



**Cover Graphic:** Vertical School Architecture by Adam Swinburn

# **VERTICAL SCHOOL ARCHITECTURE**

A Research Manual to Support Best  
Practice in an Urban Context.

Adam Paul Swinburn

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Thesis submitted in fulfilment of the requirements for  
the degree of Masters of Architecture (Research)  
under the supervision of Deborah Ascher Barnstone  
and Anthony Burke

University of Technology Sydney  
Faculty of Design, Architecture and Building

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## Certificate of Original Authorship

I, Adam Paul Swinburn, declare that this thesis is submitted in fulfilment of the requirements for the award of a Master of Architecture (Research), in the Faculty of Design, Architecture and Building at the University of Technology Sydney.

The thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in this thesis.

This document has not been submitted for qualifications at any other academic institution. This research is supported by the Australian Government Research Training Program.

Signature: APS

*Signature on file in Faculty and Graduate Research School Offices*

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## Abstract

City centres are becoming increasingly desirable residential locations for couples and young families, reversing a decades-old trend of population flight to outlying suburbs. As the populations of cities grow, large tracts of land which would support a traditional horizontal model of school design are no longer obtainable and are not financially viable. Therefore, for urban schools to accommodate the densification of cities, school design must transition from building outward to upward.

*Vertical School Architecture* is a case study analysis of the spatial planning for secondary co-educational multi-storey school models in inner-urban areas across the globe. Land economics, tight site restrictions and large accommodation briefs require a school design more aligned with high-rise construction than its suburban predecessors, posing new opportunities and challenges for the facilitation of education, student wellbeing and city-making. In this thesis, the spatial organisation patterns that emerge in vertical school design precedents are documented and considered as a resource to assist the thinking of architects, school administrations and government officials when delivering school architecture of a similar type.

Recent publications on school design focus predominately on the functional requirements of an individual space, such as the arrangement of an innovative learning environment and how it relates to its pedagogical aims. While that research is critical to understanding how learning environments should look in the twenty-first century, it does not acknowledge how all the parts of contemporary urban schools come together within a building plan and section. Therefore, the research herein endeavours to fill this gap by illustrating how the spatial diagram of vertical school precedents addresses strict site constraints to deliver a holistic, functional and connected organisational strategy.

# Contents

12	Illustrations
23	Definition of Vertical School
24	List of Abbreviations
 <b>Part 1 – Introduction</b>	
26	Context
36	Literature Review
38	Comparing Horizontal and Vertical School Models
44	Evolution of Spatial Learning Models
48	Research Questions and Objectives
49	Methodology
 <b>Part 2 – Case Studies</b>	
58	School of the Arts, Singapore
102	Singapore International School, Hong Kong
140	William Jones College Preparatory, Chicago
170	Avenues: The World School, New York
202	Arthur Phillip High School, Parramatta
240	Inner Sydney High School, Sydney
 <b>Part 3 – Spatial Type Analysis</b>	
282	Big Box Spaces
292	Learning Spaces
302	Communal Spaces
312	Recreational Outdoor Spaces
328	Circulation Spaces
344	Atrium Spaces
358	Secured and Public Use Spaces
372	Spatial Type Analysis Summary

	<b>Part 4 – Organising a Vertical School</b>
382	Ordering Principles
400	<b>Part 5 – Further Research and Conclusions</b>
	<b>Part 6 - Appendix</b>
406	Interview Transcripts
508	Architectural Drawings
574	Endnotes
582	Bibliography
590	About the Author

# Illustrations

**Figure 1.** Perspective Drawing of the Proposed Infants School, Balwyn North, Vic, 1948.  
Architect: Public Works Department, Vic (Percy Everett)

**Figure 2.** Sydney Dwelling Structure 2016 vs 2024 & 2057 (projected)  
Source: Urban Taskforce

**Figure 3.** Household Composition of Apartments in Sydney 2016 vs 2024  
Source: Urban Taskforce

**Figure 4.** Visible strollers and prams circulating around city sidewalks  
Photographs: Adam Swinburn

**Figure 5.** Total NSW Government Students, 1980-2036.  
Source: NSW Department of Education 2017

**Figure 6.** Student Boom and Vertical School Demand in Sydney  
Data from NSW Department of Education and Diagram by Adam Swinburn

**Figure 7.** Student Boom and Vertical School Demand in Parramatta Map  
Data from NSW Department of Education and Map by Adam Swinburn

**Figure 8.** Arthur Phillip High School, Parramatta  
Image: Grimshaw and BVN

**Figure 9.** Inner Sydney High School, Sydney  
Image: FJMT

**Figure 10.** The Inner City North State Secondary College, Brisbane  
Image: Cox Architecture

**Figure 11.** Prahran High School, Melbourne  
Image: Gray Puksand

**Figure 12.** Adelaide Botanic High School, Adelaide  
Image: Cox Architecture

**Figure 13.** South Melbourne Primary School, South Melbourne  
Image: Hayball

**Figure 14.** Santa Sophia Catholic College, Box Hill  
Image: BVN

**Figure 15.** St Andrews Cathedral School, Sydney  
Image: Adam Swinburn

**Figure 16.** Horizontal vs Vertical School Analysis  
Top Image: Oakhill College, Castle Hill  
Bottom Image: Arthur Phillip High School, Parramatta

**Figure 17.** Site Development Timeline of a Horizontal vs Vertical School  
Left Column: Oakhill College, Castle Hill  
Right Column: Arthur Phillip High School, Parramatta

**Figure 18.** Evolution of Learning Spatial Models  
Redrawn Diagram from Old School New School 2017 Conference Presentation by Andrew Cortese

**Figure 19.** Case Study Summary Table

**Figure 20.** Case Study Matrix Analysis

**Figure 21.** Table of Spatial Types for Analysis

**Figure 22.** School of the Arts Singapore Exterior  
Image: Patrick Bingham

**Figure 23.** School of the Arts Singapore, Site Plan

**Figure 24.** School of the Arts Forecourt  
Photograph: Patrick Bingham Hall

**Figure 25.** School of the Arts Outdoor Foyer  
Photograph: Patrick Bingham Hall

**Figure 26.** School of the Arts Performance Theatre  
Photograph: Patrick Bingham Hall

**Figure 27.** School of the Arts Concert Hall  
Photograph: Patrick Bingham Hall

**Figure 28.** School of the Arts Atrium and Plaza  
Photograph: Patrick Bingham Hall

**Figure 29.** School of the Arts Stair Circulation  
Photograph: Patrick Bingham Hall

**Figure 30.** School of the Arts Library  
Photograph: Patrick Bingham Hall

**Figure 31.** School of the Arts Outdoor Terrace  
Photograph: Patrick Bingham Hall

**Figure 32.** School of the Arts Breezeway  
Photograph: Patrick Bingham Hall

**Figure 33.** School of the Arts Breezeways Across the Atrium  
Photograph: Patrick Bingham Hall

**Figure 34.** School of the Arts Outdoor Terrace  
Photograph: Patrick Bingham Hall

**Figure 35.** School of the Arts Rooftop Football Field  
Photograph: Singapore Memory

**Figure 36.** School of the Arts, Singapore Isometric

**Figure 37.** School of the Arts, Singapore Area Table (sq.m)

**Figure 38.** School of the Arts, Singapore Area Table (%)

**Figure 39.** School of the Arts Lower Ground Floor Plan

**Figure 40.** School of the Arts Upper Ground Floor Plan

**Figure 41.** School of the Arts Level 01 Plan

**Figure 42.** School of the Arts Level 02 Plan

**Figure 43.** School of the Arts Level 03 Plan

**Figure 44.** School of the Arts Level 04 Plan

**Figure 45.** School of the Arts Level 05 Plan

**Figure 46.** School of the Arts Level 06 Plan

**Figure 47.** School of the Arts Level 07 Plan

**Figure 48.** School of the Arts Level 08 Plan

**Figure 49.** School of the Arts Roof Plan

**Figure 50.** School of the Arts Section 01

**Figure 51.** School of the Arts Section 02

**Figure 52.** School of the Arts Section 03

**Figure 53.** School of the Arts Section 04

**Figure 54.** School of the Arts Model Image 01  
Photograph: Jansen Che

**Figure 55.** School of the Arts Model Image 02  
Photograph: Jansen Che

**Figure 56.** School of the Arts Model Image 03  
Photograph: Jansen Che

**Figure 57.** Big Box vs all Other Spaces  
School of the Arts Section

**Figure 58.** Big Box vs all Other Spaces  
School of the Arts Ground Floor Plan

**Figure 59.** Learning vs all Other Spaces  
School of the Arts Section

**Figure 60.** Learning vs all Other Spaces  
School of the Arts L05 Plan

**Figure 61.** Communal vs all Other Spaces  
School of the Arts Section

**Figure 62.** Communal vs all Other Spaces  
School of the Arts L03 Plan

**Figure 63.** Outdoor vs Enclosed Spaces  
School of the Arts Section

**Figure 64.** Outdoor vs Enclosed Spaces  
School of the Arts Roof Plan

**Figure 65.** Outdoor vs Enclosed Spaces  
School of the Arts Level 04 Plan

**Figure 66.** Outdoor vs Enclosed Spaces  
School of the Arts Level 06 Plan

**Figure 67.** Circulation Spaces  
School of the Arts Section

**Figure 68.** Circulation Spaces  
School of the Arts L06 Plan

**Figure 69.** Atrium Spaces  
School of the Arts Section

**Figure 70.** Atrium Spaces  
School of the Arts L07 Plan

**Figure 71.** Secured vs Public-Use Spaces  
School of the Arts Section

**Figure 72.** Secured vs Public-Use Spaces  
School of the Arts Ground Floor Plan

**Figure 73.** School of the Arts Case Study Summary  
Diagrams  
Top: Section 1  
Bottom: Section 2

**Figure 74.** Singapore International School Exterior  
Photograph: Tim Griffith

**Figure 75.** Singapore International School, Site Plan

**Figure 76.** Singapore International School Site Plan

**Figure 77.** Singapore International School Atrium  
Photograph: Tim Griffith

**Figure 78.** Singapore International School Atrium  
Photograph: Tim Griffith

**Figure 79.** Singapore International School Plaza  
Photograph: Tim Griffith

**Figure 80.** Singapore International School Circulation  
Space  
Photograph: Tim Griffith

**Figure 81.** Singapore International School Terrace and  
Science Garden  
Photograph: Tim Griffith

**Figure 82.** Singapore International School Auditorium  
Photograph: Tim Griffith

**Figure 83.** Singapore International School Gymnasium  
Photograph: Tim Griffith

**Figure 84.** Singapore International School Isometric

**Figure 85.** Singapore International School, Hong Kong  
Area Table (sq.m)

**Figure 86.** Singapore International School, Hong Kong  
Area Table (%)

**Figure 87.** Singapore International School Ground  
Floor Plan

**Figure 88.** Singapore International School Level 01  
Plan

**Figure 89.** Singapore International School Level 02  
Plan

**Figure 90.** Singapore International School Level 03  
Plan

**Figure 91.** Singapore International School Level 04  
Plan

**Figure 92.** Singapore International School Level 05  
Plan

**Figure 93.** Singapore International School Level 06  
Plan

**Figure 94.** Singapore International School Level 07  
Plan

**Figure 95.** Singapore International School Level 08  
Plan

**Figure 96.** Singapore International School Level 09  
Plan

**Figure 97.** Singapore International School Level 10  
Plan

**Figure 98.** Singapore International School Level 11  
Plan

**Figure 99.** Singapore International School Level 12  
Plan

**Figure 100.** Singapore International School Roof Plan

**Figure 101.** Singapore International School Section 01

**Figure 102.** Singapore International School Section 02

**Figure 103.** Singapore International School Section 03

**Figure 104.** Singapore International School Section 04

**Figure 105.** Singapore International School Section 05

**Figure 106.** Singapore International School Section 06

**Figure 107.** Singapore International School Model  
Image 01  
Photograph: Jansen Che

**Figure 108.** Singapore International School Model  
Image 01  
Photograph: Jansen Che

**Figure 109.** Singapore International School Model  
Image 01  
Photograph: Jansen Che

**Figure 110.** Big Box vs all Other Spaces  
Singapore International School Section

**Figure 111.** Big Box vs all Other Spaces  
Singapore International School Level 12 Plan

**Figure 112.** Learning vs all Other Spaces  
Singapore International School Section

**Figure 113.** Learning vs all Other Spaces  
Singapore International School Level 06 Plan

**Figure 114.** Communal vs all Other Spaces  
Singapore International School Section

**Figure 115.** Communal all Other Spaces  
Singapore International School Level 06 Plan

**Figure 116.** Outdoor vs Enclosed Spaces  
Singapore International School Section

**Figure 117.** Outdoor vs Enclosed Spaces  
Singapore International School Level 06 Plan

**Figure 118.** Outdoor vs Enclosed Spaces  
Singapore International School Level 04 Plan

**Figure 119.** Outdoor vs Enclosed Spaces  
Singapore International School Roof Plan

**Figure 120.** Circulation Spaces  
Singapore International School Section

**Figure 121.** Circulation Spaces  
Singapore International School Level 06 Plan

**Figure 122.** Atrium Spaces  
Singapore International School Section

**Figure 123.** Atrium Spaces  
Singapore International School Level 06 Plan

**Figure 124.** Secured vs Public-Use Spaces  
Singapore International School Section

**Figure 125.** Secured vs Public-Use Spaces  
Singapore International School Ground Floor Plan

**Figure 126.** Singapore International School Case Study  
Summary Diagrams  
Top: Section 1  
Bottom: Section 2

**Figure 127.** William Jones College Preparatory Exterior  
Photograph: James Steinkamp

**Figure 128.** William Jones College Preparatory Site Plan

**Figure 129.** William Jones College Preparatory Site Plan

**Figure 130.** William Jones College Preparatory Lobby  
Photograph: James Steinkamp

**Figure 131.** William Jones College Preparatory Lobby  
Photograph: James Steinkamp

**Figure 132.** William Jones College Preparatory Staircase  
Photograph: James Steinkamp

**Figure 133.** William Jones College Preparatory Corridor  
Photograph: James Steinkamp

**Figure 134.** William Jones College Preparatory Classroom  
Photograph: James Steinkamp

**Figure 135.** William Jones College Preparatory Terrace  
Photograph: James Steinkamp

**Figure 136.** William Jones College Preparatory Natatorium  
Photograph: James Steinkamp

**Figure 137.** William Jones College Preparatory Gymnasium  
Photograph: James Steinkamp

**Figure 138.** William Jones College Preparatory Isometric

**Figure 139.** William Jones College Preparatory, Chicago Area Table (sq.m)

**Figure 140.** William Jones College Preparatory, Chicago Area Table (%)

**Figure 141.** William Jones College Preparatory Ground Floor Plan

**Figure 142.** William Jones College Preparatory Level 01 Plan

**Figure 143.** William Jones College Preparatory Level 02 Plan

**Figure 144.** William Jones College Preparatory Level 03 Plan

**Figure 145.** William Jones College Preparatory Level 04 Plan

**Figure 146.** William Jones College Preparatory Level 05 Plan

**Figure 147.** William Jones College Preparatory Level 06 Plan

**Figure 148.** William Jones College Preparatory Section 01

**Figure 149.** William Jones College Preparatory Section 02

**Figure 150.** William Jones College Preparatory Section 03

**Figure 151.** William Jones College Preparatory Section 04

**Figure 152.** William Jones College Preparatory Section 05

**Figure 153.** William Jones College Preparatory Section 06

**Figure 154.** William Jones College Model Image 01  
Photograph: Jansen Che

**Figure 155.** William Jones College Model Image 02  
Photograph: Jansen Che

**Figure 156.** William Jones College Model Image 03  
Photograph: Jansen Che

**Figure 157.** William Jones College Model Image 04  
Photograph: Jansen Che

**Figure 158.** Big Box vs all Other Spaces  
William Jones College Preparatory Section

**Figure 159.** Big Box vs all Other Spaces  
William Jones College Preparatory Level 06 Plan

**Figure 160.** Learning vs all Other Spaces  
William Jones College Preparatory Section

**Figure 161.** Learning vs all Other Spaces  
William Jones College Preparatory Level 04 Plan

**Figure 162.** Communal vs all Other Spaces  
William Jones College Preparatory Section

**Figure 163.** Communal vs all Other Spaces  
William Jones College Preparatory Ground Floor Plan

**Figure 164.** Outdoor vs Enclosed Spaces  
William Jones College Preparatory Section

**Figure 165.** Outdoor vs Enclosed Spaces  
William Jones College Preparatory Level 06 Plan

**Figure 166.** Circulation Spaces  
William Jones College Preparatory Section

**Figure 167.** Circulation Spaces  
William Jones College Preparatory Level 03 Plan

**Figure 168.** Atrium Spaces  
William Jones College Preparatory Section

**Figure 169.** Atrium Spaces  
William Jones College Preparatory Level 01 Plan

**Figure 170.** Secured vs Public-Use Spaces  
William Jones College Preparatory Section

**Figure 171.** Secured vs Public-Use Spaces  
William Jones College Preparatory Ground Floor Plan

**Figure 172.** William Jones College Preparatory Case  
Study Summary Diagrams  
Top: Section 1  
Middle: Section 2  
Bottom: Level 03 Plan

**Figure 173.** Avenues: The World School Exterior  
Photograph: Chris Cooper

**Figure 174.** Avenues: The World School Site Plan

**Figure 175.** Avenues: The World School Lobby Entry  
Photograph: Chris Cooper

**Figure 176.** Avenues: The World School Parent Cafe  
Photograph: The Whalen Berez Group

**Figure 177.** Avenues: The World School Cafeteria and  
New York High Line Intersection  
Photograph: Luca Pioltelli

**Figure 178.** Avenues: The World School Cafeteria  
Photograph: Luca Pioltelli

**Figure 179.** Avenues: The World School Studio Learning  
Space  
Photograph: Adam Swinburn

**Figure 180.** Avenues: The World School  
Photograph: Chris Cooper

**Figure 181.** Avenues: The World School Studio Learning  
Space Atrium  
Photograph: STV

**Figure 182.** Avenues: The World School Learning  
Spaces  
Photograph: Chris Cooper

**Figure 183.** Avenues: The World School Black Box  
Theatre  
Photograph: The Whalen Berez Group

**Figure 184.** Avenues: The World School Rooftop Play-  
ground  
Photograph: The Whalen Berez Group

**Figure 185.** Avenues: The World School Gymnasium  
Photograph: Chris Cooper

**Figure 186.** Chelsea Piers  
Photograph: Chelsea Piers New York

**Figure 187.** Avenues: The World School Isometric

**Figure 188.** Avenues: The World School Basement Plan

**Figure 189.** Avenues: The World School Ground Floor  
Plan

**Figure 190.** Avenues: The World School Level 01 Plan

**Figure 191.** Avenues: The World School Level 02 Plan

**Figure 192.** Avenues: The World School Level 03 Plan

**Figure 193.** Avenues: The World School Level 04 Plan

**Figure 194.** Avenues: The World School Level 05 Plan

**Figure 195.** Avenues: The World School Level 06 Plan

**Figure 196.** Avenues: The World School Level 07 Plan

**Figure 197.** Avenues: The World School Level 08 Plan

**Figure 198.** Avenues: The World School Level 09 Plan

**Figure 199.** Avenues: The World School Level 10 Plan

**Figure 200.** Avenues: The World School Section 01

**Figure 201.** Avenues: The World School Section 02

**Figure 202.** Avenues: The World School Section 03

**Figure 203.** Avenues: The World School Model Image  
1  
Photograph: Jansen Che

**Figure 204.** Avenues: The World School Model Image  
2  
Photograph: Jansen Che

**Figure 205.** Avenues: The World School Model Image  
3  
Photograph: Jansen Che

**Figure 206.** Big Box vs all Other Spaces  
Avenues: The World School Section

**Figure 207.** Big Box vs all Other Spaces  
Avenues: The World School Level 09 Plan

**Figure 208.** Learning vs all Other Spaces  
Avenues: The World School Section

**Figure 209.** Learning vs all Other Spaces  
Avenues: The World School Level 07 Plan

**Figure 210.** Communal vs all Other Spaces  
Avenues: The World School Section

**Figure 211.** Communal vs all Other Spaces  
Avenues: The World School Level 02 Plan

**Figure 212.** Outdoor vs Enclosed Spaces  
Avenues: The World School Section

**Figure 213.** Outdoor vs Enclosed Spaces  
Avenues: The World School Level 10 Plan

**Figure 214.** Circulation Spaces  
Avenues: The World School Section

**Figure 215.** Circulation Spaces  
Avenues: The World School Level 07 Plan

**Figure 216.** Atrium Spaces  
Avenues: The World School Section

**Figure 217.** Atrium Spaces  
Avenues: The World School Level 07 Plan

**Figure 218.** Secured vs Public-Use Spaces  
Avenues: The World School Section

**Figure 219.** Secured vs Public-Use Spaces  
Avenues: The World School Ground Floor Plan

**Figure 220.** Avenues: The World School Case Study  
Summary Diagrams  
Top: Section 1  
Bottom: Level 07 Plan

**Figure 221.** Arthur Phillip High School Exterior  
Montage  
Image: Grimshaw and BVN

**Figure 222.** Arthur Phillip High School Site Plan

**Figure 223.** Arthur Phillip High School Site Plan

**Figure 224.** Arthur Phillip High School Amphitheatre  
Photograph: Luc Remond

**Figure 225.** Arthur Phillip High School Gymnasium  
Photograph: Luc Remond

**Figure 226.** Arthur Phillip High School Outdoor Play  
Space  
Video Screenshot: "Arthur Phillip High School first  
level reveal July 2019" Video by School Infrastructure  
NSW

**Figure 227.** Arthur Phillip High School Semi-Enclosed  
Outdoor Learning and Play Space  
Photograph: Outdoor Design Source

**Figure 228.** Arthur Phillip High School Learning Hub  
Video Screenshot: "Arthur Phillip High School first  
level reveal July 2019" Video by School Infrastructure  
NSW

**Figure 229.** Arthur Phillip High School Learning Hub  
Photograph: Domonic Lorrimer

**Figure 230.** Arthur Phillip High School Learning Dry  
Studio  
Photograph: Luc Remond

**Figure 231.** Arthur Phillip High School Learning  
Space  
Photograph: Domonic Lorrimer

**Figure 232.** Arthur Phillip High School Meeting  
Room within Learning Hub  
Photograph: Luc Remond

**Figure 233.** Arthur Phillip High School Classroom  
Video Screenshot: "Arthur Phillip High School first  
level reveal July 2019" Video by School Infrastructure  
NSW

**Figure 234.** Arthur Phillip High School Tech Hub  
Photograph: Luc Remond

**Figure 235.** Arthur Phillip High School Dry Design  
Studio  
Photograph: Luc Remond

**Figure 236.** Arthur Phillip High School Isometric

**Figure 237.** Arthur Phillip High School, Parramatta  
Area Table (sq.m)

**Figure 238.** Arthur Phillip High School, Parramatta  
Area Table (%)

**Figure 239.** Arthur Phillip High School Lower Ground  
Floor Plan

**Figure 240.** Arthur Phillip High School Upper Ground  
Floor Plan

**Figure 241.** Arthur Phillip High School Level 01 Plan

**Figure 242.** Arthur Phillip High School Level 02 Plan

**Figure 243.** Arthur Phillip High School Level 02  
Mezzanine Plan

**Figure 244.** Arthur Phillip High School Level 03 Plan

**Figure 245.** Arthur Phillip High School Level 03 Mezzanine Plan

**Figure 246.** Arthur Phillip High School Level 04 Plan

**Figure 247.** Arthur Phillip High School Level 04 Mezzanine Plan

**Figure 248.** Arthur Phillip High School Level 05 Plan

**Figure 249.** Arthur Phillip High School Level 06 Plan

**Figure 250.** Arthur Phillip High School Level 06 Mezzanine Plan

**Figure 251.** Arthur Phillip High School Level 07 Plan

**Figure 252.** Arthur Phillip High School Level 07 Mezzanine Plan

**Figure 253.** Arthur Phillip High School Level 08 Plan

**Figure 254.** Arthur Phillip High School Level 08 Mezzanine Plan

**Figure 255.** Arthur Phillip High School Level 09 Plan

**Figure 256.** Arthur Phillip High School Section 01

**Figure 257.** Arthur Phillip High School Section 02

**Figure 258.** Arthur Phillip High School Section 03

**Figure 259.** Arthur Phillip High School Section 04

**Figure 260.** Arthur Phillip High School Model Image 01  
Photograph: Jansen Che

**Figure 261.** Arthur Phillip High School Model Image 02  
Photograph: Jansen Che

**Figure 262.** Arthur Phillip High School Model Image 03  
Photograph: Jansen Che

**Figure 263.** Big Box vs all Other Spaces  
Arthur Phillip High School Section

**Figure 264.** Big Box vs all Other Spaces  
Arthur Phillip High School Ground Floor Plan

**Figure 265.** Learning vs all Other Spaces  
Arthur Phillip High School Section

**Figure 266.** Learning vs all Other Spaces  
Arthur Phillip High School Level 07 Plan

**Figure 267.** Learning vs all Other Spaces  
Arthur Phillip High School Level 07 Mezzanine Plan

**Figure 268.** Communal vs all Other Spaces  
Arthur Phillip High School Section

**Figure 269.** Communal vs all Other Spaces  
Arthur Phillip High School Ground Floor Plan

**Figure 270.** Outdoor vs Enclosed Spaces  
Arthur Phillip High School Section

**Figure 271.** Outdoor vs Enclosed Spaces  
Arthur Phillip High School Level 04 Plan

**Figure 272.** Outdoor Space vs Enclosed Spaces  
Existing Arthur Phillip High School, Parramatta and Parramatta Public School Sites

**Figure 273.** Outdoor Space vs Enclosed Spaces  
Arthur Phillip High School, Parramatta and Parramatta Public School Site After Consolidation and the Vertical School Masterplan

**Figure 274.** Circulation Spaces  
Arthur Phillip High School Section

**Figure 275.** Circulation Spaces  
Arthur Phillip High School Level 03 Plan

**Figure 276.** Atrium Spaces  
Arthur Phillip High School Section

**Figure 277.** Atrium Spaces  
Arthur Phillip High School Level 07 Mezzanine Plan

**Figure 278.** Secured vs Public-Use Spaces  
Arthur Phillip High School Section

**Figure 279.** Secured vs Public-Use Spaces  
Arthur Phillip High School Ground Floor Plan

**Figure 280.** Arthur Phillip High School Case Study  
Summary Diagrams  
Top: Section 1 & 2  
Bottom: Level 04 Plan

**Figure 281.** Inner Sydney High School Exterior  
Image: FJMT

**Figure 282.** Inner Sydney High School Site Plan

**Figure 283.** Inner Sydney High School Site Plan

**Figure 284.** Inner Sydney High School Exterior  
Image: John McRae

**Figure 285.** Inner Sydney High School Exterior  
Image: John McRae

**Figure 286.** Inner Sydney High School Courtyard  
Image: John McRae

**Figure 287.** Inner Sydney High School Courtyard  
Image: Infrastructure NSW

**Figure 288.** Inner Sydney High School Level 06  
Outdoor Courts  
Image: John McRae

**Figure 289.** Inner Sydney High School Basement  
Lower Ground Hall  
Image: John McRae

**Figure 290.** Inner Sydney High School Tower Terrace  
Image: John McRae

**Figure 291.** Inner Sydney High School Podium Terrace  
Image: John McRae

**Figure 292.** Inner Sydney High School Podium  
Seating Tier  
Image: Infrastructure NSW

**Figure 293.** Inner Sydney High School Learning Space  
Image: John McRae

**Figure 294.** Inner Sydney High School Learning Space  
Image: John McRae

**Figure 295.** Inner Sydney High School Learning Space  
Image: John McRae

**Figure 296.** Inner Sydney High School Isometric

**Figure 297.** Inner Sydney High School, Sydney Area  
Table (sq.m)

**Figure 298.** Inner Sydney High School, Sydney Area  
Table (%)

**Figure 299.** Inner Sydney High School  
Lower Ground Floor Plan

**Figure 300.** Inner Sydney High School  
Upper Ground Floor Plan

**Figure 301.** Inner Sydney High School  
Level 01 Plan

**Figure 302.** Inner Sydney High School  
Level 02 Plan

**Figure 303.** Inner Sydney High School  
Level 03 Plan

**Figure 304.** Inner Sydney High School  
Level 04 Plan

**Figure 305.** Inner Sydney High School  
Level 05 Plan

**Figure 306.** Inner Sydney High School  
Level 06 Plan

**Figure 307.** Inner Sydney High School  
Level 07 Plan

**Figure 308.** Inner Sydney High School  
Level 08 Plan

**Figure 309.** Inner Sydney High School  
Level 09 Plan

**Figure 310.** Inner Sydney High School  
Level 10 Plan

**Figure 311.** Inner Sydney High School  
Level 11 Plan

**Figure 312.** Inner Sydney High School  
Level 12 Plan

**Figure 313.** Inner Sydney High School  
Level 13 Plan

**Figure 314.** Inner Sydney High School  
Section 01

**Figure 315.** Inner Sydney High School  
Section 02

**Figure 316.** Inner Sydney High School  
Section 03

**Figure 317.** Inner Sydney High School  
Section 04

**Figure 318.** Inner Sydney High School  
Section 05

**Figure 319.** Inner Sydney High School Model Image  
01  
Photograph: Jansen Che

**Figure 320.** Inner Sydney High School Model Image  
02  
Photograph: Jansen Che

**Figure 321.** Inner Sydney High School Model Image  
03  
Photograph: Jansen Che

**Figure 322.** Inner Sydney High School Model Image  
04  
Photograph: Jansen Che

**Figure 323.** Big Box vs all Other Spaces  
Inner Sydney High School Section

**Figure 324.** Big Box vs all Other Spaces  
Inner Sydney High School Level 06 Plan

**Figure 325.** Big Box vs all Other Spaces  
Inner Sydney High School Lower Ground Plan

**Figure 326.** Learning vs all Other Spaces  
Inner Sydney High School Section

**Figure 327.** Learning vs all Other Spaces  
Inner Sydney High School Level 04 Plan

**Figure 328.** Learning vs all Other Spaces  
Inner Sydney High School Level 12 Plan

**Figure 329.** Communal vs all Other Spaces  
Inner Sydney High School Section

**Figure 330.** Communal vs all Other Spaces  
Inner Sydney High School Level 01 Plan

**Figure 331.** Communal vs all Other Spaces  
Inner Sydney High School Ground Plan

**Figure 332.** Outdoor vs Enclosed Spaces  
Inner Sydney High School Section

**Figure 333.** Outdoor vs Enclosed Spaces  
Inner Sydney High School Level 02 Plan

**Figure 334.** Outdoor vs Enclosed Spaces  
Inner Sydney High School Level 10 Plan

**Figure 335.** Circulation Spaces  
Inner Sydney High School Section

**Figure 336.** Circulation Spaces  
Inner Sydney High School Level 12 Plan

**Figure 337.** Atrium Spaces  
Inner Sydney High School Section

**Figure 338.** Atrium Spaces  
Inner Sydney High School Level 12 Plan

**Figure 339.** Secured vs Public-Use Spaces  
Inner Sydney High School Section

**Figure 340.** Secured vs Public-Use Spaces  
Inner Sydney High School Level 01 Plan

**Figure 341.** Inner Sydney High School Case Study  
Summary Diagrams  
Top: Section 1  
Bottom: Section 2

**Figure 342.** Big Box vs all Other Spaces  
Comparative Section of each Case Study

**Figure 343.** Big Box vs all Other Spaces  
Comparative Ground Floor Plans of each Case Study

**Figure 344.** Big Box vs all Other Spaces  
Comparative Diagrams of Below Roof Big-Box Spaces

**Figure 345.** Big Box vs all Other Spaces  
Disassociated Big-Box Spaces from the Vertical School

**Figure 346.** Learning vs all Other Spaces  
Comparative Section of each Case Study

**Figure 347.** Learning vs all Other Spaces  
Comparative Diagrams of Student-Centered Learning  
Spaces

**Figure 348.** Learning vs all Other Spaces  
Comparative Diagrams of Teacher-Centered Learning  
Spaces

**Figure 349.** Communal Space vs all Other Spaces  
Comparative Section of each Case Study

**Figure 350.** Communal vs all Other Spaces  
Comparative Diagrams of Secondary Ground Floor  
Spaces

**Figure 351.** Communal Spaces Paired with Atriums  
Comparative Diagrams of Selected Case Studies

**Figure 352.** Communal Space vs all Other Spaces  
Comparative Diagrams of Co-located Communal  
Areas

**Figure 353.** Outdoor Space vs Enclosed Spaces  
Comparative Section of each Case Study

**Figure 354.** Outdoor Space vs Enclosed Spaces  
Arthur Phillip High School, Parramatta and Parra-  
matta Public School Site Consolidation before (1) and  
after (2) the Vertical School Masterplan

**Figure 355.** Outdoor Space vs Enclosed Spaces  
Comparative Diagrams of Outdoor Roof Spaces

**Figure 356.** Outdoor Space vs Enclosed Spaces  
Comparative Diagrams of Outdoor Terraces and  
Breezeways

**Figure 357.** Outdoor Space vs Enclosed Spaces  
Comparative Diagrams of Outdoor Terraces and  
Breezeways

**Figure 358.** Circulation Spaces  
Comparative Section of each Case Study

**Figure 359.** Circulation Spaces  
Comparative Diagrams of Lifts to Destination Floors

**Figure 360.** Circulation Spaces  
Comparative Diagrams Stair Orientated Circulation

**Figure 361.** Circulation Spaces  
Comparative Diagrams of Perimeter Off-Set Core

**Figure 362.** Site Coverage and Building Footprint  
Comparative Plan of each Case Study

**Figure 363.** Atrium Spaces  
St Andrews Cathedral School, Sydney

**Figure 364.** Atrium Spaces  
Comparative Section of each Case Study

**Figure 365.** Atrium Spaces  
Comparative Diagrams of a Central Circulation Space  
Through the Atrium

**Figure 366.** Atrium Spaces of Exemplar Architectural  
Precedents  
Comparative Section of each Case Study

**Figure 367.** Atrium Spaces  
Comparative Diagrams of Multiple Isolated Atriums

**Figure 368.** Secured vs Public-Use Spaces  
Comparative Study of each Case Study

**Figure 369.** Secured vs Public-Use Spaces  
Fortress Model

**Figure 370.** Secured vs Public-Use Spaces  
Comparative Diagram of Public Privileged Co-sharing  
Model

**Figure 371.** Secured vs Public-Use Spaces  
Civic / Co-sharing Model - Secured school zone above  
a publicly accessible ground floor

**Figure 372.** Secured vs Public-Use Spaces  
Civic / Co-sharing Model - Ground Floor Retail  
Tenancy

**Figure 373.** Secured vs Public-Use Spaces  
Comparative Diagram Civic / Co-sharing Model -  
Secured school zone via lift cores

**Figure 374.** Spatial Type Analysis of Vertical School  
Case Studies  
Comparative Model of each Case Study

**Figure 375.** Vertical School Models in Comparative  
Matrix Image 01  
Photograph: Jansen Che

**Figure 376.** Vertical School Models in Comparative  
Matrix Image 02  
Photograph: Jansen Che

**Figure 377.** Vertical School Models in Comparative  
Matrix Image 03  
Photograph: Jansen Che

**Figure 378.** Ordering Principle 1: Masterplan near  
co-shared facilities

**Figure 379.** Ordering Principle 2: Consolidated  
Massing

**Figure 380.** Ordering Principle 3: Target Floorplate  
Area Plan

**Figure 381.** Ordering Principle 4: Perimeter Core and  
Lift Bank Plan

**Figure 382.** Ordering Principle 5: Structural and  
Services Flexibility

**Figure 383.** Ordering Principle 6: Positioning Big-Box-  
es

**Figure 384.** Ordering Principle 7: Secured Line as  
Datum Section

**Figure 385.** Ordering Principle 8: Stacked Medi-  
um-Rise Volumes Section

**Figure 386.** Ordering Principle 9: Atrium as a Datum  
Section

**Figure 387.** Ordering Principle 10: Articulate Massing  
Section

**Figure 388.** Orestad College Central Atrium Space  
Photograph: Adam Swinburn

## List of Abbreviations

ABS	Australian Bureau of Statistics
APHS	Arthur Phillip High School
BCA	Building Code of Australia
CAD	Computer-aided design
CBD	Central business district
ELC	Early Learning Childhood
GFA	Gross Floor Area
HKSIS	Singapore International School in Hong Kong
ILE	Innovative Learning Environments
ISHS	Inner Sydney High School
PPS	Parramatta Primary School
SACS	St Andrews Cathedral School
SOTA	School of the Arts
STEAM	Science, technology, engineering, art and mathematics
WJCP	William Jones College Preparatory

## Definition of a Vertical School

A vertical school is a multi-storey school design. As opposed to a land-intensive traditional horizontal campus, the vertical school provides a condensed development model with often a singular building between 5 to 17 storeys in height. The planning of vertical schools frequently locates outdoor spaces on upper levels of the building and deploys atriums to connect multiple floors. The construction methods, materials and servicing of vertical schools are similar to those of a high-rise office building, often deploying commercial-grade facades and lift cores.

The vertical school is a new type of marketed development commissioned across Australia's mainland states. While a recent phenomenon in the Australian context, multi-storey schools commonly appear in dense city centres such as New York, Singapore, and Hong Kong. The emergence of vertical schools in city centres is due to land economics and tight site restrictions requiring taller developments to facilitate accommodation briefs that include teaching and administrative and recreational facilities.

