

469 BUKIT TIMAH ROAD

Graduating to a Brighter Future



Owner:
National University of Singapore
Bukit Timah Campus

Architect:
Forum Architects Pte Ltd

Engineer:
T.Y.Lin International Pte. Ltd.

Contractor:
Guan Ho Construction Co Pte Ltd

The revival of the historic NUS Bukit Timah campus showcases the restoration, recovery and upgrading of the 1928 Raffles College facility gazetted as national monuments - the Oei Tiong Ham, Manasseh Meyer, Federal and Eu Tong Sen Blocks - and Block A and the Library Block added in the 1940s and 1950s respectively. Today, the beautifully restored buildings continue to uphold



Oei Tiong Ham Block beautifully restored

their legacy as the cradle of Singapore's tertiary education. Sensitively adapted for reuse as modern classrooms and lecture theatres equipped with air-conditioning and the latest technology, the campus continues to inspire its present-day students, and enhance the memories of many generations who have walked its grounds and graduated from it.

A Studied Revival

The project team's meticulous research, investigation and documentation uncovered several architectural modifications and add-on design elements on the buildings. All the doors on most of the blocks that had been replaced over the years, as well as those on the Eu Tong Sen Block which had been removed, were painstakingly reinstated to their design detailing and rightful locations. The original coffered ceiling of Oei Tiong Ham Block was also sensitively restored after its surprise discovery, as was the severely altered connector between the building and Block A. As a result, much of the original soul, details and aesthetics were successfully preserved.

Awakening the Quads

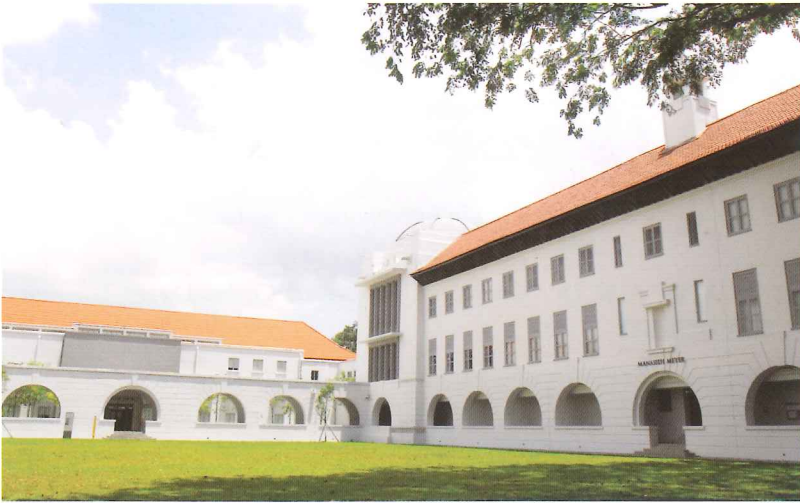
Traditionally the open space where students congregated, the development's upper and lower quadrangles had insensitive alterations and additions like the covered structures along walkways which were discordant with the original design intent of the colonial-style architecture. A minimalist design approach was taken to bring them back into focus with the matured trees kept and the sprawling lawns landscaped to give greater prominence to the

surrounding buildings. The new 'tiered landscape' decks along the Block B corridor add a nice touch as they open up more convivial spaces for students to mingle and relax. The original link connecting Oei Tiong Ham and Manasseh Meyer Blocks was also reinstated.

New Use for Familiar Spaces

Originally designed to be naturally ventilated, the buildings were upgraded and air-conditioned. This was done with expert subtlety. Louvred windows were reinstated and fitted with glass to keep cool air in and ductwork and diffusers were masterfully hidden from view. The project team is also commended for employing new technology and creative thinking to achieve a sense of larger, column-free spaces within the Oei Tiong Ham graduation hall.

All in all, this project is carried out with disciplined and exemplary effort that culminated in the immaculate revival of a venerated national institution.



Library and Manasseh Meyer Blocks frame lower quadrangle lawn



Dome of Manasseh Meyer Block



Decorative turret



Cauldron-shaped sculpture on column



Eu Tong Sen Block



Cloistered passageway with rhythmic semi-circular openings



Timber lattice fanlight and louvered door



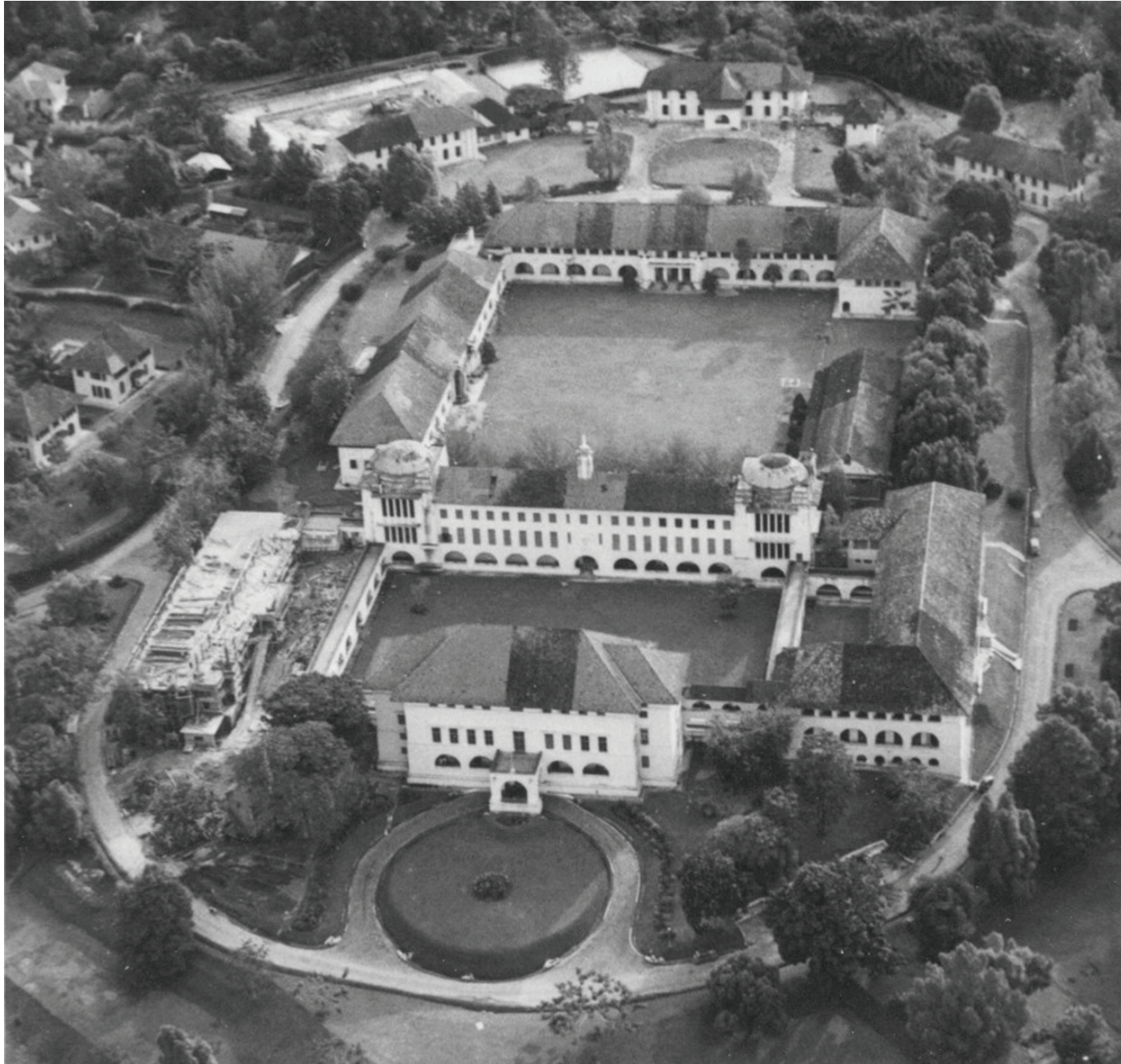
Oei Tiong Ham Block



Coffered ceiling at lobby of Oei Tiong Ham Block

BUILDING HISTORY

A Pioneering Educational Institution



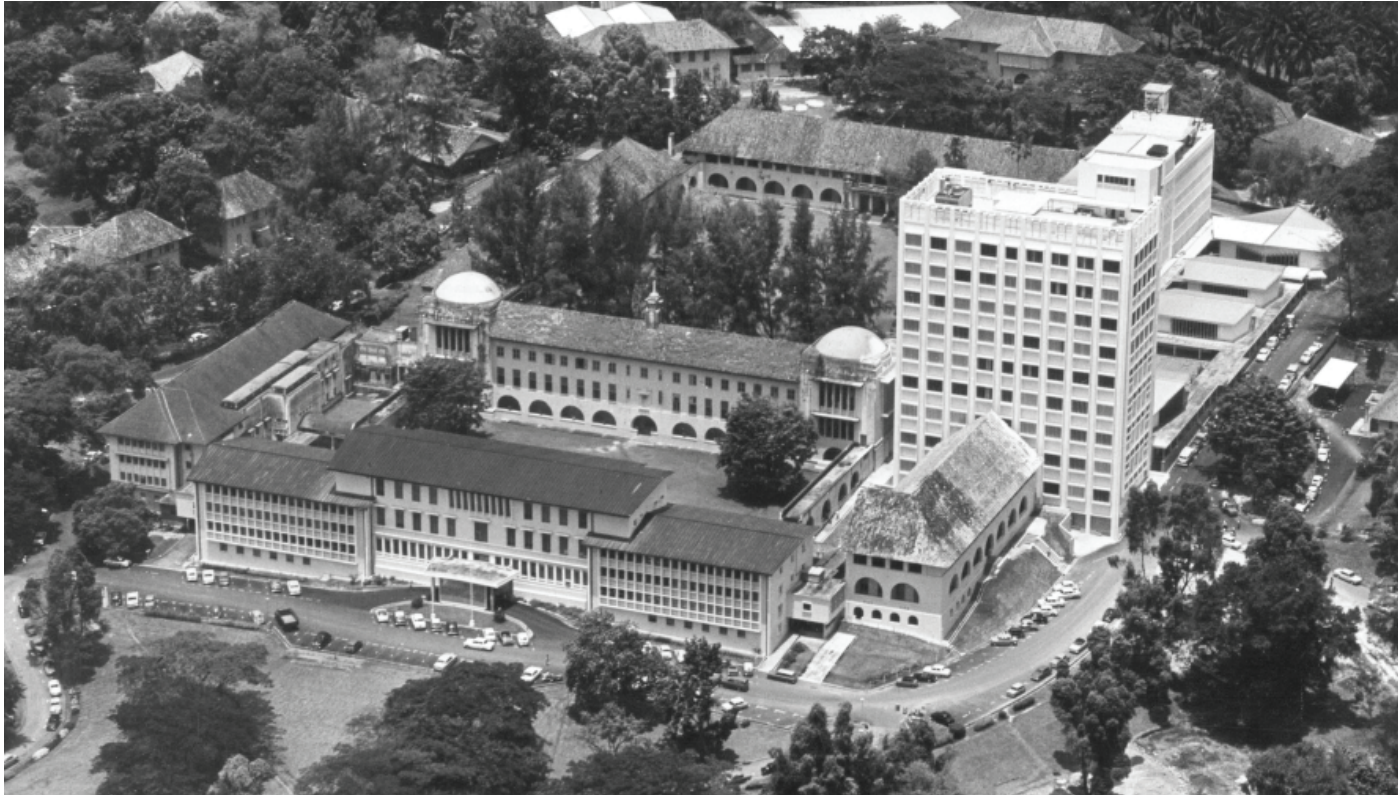
Introduction

A historical heritage site, the Bukit Timah Campus is the cradle of Singapore's tertiary education. The first sight that greets the visitors and students, the campus green is an idyllic spot for campus concerts. Guitar performances under the shady trees and students lounging in the sun made this zone a meeting point. A popular photo-taking spot on high ground with gentle slopes, it was part of the Botanic Gardens.

"Those who studied at Raffles College between late-20s and the late 40s remember the Bukit Timah Campus as wonderfully wooded [and] bucolic. Down the slope from Dalvey estate, near steps that lead up to No.5, a tembusu tree stands tall with thick horizontal branches jutting out low down its trunk. Climb up the 48 steps to the house, you come across the angšana tree which also has fragrant yellow flowers. These carpet the ground after an overnight shedding. Also on the ground but mushy are the fallen fruit of oil-palms that are so old they reach higher than the sloping roof of the building. Half a dozen water fowls wander about the grounds; their resonant croaking makes their presence very much felt. The grass snakes that co-exist with them slither silently, occasionally making their way into the building to give humans a scare. Squirrels have their freedom of the compound among the rambutan and durian trees. The old building's cream coloured walls and rust coloured trim, its old-world wooden-slat windows steadily losing their khaki-green, the two non-matching glass and aluminum casements, the obtrusive aircon units, the unadorned flagpole atop the cone, the modern red-brick annex all make up a rather melancholic picture."

Maurice Baker

Taken from *The Heart Where It Is* (1994)



Inception of the Campus

In 1919, a working committee for education recommended a college for higher education to be known as Raffles College, also the Singapore centenary memorial of Sir Stamford Raffle's founding of Singapore and the nucleus of a future university. The Government's endowment fund started with \$2 million, with large donations received from Sir Manasseh Meyer, Oei Tiong Ham, Tan Soo Guan and Eu Tong Sen. The college opened to its first 43 students In June 1928.

"Raffles College students enrolled for either arts or science. The arts students worked in the library and the science students, in the laboratory. They pondered over their booked day and night, but at tea-time they were ready to take off for football, rugby, cricket, or hockey. There were other recreational activities; music practice with voice or violin, listening to the gramophone, or strolling and romancing in the Botanic Gardens,"

Edwin Lee and Tan Tai Yong

Taken from *Beyond Degrees* (1996)

During the war years there was a growing consensus in developing the British colonies especially in higher education. In 1949, a bill creating the new university, University of Malaya was passed. This was made more significant as it coincided with the beginnings of an independent Singapore.

The university opened a campus in Kuala Lumpur when Malaya gained independence setting in motion the separation of universities. In 1962, the university was renamed University of Singapore.



BUILDING HISTORY

A Pioneering Educational Institution



Opening Ceremony

Eventful moments marked the illustrious history of the University. The most significant and memorable was Foundation Day on 8 October 1949 which officially installed the University of Malaya at Bukit Timah. Besides the Senate and the Council of the University, representatives from foreign universities in Britain and Asia, and the Sultans from Malaya came in their full regalia to participate in the pomp and ceremony of the event in typical British tradition. Foundation Day ceremony was held at Oei Tiong Ham Hall at Bukit Timah campus. The first Chancellor of the University, Malcolm Macdonald was also installed at the ceremony. A British empire-wide architectural competition was conducted and the winning design was by Cyril A Farey and Graham R Dawbarn. The architecture was simple and modern. The college was formed around two quads grassy courtyards with rows of buildings on the periphery.

“The first sight of Raffles College struck me with a feeling of reverent awe. Perched on top of a hill amidst sylvan surroundings, the stately group of buildings looked truly imposing. The somber grey of the camouflaged walls, and the cloistered tranquility which pervaded the place inspired me with an almost pious reverence. As I walked along the flagged corridors flanked on either side by circular arches, I was deeply affected by the quiet grandeur of the scene.”

Chong Seck Chim

Taken from *Raffles College* (1928-1949)





"I wonder whether you understand, whether you have a grasp of the realities of the society in which you are living. I have the feeling very often that, because the administration is so effective, you are living, like fishes in aquariums, in different tanks. And in your tank, there are only angel fish, a few black mollies, some red carp. And in the other tank, are some tiger fish, piranhas, man-eating types of fish."

Lee Kuan Yew

Prime Minister's address to students (1969)

Historical Significance

Many memorable events were held in on campus, one of which is the speech address by then Prime Minister Lee Kuan Yew. In 1969, the student union invited PM Lee for a landmark speech, attended by thousands. Students filled the lecture theatre and spilled out to the corridors. It was a time of important political and historical events, when Singapore had gained independence and was still in transition. Students were active in politics. The government was concerned about the views of some of the expatriate academic staff. The PM urged them not to accept blindly what the expat staff in the social sciences taught, without questioning their citizenship. He also emphasised the University's role as integral to nation building.

"I was warned that my editorship of the Singapore Undergrad would get me into trouble. The most memorable article I wrote was called "A question of decorum". It was on an electrifying event that took place when the then PM addressed the University students. When the chairman of that forum was asked by the PM to restrain a questioner, he replied, "I am the chairman, I decide."

Kishore Mahubani - "Four of the best"

Taken from *Memories Beyond Degrees*



Architecture of the Historic Campus

With its open, green quads and beautiful, wide, arched corridors, the Bukit Timah campus resembles a traditional British college campus- stimulating environment for scholarly reflection and contemplation with Oxford styled arches and corridors, pylon-like tower projecting from the roof at midpoint along their length and flattened domes of cupolas on either side at the ends.

There was communal interaction and small spontaneous performances in the cosy lower quad. The verandahs and corridors were 'hot spots' for students to gather or to escape the sun or rain.

Ragging also took place between class change over periods.



"Unlike 'ragging' as practiced in the British universities where students organized a parade through town to raise money for a charity, the activities in Raffles College and the medical college was more akin to 'fagging', a system of bullying whereby a British public school pupil acted as a servant to an older schoolmate."

Lee Kip Lee

Taken from *Amber Sands: A Boyhood Memoir* (1995)



Student Life in the Campus

The upper quad was the central hub to student life. It was where the students walked across to get to their classes. The campus was small and students from different faculties would mingle. The campus holds fond memories as well as personal and sentimental value for those who studied there.

Some squares within institutions spur civic activities, the lower and upper quads of the Bukit Timah Campus. The square is a focal point and an identity marker, and bring back many memories of friends and activities which the quad witnessed.

The 1950s and 1960s were a period of political awakening. Students actively took part in politics and demonstrated. There were protests on campus as students stood up for social and political causes. The University Specialist Club and Democratic Club was formed. One result was the detaining of some students on St John's island. Like-minded students would go to the police station to obtain visit passes to visit the detainees to keep their morale up.

"It is out task to see that a University without a soul will not be allowed to exist in our country. Any institution producing technical robots, inarticulate scientists, dumb doctors, bigoted pedagogues and bureaucratic civil servants is not to be tolerated."

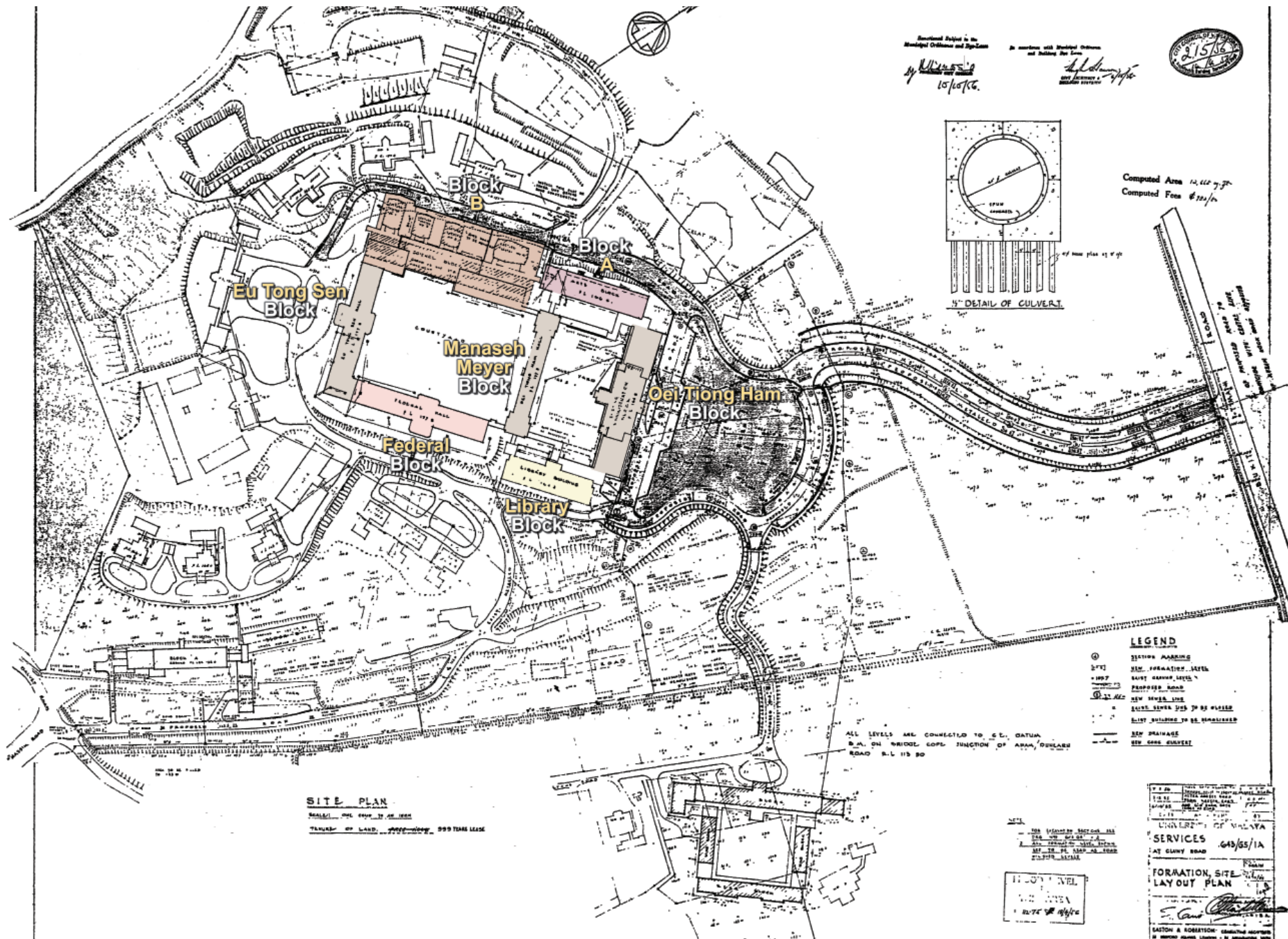
Editorial

Taken from *The Grad*

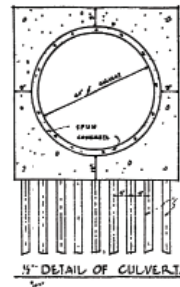
ARCHIVE DRAWINGS

Architectural floor plans of original campus





Submitted Subject to the Municipal Ordinance and Regulations
 In accordance with Municipal Ordinance and Building Act 1974
 15/10/76



Computed Area 12,422 sq ft
 Computed Foss 6,221/20

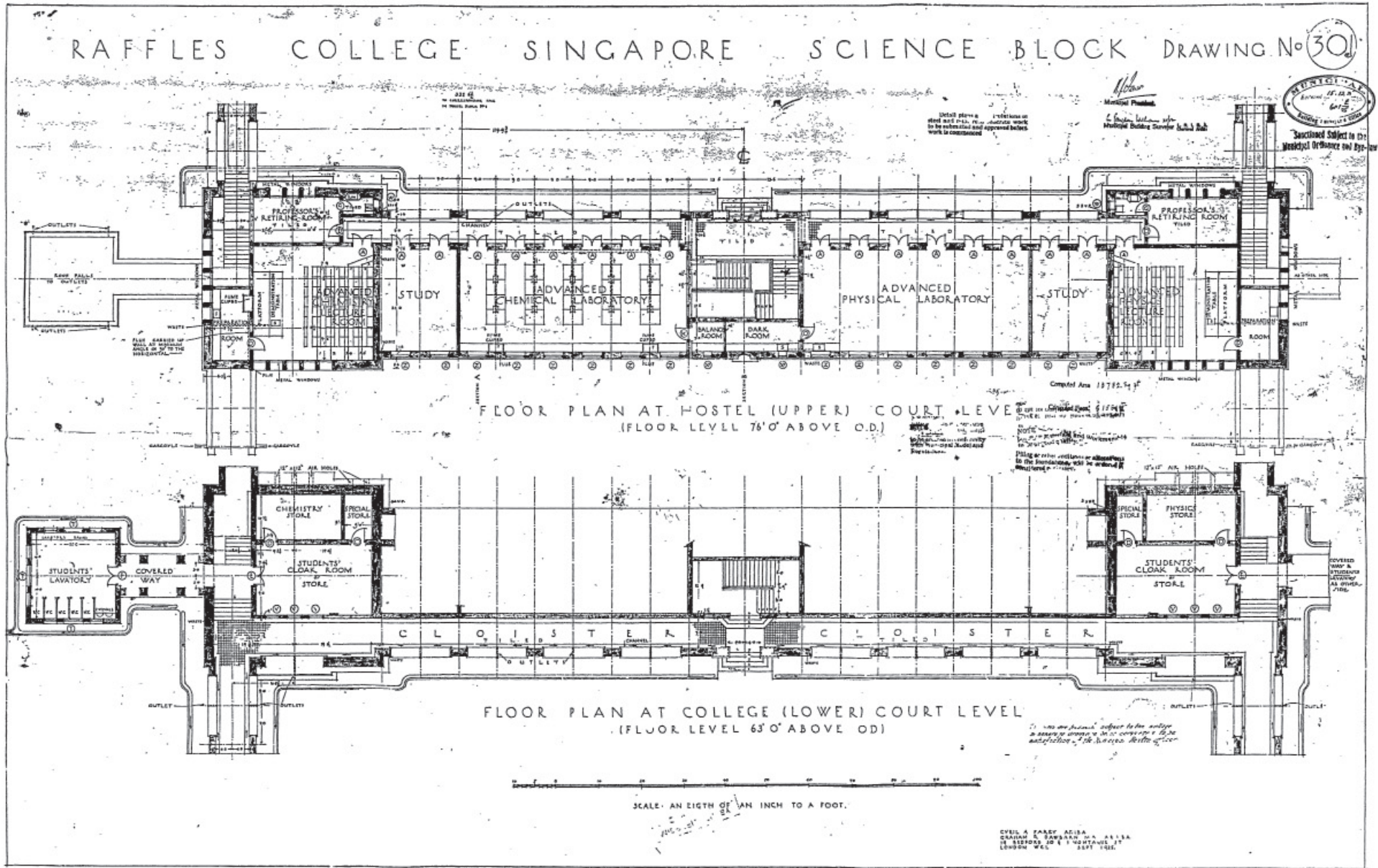
SITE PLAN
 SCALE: 1/4" = 10' - 0" AS SHOWN
 TRANSFER OF LAND - APPROXIMATE 999 YEARS LEASE

ALL LEVELS ARE CONNECTED TO S.E. DATUM
 B.M. ON BRIDGE JOINT OF ARAM, D'ALMEIDA
 ROAD S.L. 115.90

- LEGEND**
- ⊙ SECTION MARKING
 - 1967 NEW FORMATION LEVEL
 - 1967 EXIST. GRADE LEVEL
 - PROPOSED ROAD
 - NEW SEWER LINE
 - EXIST. SEWER 300 TO BE MAINT.
 - EXIST. BUILDING TO BE DEMOLISHED
 - NEW DRAINAGE
 - NEW CONC. CULVERT

11.00' LEVEL
 10.75' LEVEL

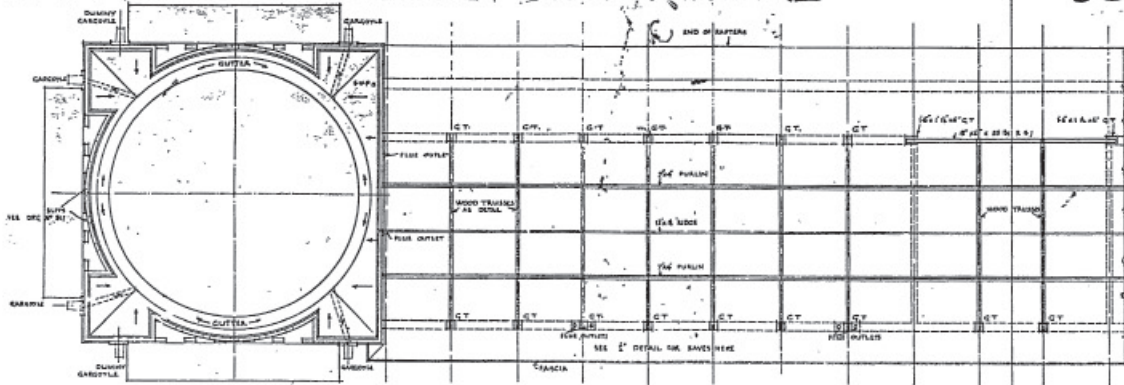
UNIVERSITY OF MALAYA
 SERVICES 645/65/1A
 FORMATION SITE LAYOUT PLAN
 SATION & ROBERTSON CONSULTING ARCHITECTS
 14, MARKET STREET, SINGAPORE



RAFFLES COLLEGE SINGAPORE

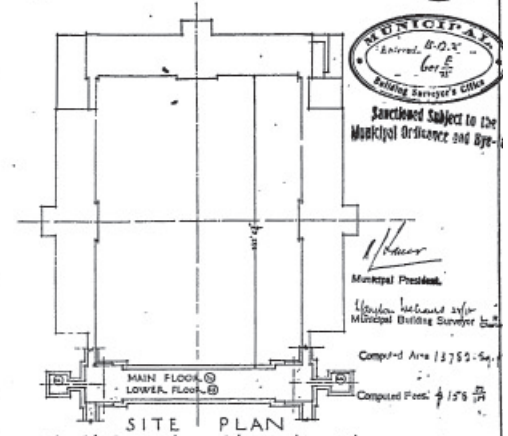
SCIENCE BLOCK

DRAWING NO. 302

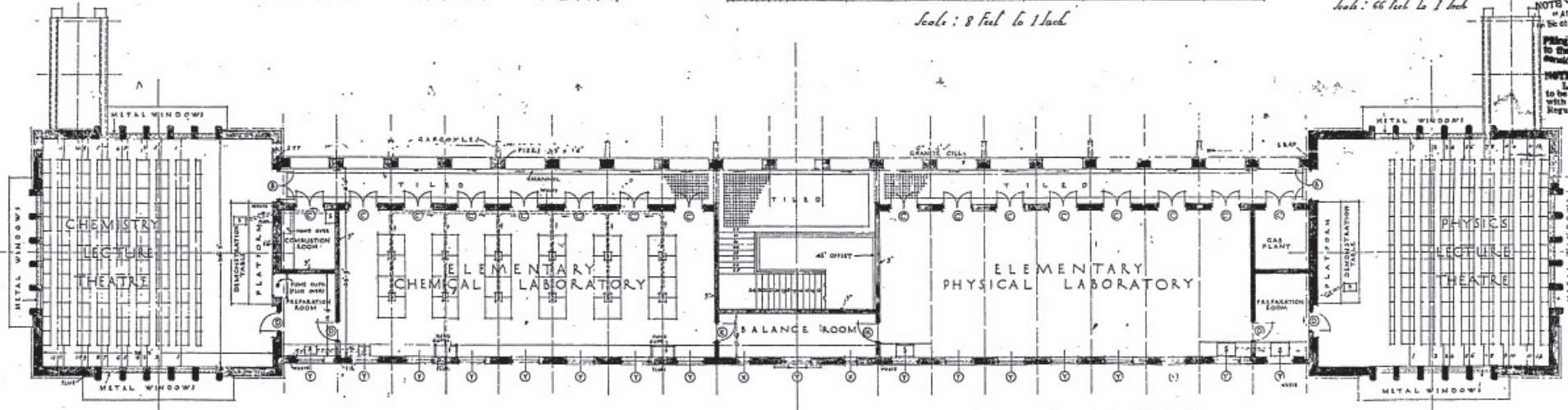


PART ROOF PLAN

Scale: 8 feet to 1 inch



SITE PLAN



PLAN of TOP FLOOR
FLOOR LEVEL 52'0" ABOVE O-D

The work is to be commenced subject to the receipt of the necessary approvals from the Municipal Council of Singapore.

Detail plan - The sections of work to be commenced are those approved by the Municipal Council of Singapore.

CYRIL A. FAHEY A.R.I.B.A.
GANGHAM & DAWSON M.A. A.R.I.B.A.
15 BEDFORD SQUARE, LONDON, W.C.1. SEPTEMBER 1937

RAFFLES COLLEGE SINGAPORE

DRAWING No

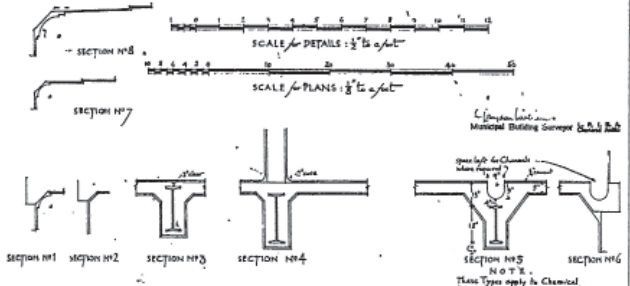
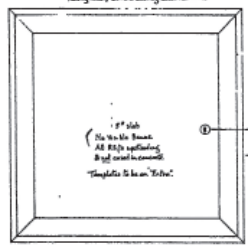
304

SCIENCE BLOCK CEILING PLANS & CORNICE DETAIL



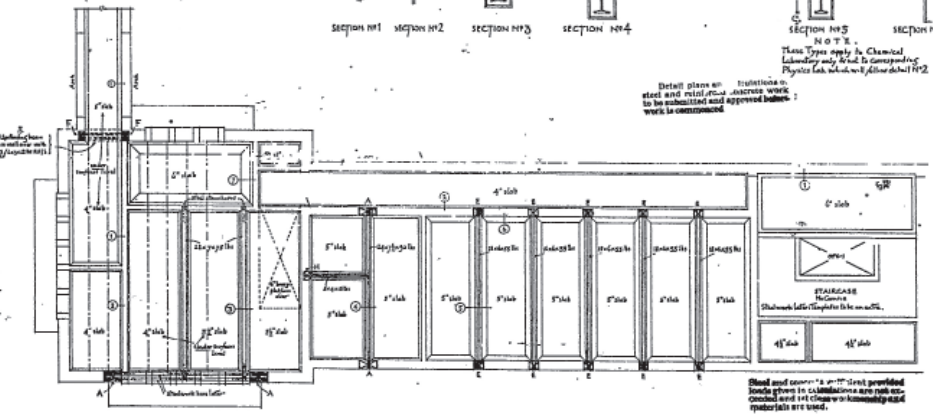
TYPICAL CALCULATION

Superficial Equivalent Total Load
Below Slab Above 112 lbs per sq ft
Beam over Annular Chemical Laboratory
Total Load $\frac{100 \times 112}{100} = 112$ lbs per sq ft
Add for Slab $\frac{10}{12} \times 150 = 12.5$ lbs per sq ft
Span is supported 28'0"
The 60 lbs R.S.J. below slab load of
19.2 lbs per sq ft of 28'0" span
TEMPLATES
for Above
Slab load on Beamwork below of
4 lbs per sq ft
Each end corner of beam
15'0" x 15'0" Templates are area $\frac{225}{16}$
Allowance under lighty corners
= 13 lbs



NOTES

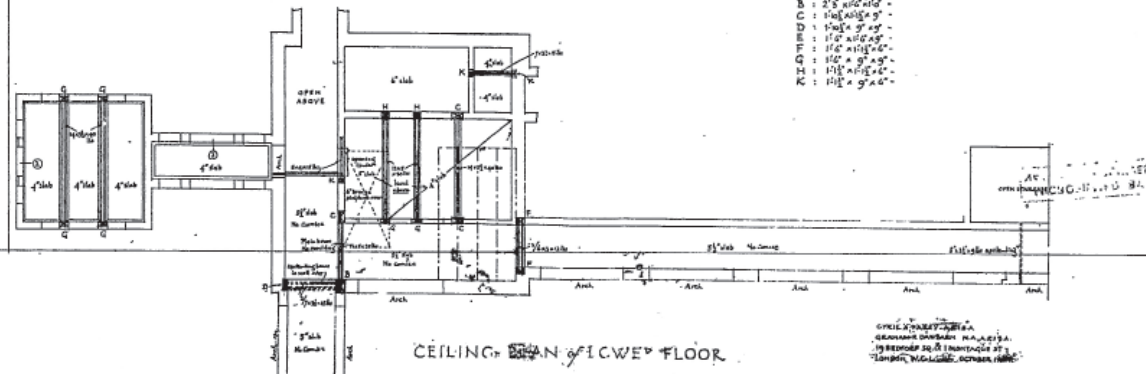
1. Detailed Ceiling Plans indicate finished ceiling elevations. It is additional to that shown here in Section & Specification.
2. Net Height of slab is shown, indication of slab is from finishing.
3. Specification of Ceiling Structure, Slab, & Beam setting in the end is given in detail in Section, General Note to Specification. See Specification for Reinforcement.
4. Granite Templates shown here are 1/4" A.



CEILING PLAN MIDDLE FLOOR

KEY TO GRANITE TEMPLATES

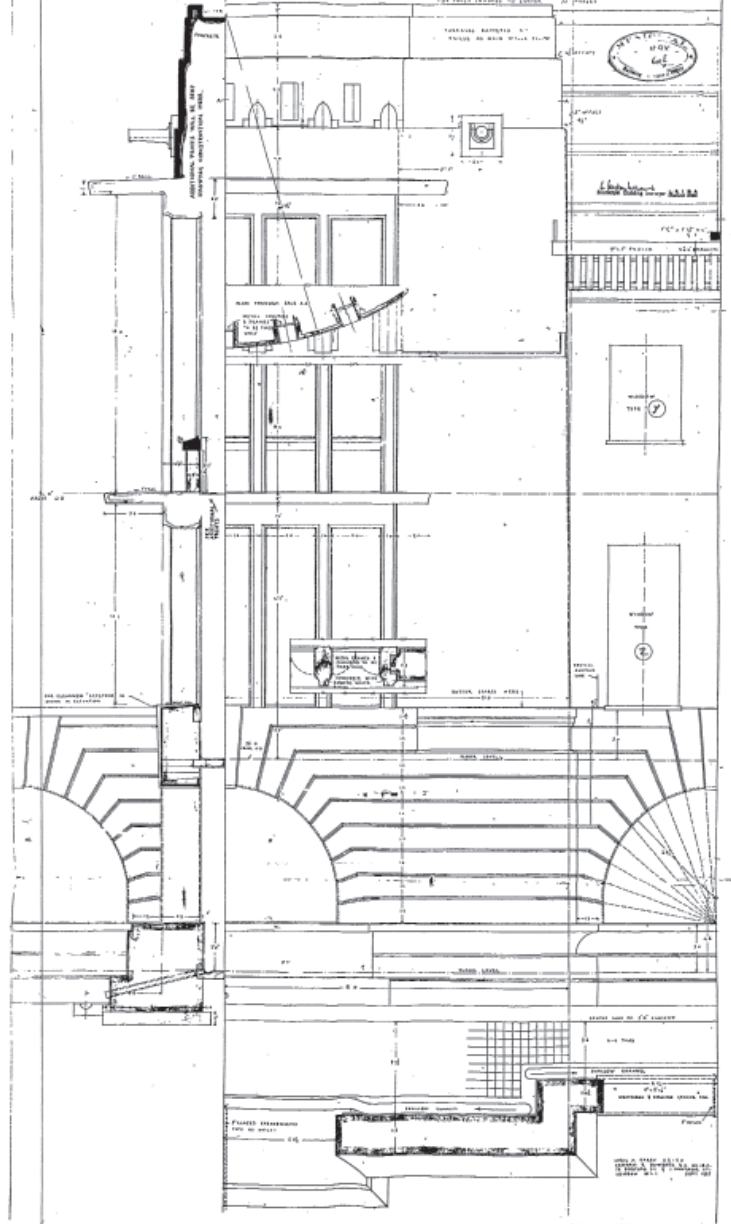
- A : 2'0" x 2'0" x 1/4" deep
- B : 2'5" x 2'0" x 1/4" "
- C : 3'0" x 2'0" x 1/4" "
- D : 3'5" x 2'0" x 1/4" "
- E : 4'0" x 2'0" x 1/4" "
- F : 4'5" x 2'0" x 1/4" "
- G : 5'0" x 2'0" x 1/4" "
- H : 5'5" x 2'0" x 1/4" "
- I : 6'0" x 2'0" x 1/4" "
- J : 6'5" x 2'0" x 1/4" "
- K : 7'0" x 2'0" x 1/4" "
- L : 7'5" x 2'0" x 1/4" "
- M : 8'0" x 2'0" x 1/4" "
- N : 8'5" x 2'0" x 1/4" "
- O : 9'0" x 2'0" x 1/4" "
- P : 9'5" x 2'0" x 1/4" "
- Q : 10'0" x 2'0" x 1/4" "
- R : 10'5" x 2'0" x 1/4" "
- S : 11'0" x 2'0" x 1/4" "
- T : 11'5" x 2'0" x 1/4" "
- U : 12'0" x 2'0" x 1/4" "
- V : 12'5" x 2'0" x 1/4" "
- W : 13'0" x 2'0" x 1/4" "
- X : 13'5" x 2'0" x 1/4" "
- Y : 14'0" x 2'0" x 1/4" "
- Z : 14'5" x 2'0" x 1/4" "

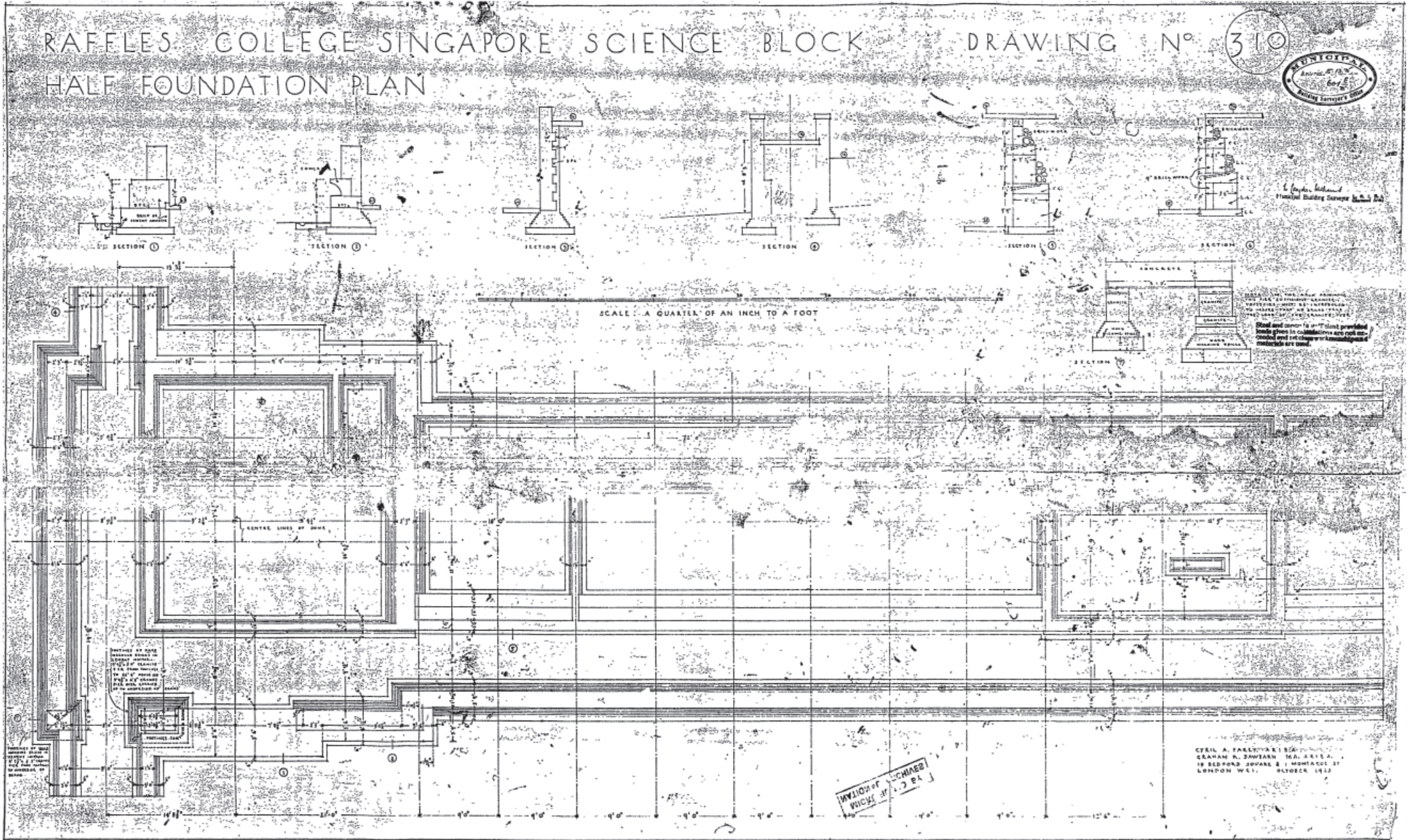


CEILING PLAN LOWER FLOOR

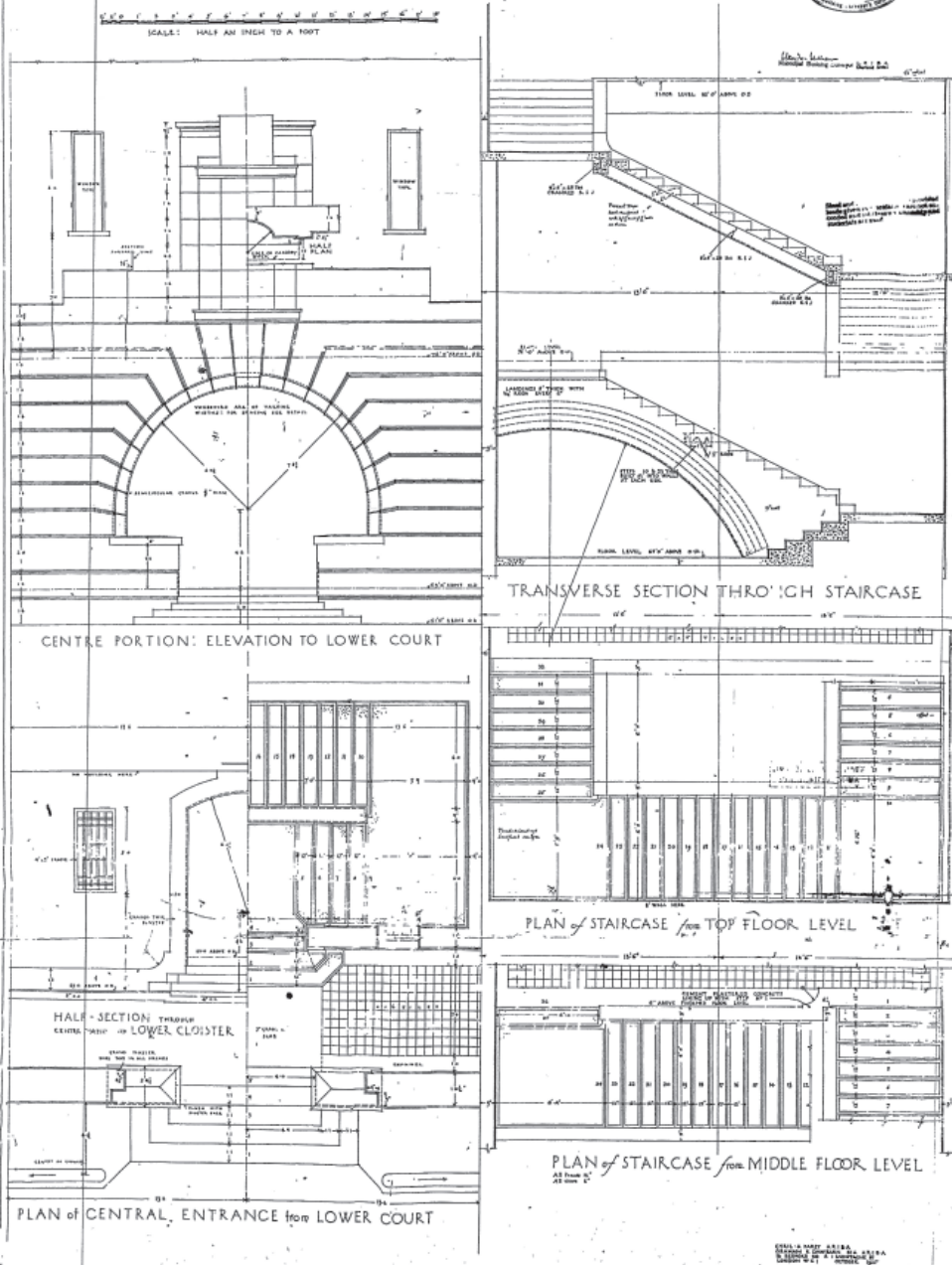
RAFFLES COLLEGE SINGAPORE DRAWING No 311

SCIENCE BLOCK DETAIL AT END OF LOWER COURT

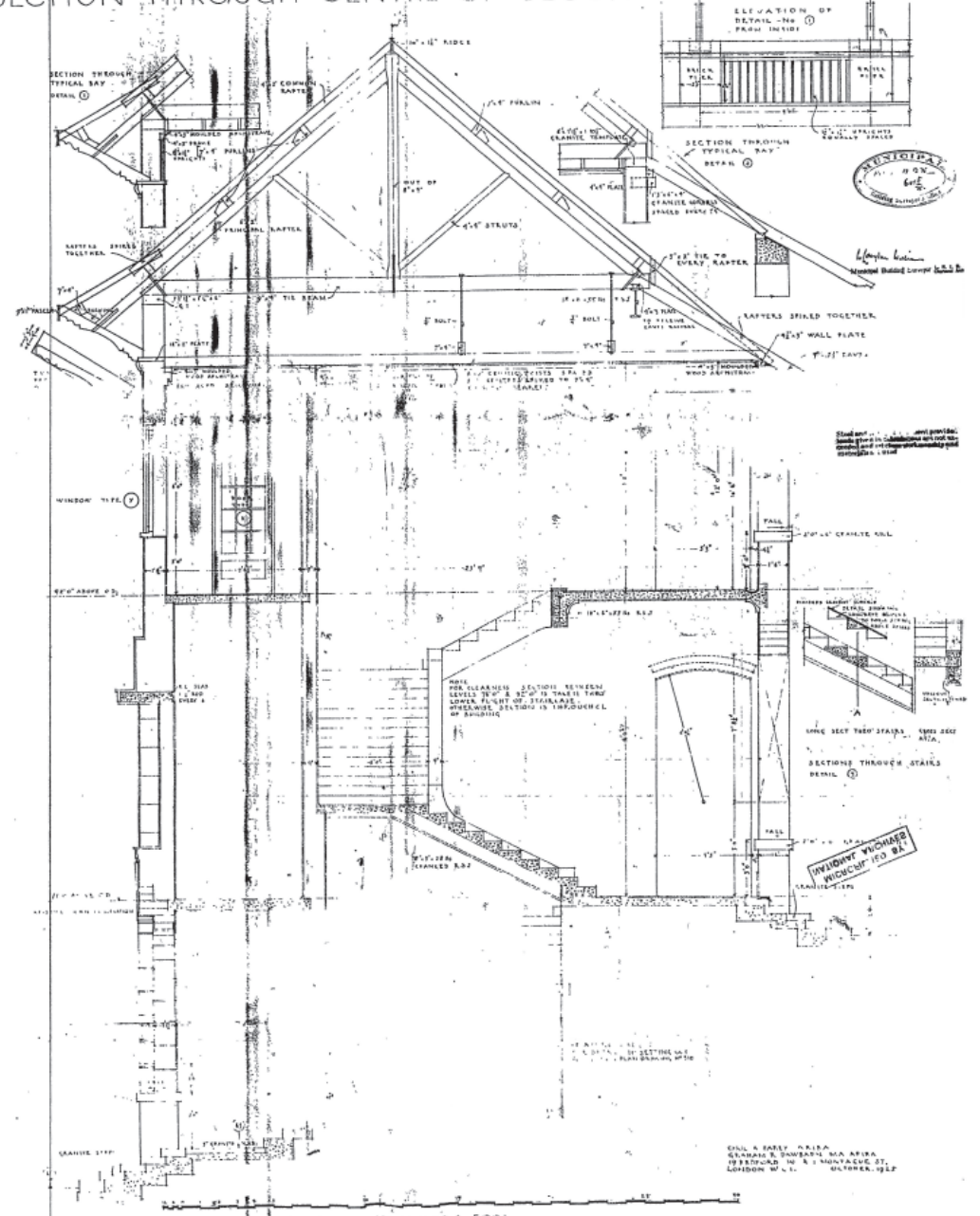




RAFFLES COLLEGE SINGAPORE SCIENCE BLOCK. DRAWING NO. (512)
 HALF-INCH DETAILS of CENTRE of BLOCK.

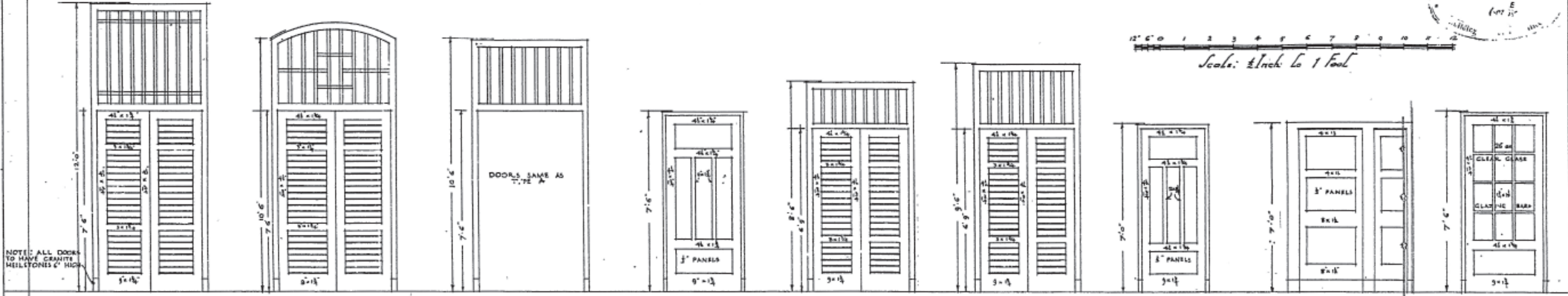
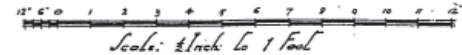


RAFFLES COLLEGE SINGAPORE SCIENCE BLOCK. DRAWING NO. (513)
 SECTION THROUGH CENTRE OF BLOCK



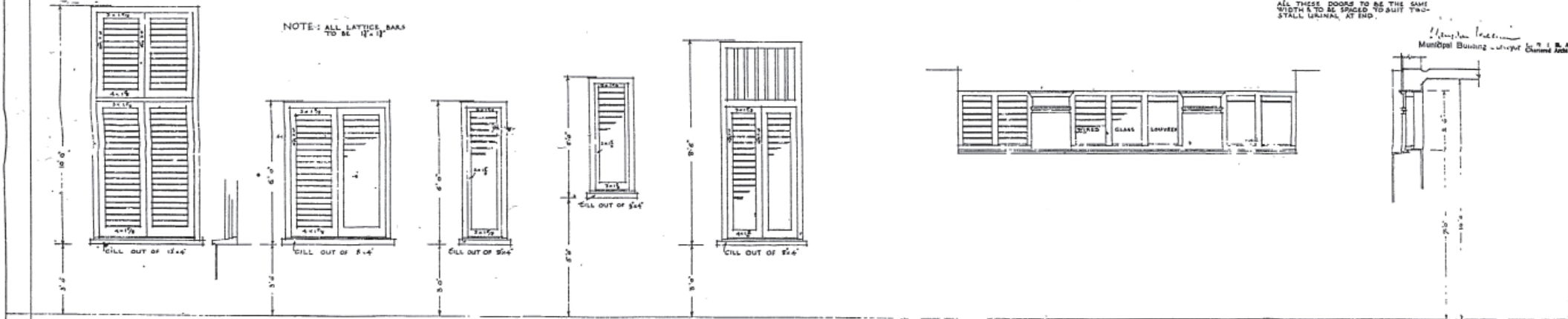
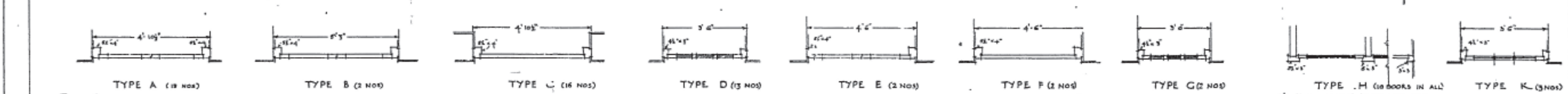
Raffles College Singapore DETAILS of DOORS & WINDOWS for SCIENCE BLOCK

DRAWING N^o 314



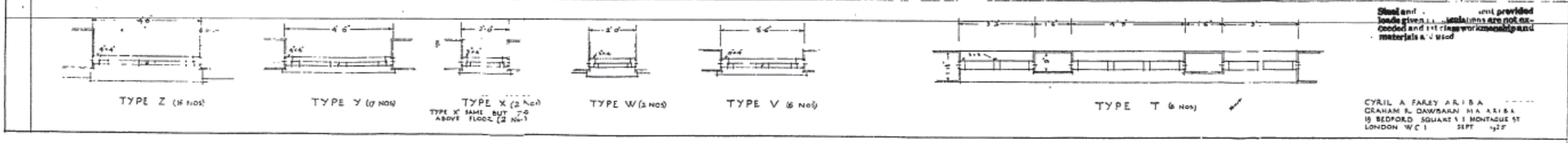
NOTE: ALL DOORS TO HAVE GRANITE HELLSTONES 6" HIGH

ALL THESE DOORS TO BE THE SAME WIDTH & TO BE SPACED TO SUIT TWO-STALL LATHING AT END.



NOTE: ALL LATTICE BARS TO BE 1 1/2" x 1/2"

Steel and... provided... materials used



CYRIL A. FARREY A.R.I.B.A. 15 BEDFORD SQUARE 111 MONTAGUE ST LONDON W.C.1

RAFFLES COLLEGE SINGAPORE STUDENTS HOSTEL No 1

DRAWING No. 203A



PLAN SHOWING STEEL WORK SUPPORTING FIRST FLOOR

TO BE READ IN CONJUNCTION WITH DRAWING No 203

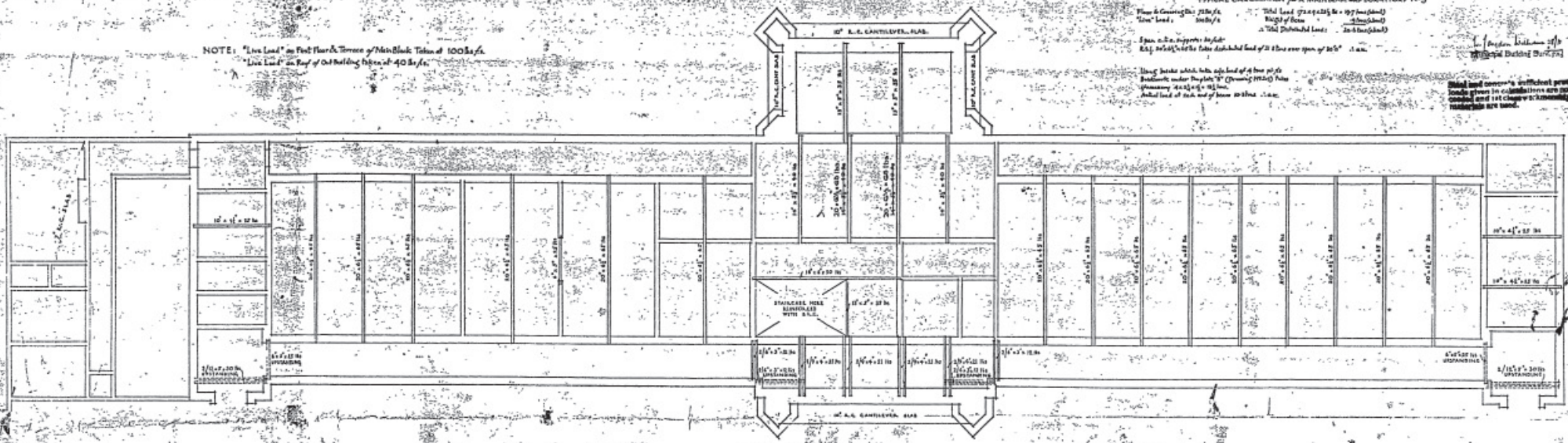
NOTE: "Live Load" on First Floor & Terrace of Main Block Taken as 100 lbs/sq ft.
"Live Load" on Roof of Old Building taken as 40 lbs/sq ft.

TYPICAL CALCULATION FOR A MAIN BEAM AND DORMITORY NO'S
Span & Center to Center 22 ft 0 in
"Live" Load 100 lbs/sq ft
Height of Room 12 ft 0 in
Total Distributed Load 22 x 100 = 2200 lbs
Span & C.C. supports 10 ft 0 in
E.g. 2200 / 10 = 220 lbs distributed load of 22 lbs per span of 10" x 12" i.e.

Heavy beams which take up load of 4 tons will be placed under Dormitory "D" (Drawing 192A) Plan. Primary beams 4 x 12" x 12" i.e. 12 ton. Actual load of 2 tons will be borne by these 4 beams.

See Section Elevation 203B (Structural Drawing 203B)

Steel and concrete reinforced provided loads given in calculations are not exceeded and all changes of arrangement and materials are noted.



NOTE: ALL FLOOR SLABS TO BE REINFORCED WITH R.C. MEN. SLABS 3" UNLESS OTHERWISE STATED.

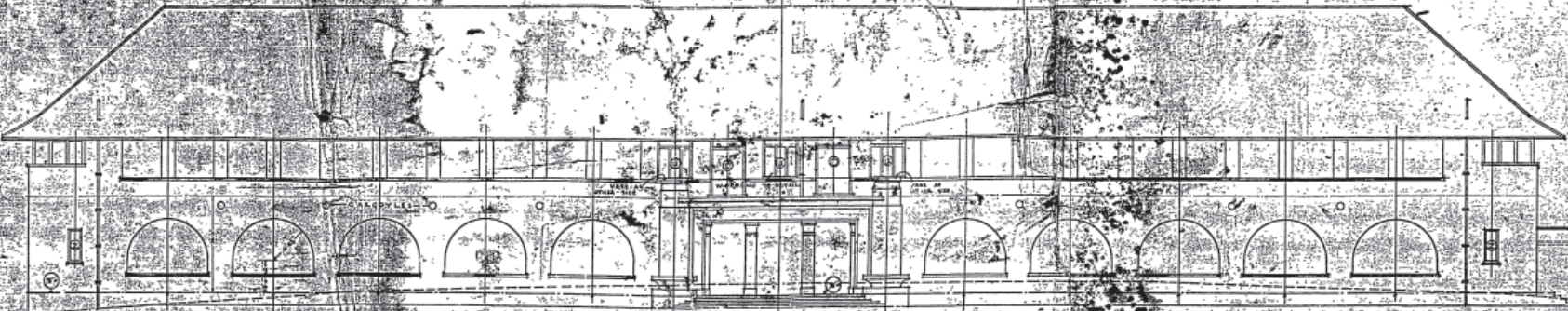


SCALE: AN EIGHTH OF AN INCH TO A FOOT.

CYRIL A. FARLEY, A.R.I.B.A.,
RAJAWATI & JAMESON ROAD, SINGAPORE.
15 BEDFORD SQUARE, MONTAGUE ST.
LONDON W.C.1. SEPTEMBER 1925.



Sanctioned Subject to the Municipal Ordinance and Bye-Laws.



NORTH EAST ELEVATION

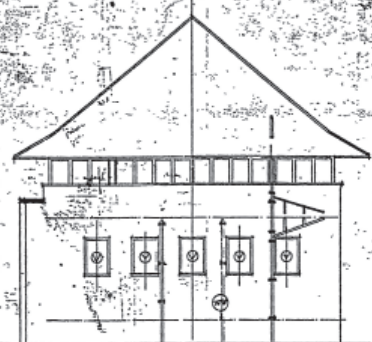
The lines are drawn subject to the subject in accordance with the bye-laws of the Municipal Council of Singapore.

Municipal Engineer
 Municipal Council of Singapore
 Proposed Plan 22561-2/14
 Approved Plan 22561-2/14



SOUTH WEST ELEVATION TO HOSTEL COURT

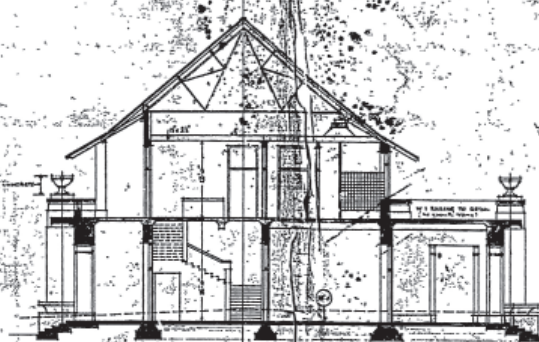
NOTE: The lines are drawn subject to the subject in accordance with the bye-laws of the Municipal Council of Singapore.



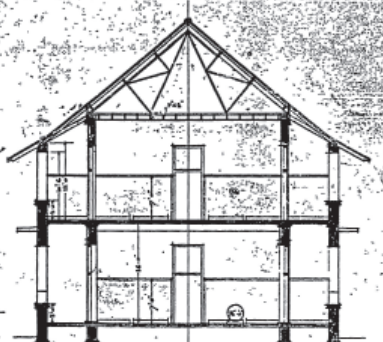
SOUTH-EAST ELEVATION



SECTION THROUGH SERVANTS' YARD

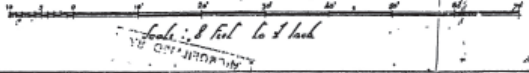


CROSS SECTION ON CENTRE LINE



CROSS SECTION THROUGH DORMITORIES

FLOOR LEVELS: ————
 CHAIN LINE: ————
 NATURAL GROUND LEVELS: DOTTED LINE
 FINISHED GROUND LEVEL: FULL LINE

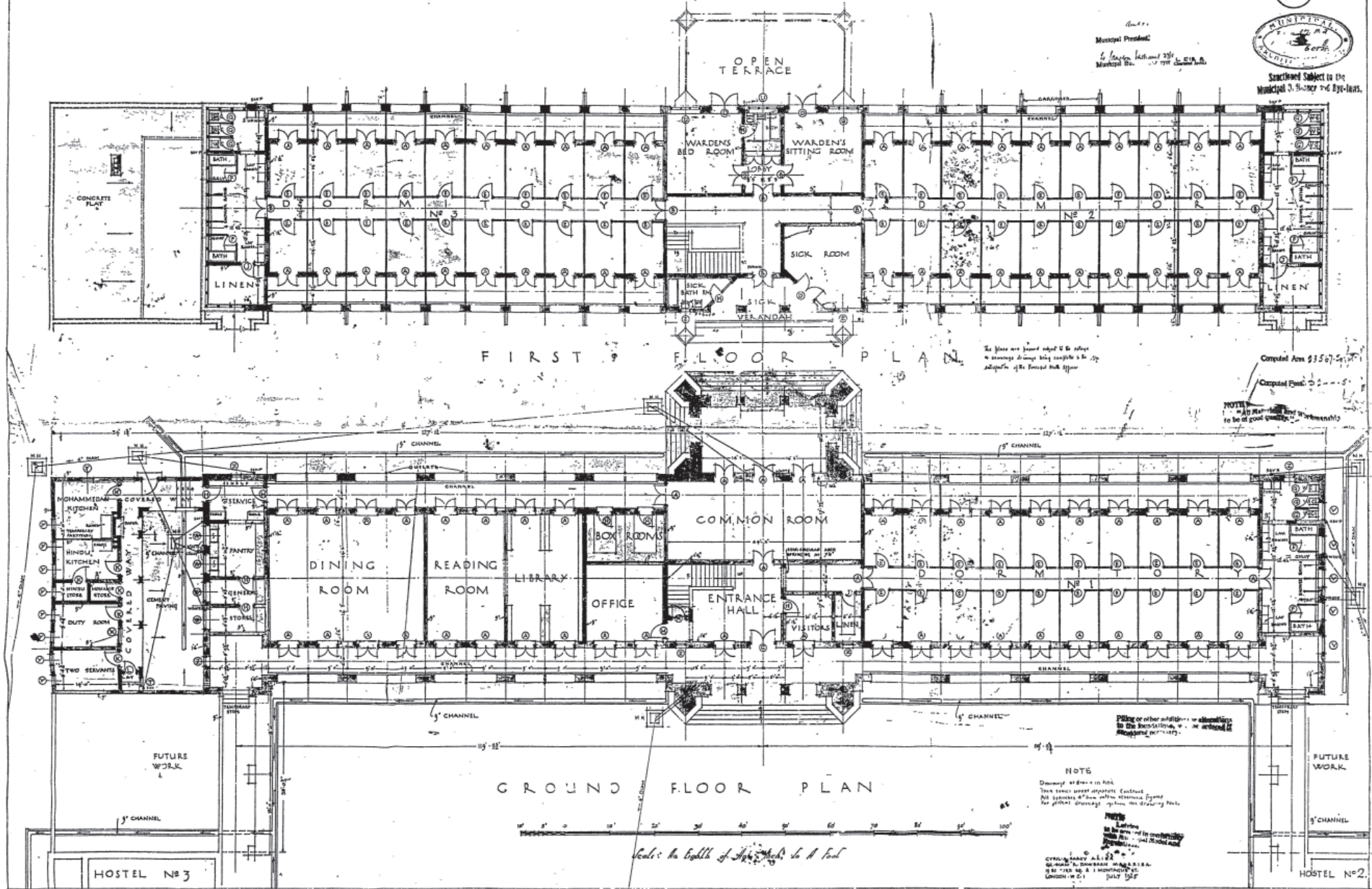


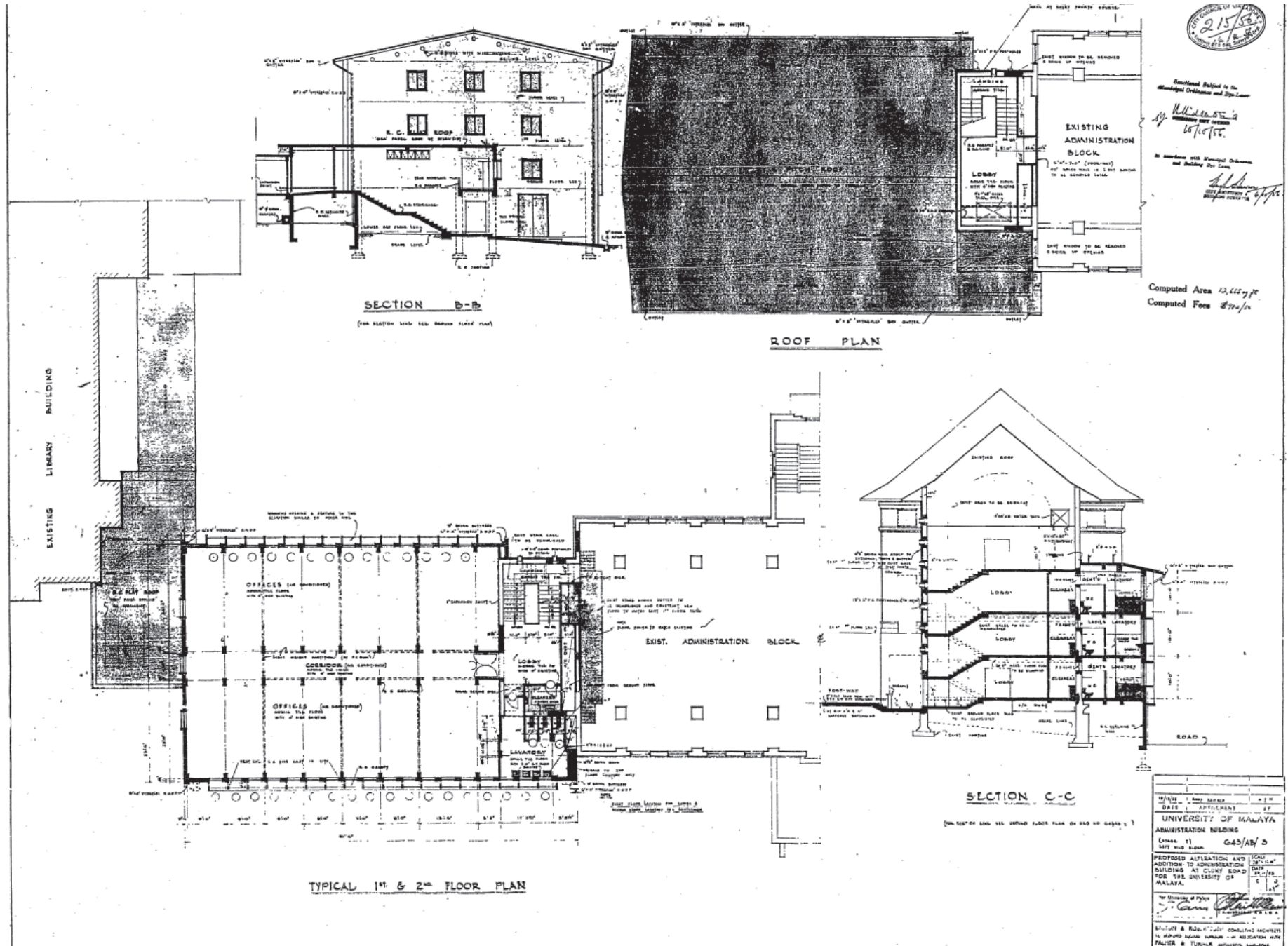
Scale: 1/8 inch to 1 foot

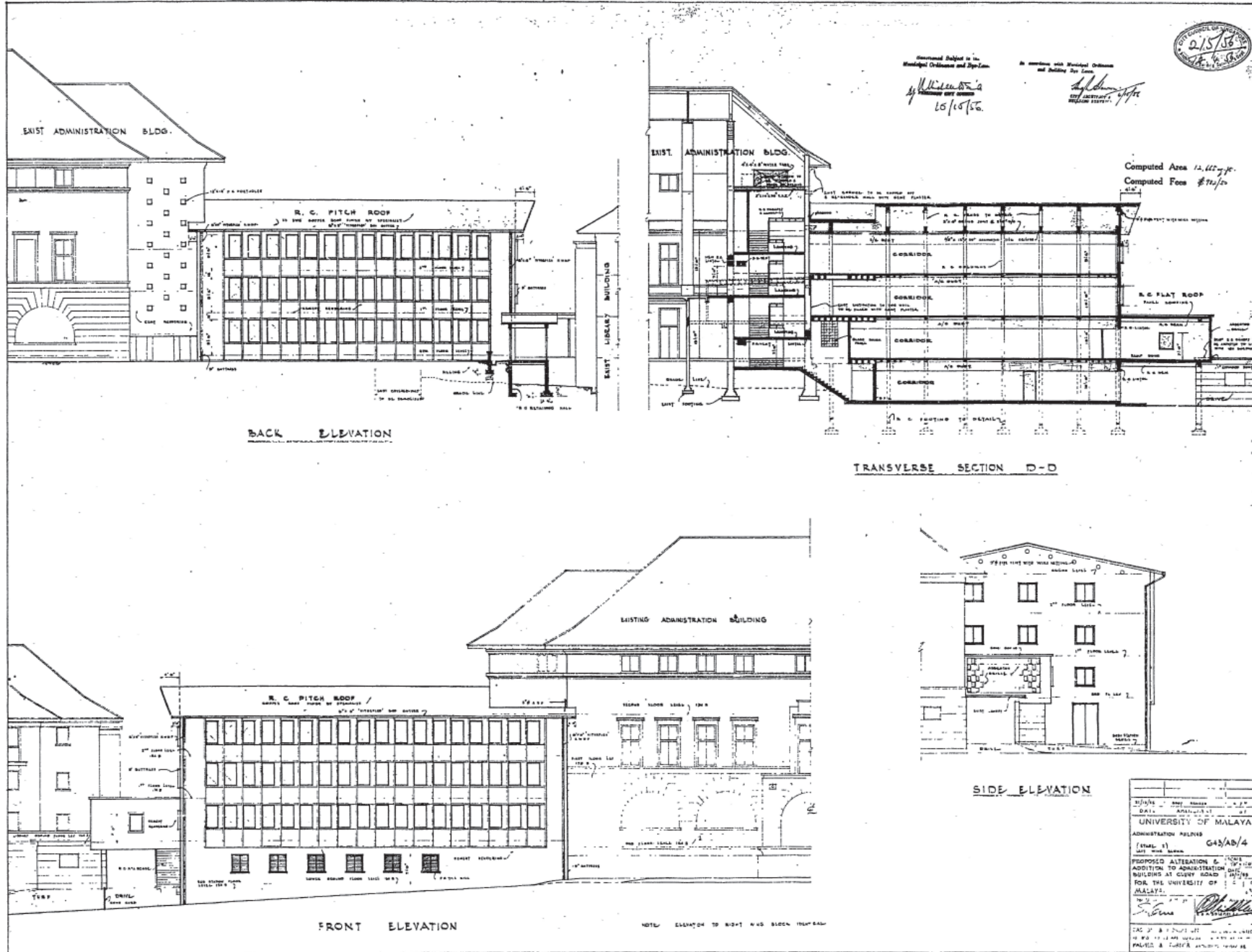
NORTH WEST ELEVATION OF COOLIE QUARTERS

DESIGNED BY: PARKY & BURNETT
 ARCHITECTS: GRAHAM & DAWBARN W & A R 1914
 115 BEDFORD SQUARE, LONDON, W.C.1.

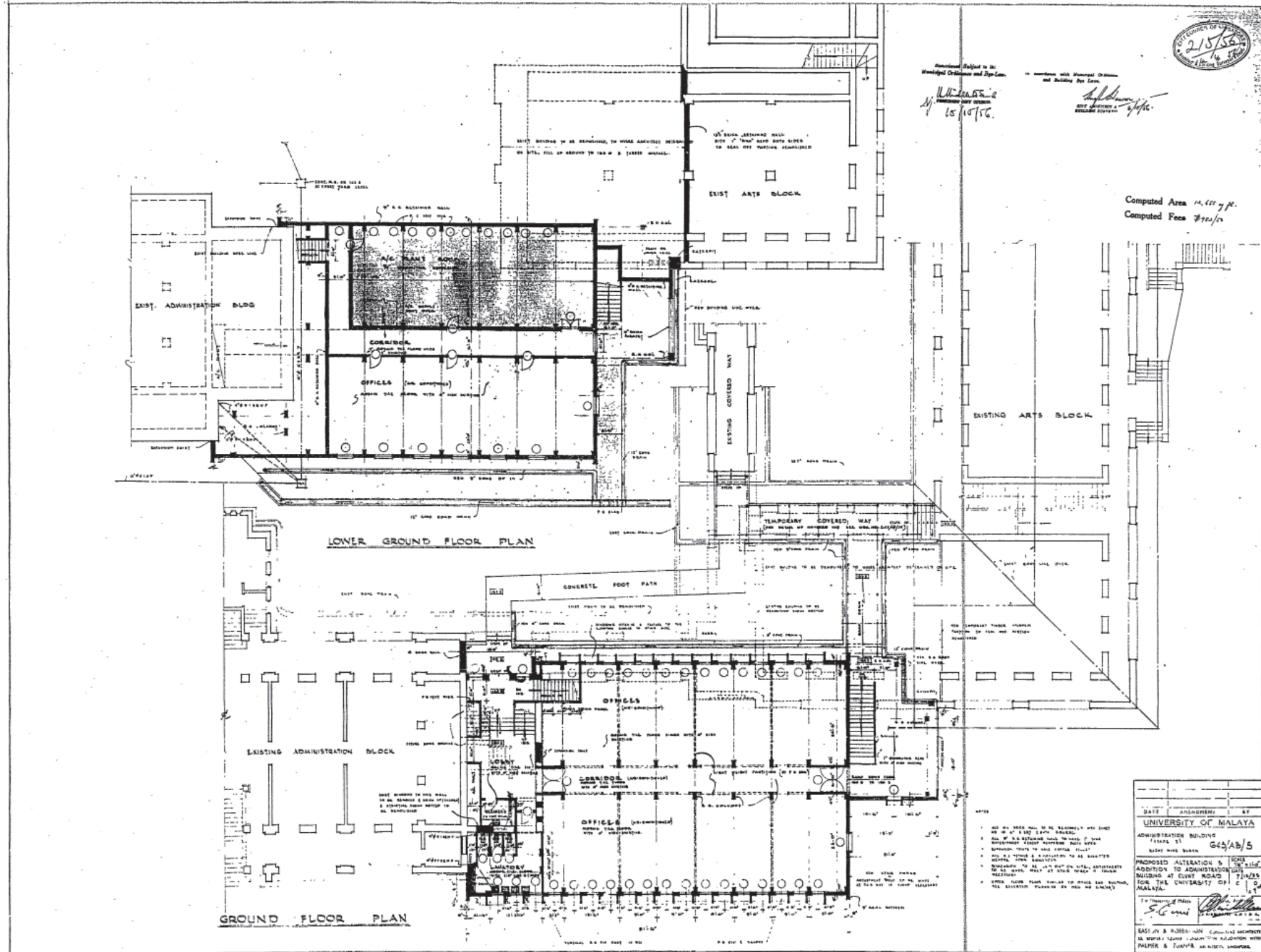
RAFFLES COLLEGE SINGAPORE: STUDENT HOSTEL N°1 DRAWING N° 201

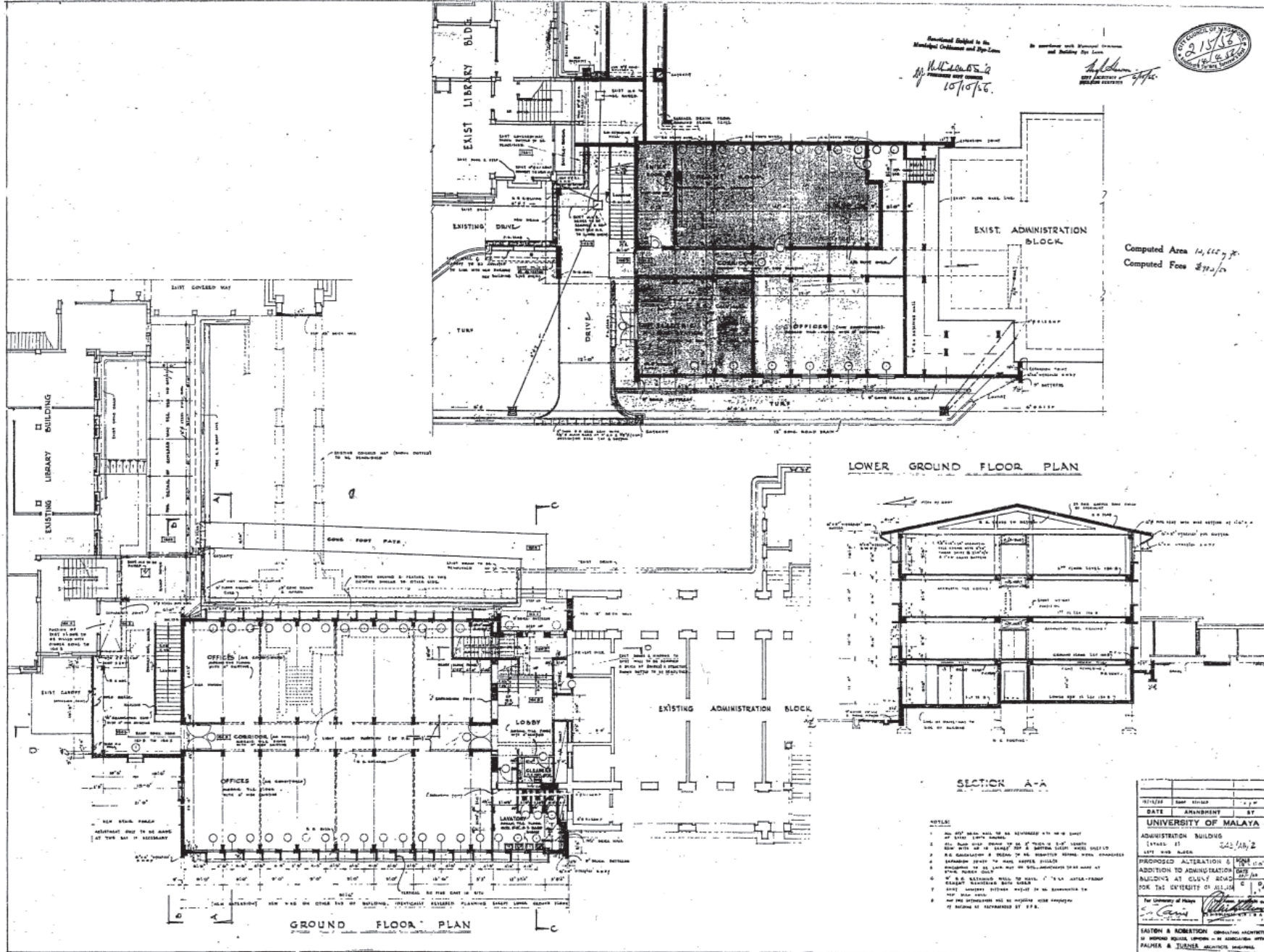






UNIVERSITY OF MALAYA	ADMINISTRATION SERVICES
PROPOSED ALTERATION & ADDITION TO ADMINISTRATION BUILDING AT CUSBY ROAD, SINGAPORE.	FOR THE UNIVERSITY OF MALAYA.
PROJECT NO. G43/AB/4	
DATE: 1956	
DESIGNED BY: [Signature]	
CHECKED BY: [Signature]	
APPROVED BY: [Signature]	





RAFFLES COLLEGE SINGAPORE ADMINISTRATION BLOCK DRAWING NO 403



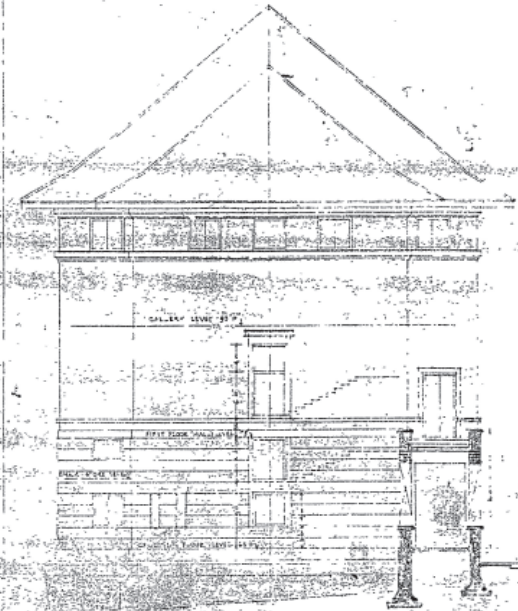
Sanctioned Subject of the
Municipal By-laws and Bye-laws

Municipal President:
Municipal Building Surveyor: *Charles H. H. H.*

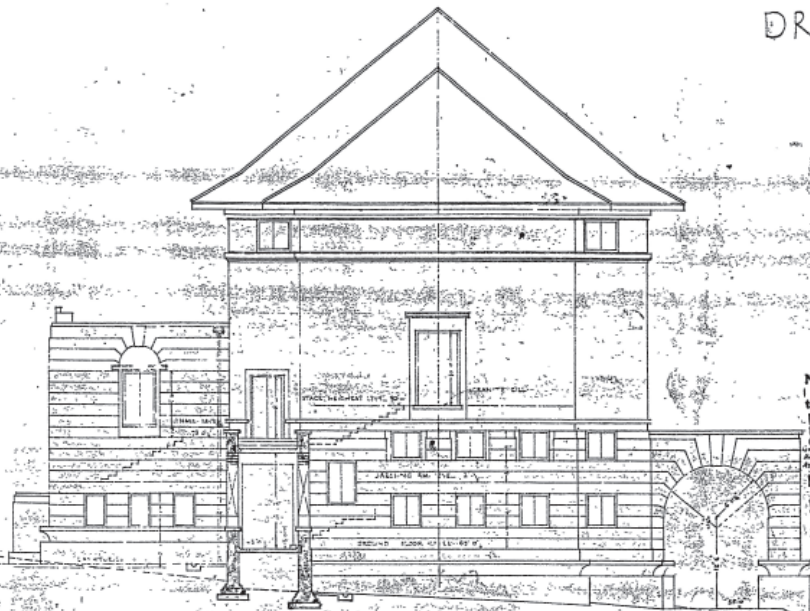
Computed Area *13,233 sq feet*
Computed Floor Area *10,000*

NOTE
All Materials and Workmanship
to be of good quality.
Piling or other additions or alterations
to the foundations, will be ordered if
considered necessary.

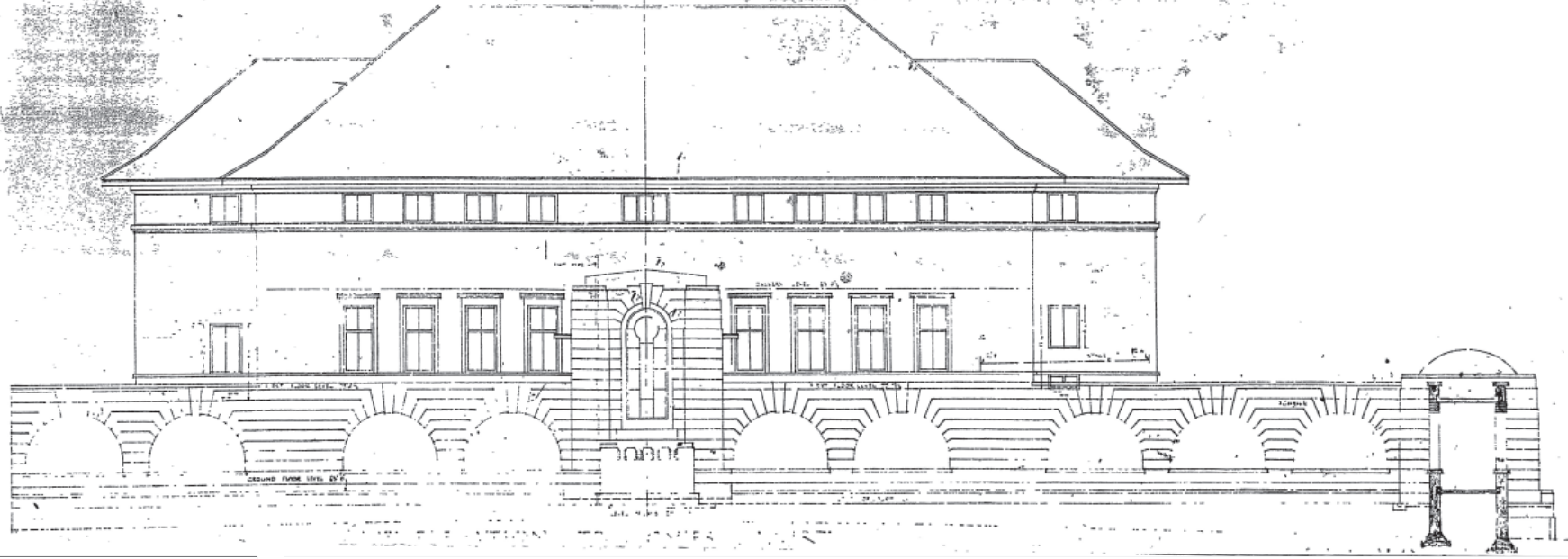
NOTE
Ladders
to be erected in conformity
with Municipal Model and
Specifications.



ELEVATION



S.E. ELEVATION
WITH SECTION THROUGH COVERED WAY



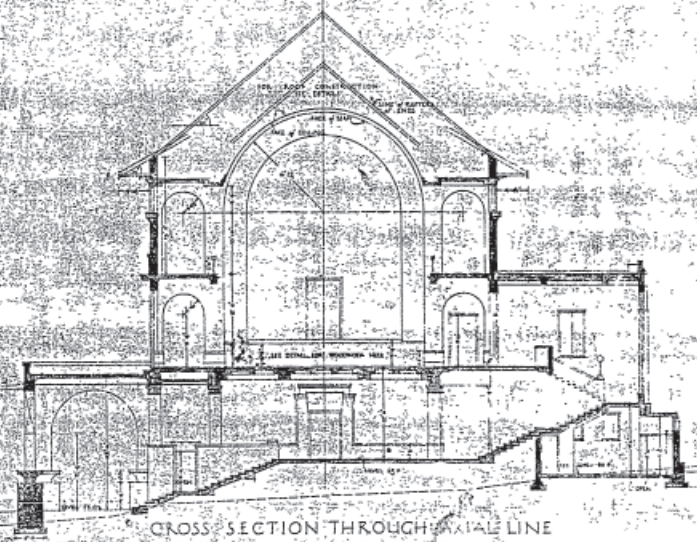
RAFFLES COLLEGE SINGAPORE: ADMINISTRATION BLOCK

DRAWING N° 402



Sanctioned Subject to the Municipal Ordinance and Bye-Laws.

Handwritten notes and signatures, including 'Approved by Municipal Council Singapore' and 'Capital cost Rs. 437,000'.



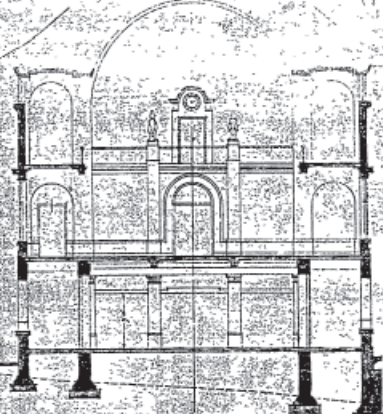
CROSS SECTION THROUGH AXIAL LINE



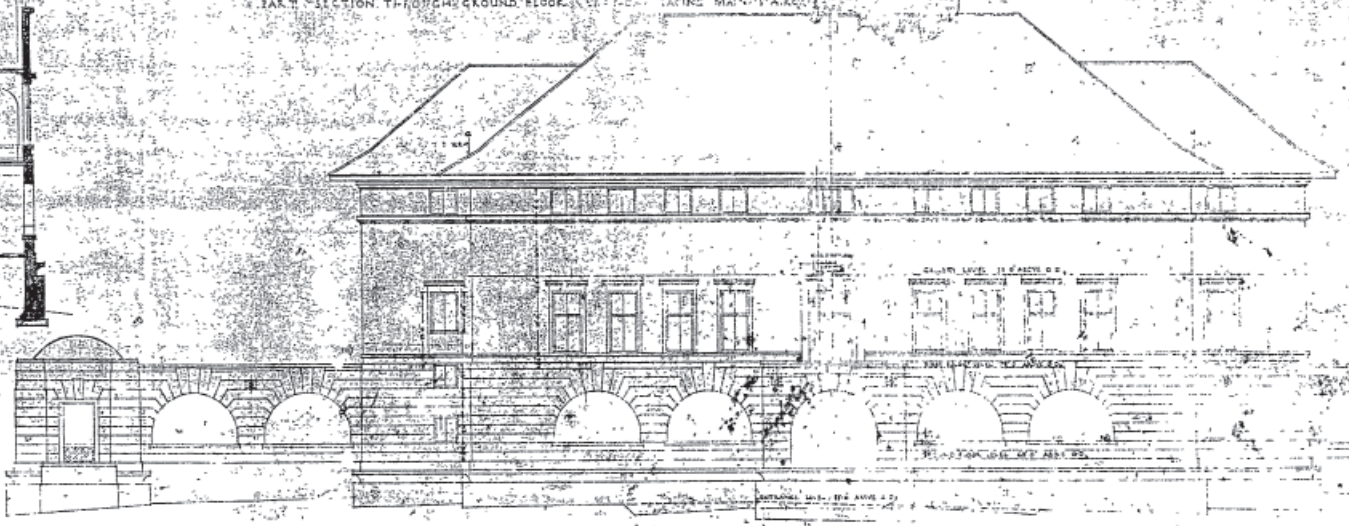
TRANSVERSE SECTION THROUGH CENTRE



PART SECTION THROUGH GROUND FLOOR SHOWING MAIN STAIRS



CROSS SECTION A-A

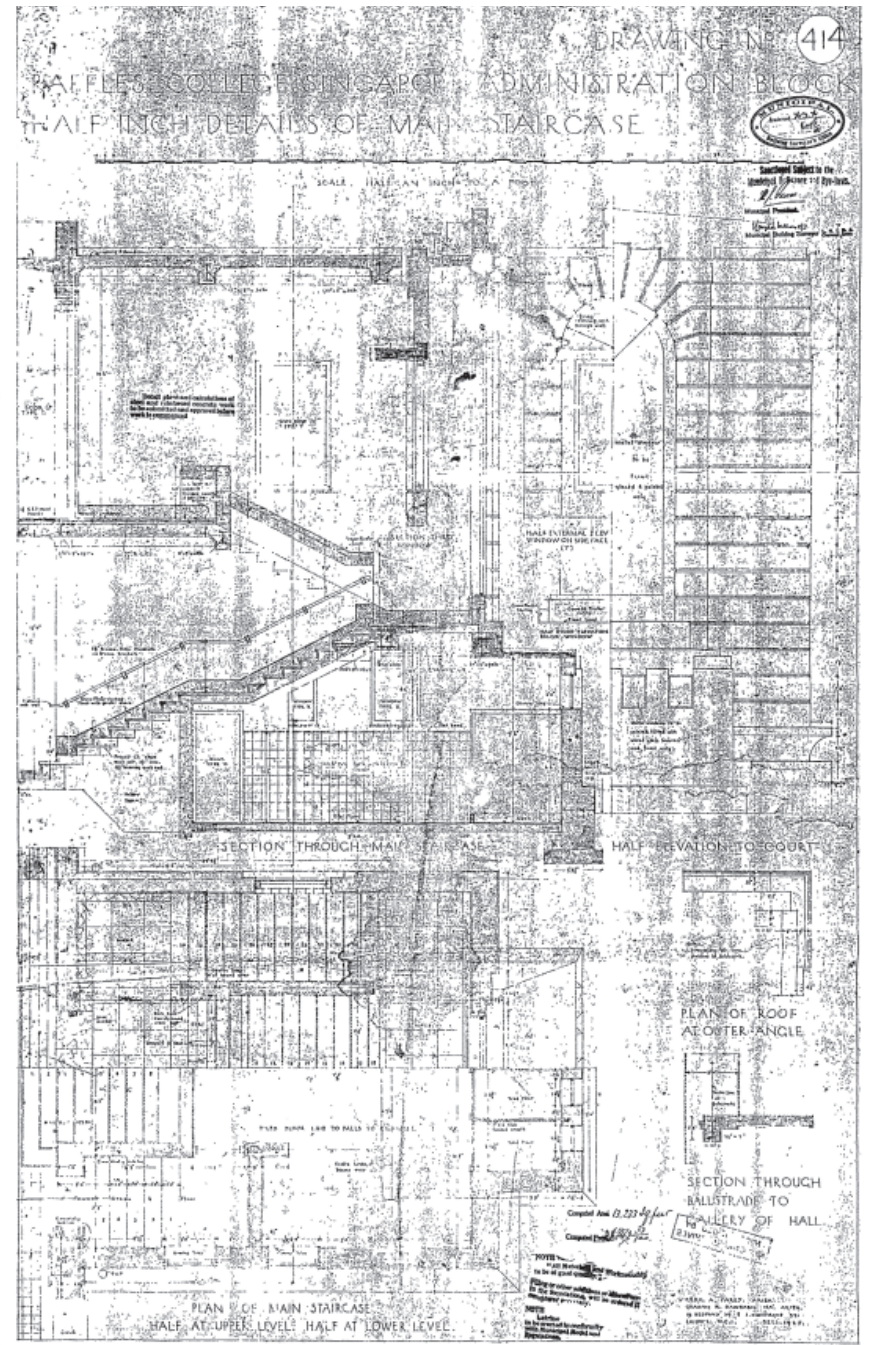
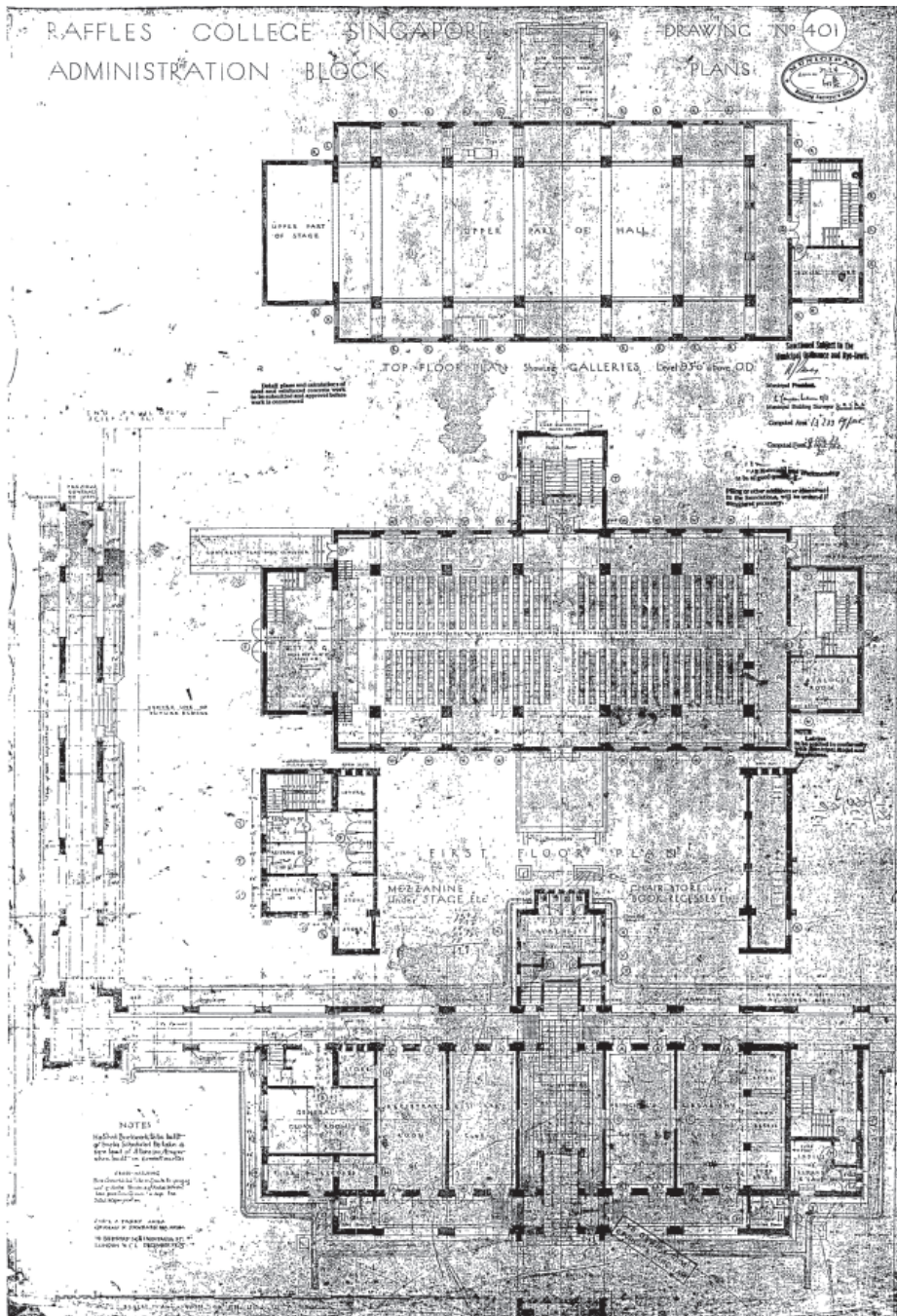


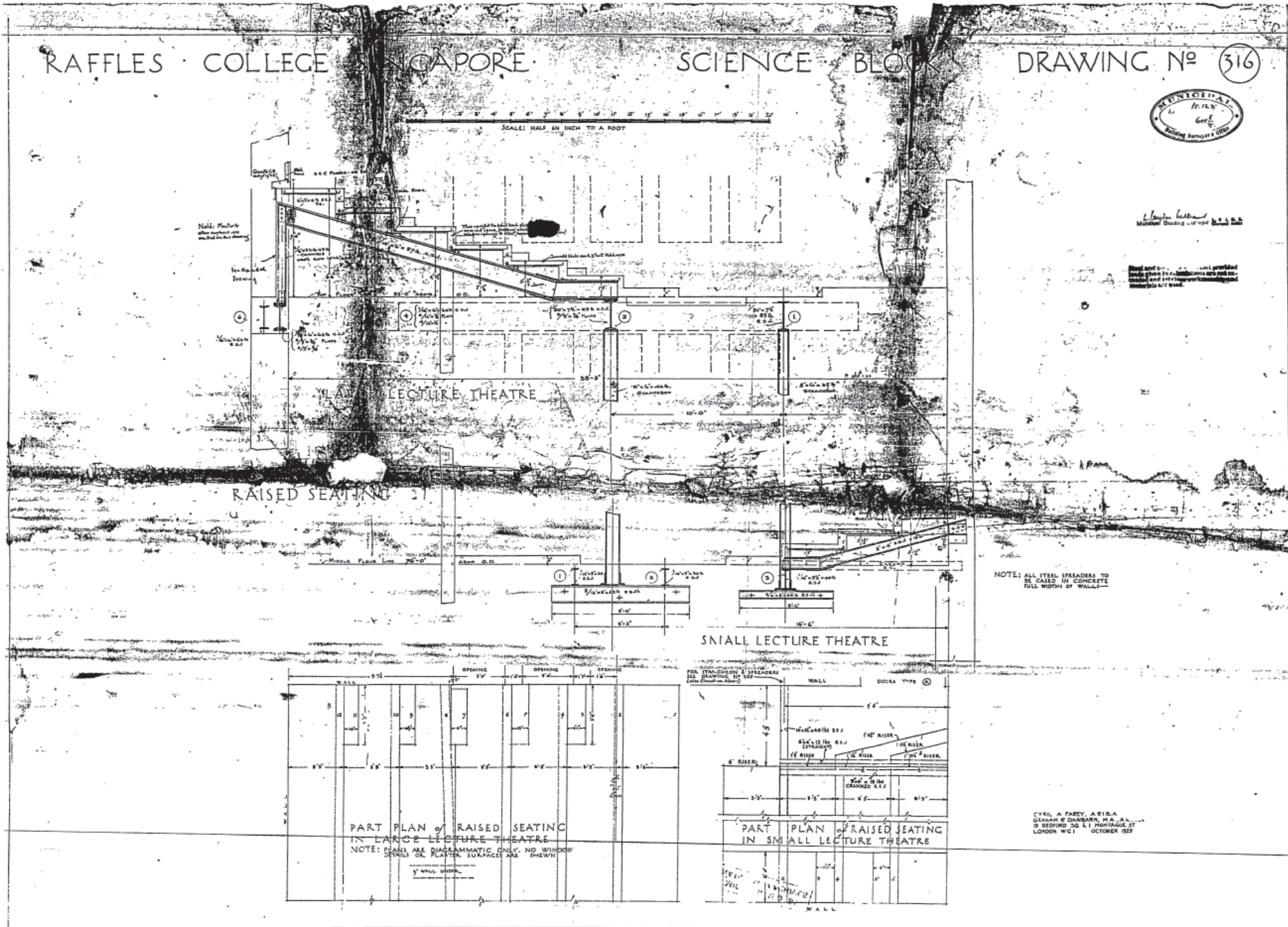
FRONT ELEVATION

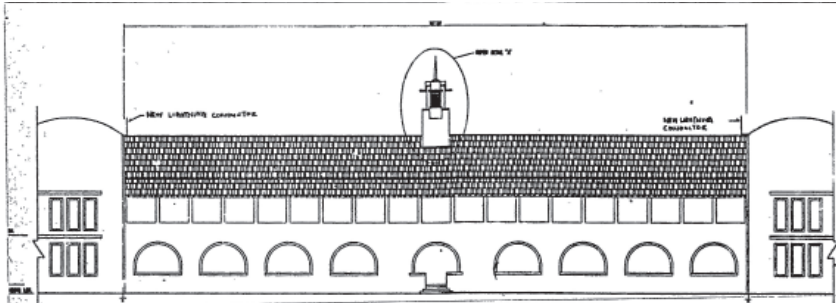
NOTE: All materials and workmanship to be of good quality. Piling or other additions or alterations to the foundations will be made at the contractor's expense.

SCALE: AN EIGHTH OF AN INCH TO A FOOT

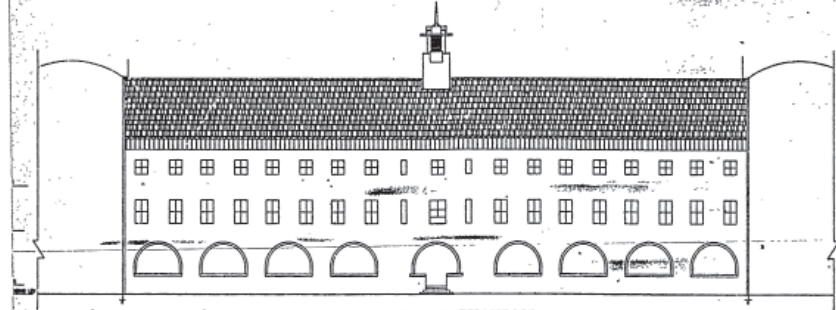
Small text at the bottom right corner, likely the architect's name and address: 'W. J. B. B. B. 11, COLLEGE STREET, SINGAPORE'.



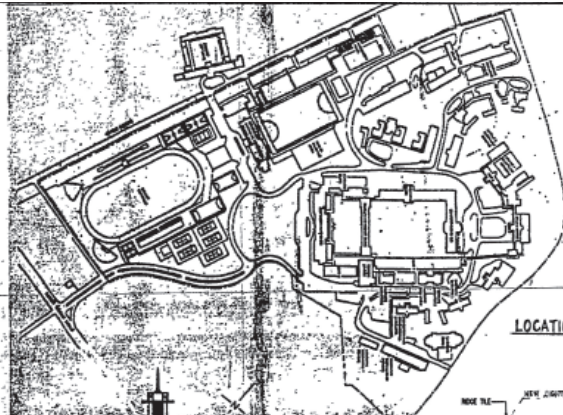




FRONT ELEVATION
SCALE: 1:200



REAR ELEVATION
SCALE: 1:200



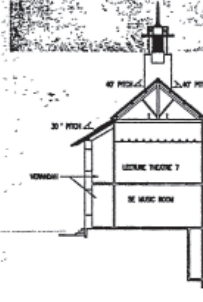
LOCATION

PWD BCD BP 3-81186-1996 STAB001
AS-BUILT STRUCTURAL PLAN FOR REPAIR OF TOWER & ROOF OF MANASSEH MEYER BUILDING ON LOT 1187 TS 25 AT 469 BUKIT TIMAH ROAD

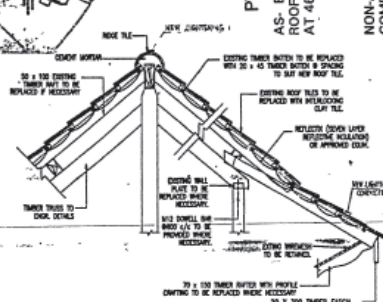
NON-AC '84S/REGISTRATION DATE: 26/06/1997
COMPLIANCE DATE: 24/07/1997

PUBLIC WORKS DEPARTMENT
BUILDING SERVICES DIVISION
DRAWING NO. 3-51186-1996 STAB001

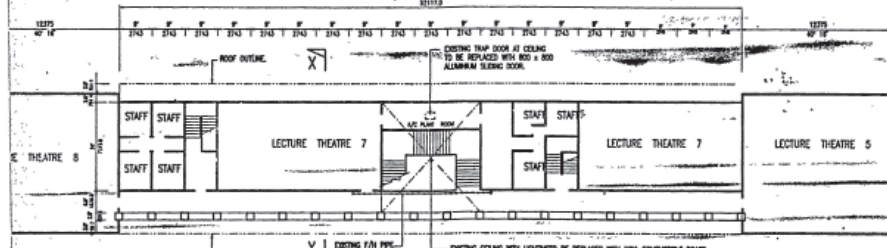
027618



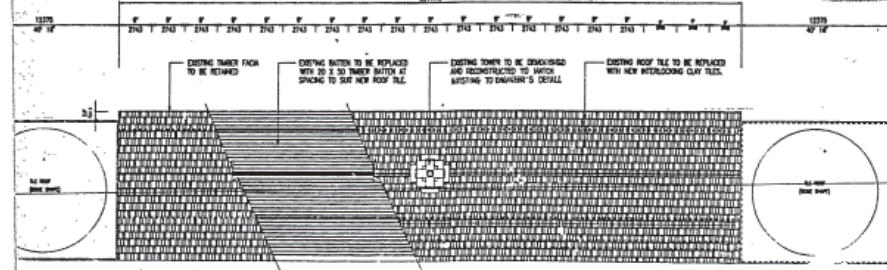
SECTION X-X
SCALE: 1:200



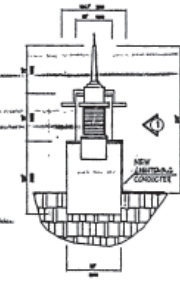
TYPICAL RIDGE / EAVE DETAIL
SCALE: 1:25



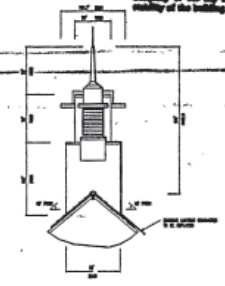
SECOND STOREY FLOOR PLAN
SCALE: 1:200



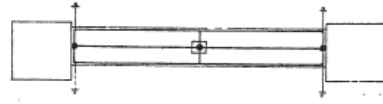
ROOF LAYOUT PLAN
SCALE: 1:200



DETAIL "A"
R.C. TOWER OVER THE RIDGE.
SCALE: 1:100



ELEVATION "1"
R.C. TOWER OVER THE RIDGE.
SCALE: 1:100



LIGHTNING CONDUCT PLAN
SCALE: 1:500

WORKS PUN JIN Professional Engineer
I hereby certify that to the best of my knowledge and belief the dimensions and description shown in the As-Built Plans do not affect the structural integrity of the top structural elements and the stability of the building.

OWNER:
PROF. LEO TAN NEE HIN
DIRECTOR
NATIONAL INSTITUTE OF EDUCATION
DEVELOPMENT & ESTATE DIVISION
463 BUKIT TIMAH ROAD
SINGAPORE 153756

STRUCTURAL CONSULTANT
A.T. CONSULTANTS
5 VERDUN ROAD #02-07 SPA BUILDING
SINGAPORE 202724
Tel: 298 1400 Fax: 298 1455

Project:
REPAIR OF TOWER AND ROOF TILE
OF MANASSEH MEYER BUILDING
AT BUKIT TIMAH ROAD

DWG TITLE:
FRONT ELEVATION, REAR ELEVATION,
2ND STOREY FLOORPLAN AND ROOF PLAN,
SECTION AND DETAILS.

Drawn: J.W. Date: Jan '96
Checked: J.W. Date: 01/01/96/AD1

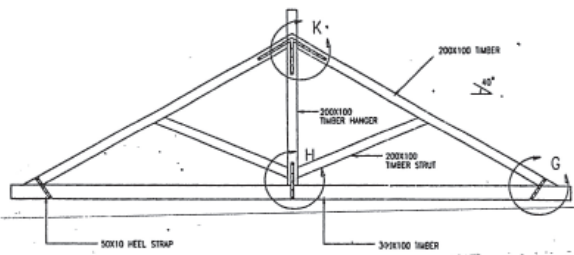
4 sheet of 4

PUBLIC WORKS DEPARTMENT
BUILDING CONTROL DIVISION
APPROVED IN ACCORDANCE WITH SECTION 20 OF THE
BUILDING CONTROL ACT (CHAPTER 30)
BP No 3-8186-1996 STAA 001
S-8 1185-1996 STA 001

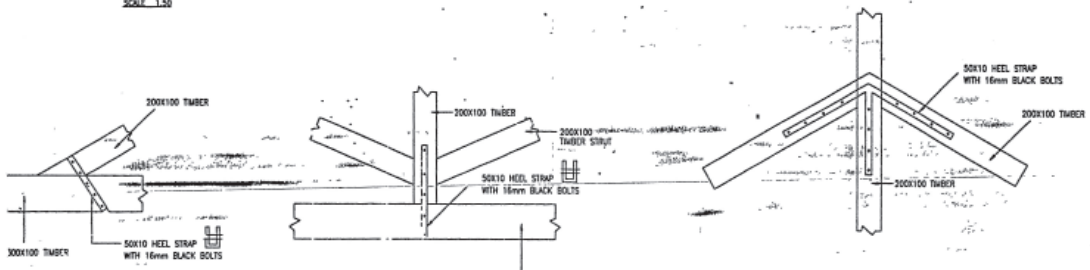
For Building Authority

027621

422



CONNECTION DETAIL FOR ROOF TRUSS
SCALE 1:20

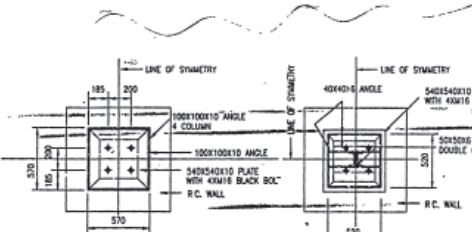


DETAIL G
SCALE 1:20

DETAIL H
SCALE 1:20

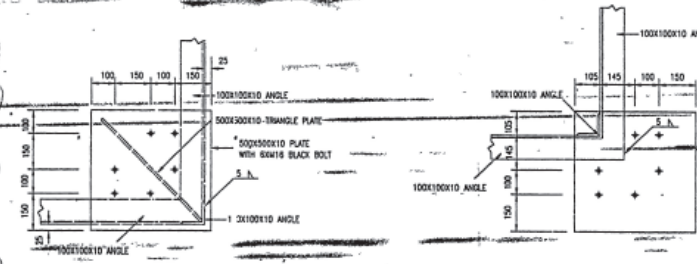
DETAIL K
SCALE 1:20

STANDARD CERTIFICATION ON STRUCTURAL PLANS AND DESIGN CALCULATIONS, BY THE QUALIFIED DESIGNER FOR STRUCTURAL WORKS:
In accordance with Regulation 8 of the Building Control Regulations (Cap 30, Reg 8, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



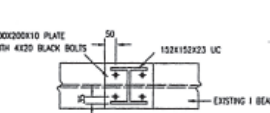
SECTION E-E

SECTION F-F

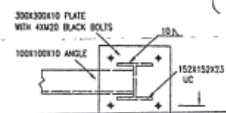


DETAIL D
SCALE 1:10

DETAIL E
SCALE 1:10



DETAIL A
SCALE 1:10



DETAIL B
SCALE 1:10



DETAIL C
SCALE 1:10



REV.	DATE	DESCRIPTION
A	14/10/98	CHANGING FROM THE OLD TRUSS 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

OWNER :
NATIONAL INSTITUTE OF EDUCATION
DEVELOPMENT & ESTATE DIVISION
409 BUKIT TIMAH ROAD, SINGAPORE 259758

STRUCTURAL CONSULTANT
A. T. CONSULTANTS
183 TRAS STREET LIAN HUAT BUILDING #03-04
SINGAPORE 207274
Tel: 223 3125 Fax: 223 5543

TENURE OF LAND : FREEHOLD

PROJECT
REPAIR OF TOWER AND ROOF TILE
OF MANASSEH MEYER BUILDING
AT BUKIT TIMAH ROAD

AS BUILT DRAWING

DRAWING TITLE
DETAILS OF ROOF TRUSS
AND DETAILS A B C D E

DESIGNED BY	DATE	SCALE
9703/02	10/97	1:20 1:20 1:20

THIS DRAWING IS COPYRIGHT
Contractors shall work from figures dimensions only
Dimensions shall be in millimeters unless otherwise stated
No part of this drawing shall be reproduced without the written consent of the engineer

PUBLIC WORKS DEPARTMENT
 BUILDING CONTROL DIVISION
 APPOINTED DESIGN SECTION 4.2 THE
 BUILDING CONTROL ACT, CAP 309
 1-81186-1996 STA 0014

Name of Officer: **THIRU DEVARAJAN**
 Date of Approval: **10 FEB 1998**

256

I have inspected the building and considered the structural drawings and find, in my opinion, the building is capable of resisting the forces and moments which may be increased or altered by reason of the repairs, alterations or additions shown on these plans.

Donall 2/5/98
 Name & Signature of Professional Engineer
 Date
 Professional Engineer's Registration No. 1000

a) In accordance with Regulation 44 of the Building Regulations 1974, Section 101 (1) (a) of the Building Act 1974, the structural drawings submitted for approval shall be prepared in accordance with the provisions of the Building Regulations 1974, Section 101 (1) (a) of the Building Act 1974, and shall be prepared in accordance with the provisions of the Building Regulations 1974, Section 101 (1) (a) of the Building Act 1974.

b) I hereby certify that these structural drawings and design calculations are in accordance with the provisions of the Building Regulations 1974, Section 101 (1) (a) of the Building Act 1974.

c) The number of structural plans submitted: **11**
 The number of pages of design calculations in this book: **11**



REV. DATE
 OWNER
 BRIG. LEO TAN WEE HEN
 DIRECTOR
 NATIONAL INSTITUTE OF EDUCATION
 DEVELOPMENTAL ESTATE DIVISION
 409 BUKIT TIMAH ROAD, SINGAPORE-286756

STRUCTURAL CONSULTANT
A. T. CONSULTANTS
 163 TRAS STREET LIAN HUAT BUILDING #03-04
 SINGAPORE 207274
 Tel. 223 3125 Fax 223 5543

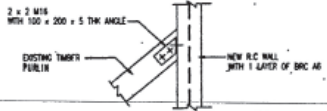
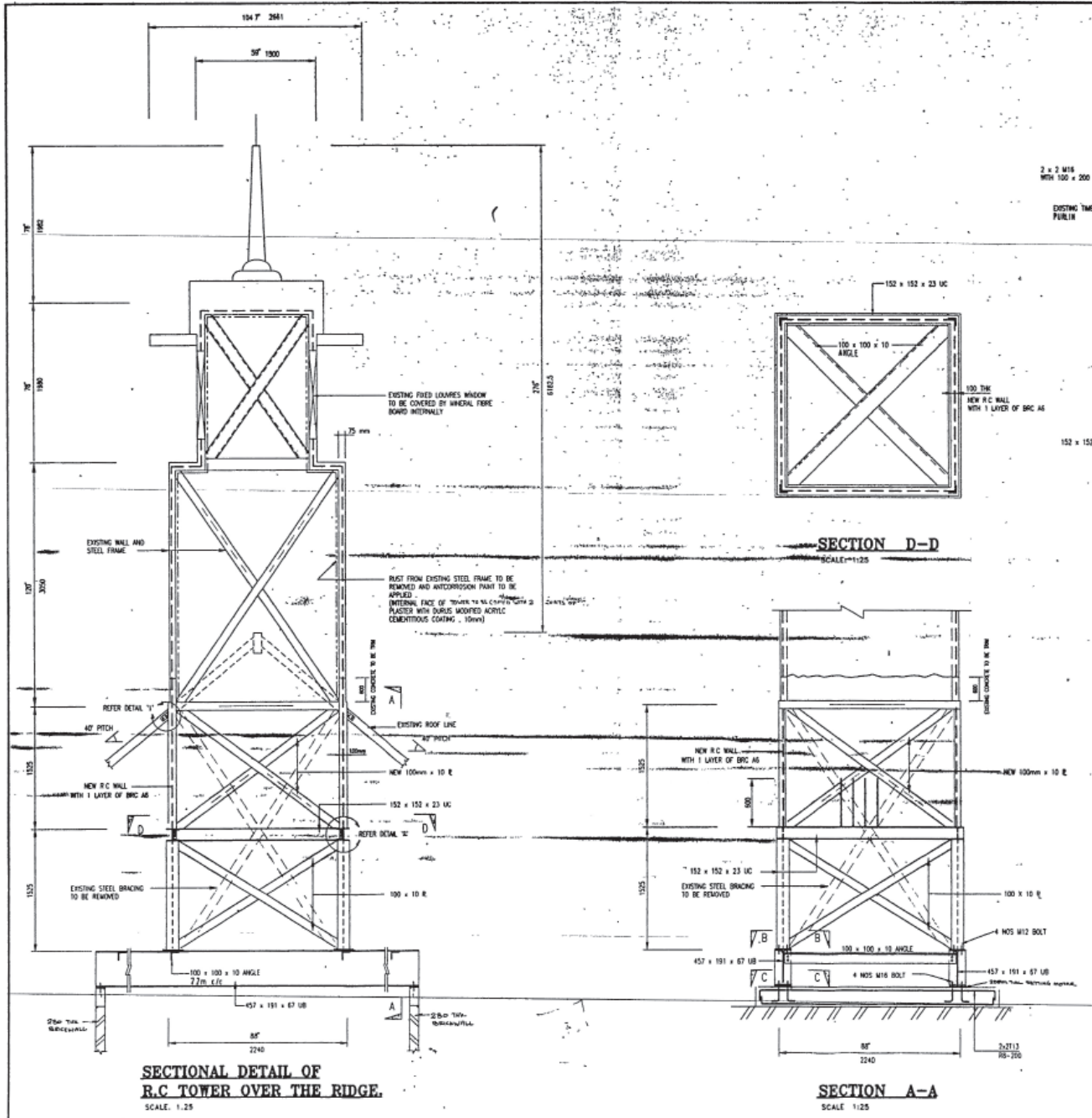
Project:
 REPAIR OF TOWER AND ROOF TILE
 OF MANNEBER MEYER BUILDING
 AT BUKIT TIMAH ROAD

TOUR OF LAD
 DWG TITLE

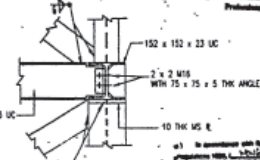
SECTIONAL DETAILS OF
 TOWER STEEL FRAME

Drawn: Farnol Scale: 1/25, 1/10
 Designed: J.W. Date: April 98
 Checked: [Signature] Dwg no.: AT/05011-5/02

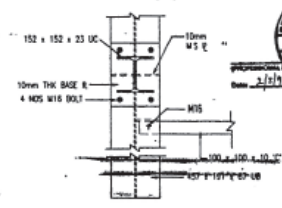
THE OWNERSHIP OF THE CONTENTS OF THIS DWG IS RETAINED BY A. T. CONSULTANTS WHOSE CONSENT MUST BE OBTAINED BEFORE ANY USE OR REPRODUCTION OF THIS DWG OR ANY PART THEREOF.



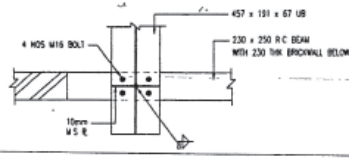
DETAIL '1'
 SCALE: 1/10



DETAIL '2'
 SCALE: 1/10



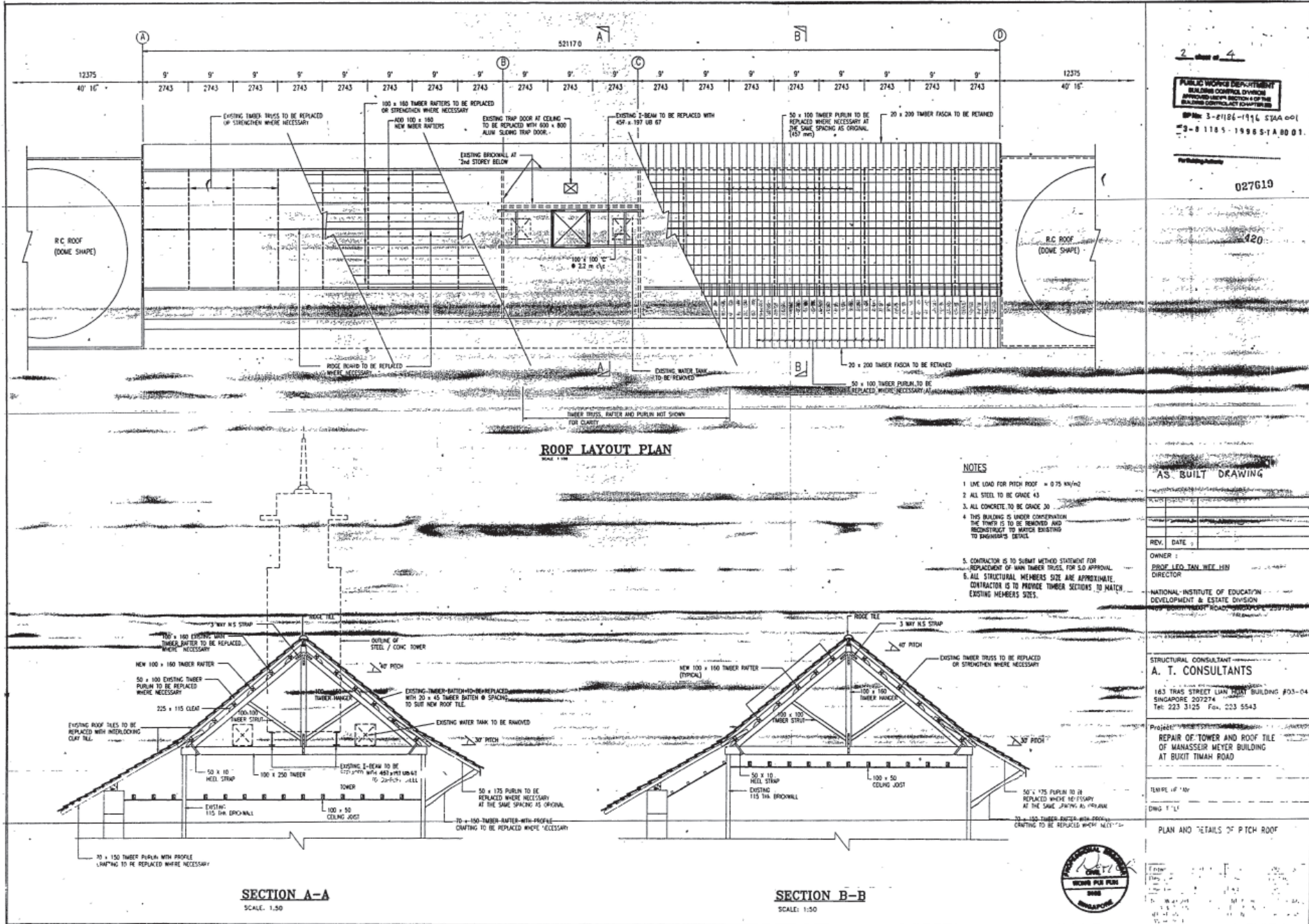
SECTION B-B
 SCALE: 1/10



SECTION C-C
 SCALE: 1/10

SECTIONAL DETAIL OF R.C. TOWER OVER THE RIDGE.
 SCALE: 1/25

SECTION A-A
 SCALE: 1/25



2 out of 4

PUBLIC WORKS DEPARTMENT
BUILDING CONTROL DIVISION
APPROVED WORKS SECTION & OFFICE
BUILDING CONTRACTS UNIT

SP No: 3-21186-1916 S1AA 001
3-8 1185-1996 S-1A 00 01

027619

420

OWNER:
PROF. LEO TAN WEE HEN
DIRECTOR

NATIONAL INSTITUTE OF EDUCATION
DEVELOPMENT & ESTATE DIVISION

STRUCTURAL CONSULTANT:
A. T. CONSULTANTS
183 TRAS STREET LIAM HOAT BUILDING #03-04
SINGAPORE 207274
Tel: 223 3125 Fax: 223 5543

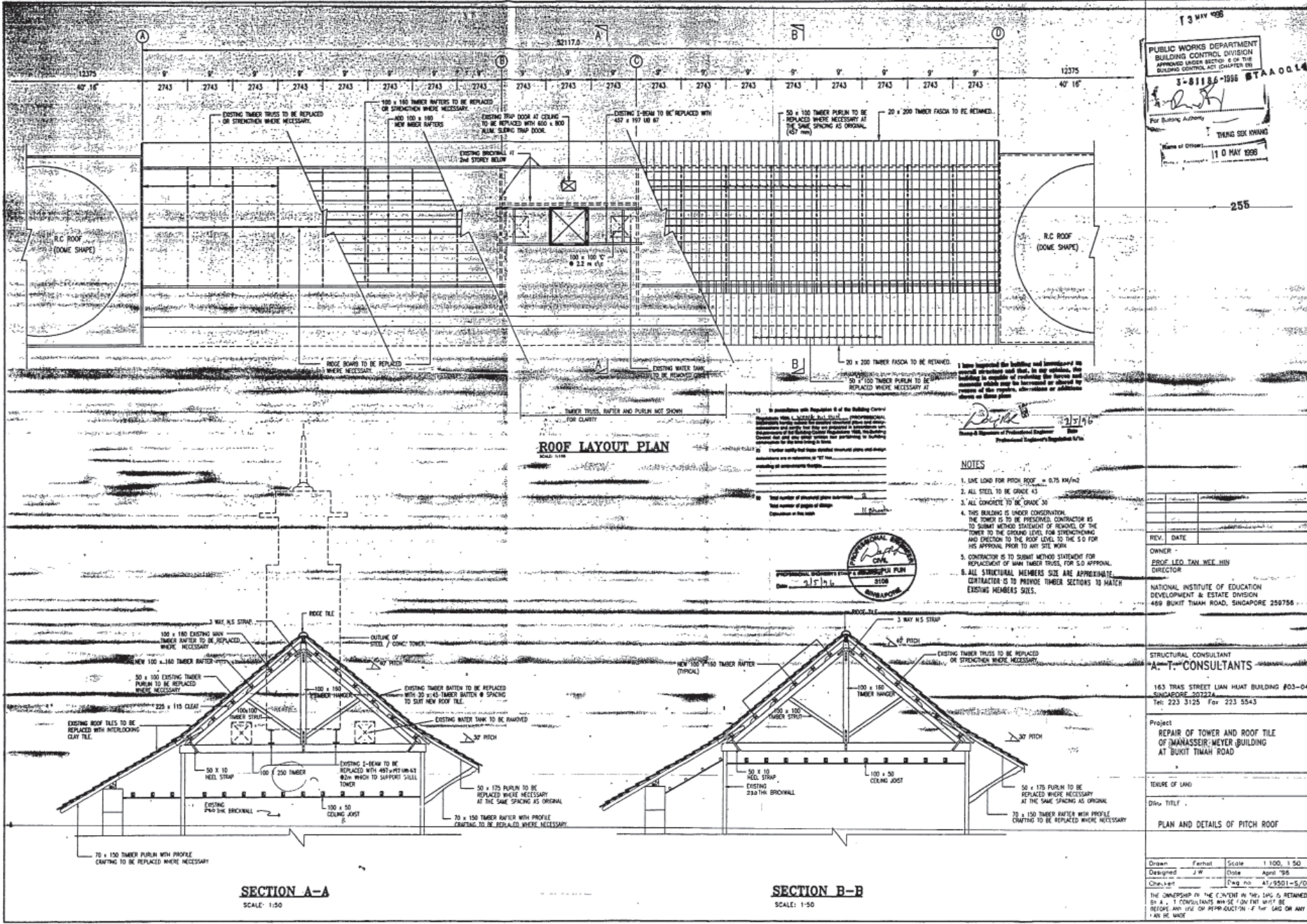
Project: REPAIR OF TOWER AND ROOF TILE OF MANASSEIR MEYER BUILDING AT BUKIT TIMAH ROAD

TEMPERATURE

DWG TITLE

PLAN AND DETAILS OF PITCH ROOF





13 MAY 1998

PUBLIC WORKS DEPARTMENT
BUILDING CONTROL DIVISION
APPROVED UNDER SECTION 4 OF THE
BUILDING CONTROL ACT (CHAPTER 50)

3-81186-1096 STAA 0014

For Building Approval
THANG SOK KWANG

Name of Officer: 11 0 MAY 1998

255

ROOF LAYOUT PLAN
SCALE: 1:100

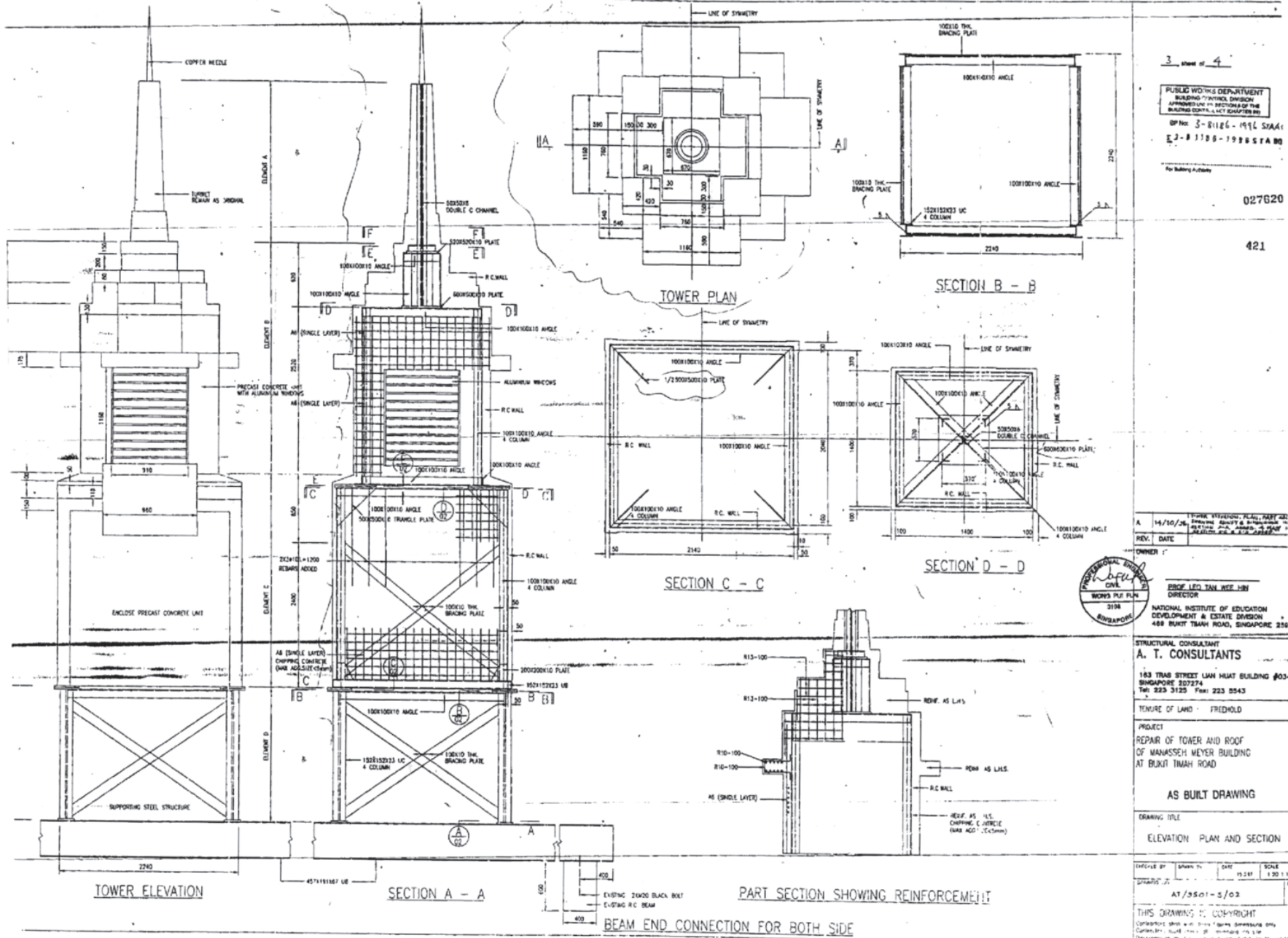
NOTES

1. LIVE LOAD FOR PITCH ROOF = 0.75 KN/m²
2. ALL STEEL TO BE GRADE 43
3. ALL CONCRETE TO BE GRADE 30
4. THIS BUILDING IS UNDER CONSERVATION. THE OWNER IS TO BE PROVIDED. CONTRACTOR IS TO SUBMIT METHOD STATEMENT OF REPAIRS OF THE TOWER TO THE GROUND LEVEL FOR STRENGTHENING AND ERECTION TO THE ROOF LEVEL TO THE S.O FOR HIS APPROVAL PRIOR TO ANY SITE WORK
5. CONTRACTOR IS TO SUBMIT METHOD STATEMENT FOR REPLACEMENT OF MAIN TIMBER TRUSS FOR S.O APPROVAL
6. ALL STRUCTURAL MEMBERS SIZE AND APPROPRIATE. CONTRACTOR IS TO PROVIDE DIMENSIONS TO MATCH EXISTING MEMBERS SIZES.

SECTION A-A
SCALE: 1:50

SECTION B-B
SCALE: 1:50

REV.	DATE
OWNER	PROF. LEO TAN WEE HIU DIRECTOR
NATIONAL INSTITUTE OF EDUCATION DEVELOPMENT & ESTATE DIVISION 469 BUKIT TIMAH ROAD, SINGAPORE 259756	
STRUCTURAL CONSULTANT	A-T CONSULTANTS
163 TRIAS STREET LIAN HUAJ BUILDING #03-04 SINGAPORE 200224 Tel: 223 3125 Fax: 223 5543	
Project	REPAIR OF TOWER AND ROOF TILE OF MANASSEH MEYER BUILDING AT BUKIT TIMAH ROAD
TENDER OF WORK	
Drawn	Checked
Designed	Date
Checked	Scale
Drawn	1:100, 1:50
Designed	J.W. April '98
Checked	1:2500 (1-5/01)
THE OWNERSHIP OF THE CONTENT IN THIS LAYOUT IS RETAINED BY A.T. CONSULTANTS AND SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS.	



3 of 4
 PUBLIC WORKS DEPARTMENT
 BUILDING DIVISION
 APPROVED FOR THE SECTION OF THE
 BUILDING CONTROL OFFICER
 DP No. 3-8126-196 STAA
 E 2-B 1188-1985 STAA
 For Building Purposes

027620
 421

DATE	14/10/76	TYPE REVISION	PLAN, P&S
REV.		REVISION	REVISION
OWNER	NATIONAL INSTITUTE OF EDUCATION DEVELOPMENT & ESTATE DIVISION 489 BUKIT TIMAH ROAD, SINGAPORE 250		
DIRECTOR	ENGR. LEO TAN HEE JIN		
STRUCTURAL CONSULTANT	A. T. CONSULTANTS		
PROJECT	REPAIR OF TOWER AND ROOF OF MANASSEH MEYER BUILDING AT BUKIT TIMAH ROAD		
TENURE OF LAND	FRESHOLD		
AS BUILT DRAWING			
DRAWING TITLE	ELEVATION, PLAN AND SECTION		
DATE	15/10/76	SCALE	1:50 & 1:10
DATE	AT/9501-5/02		
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