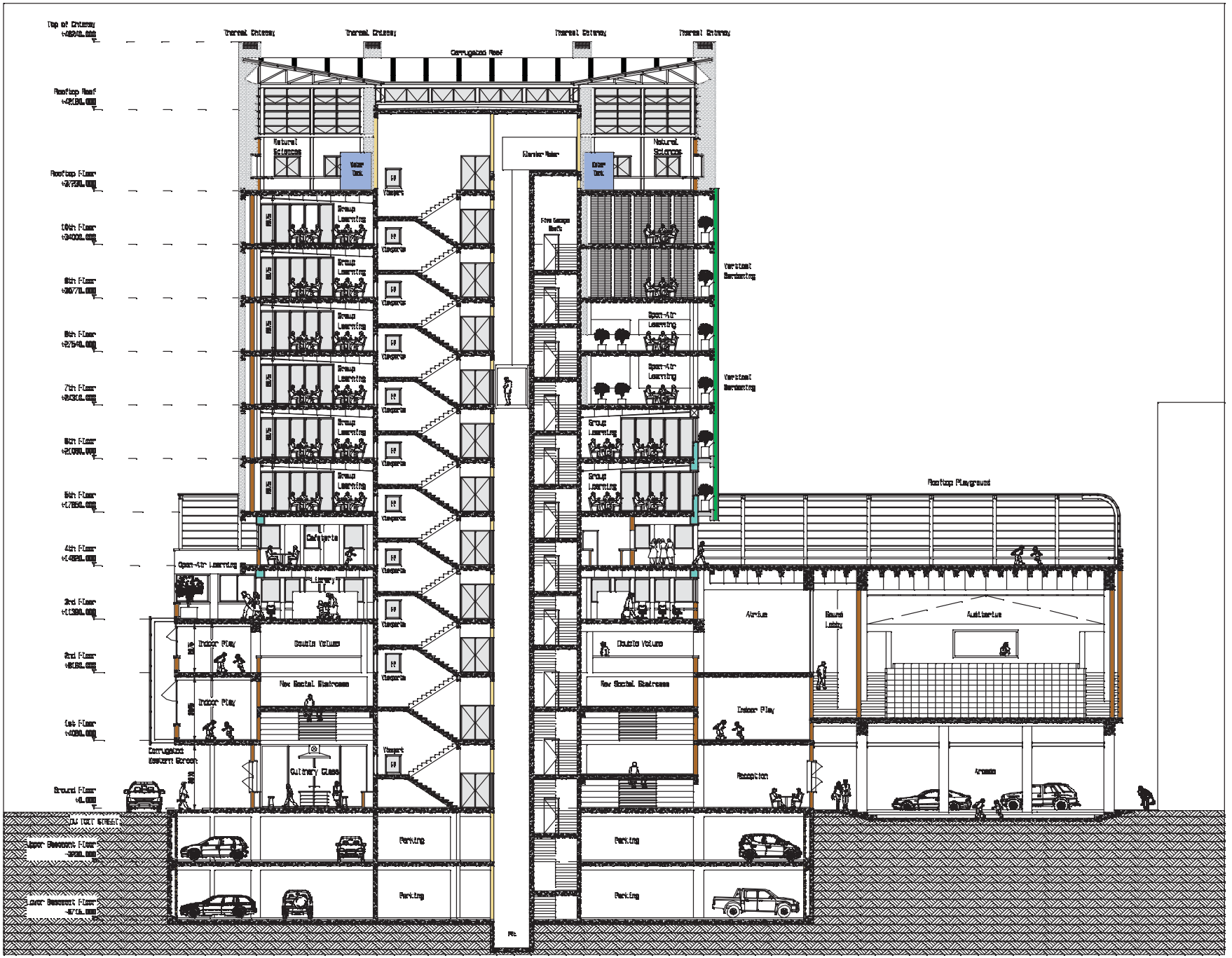


Apollo Primary School

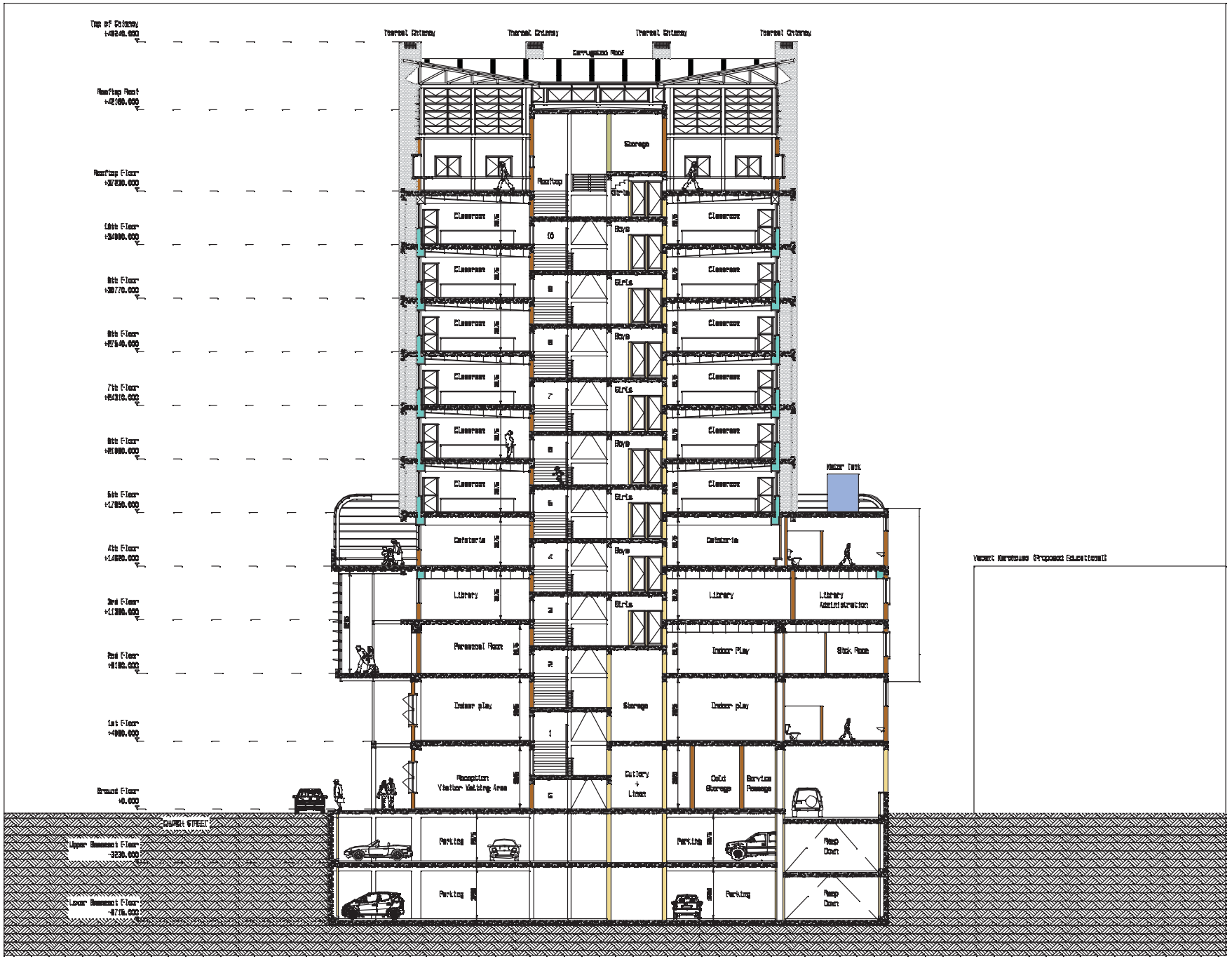
Towards Integrated Urban Education in Pretoria

Section A-A - Scale 1 : 100

Exist. Structure
New Structure
Exist. Services
New Services
Exist. Buildings
New Drywall

Dewald du Plessis - MArch(Prof) 2010

fig.10.102. Section A-A (Drawing not to scale)



Apollo Primary School

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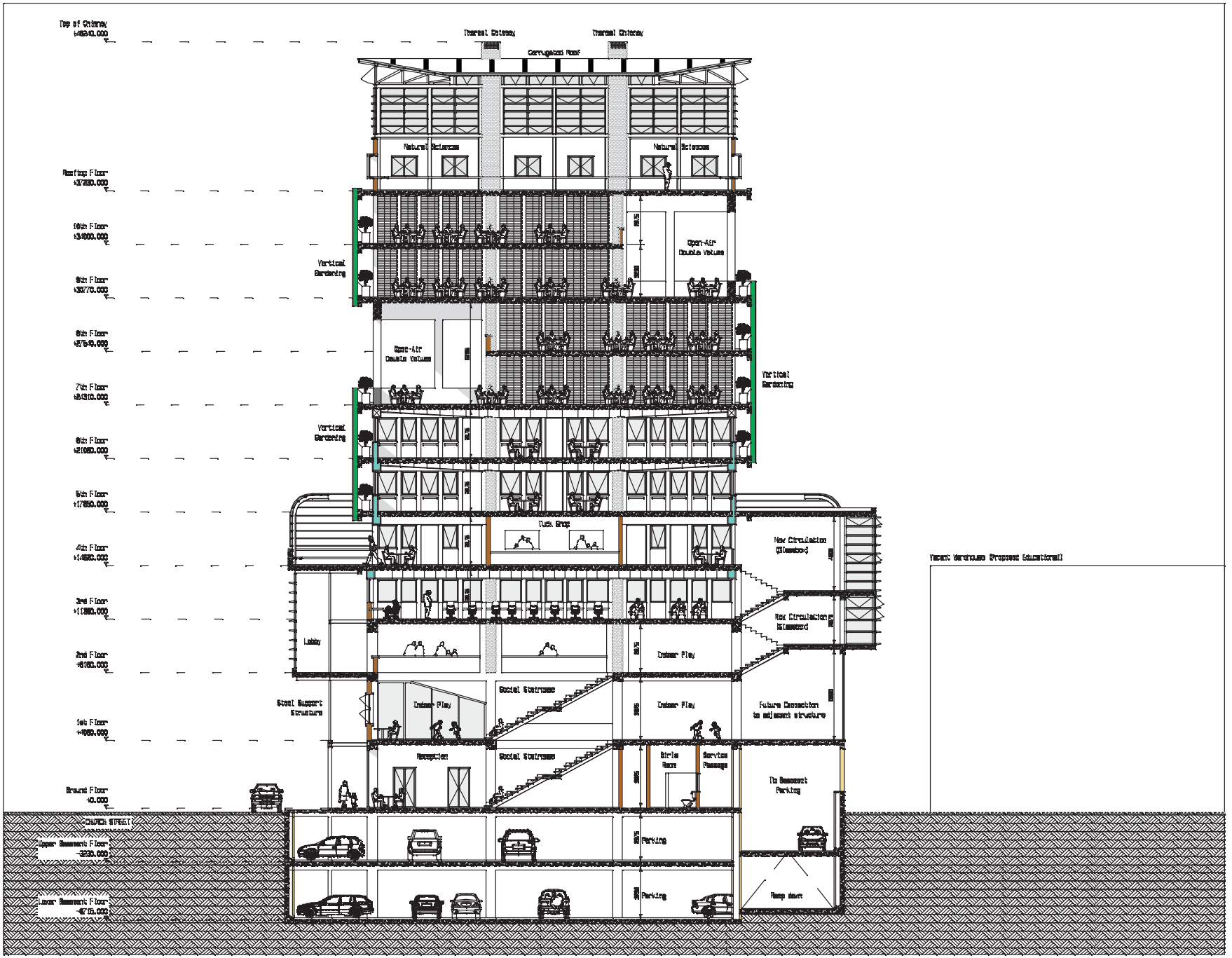
Section B-B - Scale 1 : 100

Exist. Brickwork
New Brickwork
Exist. Concrete
New Concrete
Exist. Buildings
New Drywall

Dewald du Plessis - MArch(Prof) 2010

fig.10.103. Section B-B (Drawing not to scale)



Apollo Primary School

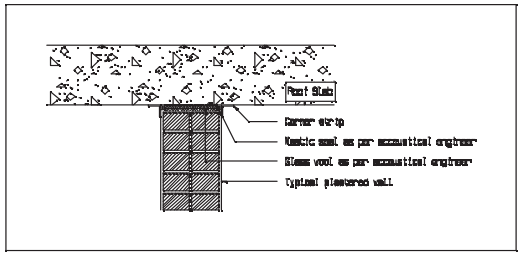
Towards Integrated Urban Education in Pretoria

Section C-C - Scale 1 : 100

Exist. Brickwork		New Brickwork	
Exist. Concrete		New Concrete	
Exist. Buildings		New Drywall	

Dewald du Plessis - MArch(Prof) 2010

fig.10.104. Section C-C (Drawing not to scale)



Soundproofing wall-roof gap
Scale 1 : 10

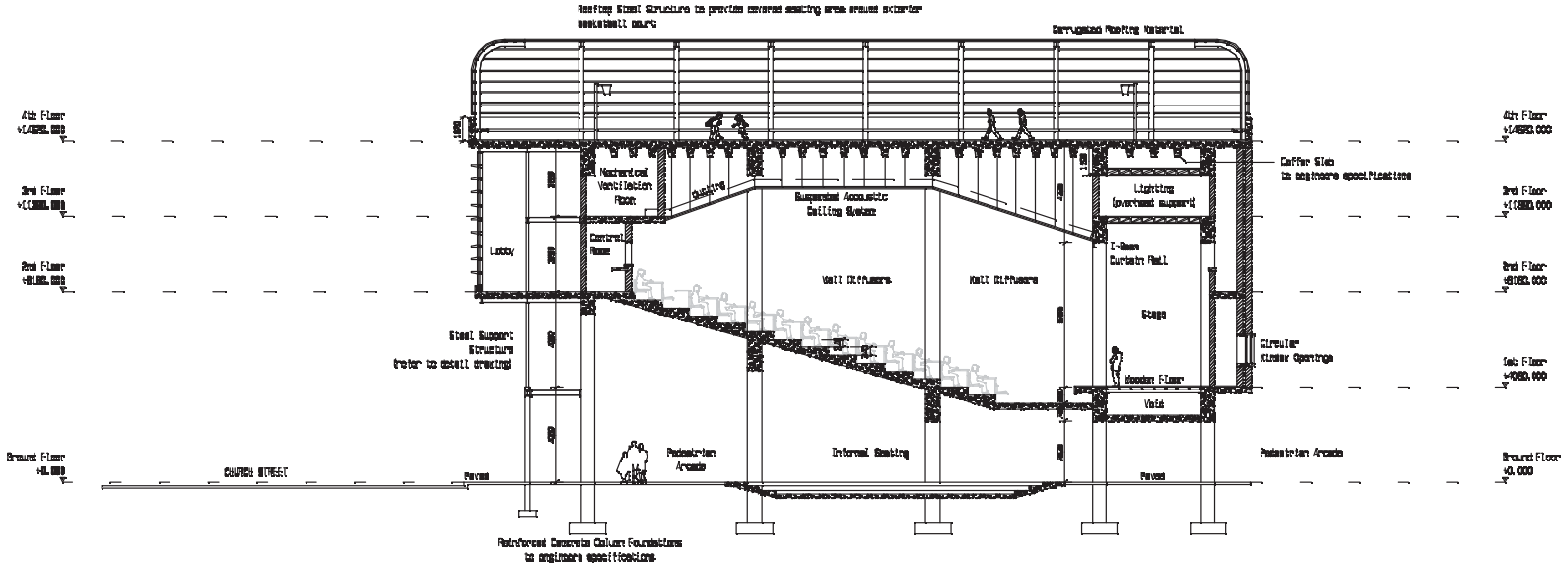


fig.10.105. Section D-D (Drawing not to scale)

NOTES

1. SEALING OF WALL JOINTS AND GAPS
(Refer to detail drawing)

1.1.1 Any joints between or gaps between walls and columns or walls and roof slabs that in any plumbrous airtight, must be acoustically sealed off.

1.2) Joints too narrow to be plugged with glass wool, must be sealed on both sides of the wall with a general-purpose non-hardening acrylic or mastic sealant, applied with a hand gun or pressed into the gap.

1.3) Joints bearing wide gaps to be sealed by first plugging the gap thoroughly with low-density glass wool blanket (acrylic "brick grab"), then sealed off both sides with non-hardening acrylic sealant using a hand gun applicator and finally blanking off with a flashing strip such as a timber cleat, aluminium cover strip or cornice, depending on its visibility.

Apollo Primary School

Towards Integrated Urban Education in Pretoria

Section D-D - Scale 1 : 100

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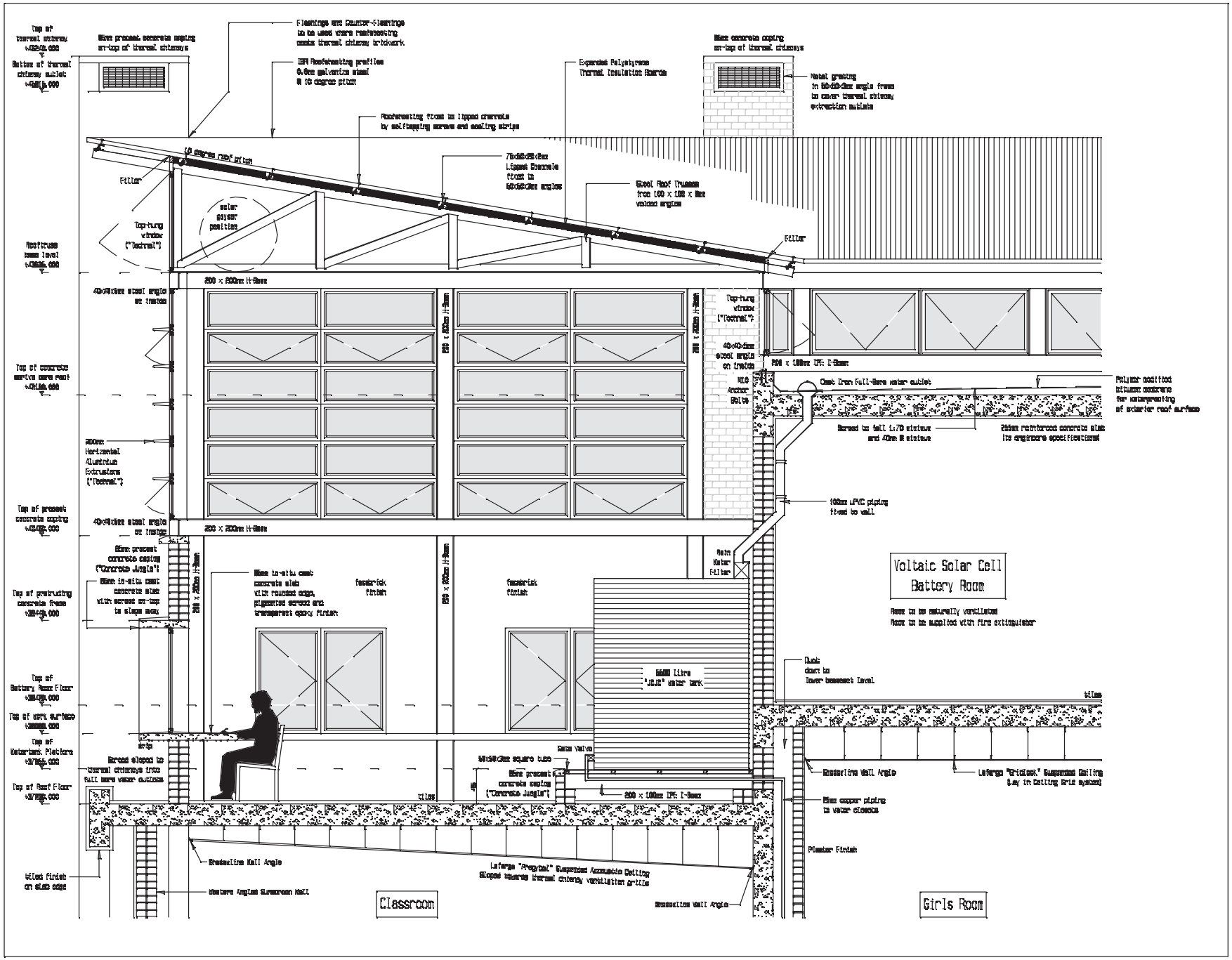
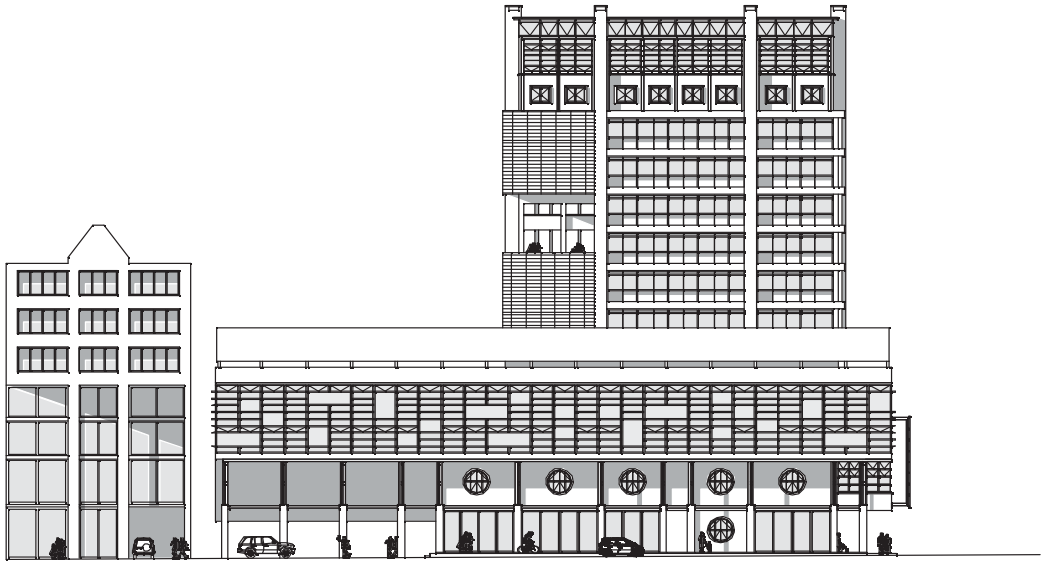
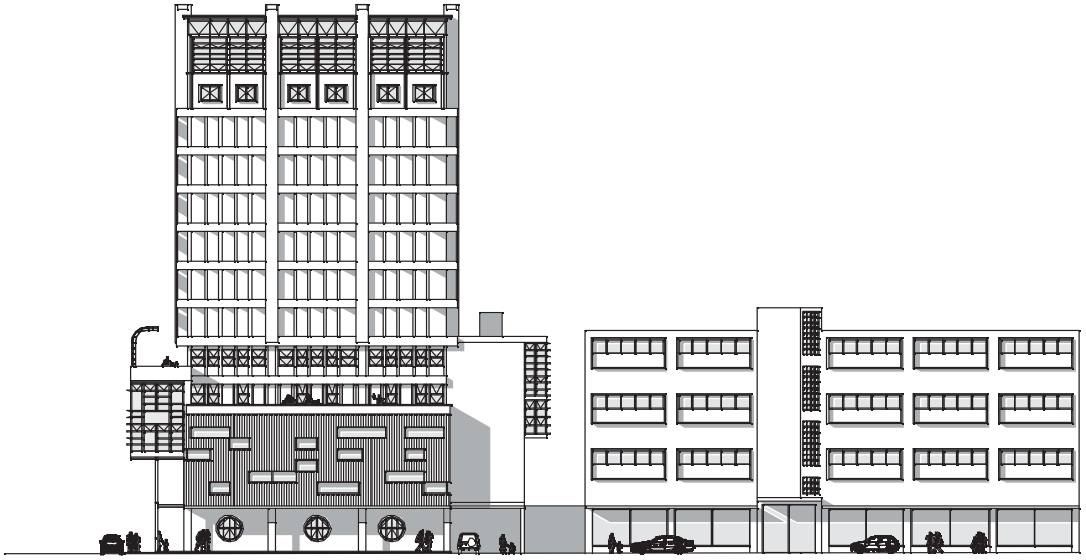


fig.10.106. Detailed Rooftop Section (Drawing not to scale)



Northern Elevation
Scale 1 : 200



Western Elevation
Scale 1 : 200

Apollo Primary School

Towards Integrated Urban Education in Pretoria

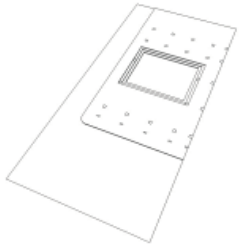
Elevations
Scale 1 : 200

Dewald du Plessis - MArch(Prof) 2010

fig.10.107. Elevations (Drawing not to scale)

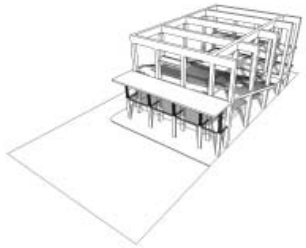
Auditorium Construction Process

1



As indicated in the final design proposal, the structure east of the Apollo Building is proposed to be demolished. An auditorium is proposed to be built overhead of a pedestrian arcade that is introduced. An informal seating area will be provided for children to not only safely wait for their parents, but also allow for informal performances.

2

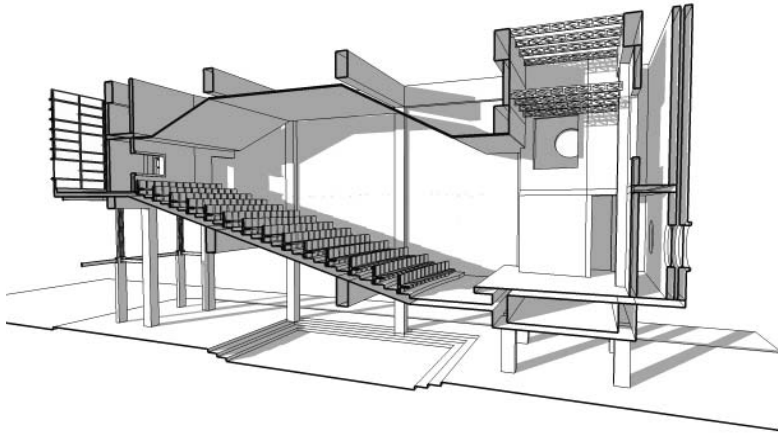


The auditorium will mainly consist of a concrete frame structure, with the northern foyer area consisting of a composite concrete and steel ("H" and "I" Beam) structure that will support a cantilevering concrete platform that is part of the second floor level. Deep concrete beams will span the width of the auditorium, with a coffer-slab system above that will support the rooftop playground. A sloped concrete floor will increase the natural volume of the pedestrian arcade below.

2

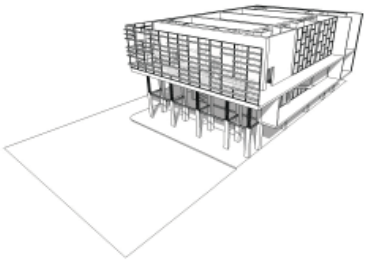
Here it can be seen how the sloped concrete floor increases the pedestrian volume below. The proposed composite concrete and steel support structure can also be seen on the northern part. The structural frame of the auditorium is mainly composed of a concrete column and beam system.

4



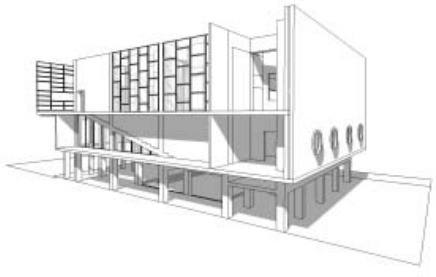
A 3-dimentional view of the interior shows the seating arrangement facing the stage area. An acoustical suspended ceiling is proposed that will reflect sound produced to the audience. Steel girders above the stage area will support lighting requirements therefor. A control room at the rear of the auditorium will control all of the electrical and mechanical ventilation equipment. Entrance to the auditorium happens through sound lobbies at the rear and at the side. Walls will consist of an uneven brick surface with accoustical wall panels to reflect sound to the audience.

3



The foyer on the northern part of the auditorium will be sealed off from the exterior by a fully glazed facade. The horizontal mullions will have deep aluminium extrusions fixed to it to provide the necessary shading for the interior. The glazed facade will not be monotonous, but rather playfully expressed by differing sized aluminium frames.

3

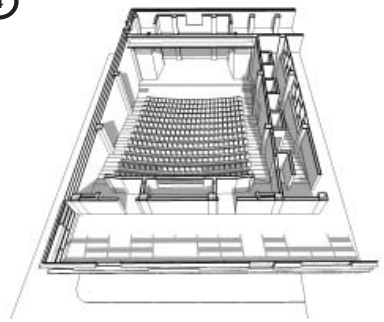


The sound-lobby on the eastern part of the auditorium will be sealed off from the proposed Apollo Primary School by a double glazed curtain wall. Children will thus be able to observe audience members participating in the auditorium moving in and out of the venue. Audience members will thus also be able to see into the schooling environment while entering or exiting the auditorium. The curtain wall is playfully expressed by offset aluminium frames.

3

The northern glazed facade will express the differing sized aluminium frames by making the larger glazed sections various colours.

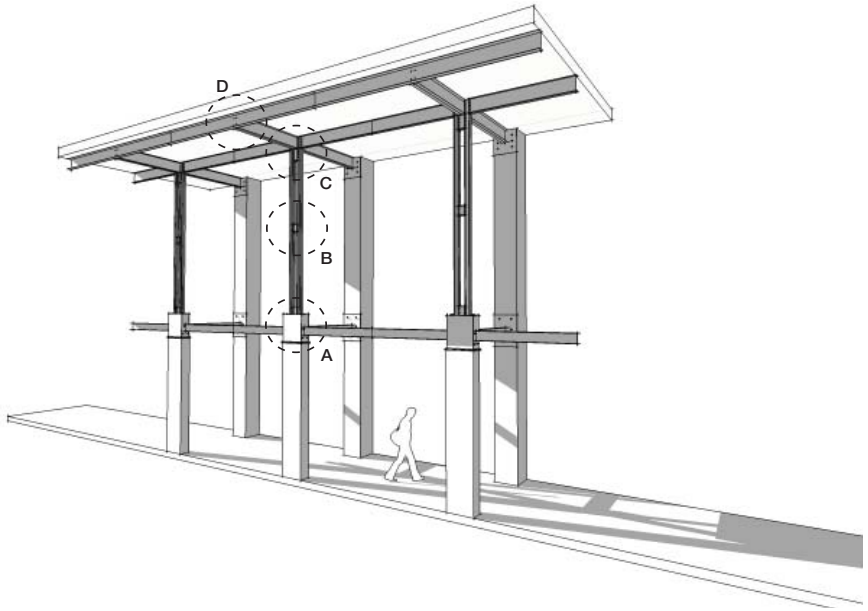
4



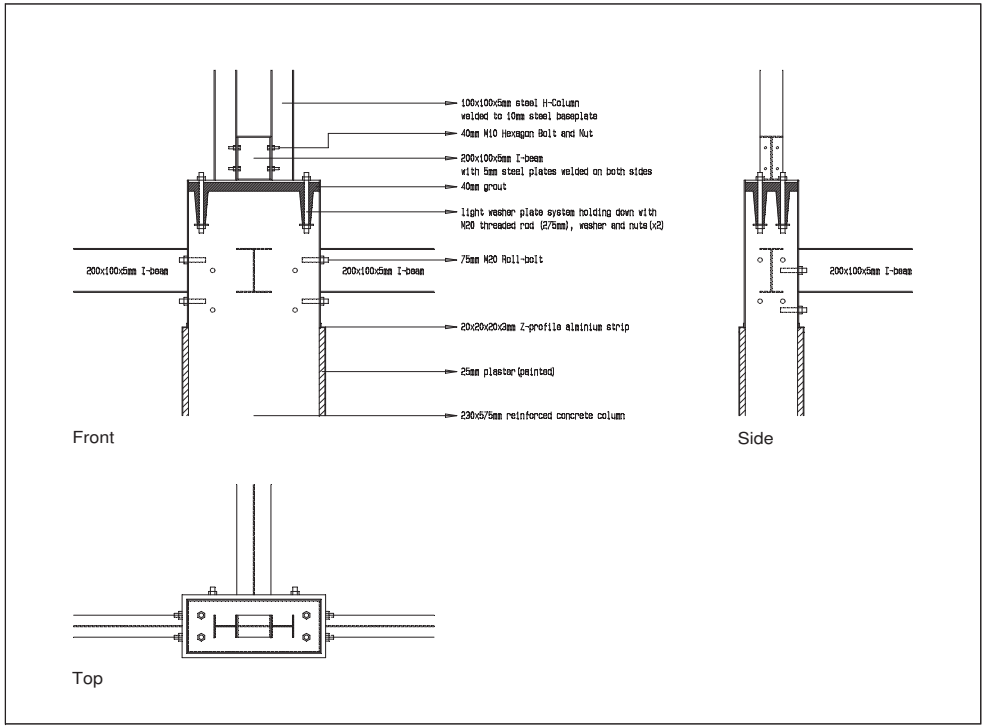
The interior walls will consist of facebricks that are stepped back from each other in a consistently varying manner. This is done for accoustical purposes. Entrance to the auditorium will mainly happen from the rear and from the side. Backstage access is provided on the first and second floor.

fig.10.108. Auditorium Construction Process

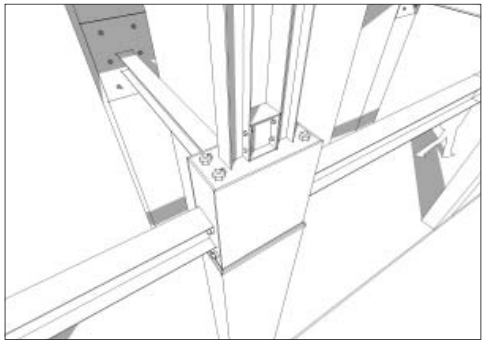
New Church Street Concrete and Steel Composite support structure



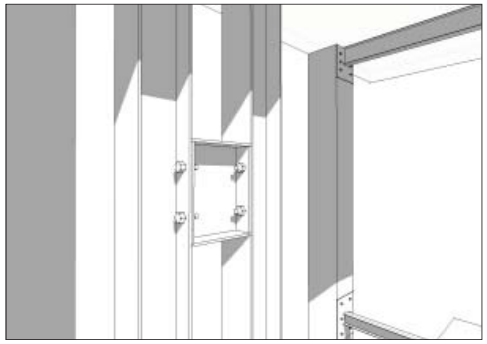
Detail Drawing of composite steel column connection to concrete column base



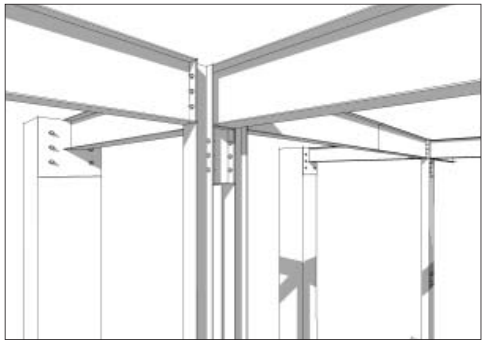
A - Base of column connection



B - Intermediate Column Support Connection



C - Top of column connection



D - Front Edge of supporting beams connection

fig.10.109. New Church Street Concrete and Steel Composite Support Structure

Diagram of Water System

Rainwater is collected from the roof surface. The rainwater is stored in "Jojo" tanks at rooftop level. The rainwater is intended to assist in the water supply that is required for flushing toilets in the structure. The water flows to the water closets through gravity.
A secondary storage system is located lower in the structure. These storage tanks use the exact same principle to supply the toilets located on the lower levels. Municipal water provision will ensure that all of the tanks have enough water at all times to supply the required water.

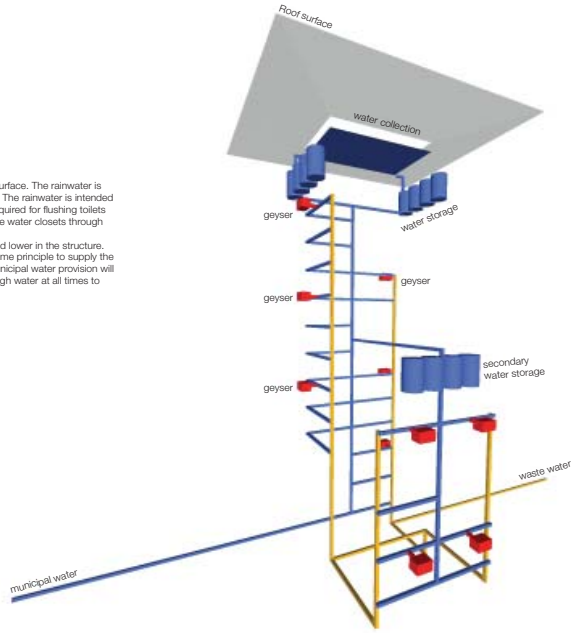
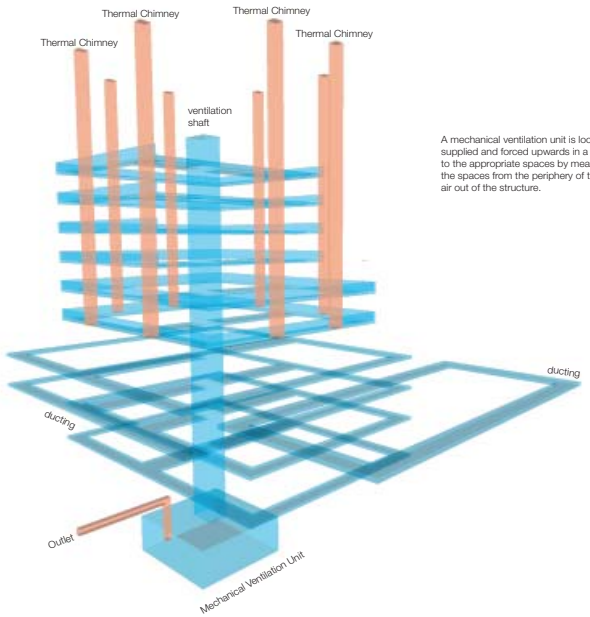


fig.10.110. Diagram of proposed Water System

Diagram of Air-Flow System



A mechanical ventilation unit is located in the basement of the structure. Cold air is supplied and forced upwards in a ventilation shaft. From here the cold air is directed to the appropriate spaces by means of ducting underneath the floor slab and enters the spaces from the periphery of the floor plan. Thermal chimneys extracts heated air out of the structure.

fig.10.113. Proposed Air-Flow System in the structure

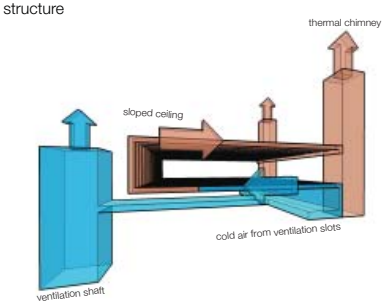


fig.10.114. Proposed Air-Flow in classrooms

Cold air from the ventilation shaft is distributed into the appropriate spaces by ducts underneath the floor slab, and on top of a suspended ceiling. These ducts go to the periphery of each floor and mechanically forces cold air upward and out of horizontally orientated ventilation slots located at waist high level. As air naturally gets heated by the occupants of the space the air starts rising. A sloped suspended ceiling directs the rising air to the periphery of the floor. A thermal chimney extracts the heated air from the space through a ventilation grill by means of the "stack effect".

RAINWATER STORAGE CALCULATOR (FOR IDEAL SELF-SUSTAINED SYSTEM)

by Dewald du Plessis (rainfall data from http://weather.za.msn.com)

	Rainfall (mm)	Cubic meters	Water harvested (cub.M)	Litres	Usage (pm)	How much in unknown storage?
January	78.9	0.0789	136.69425	136694.25	*61200*	75494.25
February	93.3	0.0933	161.64225	161642.25	*61200*	175936.5
March	**77.7**	**0.0777**	**134.61525**	**134615.25**	***61200***	**249351.75**
April	34.5	0.0345	59.77125	59771.25	*61200*	247923
May	10.8	0.0108	18.711	18711	*61200*	205434
June	6.3	0.0063	10.91475	10914.75	*61200*	155148.75
July	0.7	0.0007	1.21275	1212.75	*61200*	95161.5
August	3.4	0.0034	5.8905	5890.5	*61200*	39852
September	12.6	0.0126	21.8295	21829.5	*61200*	**481.5**
October	50.1	0.0501	86.79825	86798.25	*61200*	26079.75
November	76.8	0.0768	133.056	133056	*61200*	97935.75
December	86.8	0.0868	150.381	150381	*61200*	187116.75
Total	**531.9**	**0.5319**	**921.51675**	**921516.75**	***734400***	*(Tank must have water all times!!!)*

1925	**Min Roof Area req (sqm)**
61200	**Monthly Water Usage (L)**
249351.75	**Required Storage (L)**

Water Usage			Per Day		(30 days) Per Month (L)	(30 days x 12) Per Year (L)
				*People**		
	Water consumption (L)	Uses per day (Times)	Water consumtion Total (L)	340		
Flush Toilet	6	1	**6**	2040	61200	734400
Hand Basin	0.7	2	**1.4**	476	14280	171360
				2516	75480	905760

*(*People = 320 **Students** + 16 **Teachers** + 4 **Miscelaneous** = 340)*

(Required Ideal Storage = 25 x 10000L or 12.5 x 20000L "Jojo" Tanks

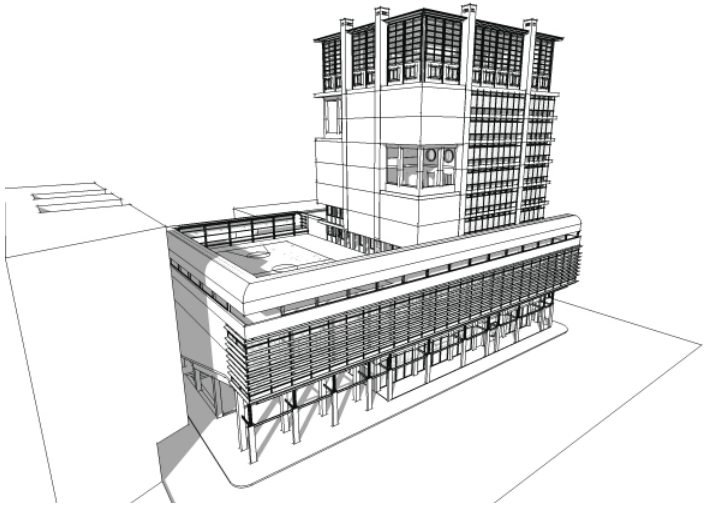
fig.10.111. Rainwater Storage Calculator Table

Table 6: Amount of Sanitary Appliances required in relation to population

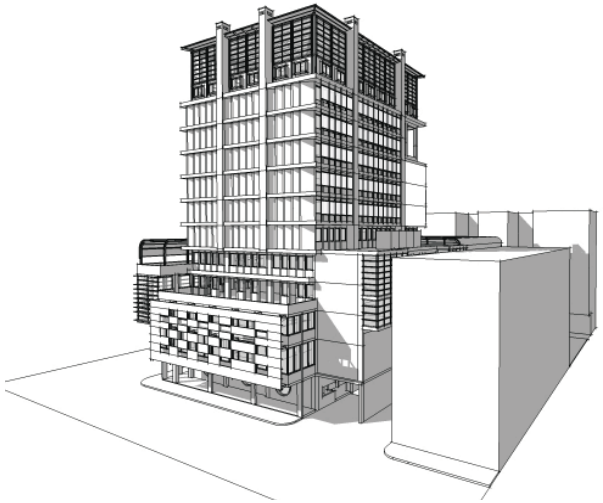
	MALE			FEMALE	
Population	*Water Closets*	*Urinals*	*Handwash Basins*	*Water Closets*	*Handwash Basins*
15	1	1	1	2	1
30	1	2	2	3	2
60	2	3	3	5	3
90	3	5	4	7	4
120	3	6	5	9	5
For a population of more than 120, add 1 Water Closet, 1 Urinal and 1 Handwash Basin for every 100 additional people				**For a population of more than 120, add 1 Water Closet for every 50 additional people**	**For a population of more than 120, add 1 Handwash Basin for every 100 additional people**
220	4	7	6	11	6
320	5	8	7	13	7
420	6	9	8	15	8
520	7	10	9	17	9
620	8	11	10	19	10
720	9	12	11	21	11
820	10	13	12	23	12
920	11	14	13	25	13
1020	12	15	14	27	14
1120	13	16	15	29	15
1220	14	17	16	31	16

fig.10.112. Required Sanitary Appliances

Apollo Primary School

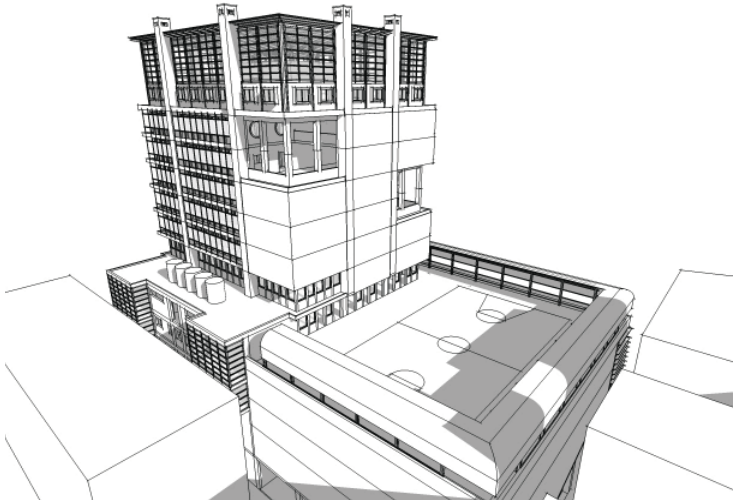


North Eastern View



South Western View

North Western View



South Eastern View

fig.10.115. 3-D Views of the proposed Apollo Primary School

Final Model (Scale 1 : 200)

Final Model (Scale 1 : 200)