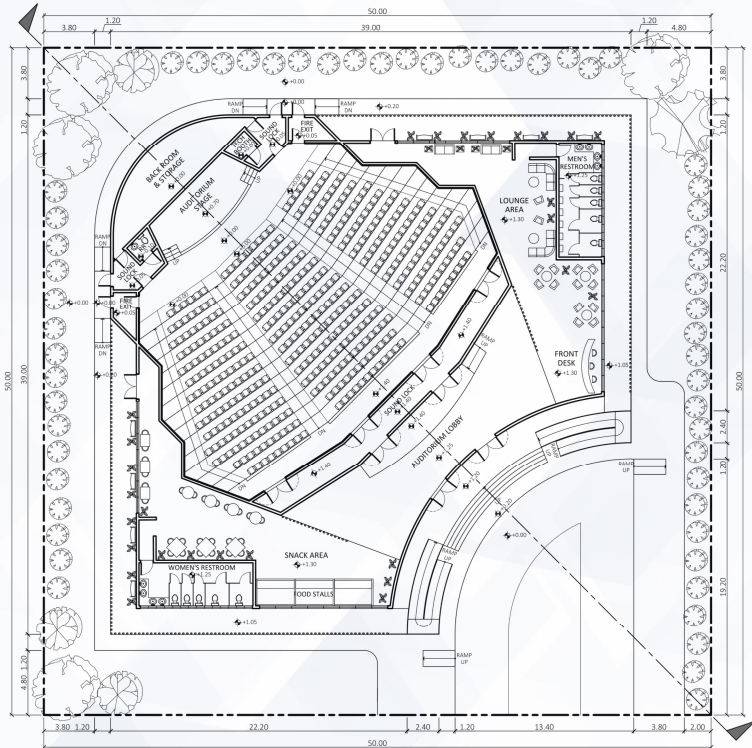




ARCH 147
AUDITORIUM
DESIGN
 RUBY ANN MAMANGUN
 ARCH 147 WFCDE-2
 PROF. ALEX RAY EVANGELISTA



FLOOR PLAN

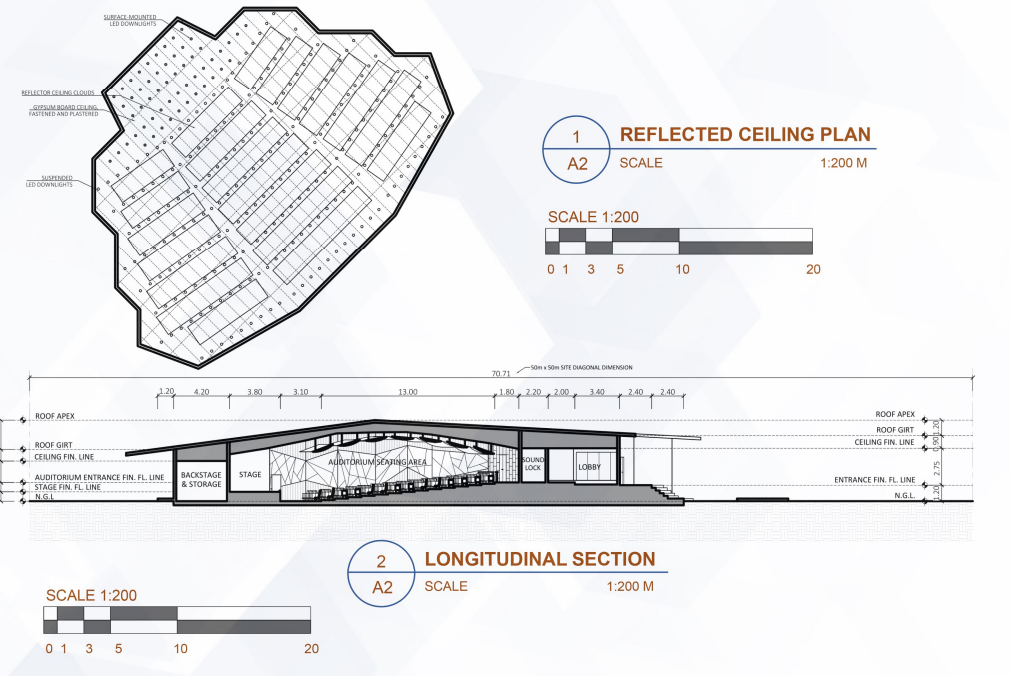


1 GROUND FLOOR PLAN
 A1 SCALE 1:200 M

SCALE 1:200

0 1 3 5 10 20

CEILING PLAN AND SECTION



1 REFLECTED CEILING PLAN
 A2 SCALE 1:200 M

SCALE 1:200

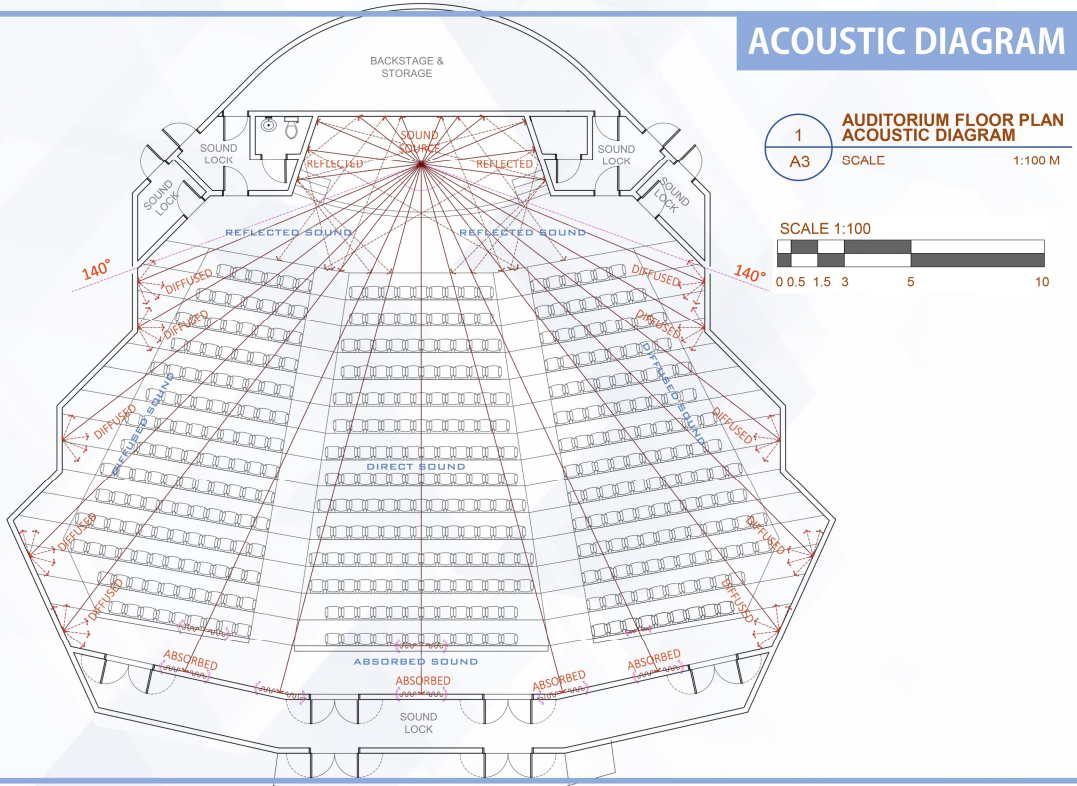
0 1 3 5 10 20

2 LONGITUDINAL SECTION
 A2 SCALE 1:200 M

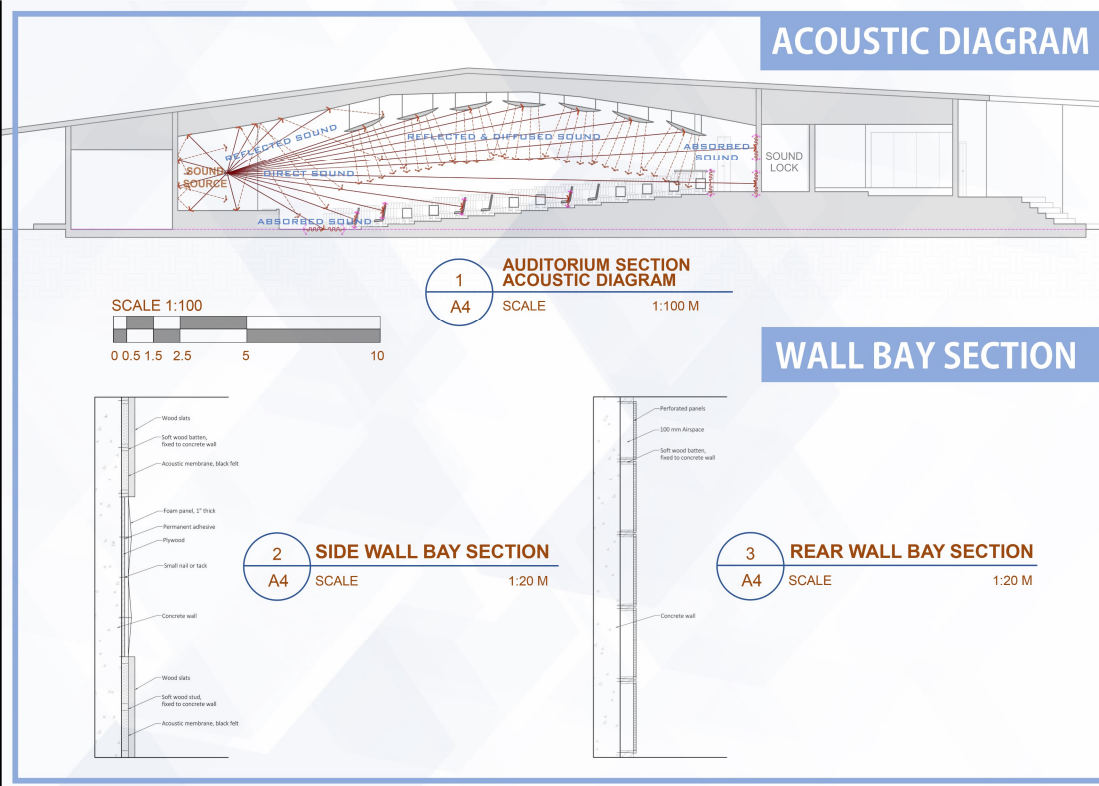
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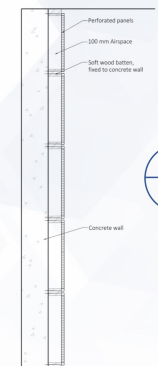
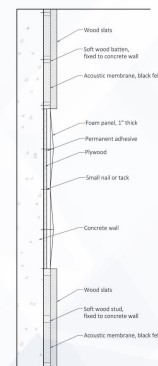
ACOUSTIC DIAGRAM



ACOUSTIC DIAGRAM



WALL BAY SECTION



MATERIAL SPECIFICATIONS AND CALCULATIONS

SOUND REFLECTION

- Acoustically reflective materials - used to reflect and redirect the sounds towards the audience and enhance the loudness of the sound received:
- Fastened gypsum board and convex cloud reflectors on the ceiling
 - Concrete on the stage floor and front walls
 - Wood-patterned vinyl plank tiles flooring installed over concrete on the floor area below the seats

SOUND DIFFUSION

- Surface irregularities and a mix of absorptive and reflective materials - used to diffuse the sound and achieve uniform sound distribution:
- Concrete walls are lined with wood slats and randomly shaped and mounted panel boards to absorb sound across wide frequency range
 - Irregular and jagged side wall orientation and foam cladding shape to effectively disperse sound
 - Mix of absorptive and reflective flooring materials on the middle section

SOUND ABSORPTION

- Highly absorptive material - to effectively reduce reverberation time and avoid delayed reflections and echo defects:
- Perforated panels and wood slats with air space to absorb sound on rear end of the room
 - Upholstered chairs and carpet to improve sound absorption on the seating area

Auditorium Estimated Volume: 1807 m³
 Number of Seats: 426
 Ideal Volume per Seat Value: 4.30 m³ / seat
 Actual Estimated Volume per Seat Value: 4.24 m³ / seat → acceptable

Optimum Reverberation Time, OptRT:
 OptRT = 0.30 log (V/10)
 OptRT = 0.30 log (180.7/10)
 OptRT = 0.30 (2.256958) = 0.677087 seconds

Total Surface Absorption, A, at RT = OptRT:
 RT = OptRT = 0.16V / A
 A = 0.16V / OptRT
 A = 0.16 (1807) / 0.677087
 A = 427.0054 Sabins → target total absorption

Location	Surface	Area (sqm) on Qty	Material	NRC	Surface Absorption
Front	Ceiling	27.4	gypsum board, fastened	0.05	1.37
	Floor	26.1	concrete	0.02	0.52
	Front Wall	59.5	concrete block, painted	0.10	5.95
	Side Wall (left)	10.9	concrete block, coarse	0.15	1.64
	Side Wall (right)	10.9	concrete block, coarse	0.15	1.64
Middle	Ceiling	454.0	gypsum board, fastened reflector ceiling cloud, suspended convex wood panels	0.05	22.70
	Ceiling	235.3		0.05	11.77
Middle	Floor (Aisles / Corridor)	168.1	carpet on rubber foam	0.40	67.26
Middle	Side Wall (left half)	41.2	wood slats	0.40	16.47
	Side Wall (left half)	41.2	foam panel, 1"	0.40	16.47
Middle	Side Wall (left half)	41.2	wood slats	0.40	16.47
	Side Wall (left half)	41.2	foam panel, 1"	0.40	16.47
Rear	Rear Wall	58.8	perforated panels, 100mm airspace	0.80	47.03
	Rear Wall (Back of last seat)	21.2	wood slats	0.40	8.46
Middle	Occupied Chairs (70%)	298	upholstered and occupied	0.50	149.00
	Unoccupied Chairs (30%)	128	upholstered and empty	0.34	43.52
Designed Total Surface Absorption, A (Sabins):					426.74

DESIGNED REVERBERATION TIME

A = 426.74 Sabins
 RT = 0.16V / A
 RT = 0.16 (1807) / 426.74
RT = 0.6775 seconds → which is within allowable value of Optimum Reverberation Time of 0.677087 seconds (+/- 5%)

