second Floor, Author 2010

**Figure 10.25**

Bird's eye view of Second Floor, Author 2010

**Figure 10.26**

Glazed northern facade with horizontal aluminium extrusions fixed to the structural window frame system, Author 2010

**Figure 10.27**

Glazed facade wraps around to western side with the corrugated western screening continuing on the western facade, Author 2010

**Figure 10.28**

New circulation areas on the southern facade with protruding glass boxes, Author 2010

**Figure 10.29**

Double volume lobby area continuing along the whole northern perimeter of the second floor, Author 2010

**Figure 10.30**

Views from lobby and personnel room down to the socializing areas, Author 2010

**Figure 10.31**

New circulation areas on the southern facade with steel staircase structure, Author 2010

**Figure 10.32**

View into transparent sound-lobby area alongside the auditorium, Author 2010

**Figure 10.33**

View from stage gallery to seating area of auditorium, Author 2010

**Figure 10.34**

Third Floor, Author 2010

**Figure 10.35**

Bird's eye view of Third Floor, Author 2010

**Figure 10.36**

Glazed northern facade with horizontal aluminium extrusions fixed to the structural window frame system, Author 2010

**Figure 10.37**

Glazed facade wraps around to western side with the corrugated western screening continuing on the western facade, Author 2010

**Figure 10.38**

Double volume lobby area with library above, Author



2010

**Figure 10.39**

View from library to lobby area below, Author 2010

**Figure 10.40**

The western side of the library opens up to the exterior with an open-air learning space provided outside, Author 2010

**Figure 10.41**

Library administration area located in-between the two new circulation areas on the southern facade, Author 2010

**Figure 10.42**

Steel staircase structure with protruding glass boxes on the southern facade, Author 2010

**Figure 10.43**

View towards auditorium stage from rear entrance, Author 2010

**Figure 10.44**

Fourth Floor, Author 2010

**Figure 10.45**

Bird's eye view of Fourth Floor, Author 2010

**Figure 10.46**

Concrete edge of exterior recreation area, Author 2010

**Figure 10.47**

Concrete edge with covered seating provided, Author 2010

**Figure 10.48**

Full size exterior basketball court, Author 2010

**Figure 10.49**

Tuck Shop located within cafeteria area, Author 2010

**Figure 10.50**

Cafeteria area with viewports to main circulation shaft, Author 2010

**Figure 10.51**

New circulation areas protruding from the southern facade, Author 2010

**Figure 10.52**

New circulation areas ending on the fourth floor, Author 2010

**Figure 10.53**

Fifth Floor, Author 2010

**Figure 10.54**

Bird's eye view of Fifth Floor, Author 2010

**Figure 10.55**

Bird's eye view of Sixth Floor, Author 2010

**Figure 10.56**

Structural steel mesh on eastern facade to allow for vertical gardening, Author 2010

**Figure 10.57**

Water collection tanks to provide grey water for ablution facilities below, Author 2010

**Figure 10.58**

Colorful angled walls to provide western screening. Northern screening provided by new glazed panels allowing for ventilation, Author 2010

**Figure 10.59**

Typical interior of classroom with viewports to main circulation shaft

**Figure 10.60**

Sixth Floor, Author 2010

**Figure 10.61**

Bird's eye view of Fifth Floor, Author 2010

**Figure 10.62**

Bird's eye view of Sixth Floor, Author 2010

**Figure 10.63**

Structural steel mesh on eastern facade to allow for vertical gardening, Author 2010

**Figure 10.64**

Water collection tanks to provide grey water for ablution facilities below, Author 2010

**Figure 10.65**

Colorful angled walls to provide western screening. Northern screening provided by new glazed panels allowing for ventilation, Author 2010

**Figure 10.66**

Typical interior of classroom with viewports to main circulation shaft

**Figure 10.67**

Seventh Floor, Author 2010

**Figure 10.68**

Bird's eye view of Seventh Floor, Author 2010

**Figure 10.69**

Bird's eye view of Eighth Floor, Author 2010

**Figure 10.70**

Structural steel allow for vertical gardening. The proposed double volume opening connects both open-air learning areas, Author 2010

**Figure 10.71**

The proposed double volume opening connects both open-air learning areas, Author 2010

**Figure 10.72**

Colorful angled walls to provide western screening. Northern screening provided by new glazed panels allowing for ventilation, Author 2010

**Figure 10.73**

Typical interior of classroom with viewports to main circulation shaft, Author 2010

**Figure 10.74**

Eighth Floor, Author 2010

**Figure 10.75**

Bird's eye view of Seventh Floor, Author 2010

**Figure 10.76**

Bird's eye view of Eighth Floor, Author 2010

**Figure 10.77**

Structural steel allow for vertical gardening. The proposed double volume opening connects both open-air learning areas, Author 2010

**Figure 10.78**

The proposed double volume opening connects both open-air learning areas, Author 2010

**Figure 10.79**

Colorful angled walls to provide western screening. Northern screening provided by new glazed panels allowing for ventilation, Author 2010

**Figure 10.80**

Typical interior of classroom with viewports to main circulation shaft, Author 2010

**Figure 10.81**

Ninth Floor, Author 2010

**Figure 10.82**

Bird's eye view of Ninth Floor, Author 2010

**Figure 10.83**

Bird's eye view of Tenth Floor, Author 2010

**Figure 10.84**

Structural steel allow for vertical gardening. The proposed double volume opening connects both

open-air learning areas, Author 2010

**Figure 10.85**

The proposed double volume opening connects both open-air learning areas, Author 2010

**Figure 10.86**

Colorful angled walls to provide western screening. Northern screening provided by new glazed panels allowing for ventilation, Author 2010

**Figure 10.87**

Typical interior of classroom with viewports to main circulation shaft, Author 2010

**Figure 10.88**

Tenth Floor, Author 2010

**Figure 10.89**

Bird's eye view of Ninth Floor, Author 2010

**Figure 10.90**

Bird's eye view of Tenth Floor, Author 2010

**Figure 10.91**

Structural steel allow for vertical gardening. The proposed double volume opening connects both open-air learning areas, Author 2010

**Figure 10.92**

The proposed double volume opening connects both open-air learning areas, Author 2010

**Figure 10.93**

Colorful angled walls to provide western screening. Northern screening provided by new glazed panels allowing for ventilation, Author 2010

**Figure 10.94**

Typical interior of classroom with viewports to main circulation shaft, Author 2010

**Figure 10.95**

Roof Floor Plan, Author 2010

**Figure 10.96**

Bird's eye view of Rooftop Floor, Author 2010

**Figure 10.97**

Bird's eye view of Roof, Author 2010

**Figure 10.98**

Solid walls with viewports to the urban context are topped with openable glazed facades, Author 2010

**Figure 10.99**

Openable glazed facades allow for an abundance of natural lighting and ventilation. Water tanks store



water collected from the roof, Author 2010

**Figure 10.100**

Work surfaces are placed on the perimeter with viewports to the urban context, Author 2010

**Figure 10.101**

Thermal Chimneys on the perimeter are provided with openings that will allow for hot air to escape by means of the stack effect, Author 2010

**Figure 10.102**

Section A-A, Author 2010

**Figure 10.103**

Section B-B, Author 2010

**Figure 10.104**

Section C-C, Author 2010

**Figure 10.105**

Section D-D, Author 2010

**Figure 10.106**

Detailed Rooftop Section, Author 2010

**Figure 10.107**

Elevations, Author 2010

**Figure 10.108**

Auditorium Construction Process, Author 2010

**Figure 10.109**

New Church Street Concrete and Steel Composite Support Structure, Author 2010

**Figure 10.110**

Diagram of Water System, Author 2010

**Figure 10.111**

Rainwater Storage Calculator Table, Author 2010

**Figure 10.112**

Required Sanitary Appliances, SABS (p.126), modified by author, 2010

**Figure 10.113**

Proposed Air-Flow System in the Structure, Author 2010

**Figure 10.114**

Proposed Air-Flow System in the Classrooms, Author 2010

**Figure 10.115**

3-D Views of the proposed Apollo Primary School, Author 2010