



AL THUMAMA AVIATION CLUB

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2025-2027



Al Thumama Aviation Club

COLLEGE OF ARCHITECTURE AND PLANNING
DEPARTMENT OF ARCHITECTURE AND BUILDING SCIENCES



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INTRODUCTION



INTRODUCTION

The Aviation Club in Riyadh is one of the leading centers for recreational and sports aviation activities in Saudi Arabia. Located at Thumamah Airport north of Riyadh, the club offers an ideal environment for aviation enthusiasts thanks to its prime location and modern facilities. It aims to promote the culture of aviation and aerial hobbies among different segments of society by organizing training courses, interactive activities, and providing services for private aircraft and hobbyists. The club also serves as a meeting point for aviation lovers and those interested in the latest technologies in this field, while contributing to domestic tourism through air shows, exhibitions, and specialized festivals.



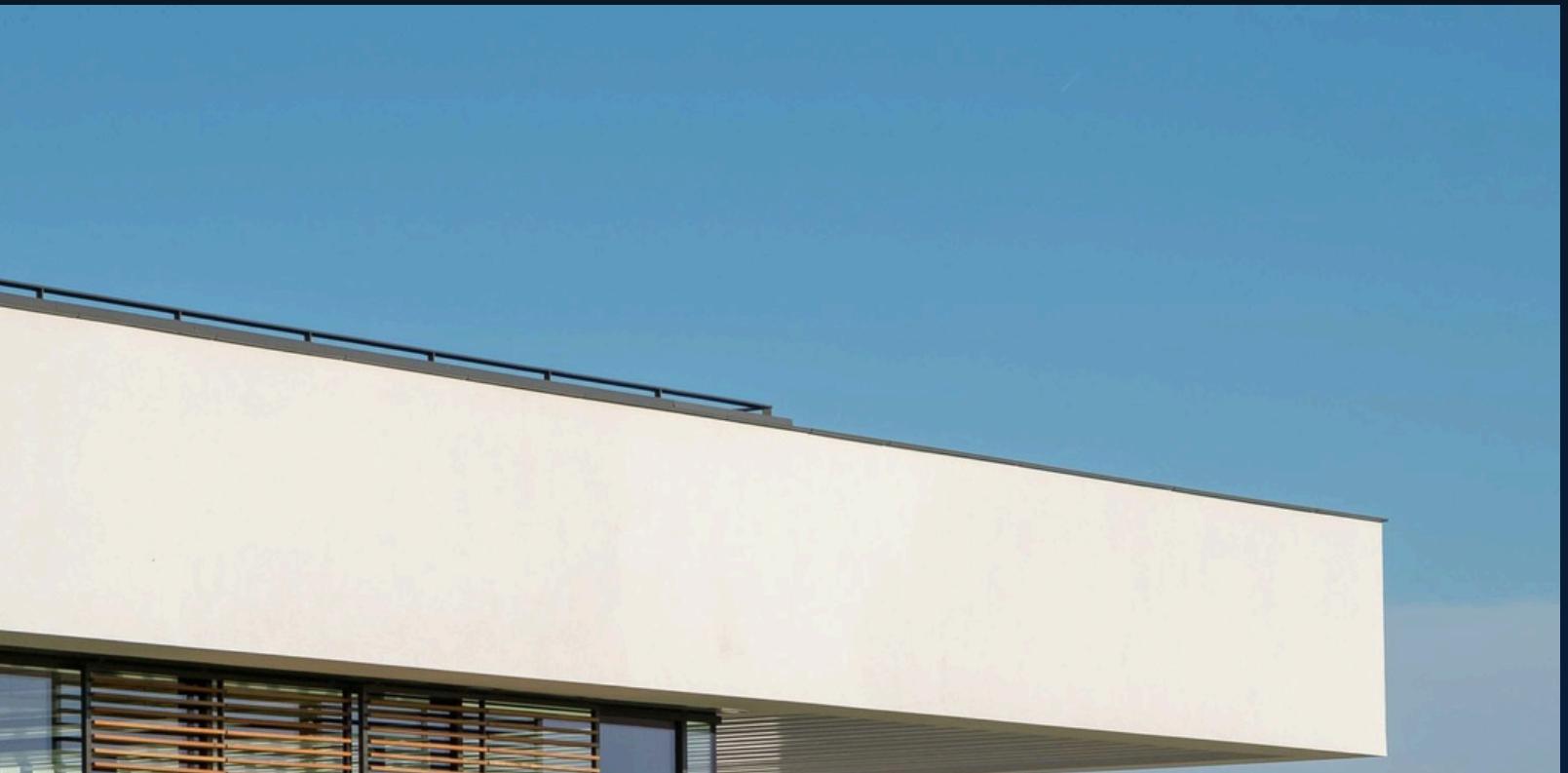


CASE STUDIES



CASE STUDIES

Introduction to the project
Goodwood Aerodrome
Location: Britain, Chichester
Area: 950 square meters

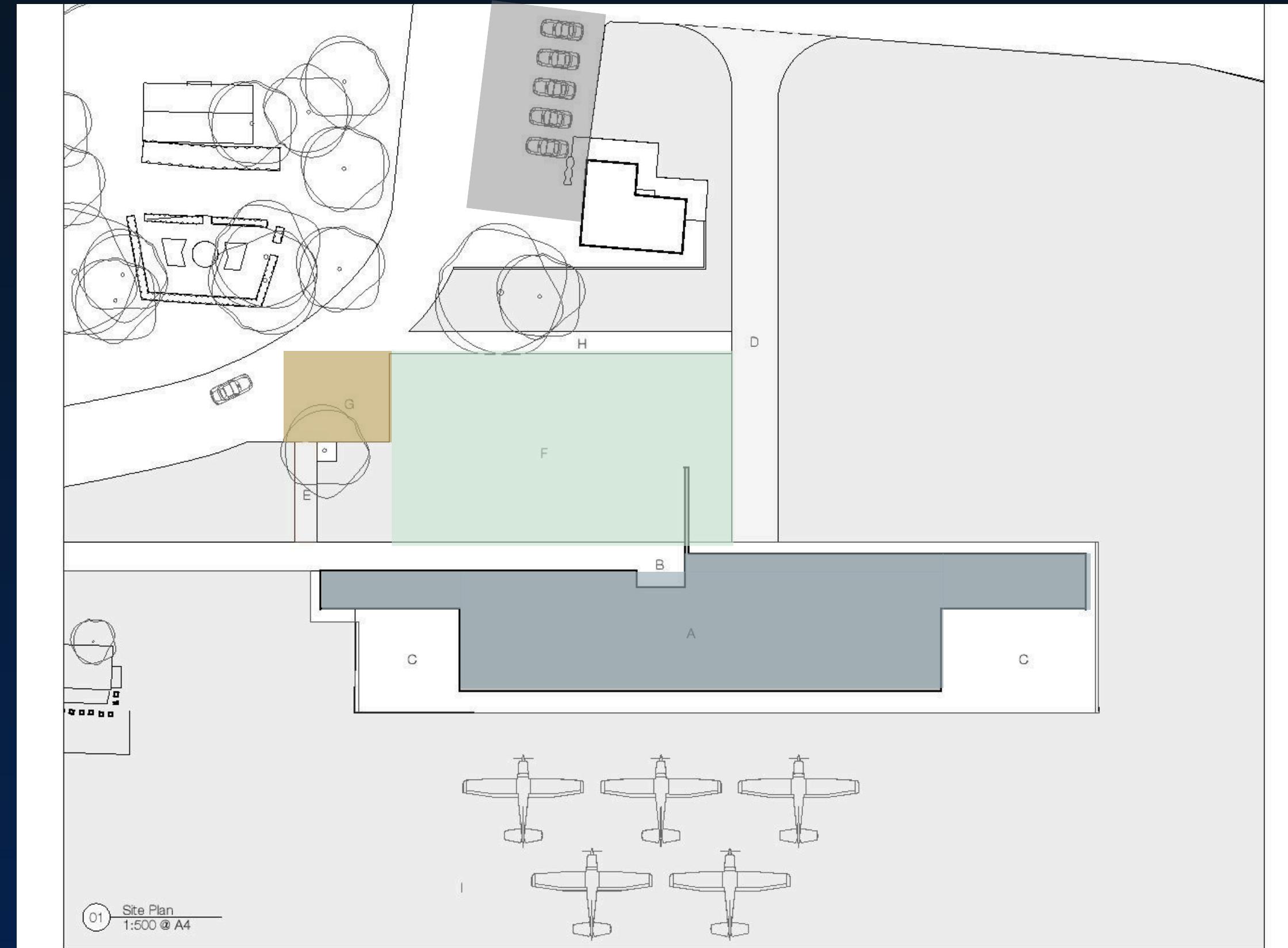


CASE STUDIES

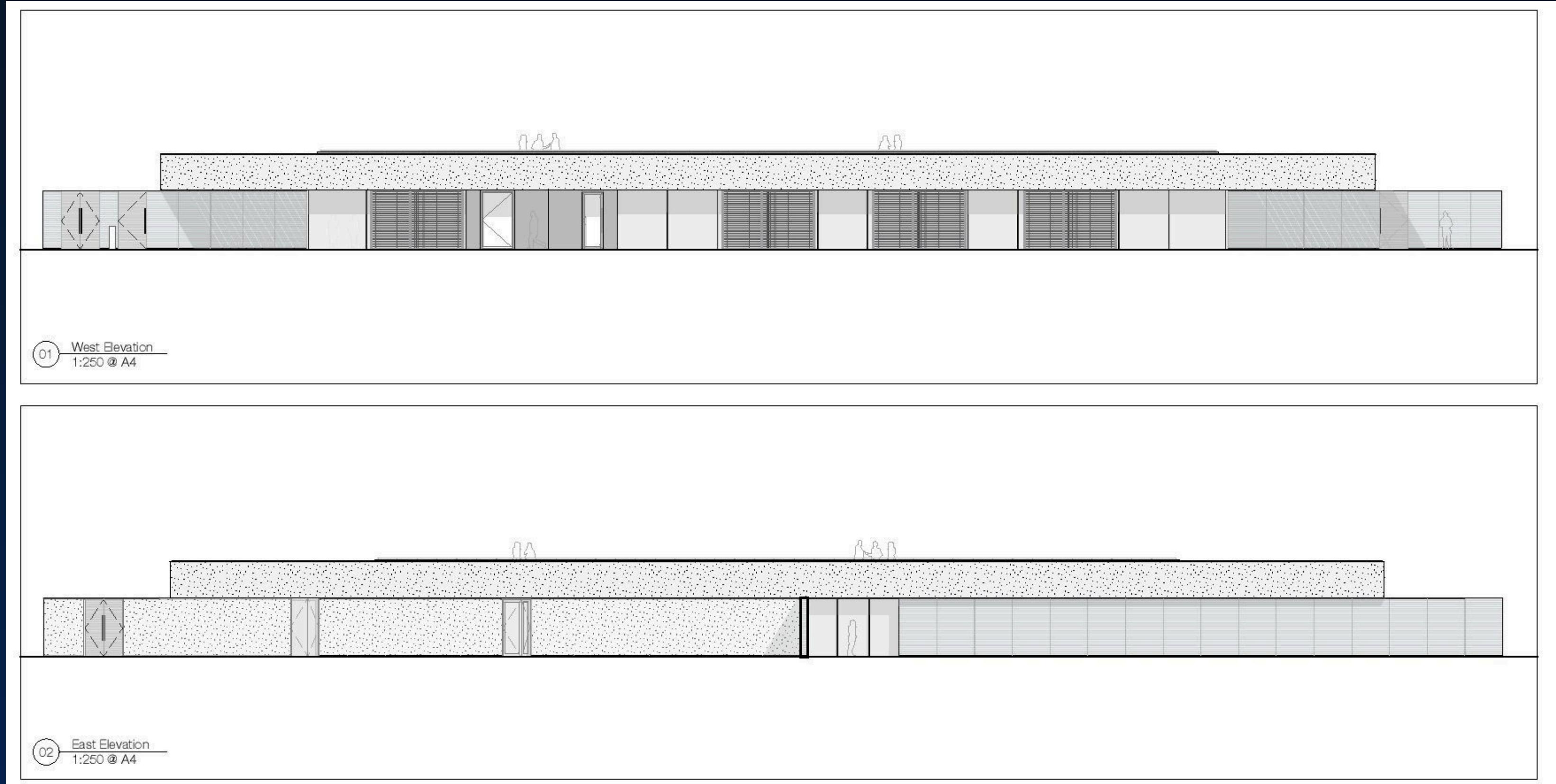


CASE STUDIES

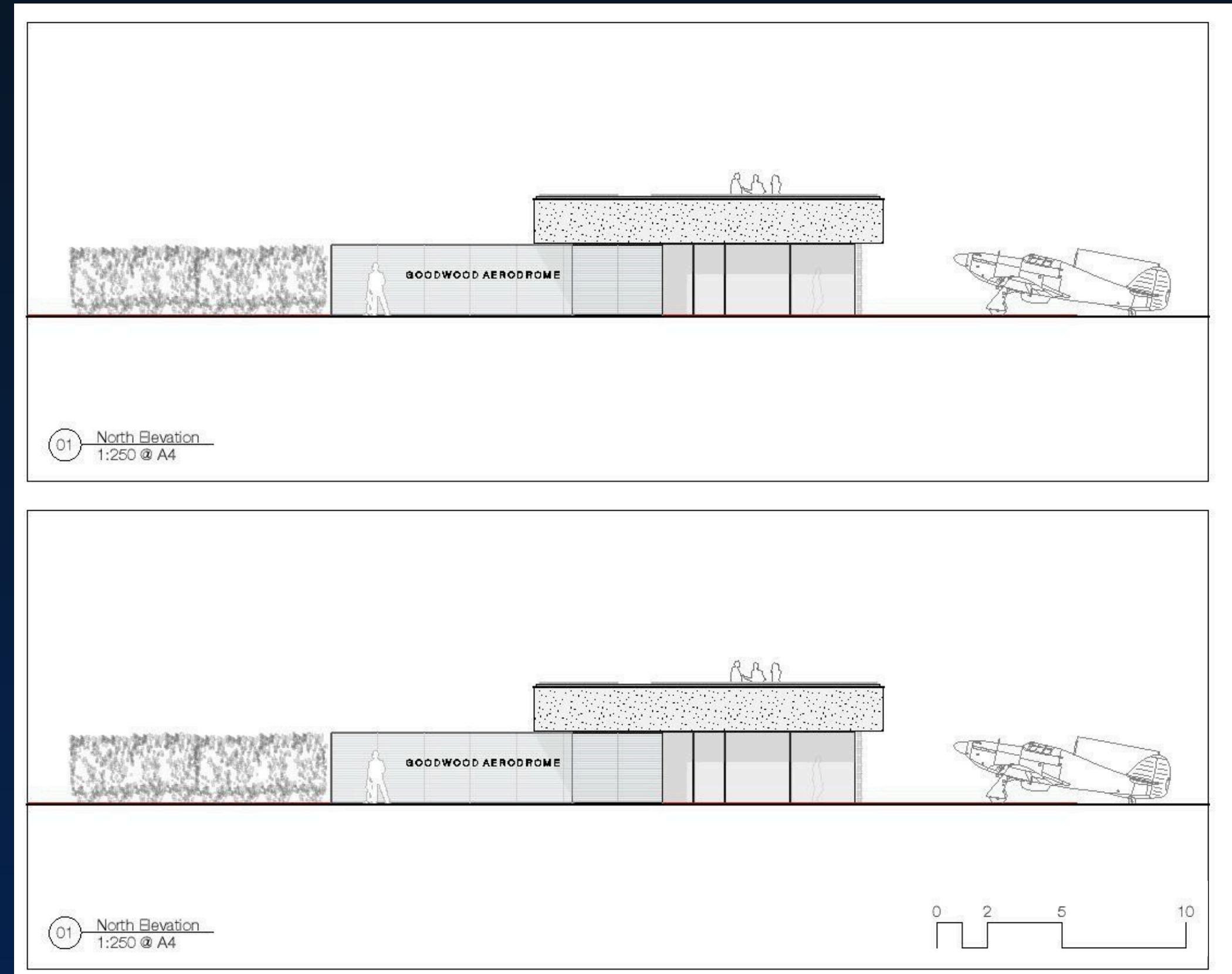
- Aviation Club
- Download and upload
- garden
- Positions
- Aircraft parking



CASE STUDIES



CASE STUDIES





SITE ANALYSIS



SITE ANALYSIS



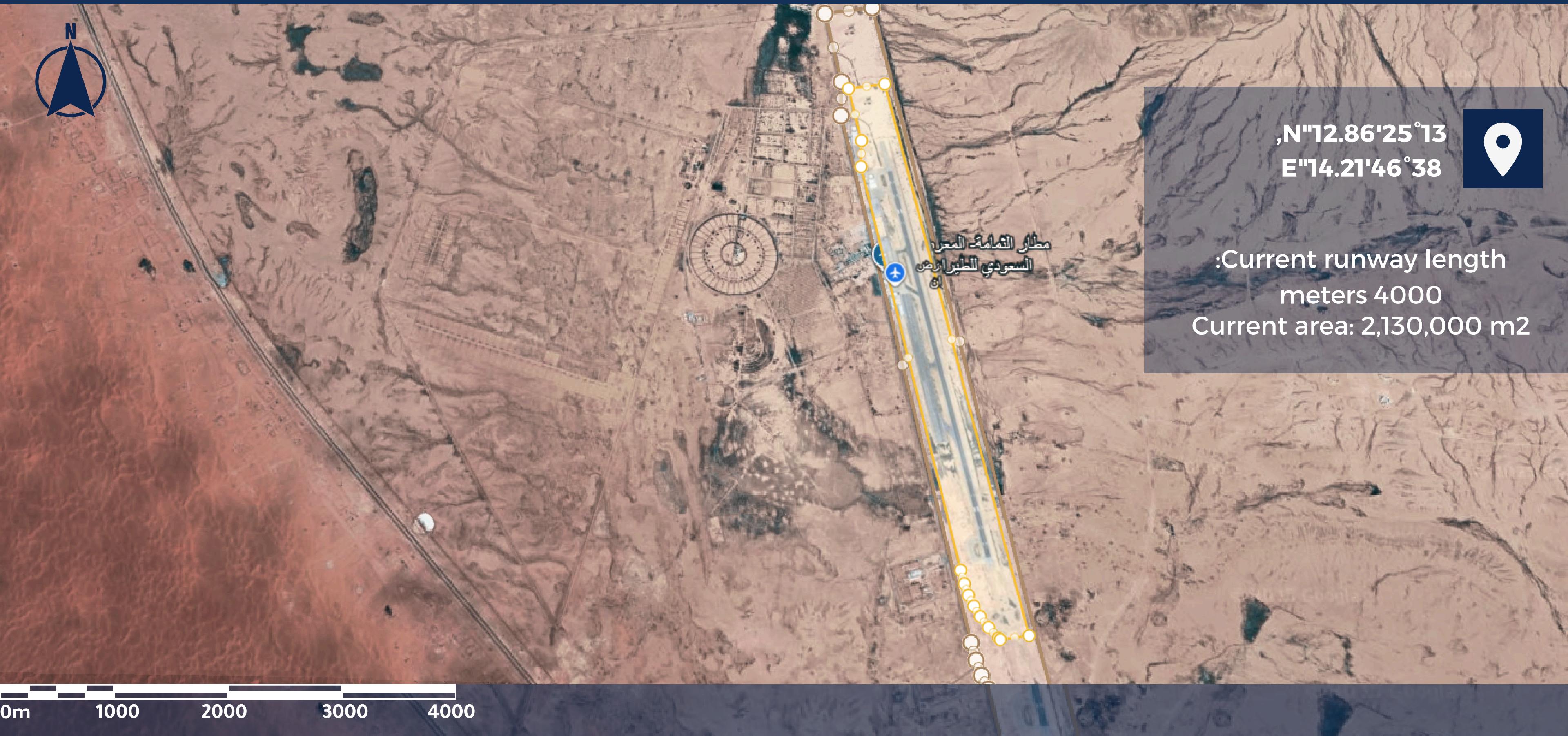
Location relative to Riyadh

The project site is located in the Kingdom of Saudi Arabia, north of Riyadh, specifically in the Al-Thumama area, and is located within the boundaries of the King Khalid Royal Reserve.

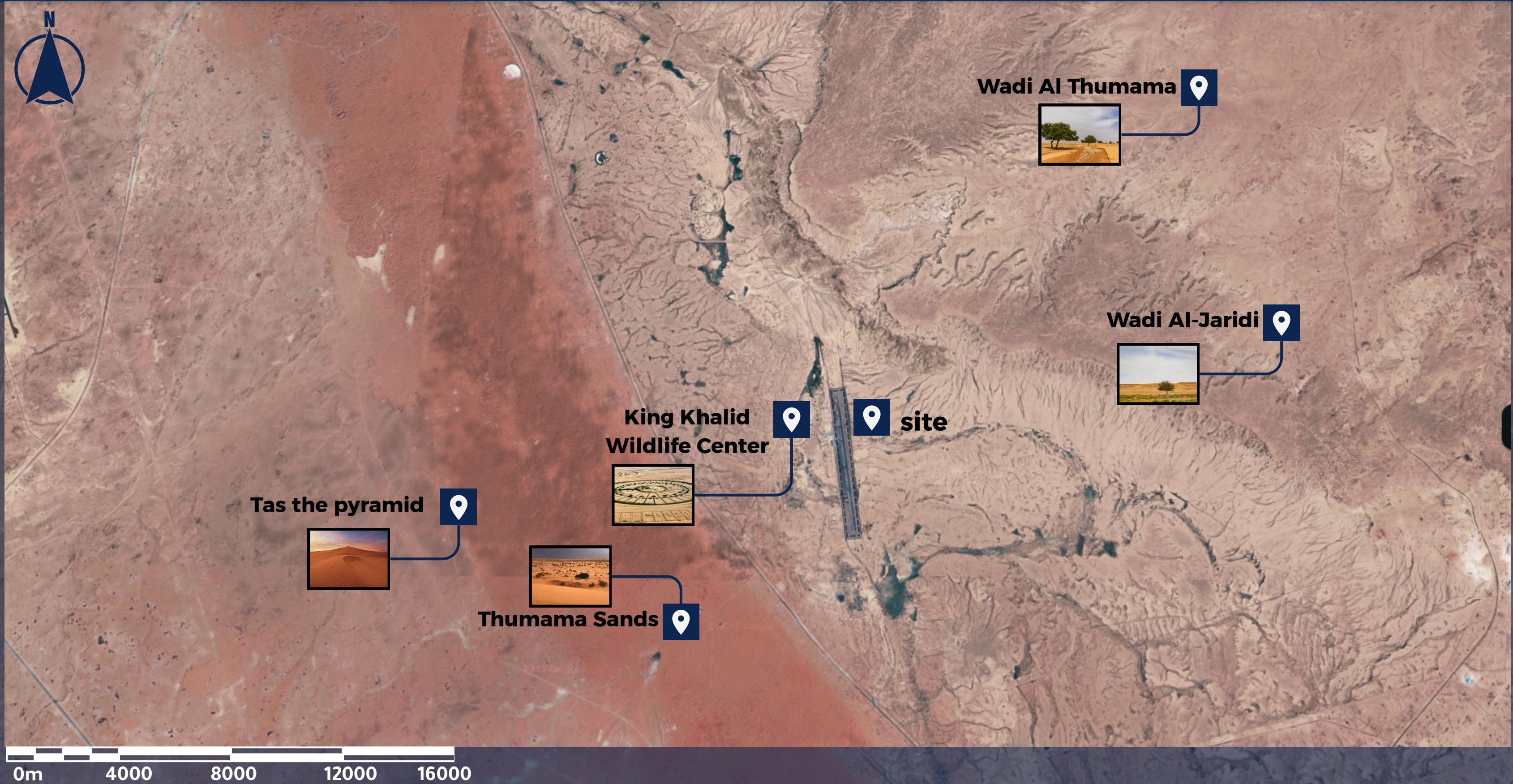
SITE ANALYSIS



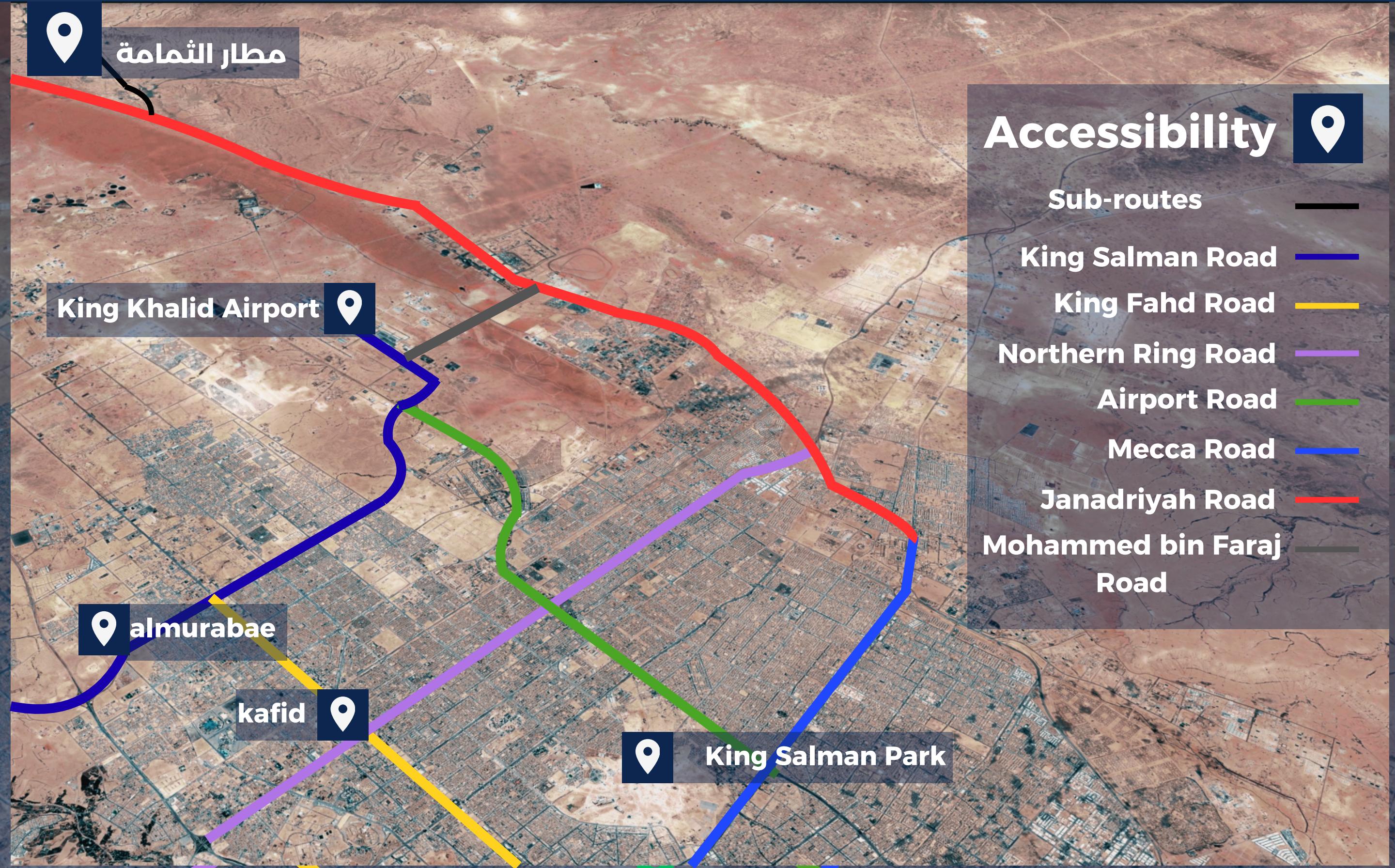
SITE ANALYSIS



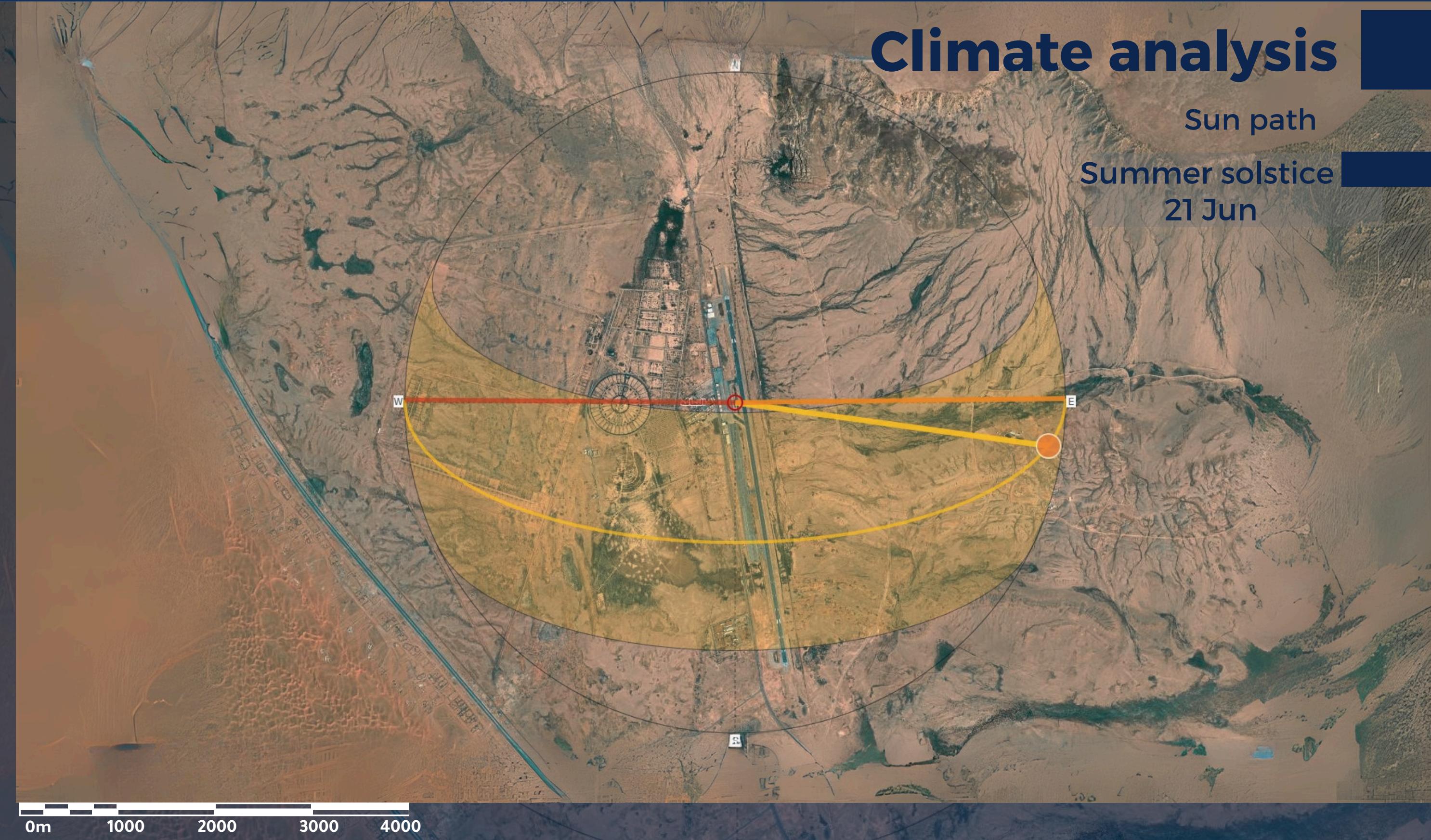
SURROUNDING LANDMARKS



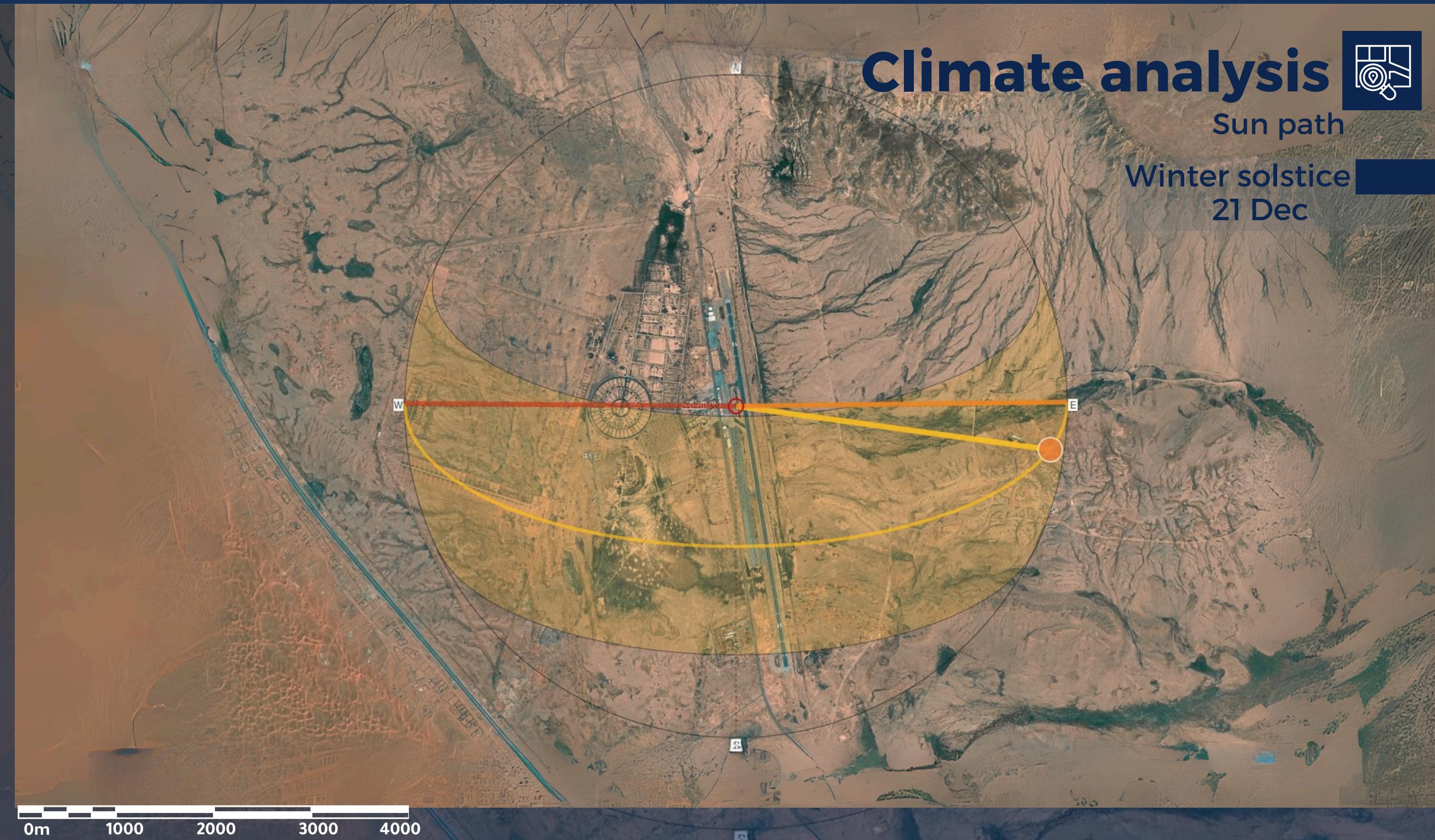
ACCESSIBILITY



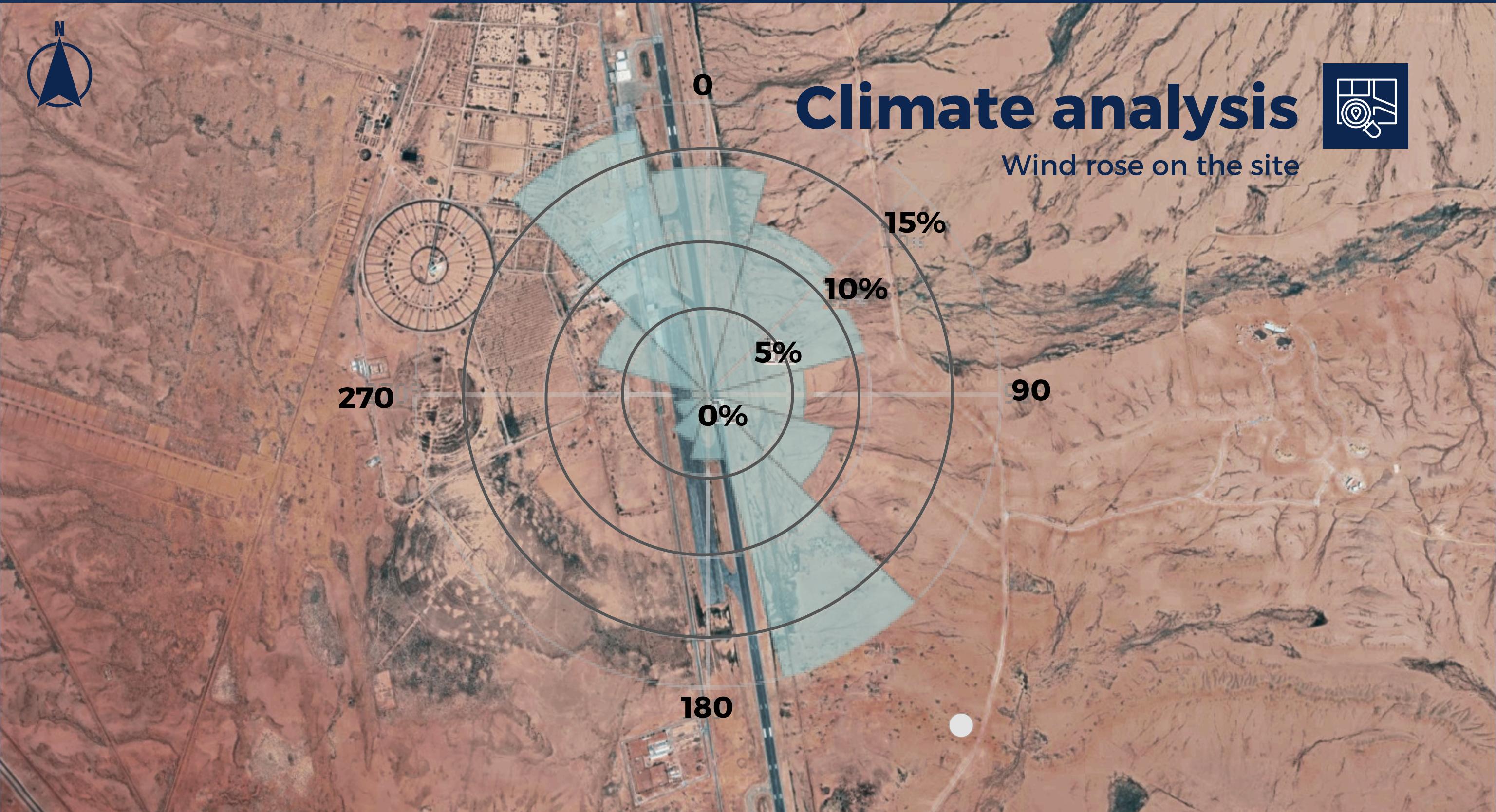
CLIMATE ANALYSIS



CLIMATE ANALYSIS



CLIMATE ANALYSIS





PROJECT DRAWINGS



PROJECT DRAWINGS

Administrative vacancies

Space name	number	Space
• Shared staff office	• 2	• 60m ²
• Individual staff office	• 3	• 30m ²
• Maintenance Services Staff Office	• 2	• 20m ²
• Maintenance Engineer's Office	• 1	• 20m ²
• Director's office	• 1	• 30m ²
• Public Relations Director's Office	• 1	• 30m ²
• meeting room	• 1	• 42m ²

PROJECT DRAWINGS

Social voids

Space name	number	Space
• Main hall	• 1	• 1600m2
• restaurant	• 1	• 60m2
• cafe	• 1	• 48m2
• library	• 1	• 140m2
• stage	• 1	• 240m2
• multi-purpose hall	• 1	• 180m2
• Student club	• 1	• 60m2
• External spaces	• -	• -

PROJECT DRAWINGS

Academic areas

Space name	number	Space
• Classes	• 2	• 60m2
• Aviation Technical Affairs Laboratories	• 1	• 60m2
• Computer lab	• 2	• 60m2
• Research Center	• 1	• 60m2

PROJECT DRAWINGS

Aviation blanks

Space name	number	Space
• Hunger	• 1	• 1125m2
• Aircraft maintenance	• 1	• 600m2
• Operations and Dispatch Office	• 1	• 12m2
• Aviation changing cabins	• 1	• 16m2
• Flight simulation	• 1	• 48m2

PROJECT DRAWINGS

Service spaces

Space name	number	Space
• A prayer room for men	• 1	• 60m2
• A prayer room for women	• 1	• 30m2
• WC	• 5	• 30m2
• Electricity room	• 1	• 36m2
• Security and safety room	• 1	• 24m2
• Air conditioning room	• 3	• 60m2



ARCHITECTURAL DRAWINGS:

CONCEPT DESIGN

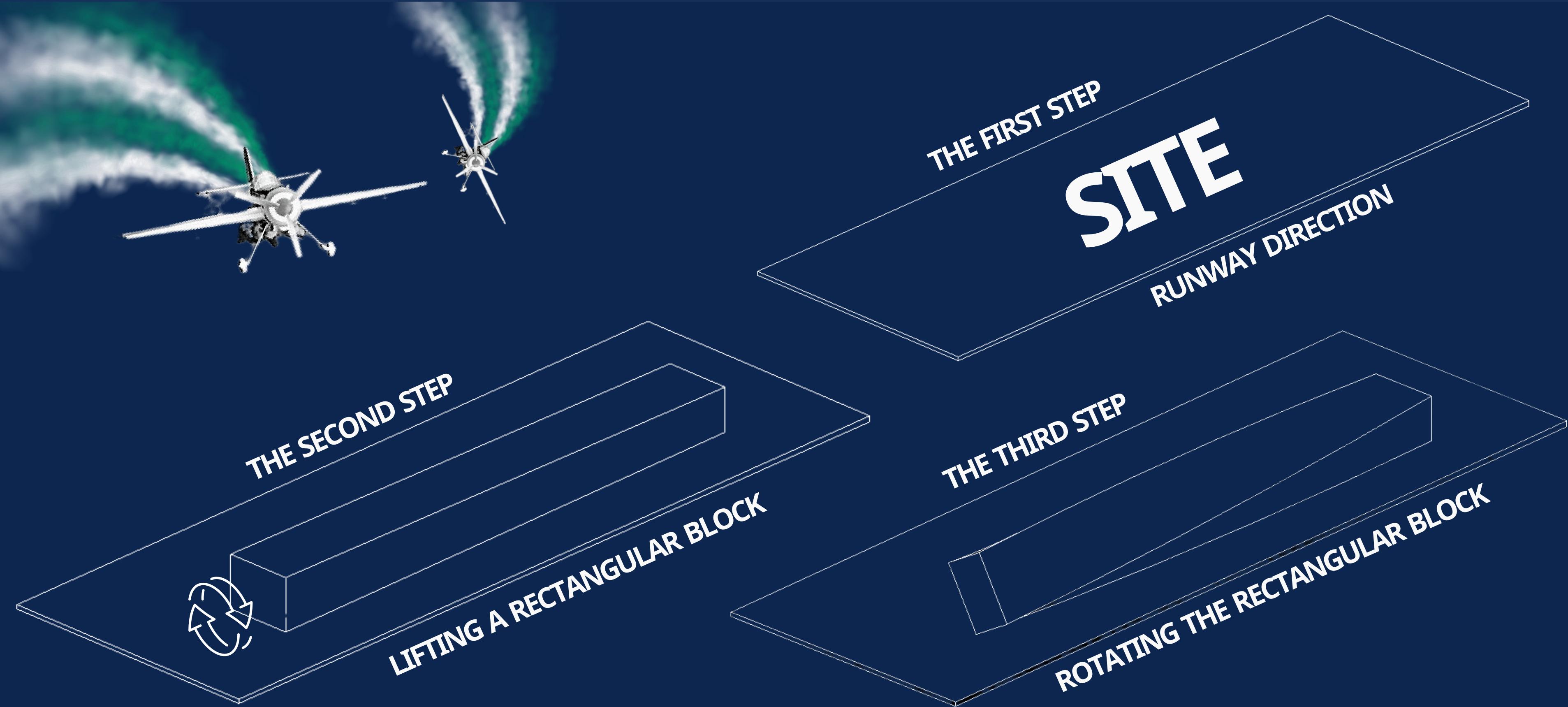


DESIGN PHILOSOPHY

The design of the Aviation Club in Riyadh emerges from the rotational movement of an aircraft around its axis, transforming this dynamic maneuver into a curved and twisted architectural mass that embodies strength, elegance, and fluidity. The building translates this motion into a helical form that conveys continuous progress and a forward-looking spirit, making the architectural space an extension of flight itself. The volumes are shaped as a twisted ribbon that embraces the interior spaces and creates layered pathways for activities, while the façades follow flowing lines that emulate the movement of air around the aircraft's body during rotation. This configuration gives visitors a tangible sense of motion even while on the ground and establishes the club as a visual landmark that reflects Riyadh's identity as a center of innovation and aviation.



CONCEPT DESIGN



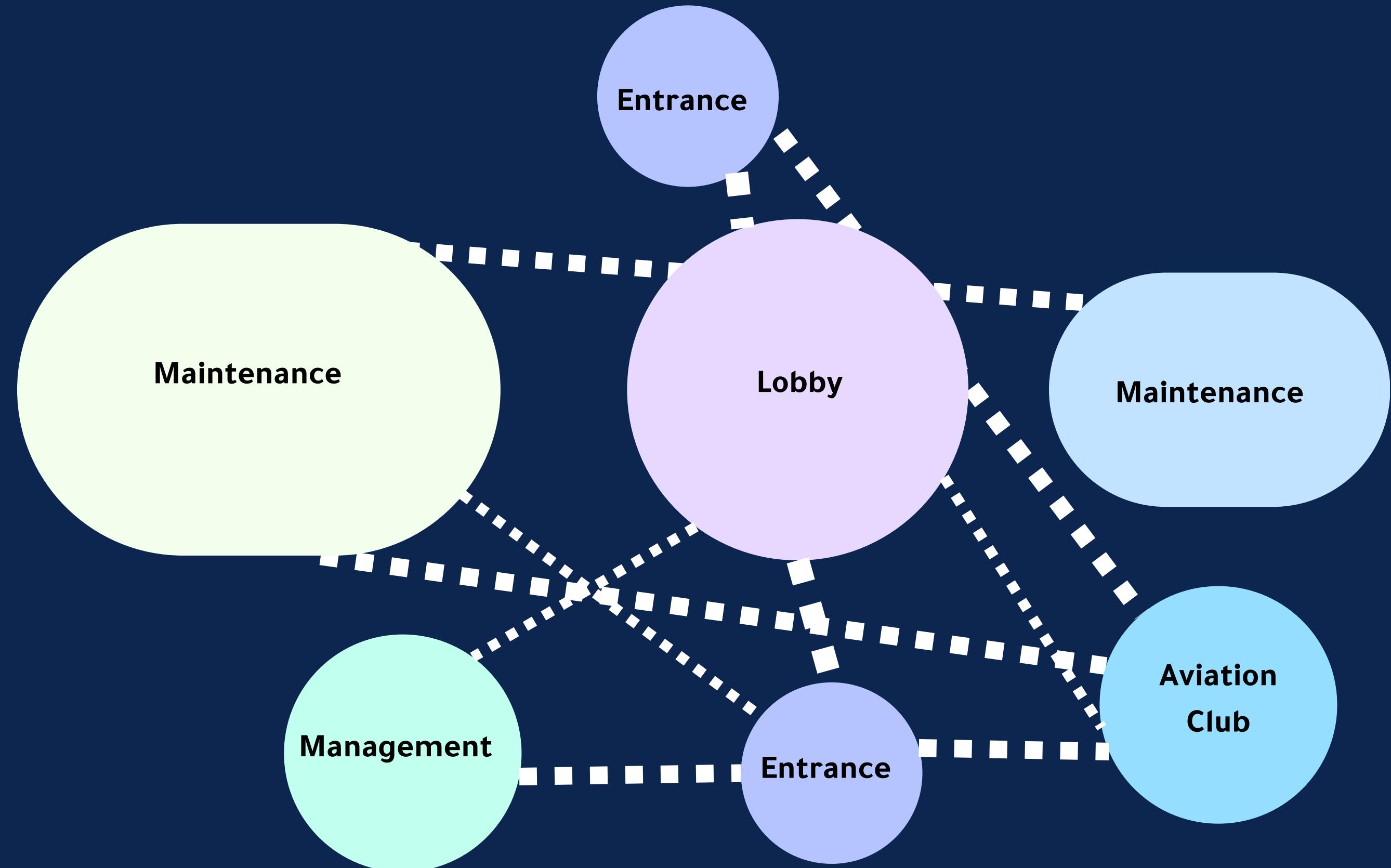


ARCHITECTURAL DRAWINGS:

AREA DISTRIBUTION



AREA DISTRIBUTION





ARCHITECTURAL DRAWINGS:

LOGO



LOGO



AL THUMAMA AVIATION CLUB

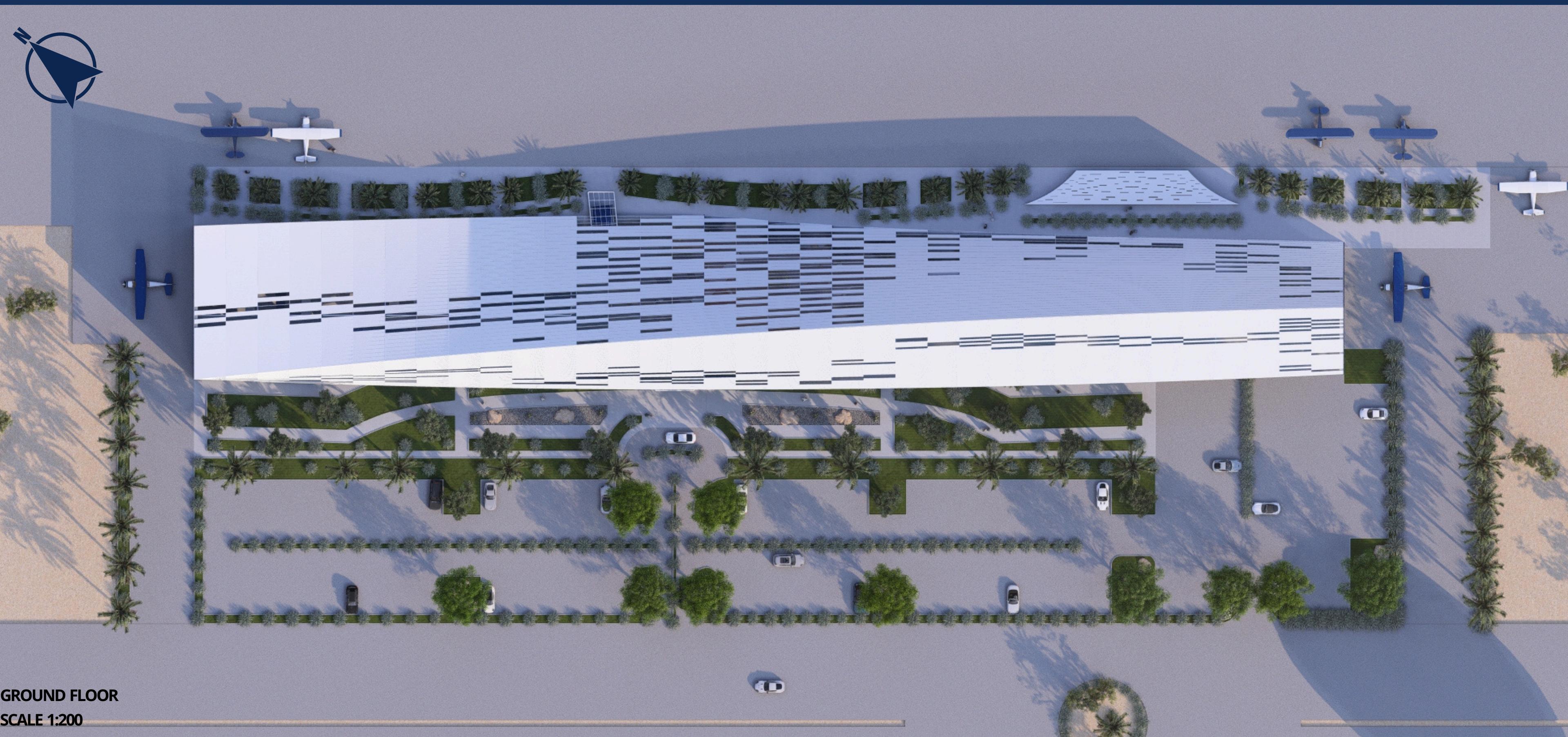


ARCHITECTURAL DRAWINGS:

SITE PLAN



SITE PLAN



GROUND FLOOR

SCALE 1:200

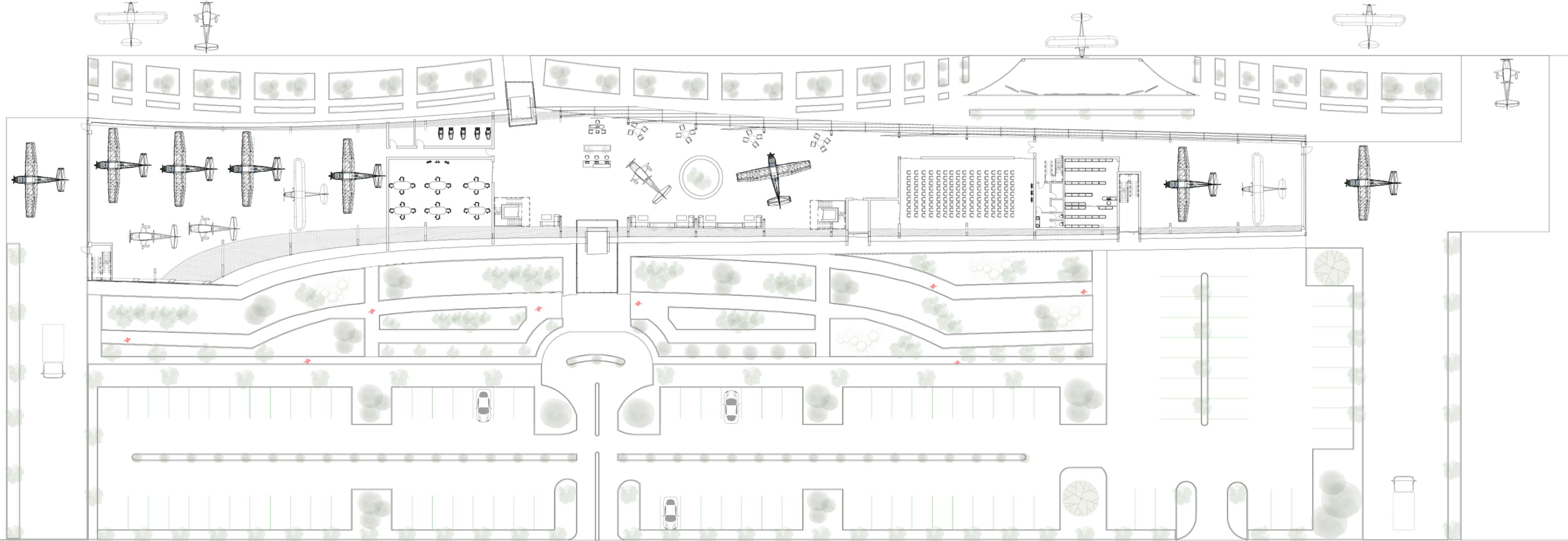


ARCHITECTURAL DRAWINGS:

ARCHITECTURE PLANS



ARCHITECTURE PLANS

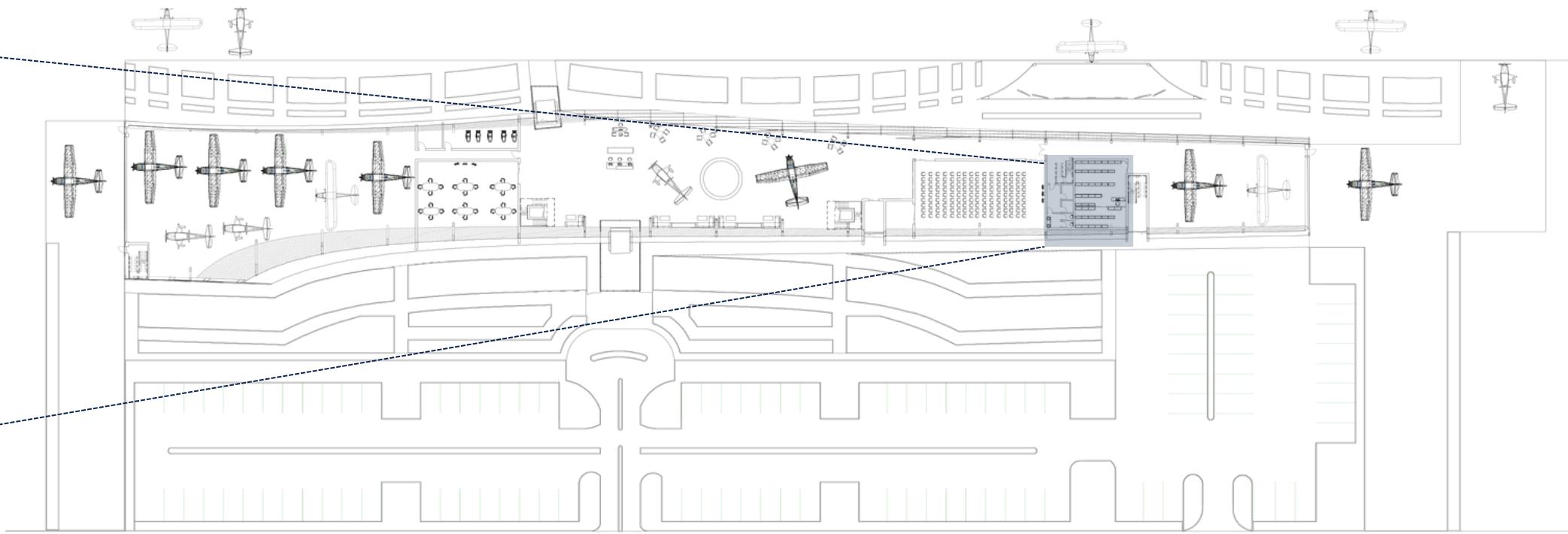
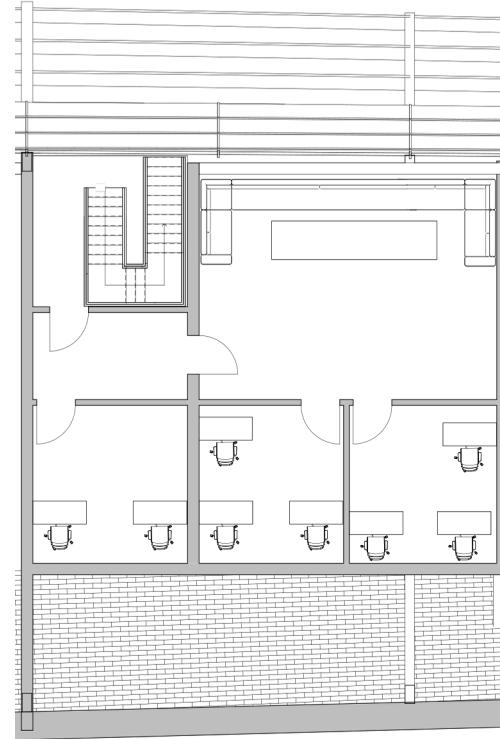


GROUND FLOOR

SCALE 1:200

ARCHITECTURE PLANS

FIRST FLOOR
SCALE 1:50



SECOND FLOOR

SCALE 1:200



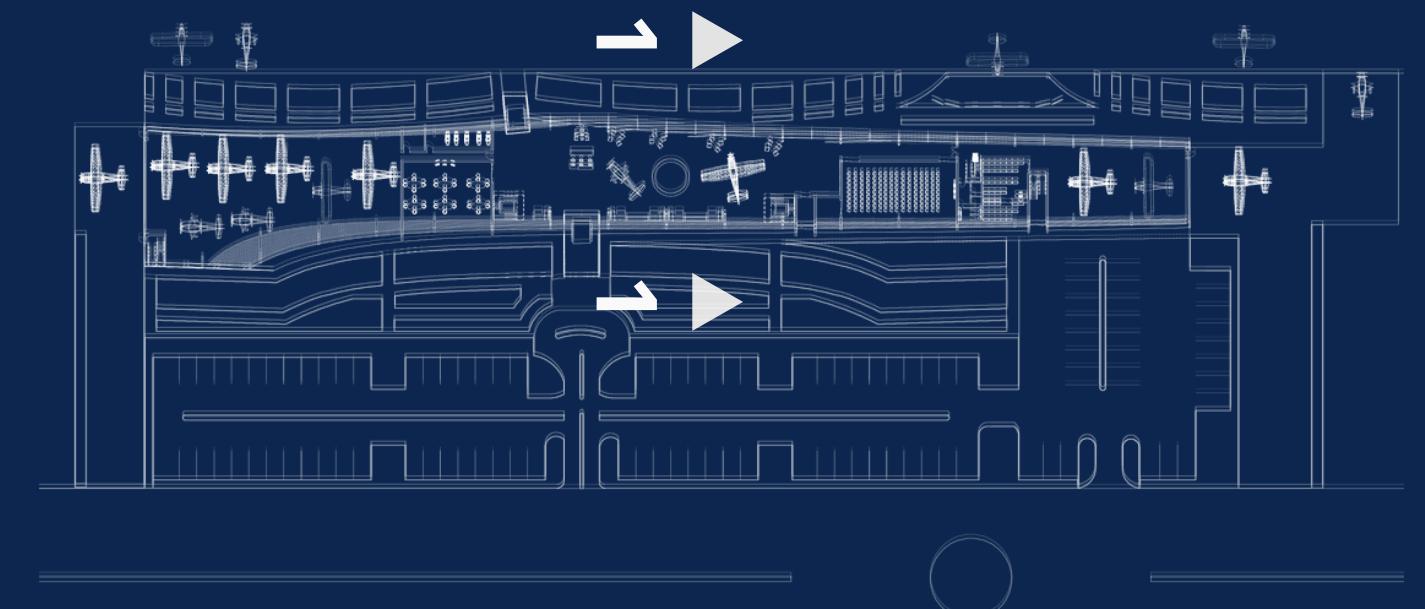
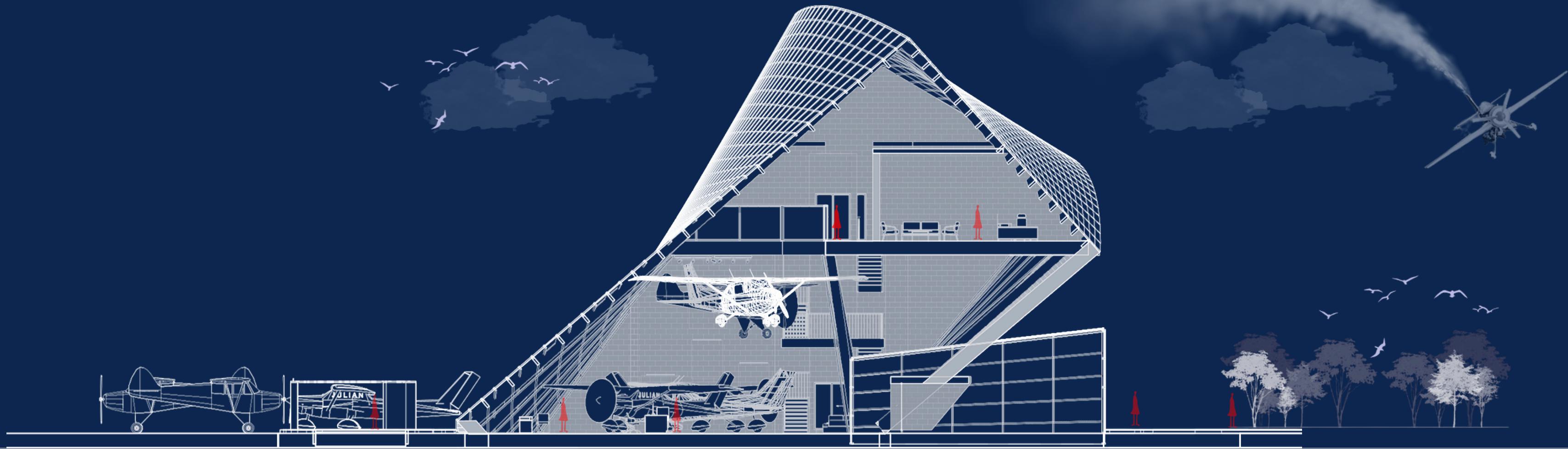


ARCHITECTURAL DRAWINGS:

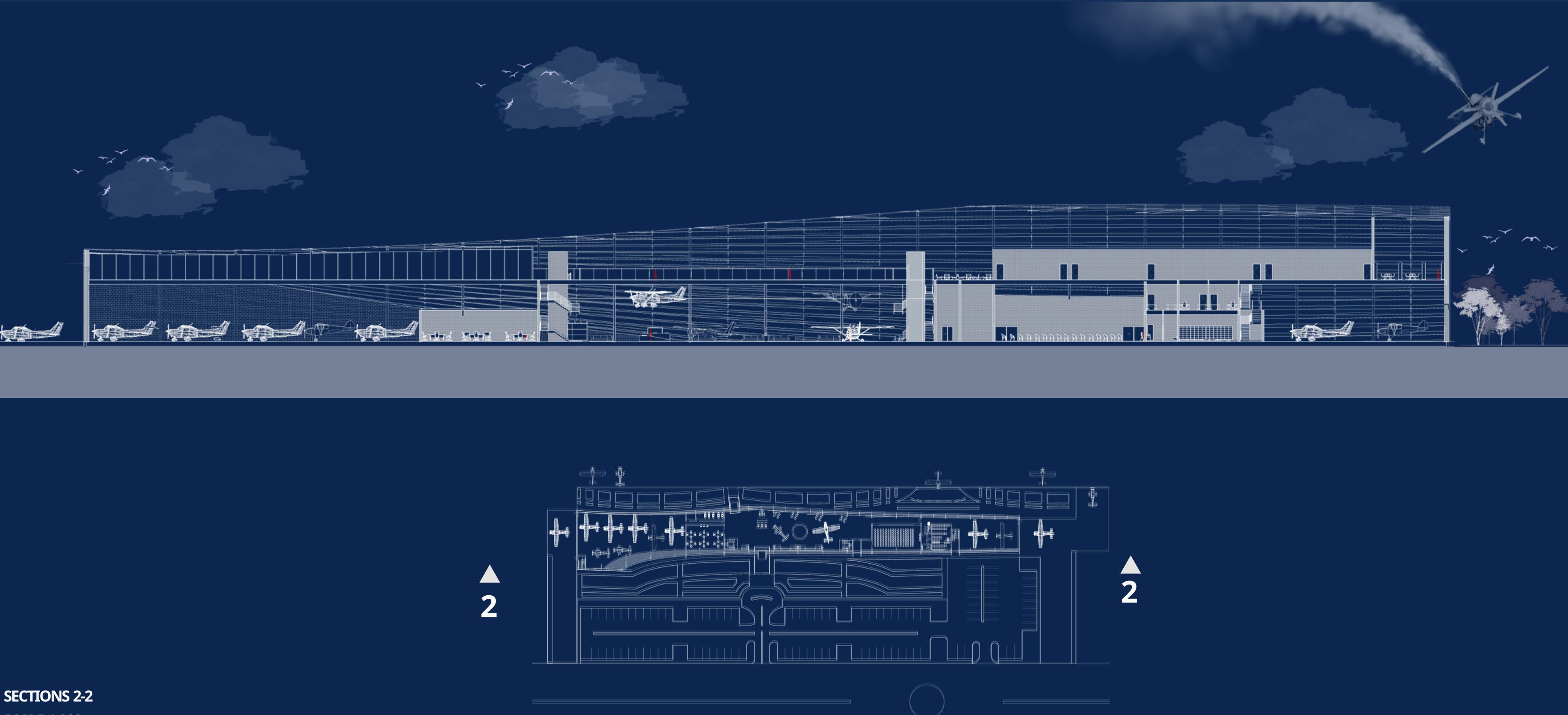
SECTIONS



SECTIONS



SECTIONS





ARCHITECTURAL DRAWINGS:

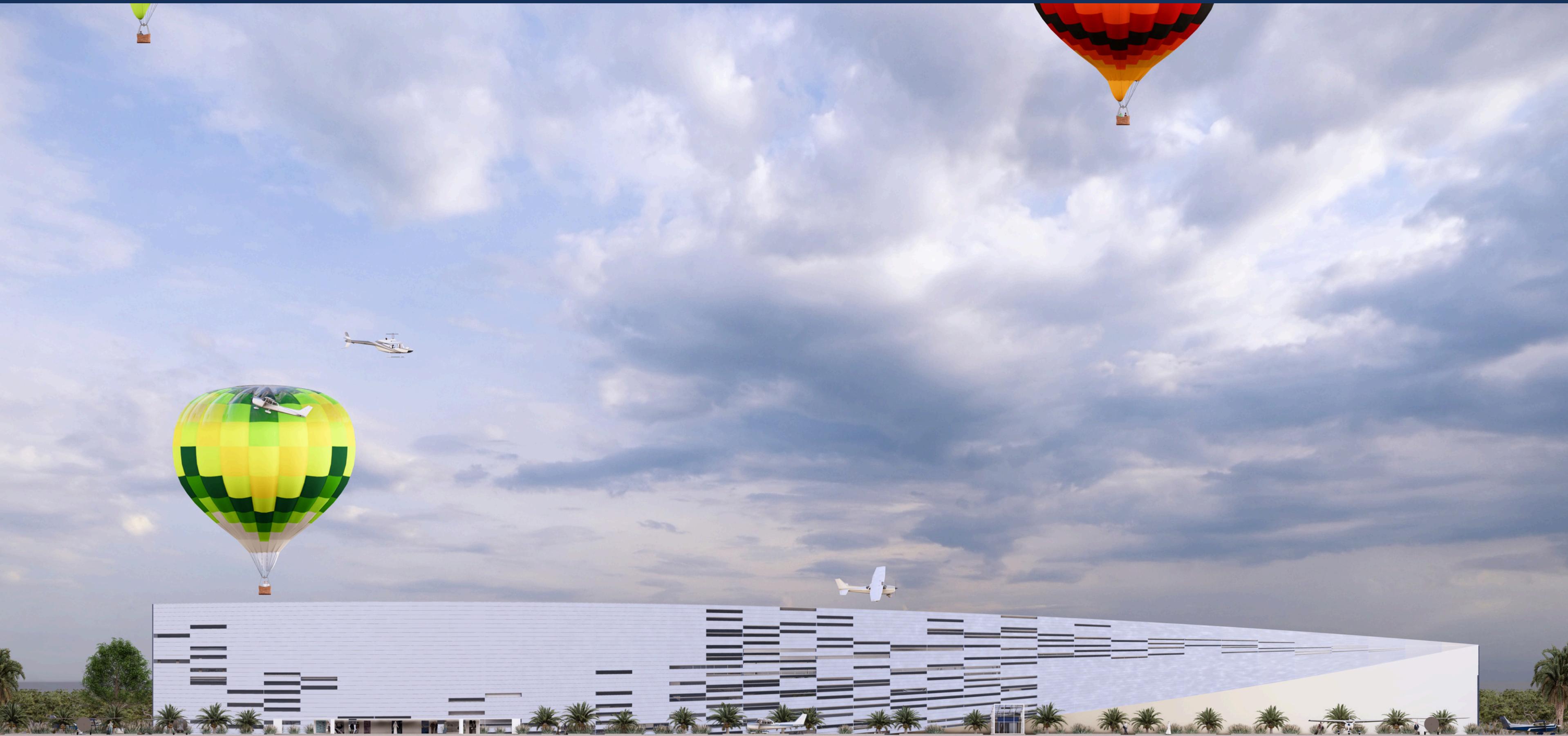
ELEVATIONS



ELEVATIONS



ELEVATIONS



ELEVATIONS



ELEVATIONS



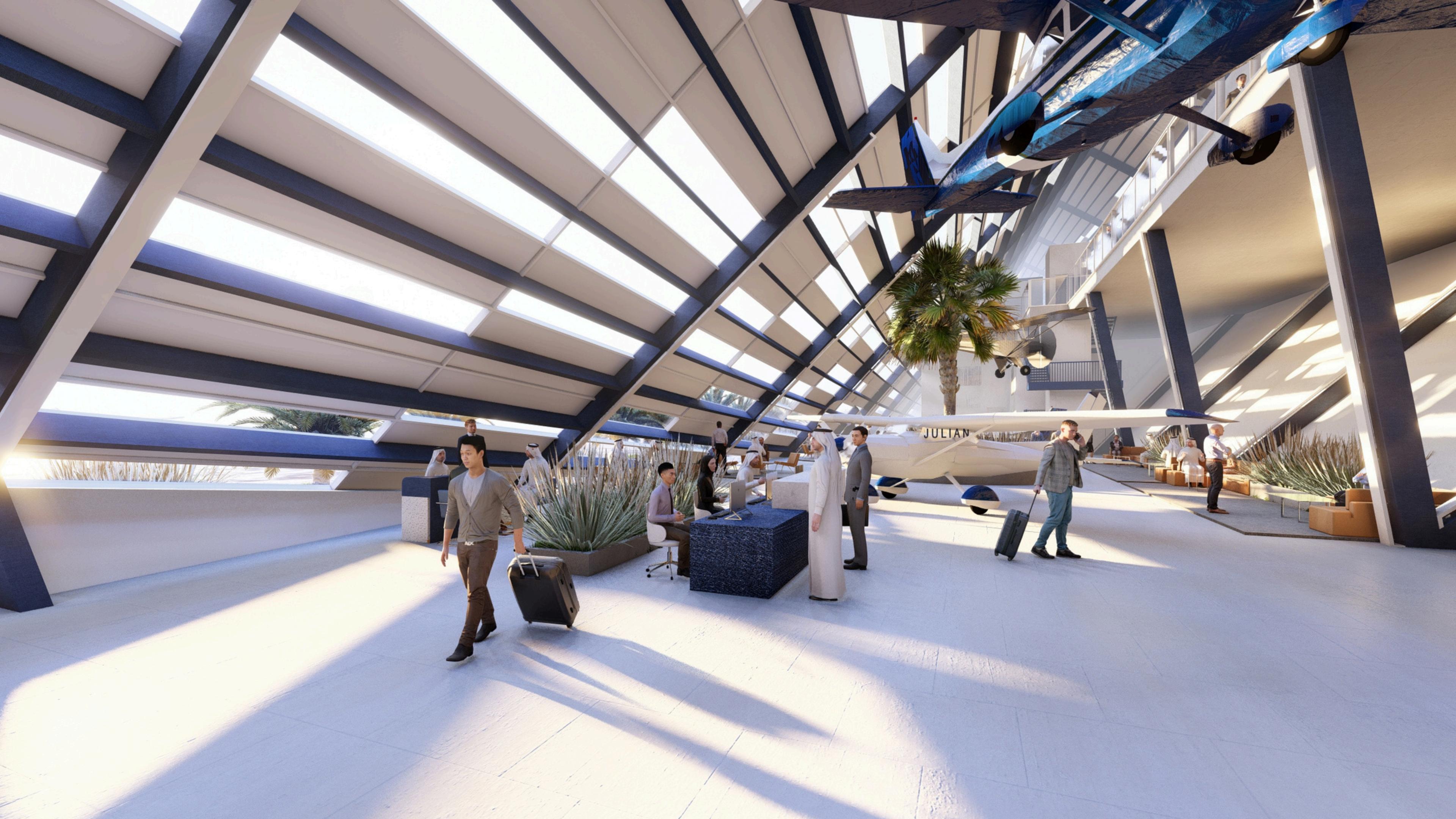


ARCHITECTURAL DRAWINGS:

PERSPECTIVES







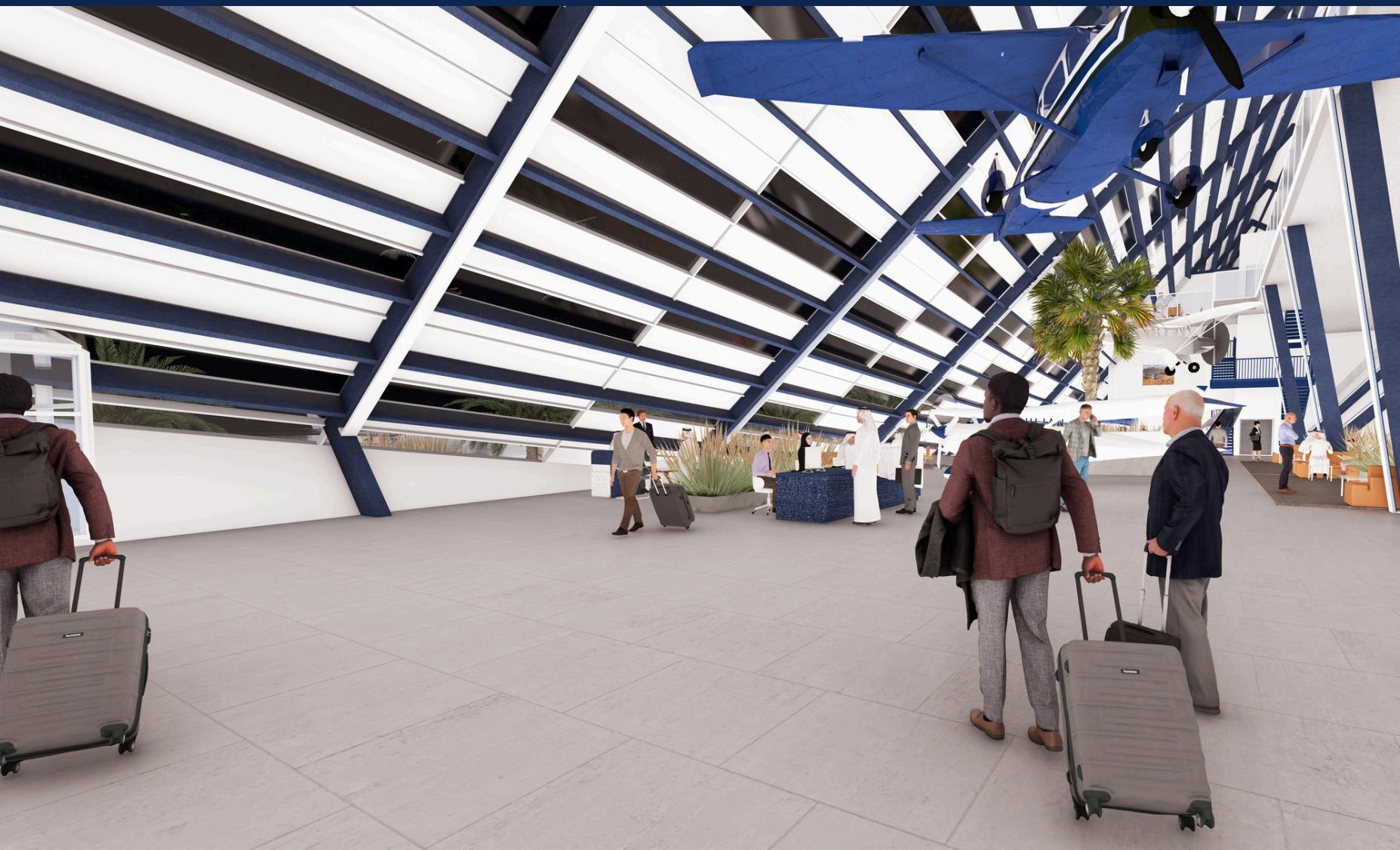














ARCHITECTURAL DRAWINGS:

SUSTAINABLE SOLUTIONS



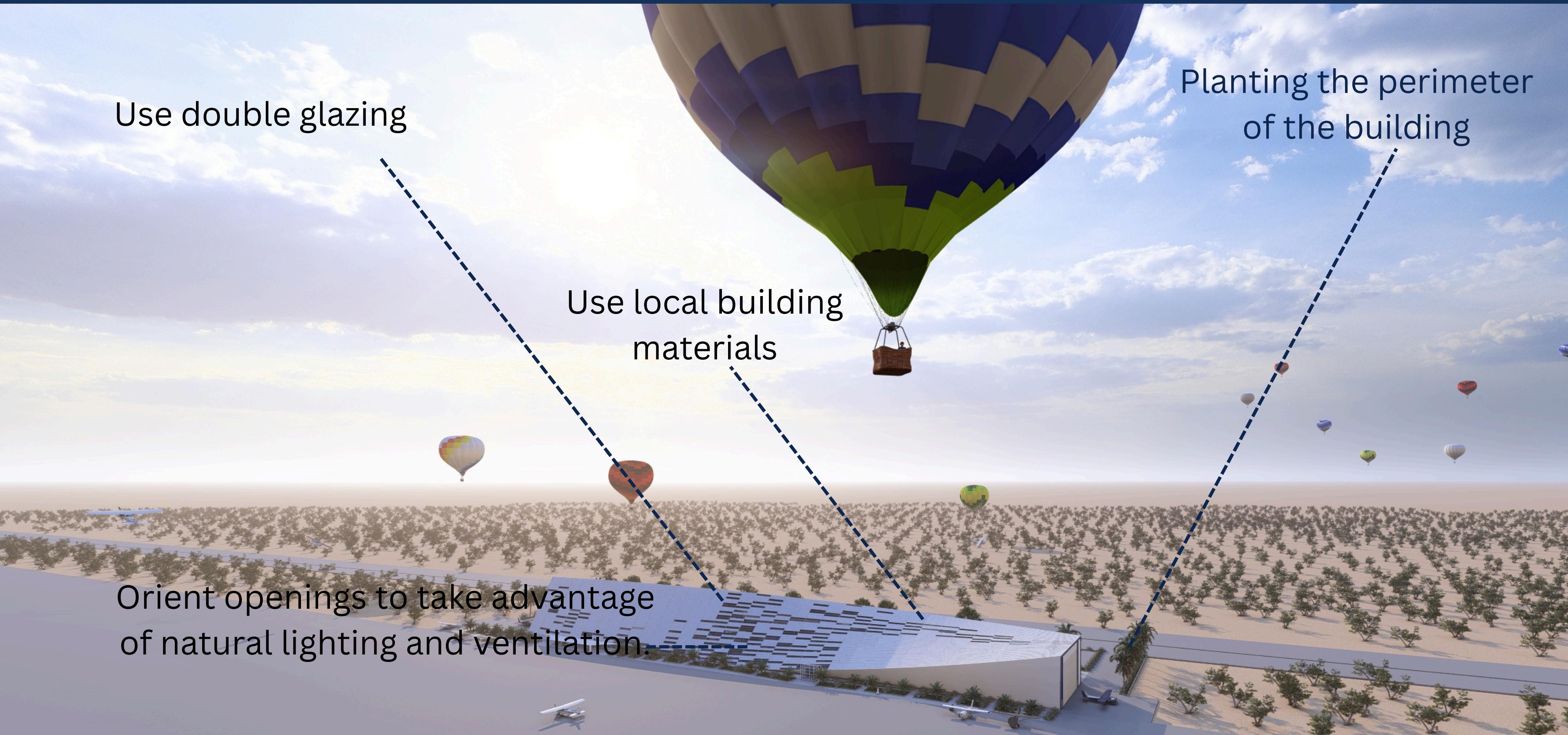
SUSTAINABLE SOLUTIONS

Use double glazing

Use local building
materials

Orient openings to take advantage
of natural lighting and ventilation.

Planting the perimeter
of the building





ARCHITECTURAL DRAWINGS:

STRUCTURAL DRAWINGS



STRUCTURAL

A steel portal frame

Steel Portal Frame System It is one of the simplest and smartest structural systems used to cover large spaces. Here is a brief explanation of how it works and its components:

1. The Core Concept (Why "Portal"?)

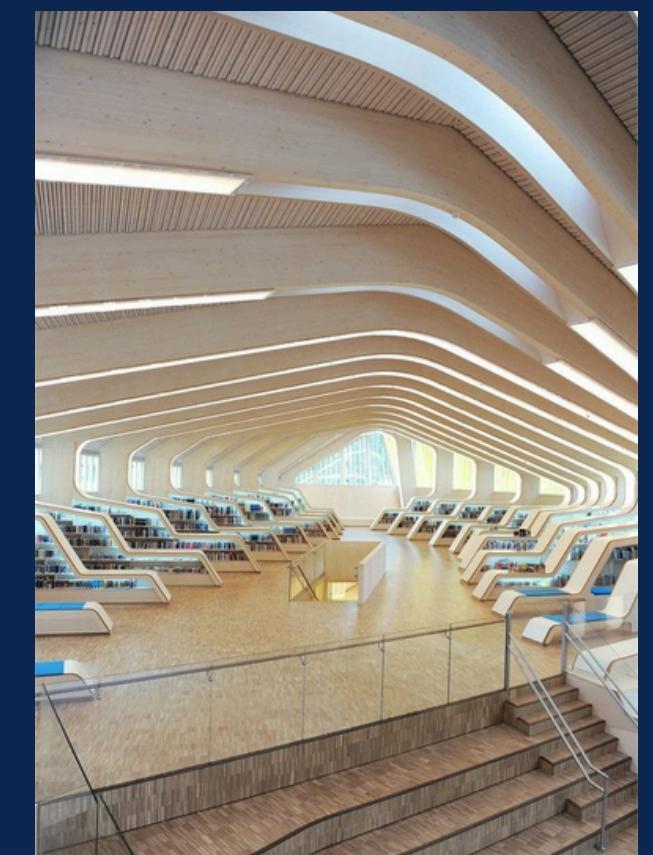
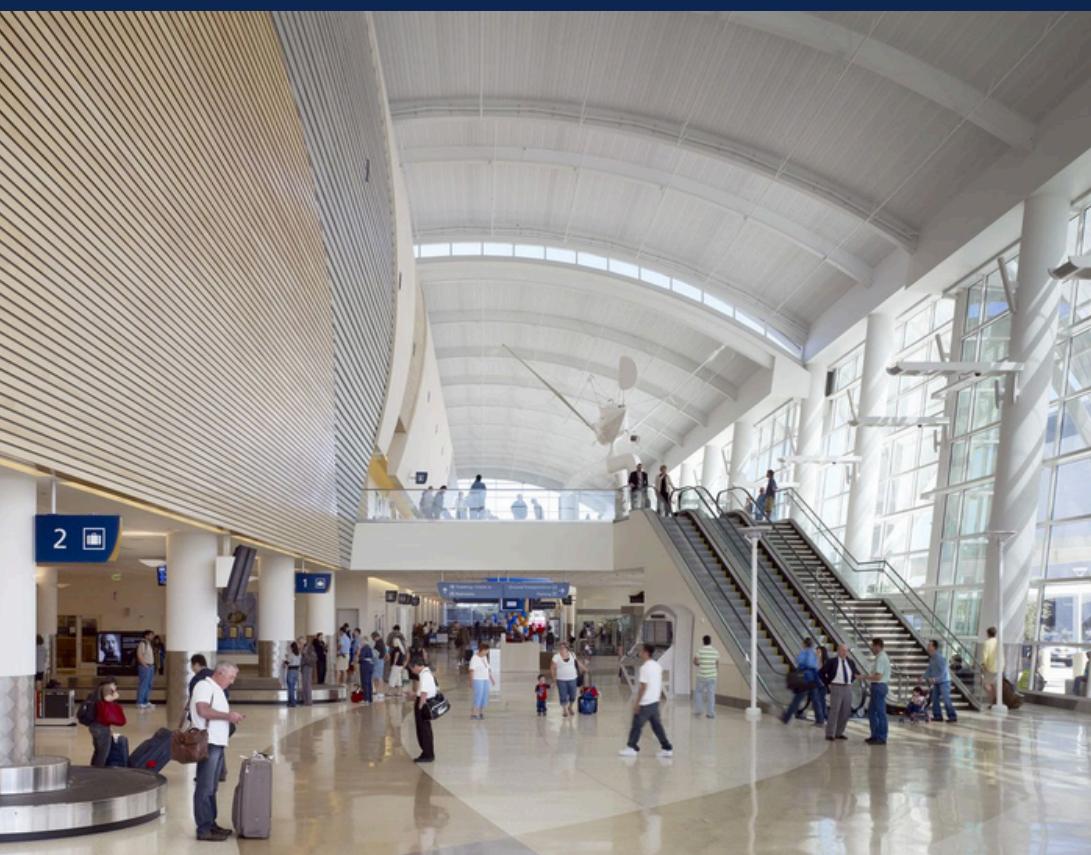
The word "Portal" refers to a gate or door-like entry.

- Structure: It simply consists of two Columns and a horizontal or sloped beam called a Rafter.
- The Engineering Trick: It lies in how the column connects to the rafter. They are welded or bolted together in a very strong, Rigid Joint, making them act as a single continuous unit, not just a beam resting on top of a column.

2. How It Works? (The Secret of its Strength)

In standard buildings, beams often just rest on columns. In a Portal Frame:

- Rigid Connections: The corner where the rafter meets the column (called the Knee) is designed to be extremely stiff and resistant to rotation.
- Load Distribution: When the weight of the roof presses down, the rafters try to push the columns outward. However, because the connection is rigid, the columns resist this push and transfer the load and "moment" down to the foundations.



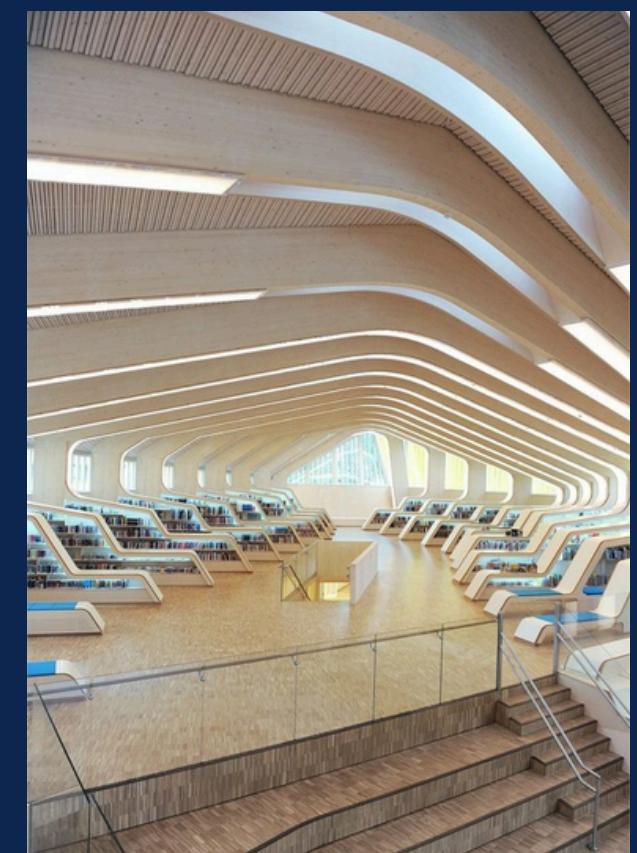
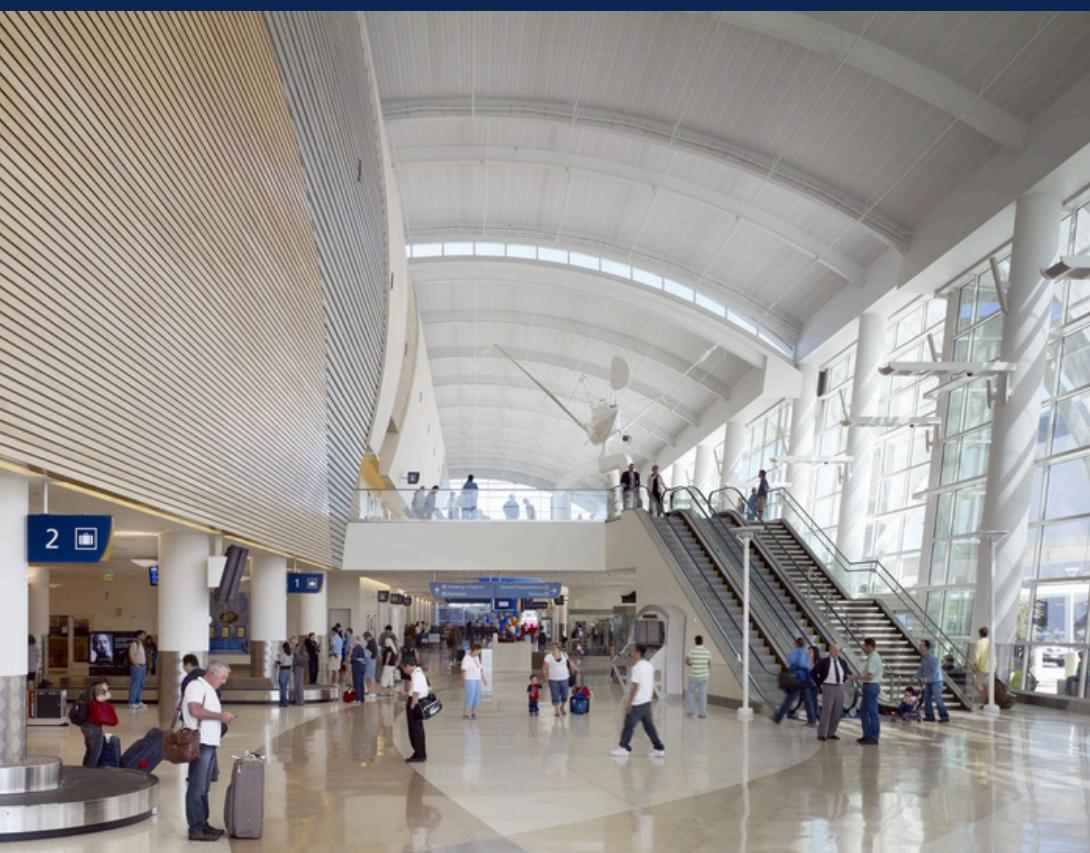
STRUCTURAL

3. Main Components (What you see in your image)

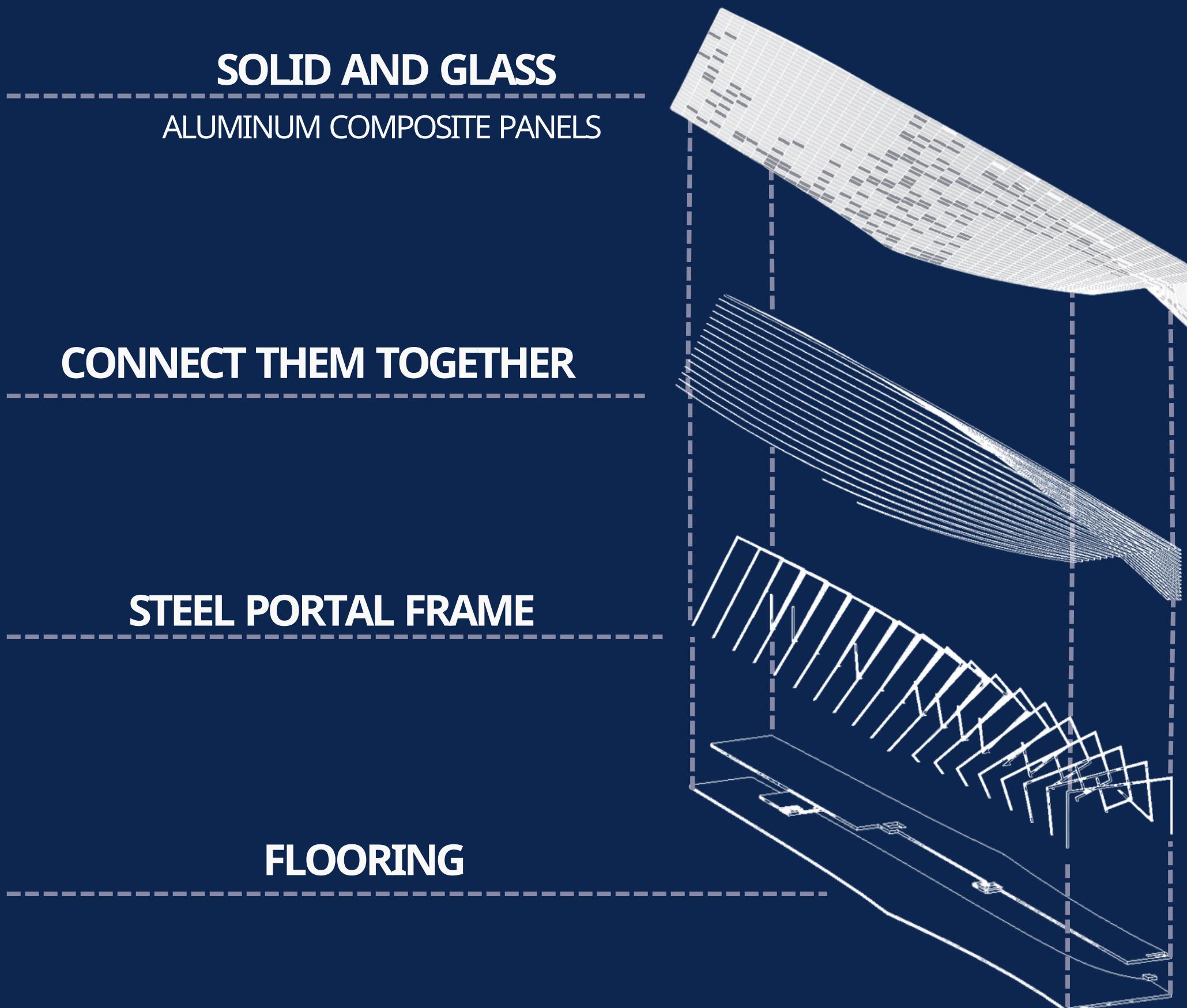
- If you look at your image, you can identify these parts:
- Columns: The vertical supports on the sides.
- Rafters: The steel beams that form the sloped roof (the A-shape).
- Haunch: This is a distinct feature; you will notice the steel gets "thicker" or "deeper" at the corner where the roof meets the column. This reinforcement is necessary to handle the high stress (Moment) in that area.
- Purlins: Smaller beams placed horizontally across the rafters to support the roof cladding (sheets or glass).

4. Why is it so popular?

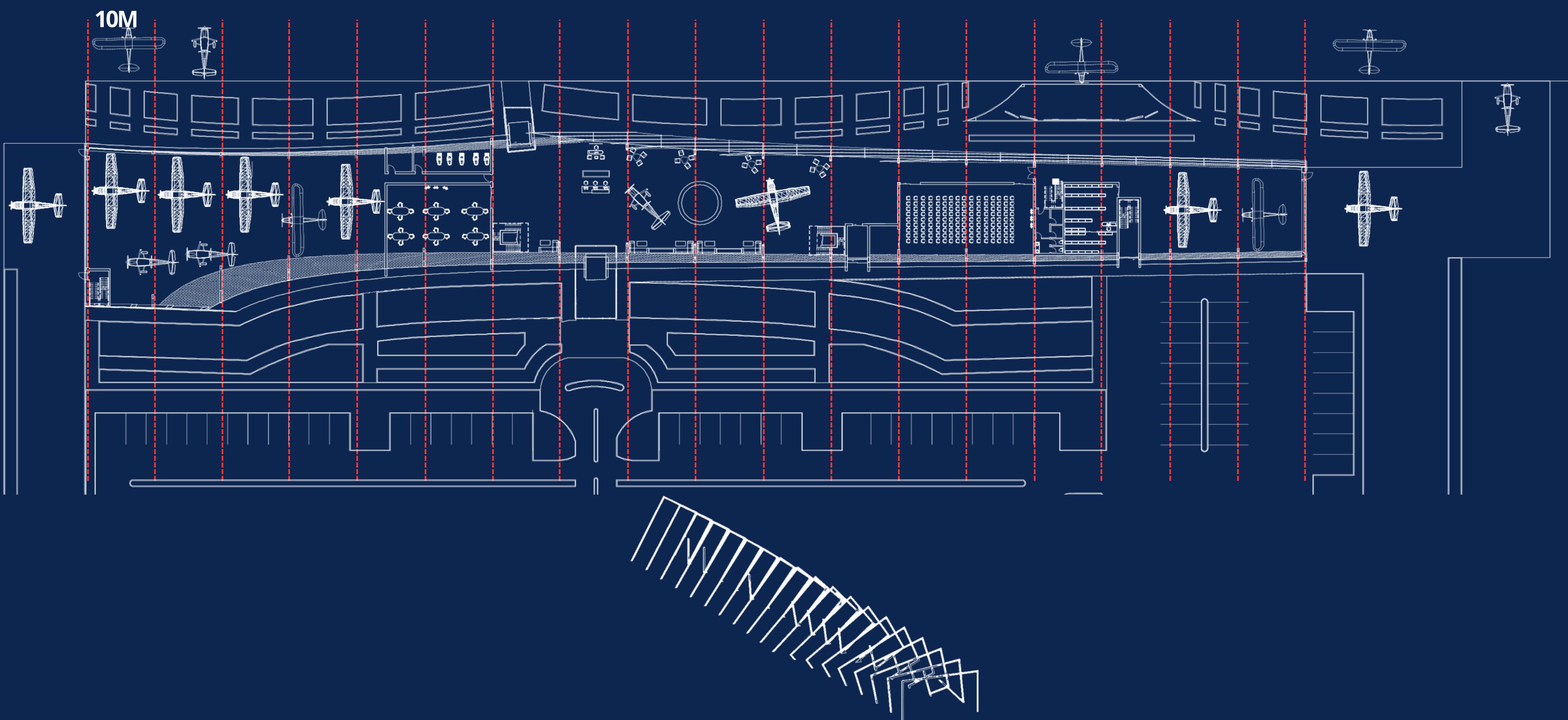
- Clear Span: It provides huge open spaces (up to 40-50 meters wide) without any internal columns obstructing movement (perfect for aircraft and factories).
- Speed: It is prefabricated in a factory and assembled quickly on-site (like Lego).
- Cost: It is much more economical than concrete for large areas.
- Flexibility: It allows for high-pitched roofs (as in your image) which are great for shedding snow or rain.



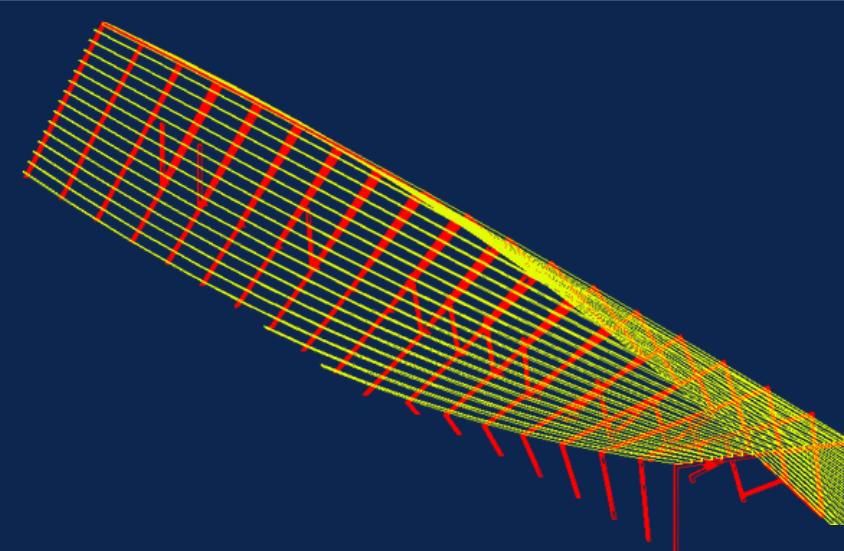
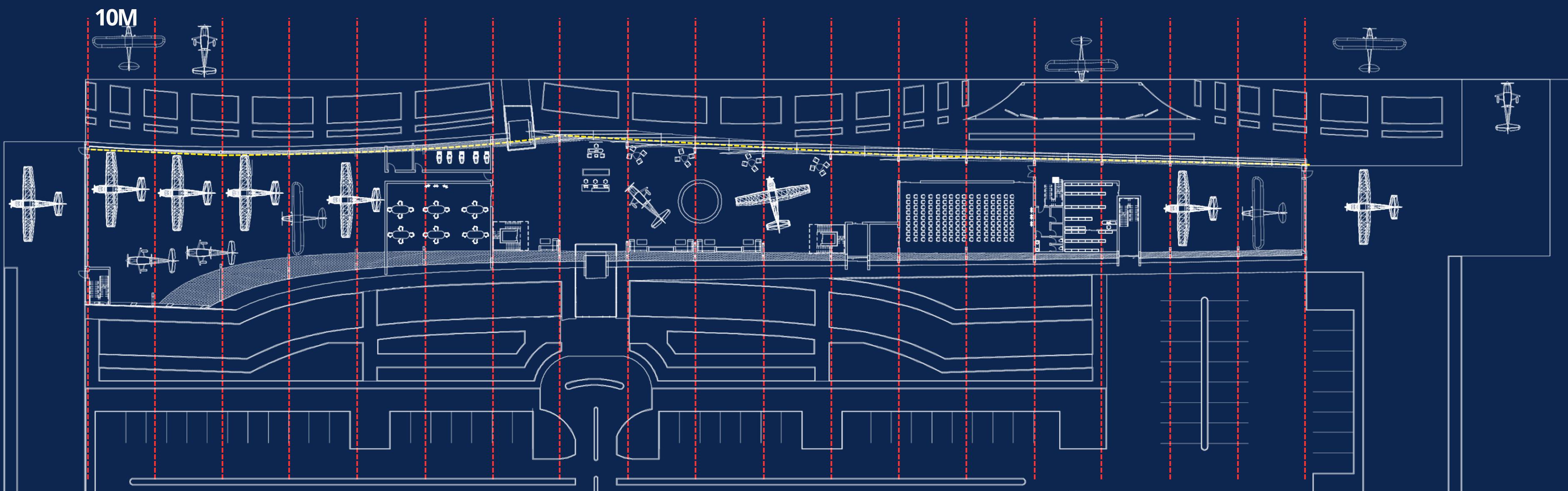
STRUCTURE DETAILS



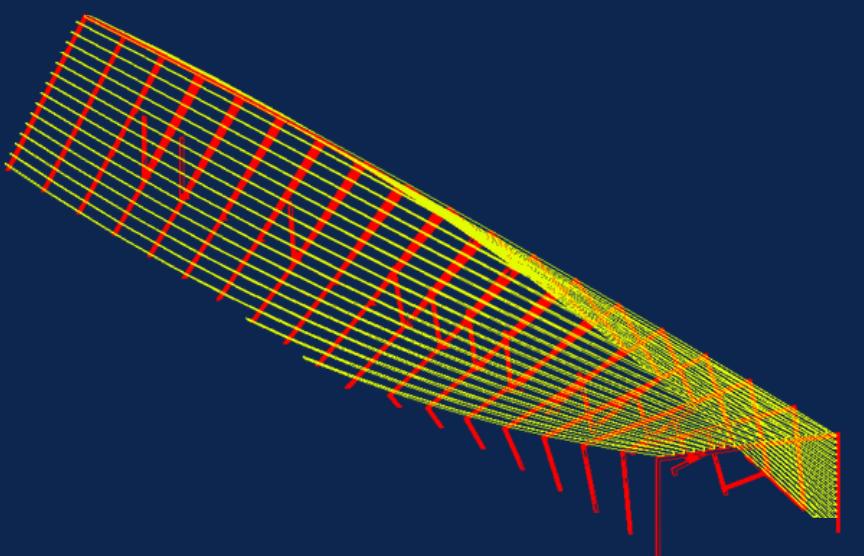
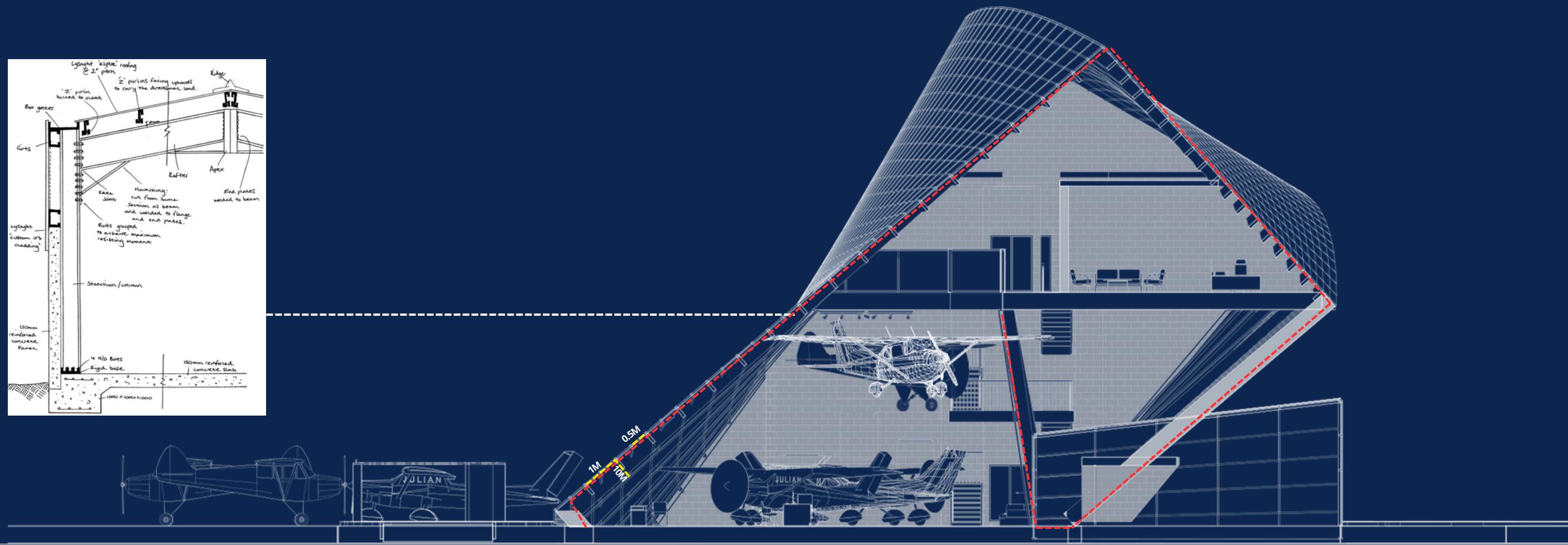
STRUCTURE DETAILS



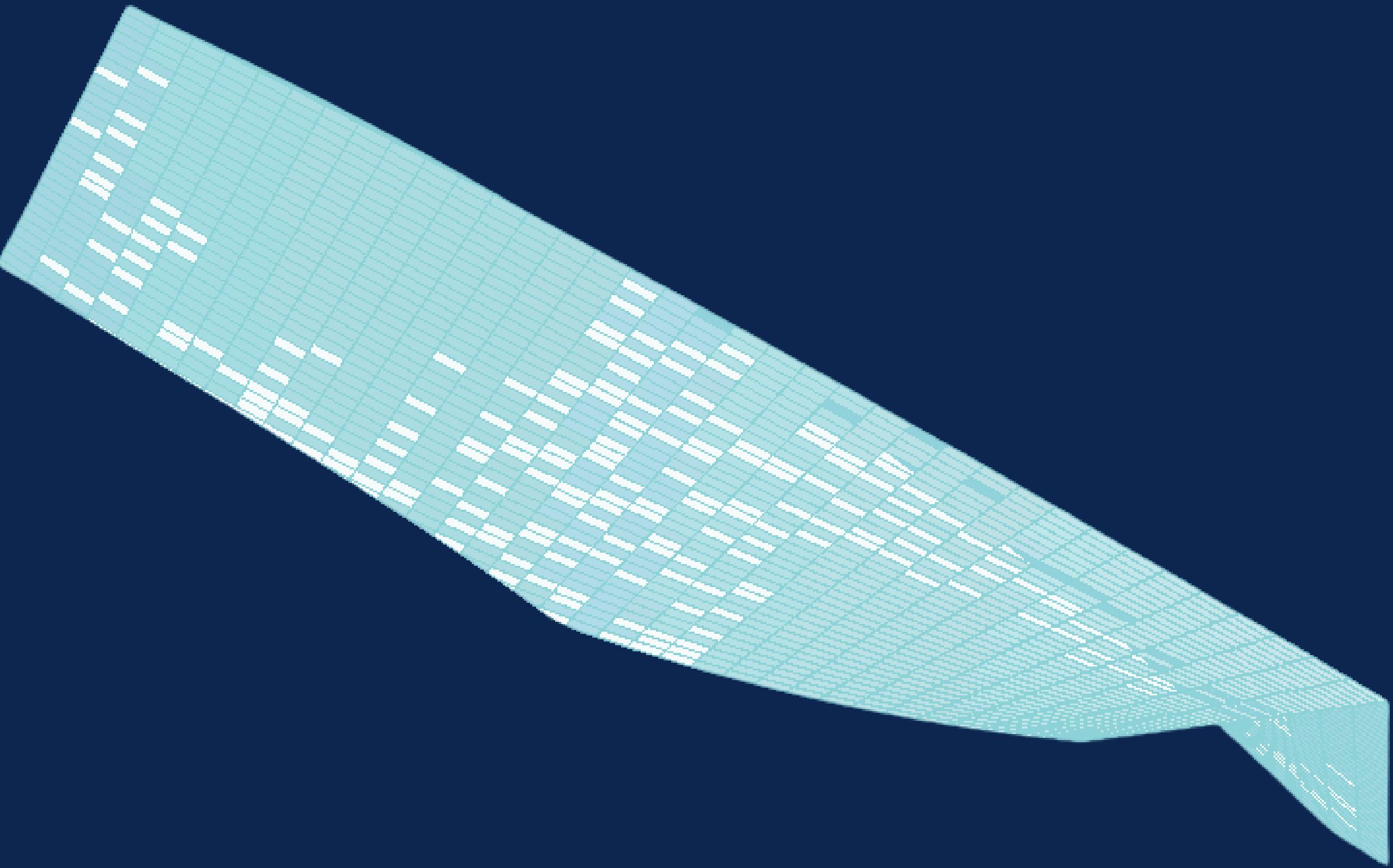
STRUCTURE DETAILS



STRUCTURE DETAILS



STRUCTURE DETAILS



CLADDING PANELS



ARCHITECTURAL DRAWINGS:

SYSTEMS DRAWING



AIR CONDITIONING SYSTEMS

Chilled Water HVAC System

1. Production (The Plant)

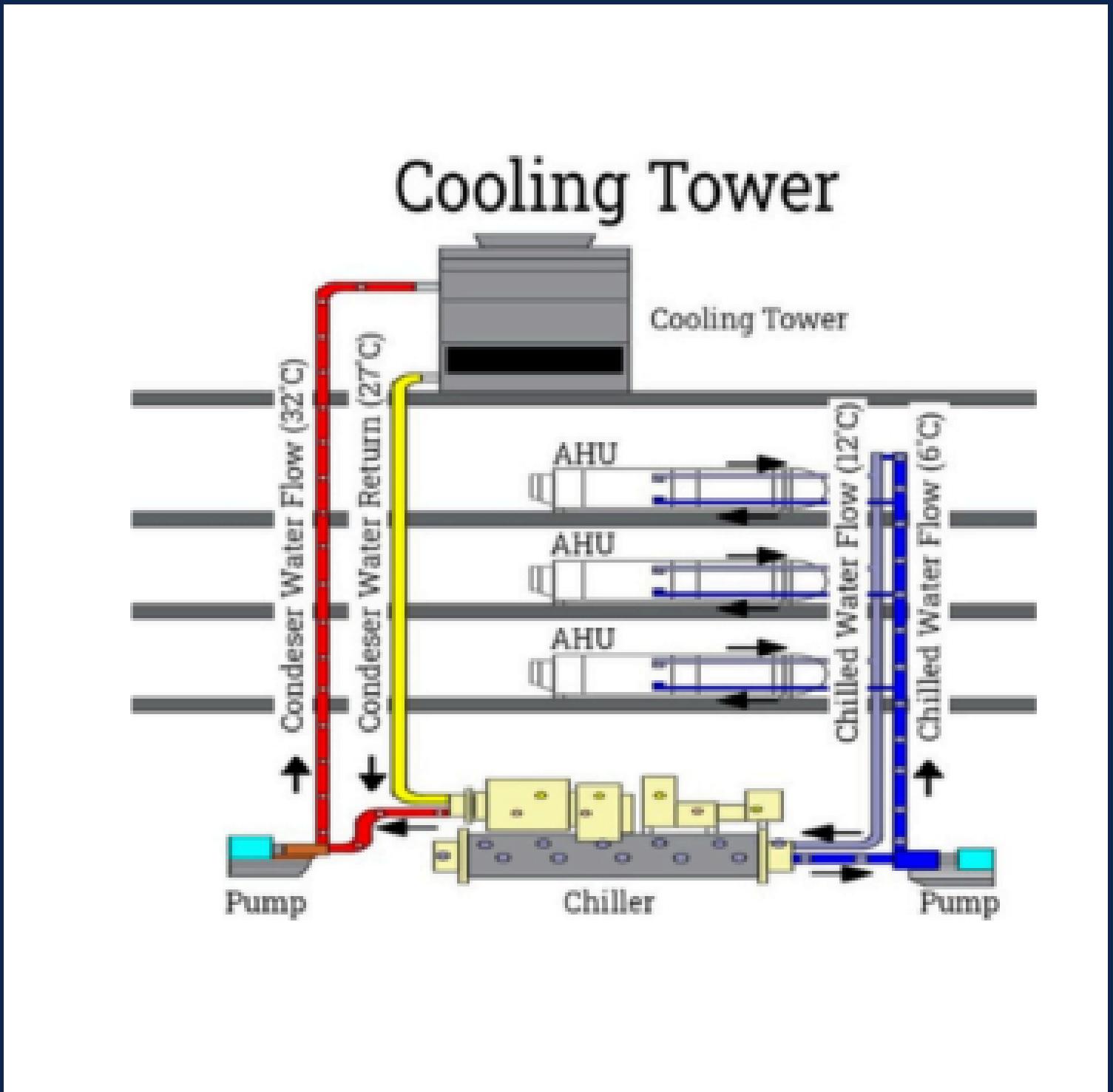
- Chiller: The central unit that cools the water (Air-cooled or Water-cooled).
- Cooling Tower: Rejects heat outdoors (only used with Water-cooled chillers).

2. Distribution (The Network)

- Chilled Water Pumps: Circulate the cold water throughout the building.
- Piping: Insulated pipes that transport supply and return water.

3. Air Side (The Delivery)

- AHU (Air Handling Unit): Large unit for cooling big, open spaces (connected to ducts).
- FCU (Fan Coil Unit): Small unit for cooling individual rooms or offices.



AIR CONDITIONING SYSTEMS

حساب عدد الأطنان في المبنى

اسم الفراغ	نوع النشاط	مساحة الفراغ متر مربع	سعة الطن متر مربع/طن	عدد الأطنان المطلوبة طن	ارتفاع الدور الصافي متر	معامل الارتفاع	حمل التبريد (طن)	حجم الهواء الداخل قدم	السعة قدم مكعب/الدقيقة	عدد المكائن	سعة وحدة مناولة الهواء قدم مكعب/متر مكعب	سرعة الهواء قدم/دقيقة	مساحة الدكت قدم مربع	مساحة الدكت متر مربع
منطقة اجتماعية	عالي	1900	16	119	8	1.2	143	350	50050	2*20000+ 1*12000	52000	1500	34.67	3.22
منطقة ادارية	متوسط	570	20	29	3.7	1	29	350	10150	1	12000	1500	8	0.74
منطقة اكاديمية	متوسط	800	20	40	3.7	1	40	350	14000	1	16000	1500	10.67	0.99
منطقة الهانقر	عالي	1080	16	68	8	1.2	82	350	28700	1	17000	1500	11.33	1.05
منطقة صيانة	عالي	560	16	35	8	1.2	42	350	14700	1	3000	1500	2	0.19

AIR CONDITIONING SYSTEMS

حساب عدد الأطنان في المبنى للمنطقة الاجتماعية

اسم الفراغ	نوع النشاط	مساحة الفراغ متر مربع	سعة الطن متراً مربع / طن	عدد الاطنان المطلوبة طن	ارتفاع الدور الصافي متراً	معامل الارتفاع	حمل التبريد (طن)	حجم الهواء الداخل قدم مكعب / متر مكعب	السعة قدم مكعب / دقيقة	عدد المكائن	سعة وحدة مناولة الهواء قدم مكعب / دقيقة	سرعة الهواء قدم / دقيقة	مساحة الدكت قدم مربع	مساحة الدكت متر مربع
البهو	عالي	1360	16	119	8	1.4	167	350	58450	1	58450	1500	38.97	3.62
المسرح	متوسطة	220	20	11	8	1.4	15	350	5250	1	16000	1500	10.67	0.99
قاعة متعددة الاستخدام	متوسطة	180	20	9	8	1.4	13	350	4550	1	16000	1500	10.67	0.99
مكتبة	متوسطة	140	20	7	8	1.4	10	350	3500	1	17000	1500	11.33	1.05

AIR CONDITIONING SYSTEMS

حساب عدد الأطنان في المبني للمنطقة الاداريه

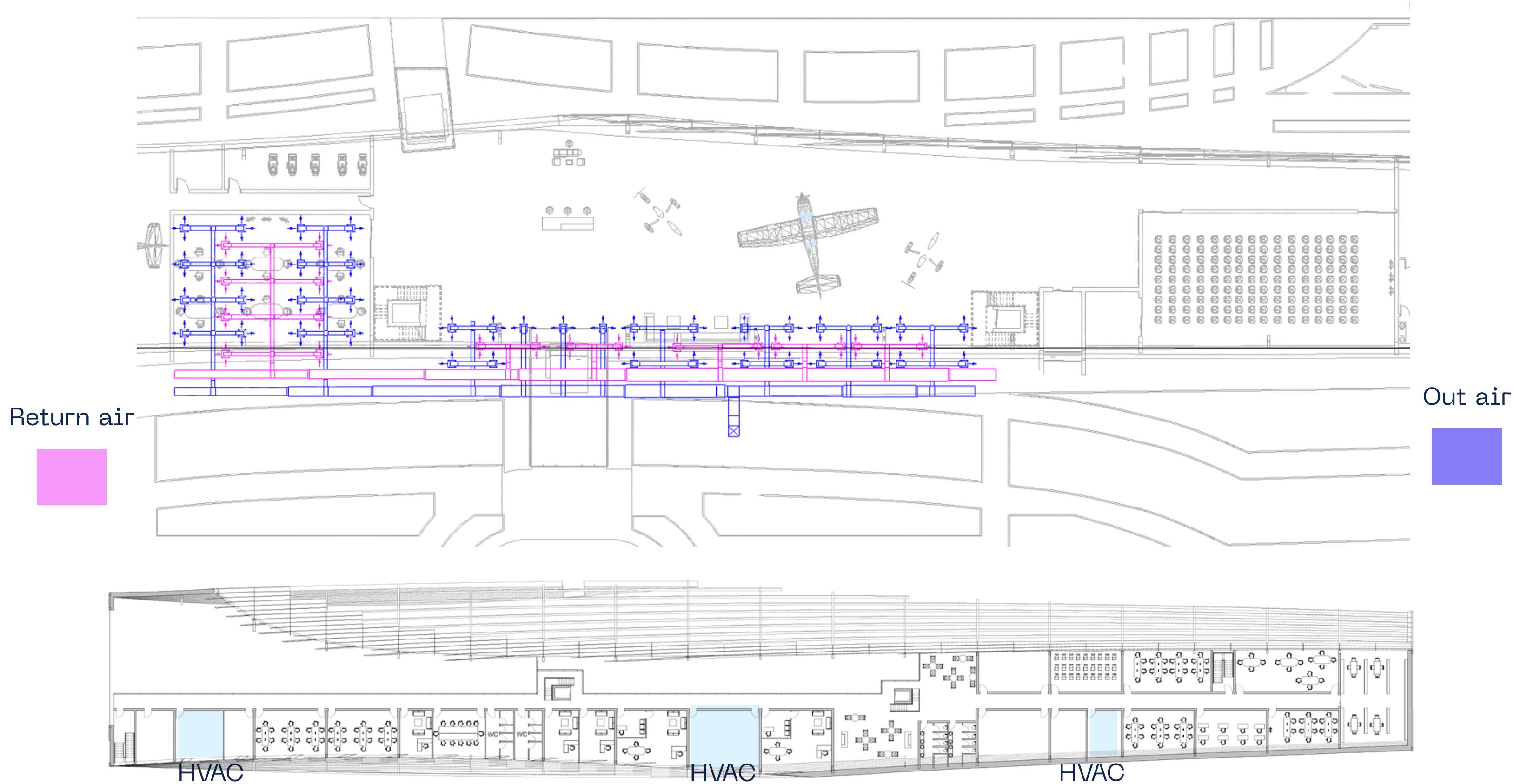
اسم الغراغ	نوع النشاط	مساحة الفراغ متر مربع	سعة الطن متر مربع/طن	عدد الاطنان المطلوبة طن	ارتفاع الدور الصافي متر	معامل الارتفاع	حمل التبريد (طن)	حجم الهواء الداخل قدم مكعب/دقيقة	السعة قدم مكعب/الدقيقة	عدد المكائن	سعة وحدة مناولة الهواء قدم مكعب/الدقيقة	سرعة الهواء قدم/دقيقة	مساحة الدكت قدم مربع	مساحة الدكت متر مربع
الإداريين	متوسطة	60	20	3	3.7	1	3	350	1050	2	17000	1500	11.33	1.05
مكتب فردي	متوسطة	30	20	2	3.7	1	2	350	700	3	16000	1500	10.67	0.99
اجتماعات	متوسطة	48	20	2	3.7	1	2	350	700	1	16000	1500	10.67	0.99
مكاتب مشتركة	متوسطة	60	20	3	3.7	1	3	350	1050	2	17000	1500	11.33	1.05

AIR CONDITIONING SYSTEMS

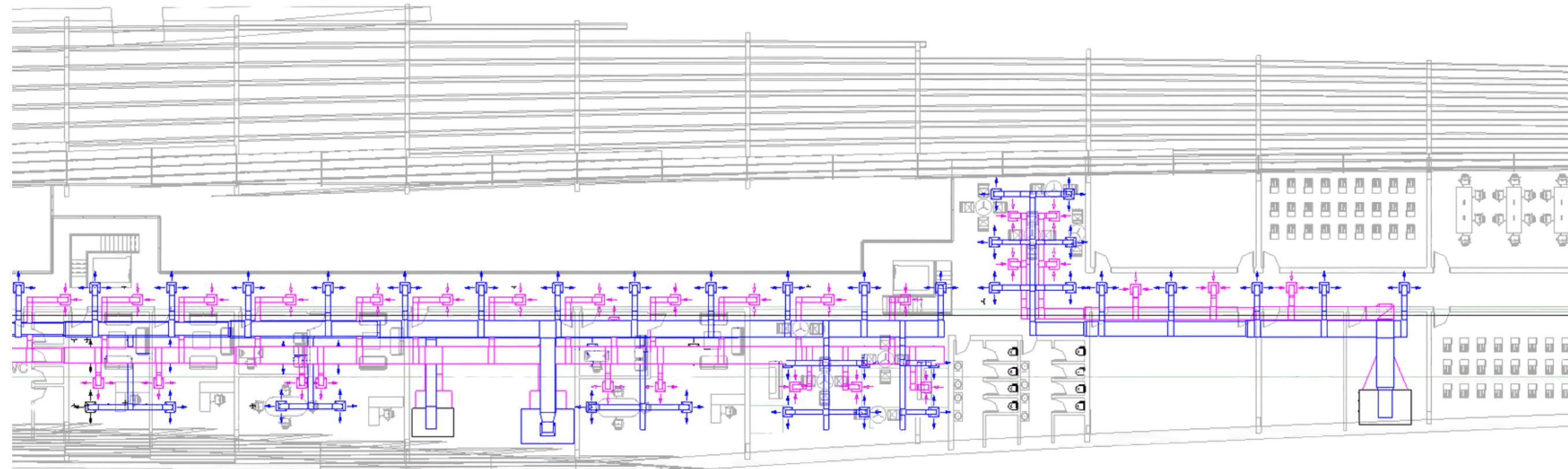
حساب عدد الأطنان في المبنى للمنطقة الأكاديمية

اسم الفراغ	نوع النشاط	مساحة الفراغ متر مربع	سعة الطن متر مربع/طن	عدد الأطنان المطلوبة طن	ارتفاع الدور الصافي متر	معامل الارتفاع	حمل التبريد (طن)	حجم الهواء الداخلي قدم مكعب/دقيقة	السعه قدم مكعب/الدقيقة	عدد المكائن	سعه وحدة مناولة الهواء قدم مكعب/الدقيقة	سرعة الهواء قدم/دقيقة	مساحة الدكت قدم مربع	مساحة الدكت متر مربع
كلاسات	متوسطة	60	20	3	3.7	1	3	350	1050	2	17000	1500	11.33	1.05
معامل حاسب	متوسطة	60	20	3	3.7	1	3	350	1050	2	16000	1500	10.67	0.99
نادي طلابي	متوسطة	60	20	3	3.7	1	3	350	1050	1	16000	1500	10.67	0.99
معامل شؤون الطلابيه	متوسطة	60	20	3	3.7	1	3	350	1050	1	17000	1500	11.33	1.05

AIR CONDITIONING SYSTEMS



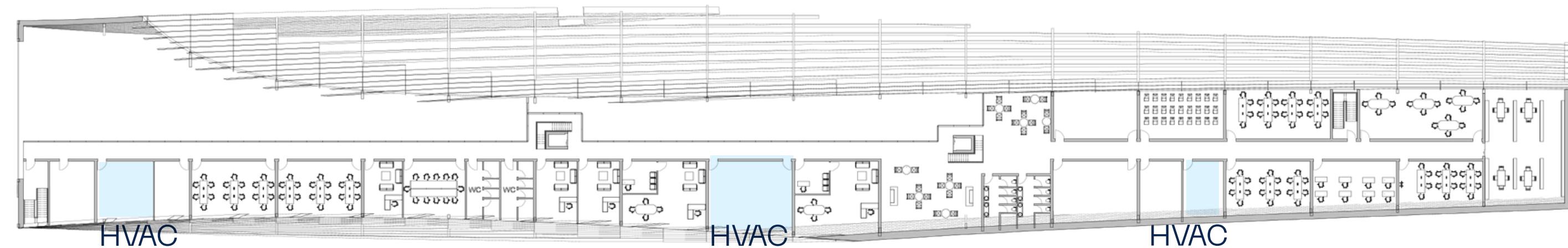
AIR CONDITIONING SYSTEMS



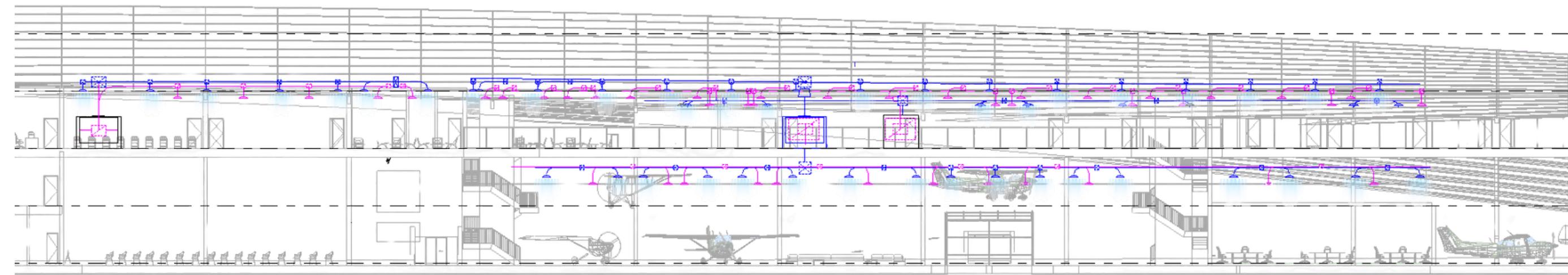
Return air



Out air



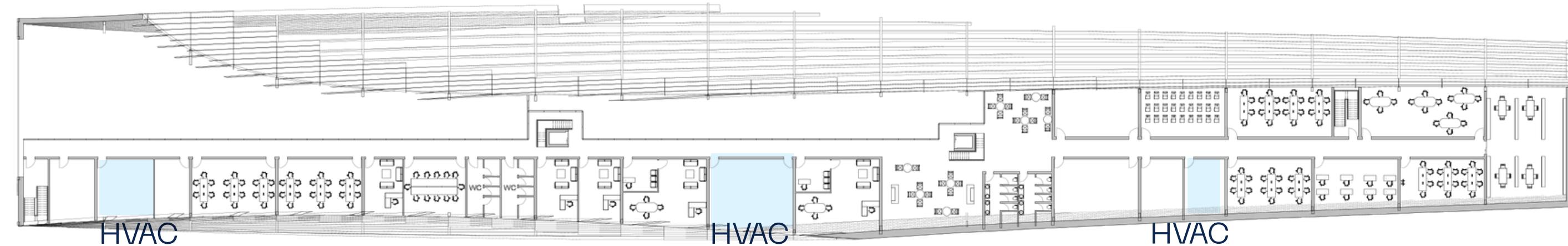
AIR CONDITIONING SYSTEMS



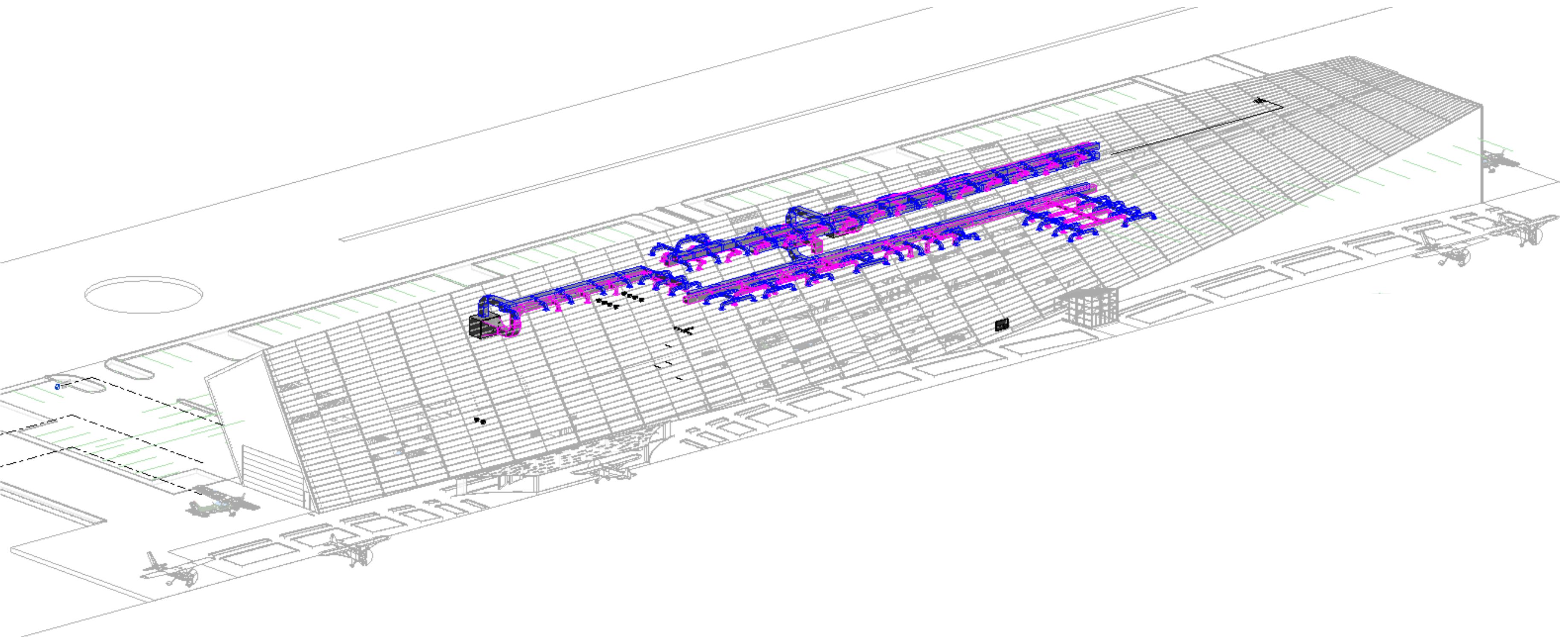
Return air



Out air



AIR CONDITIONING SYSTEMS





ARCHITECTURAL DRAWINGS:

SYSTEMS DRAWING

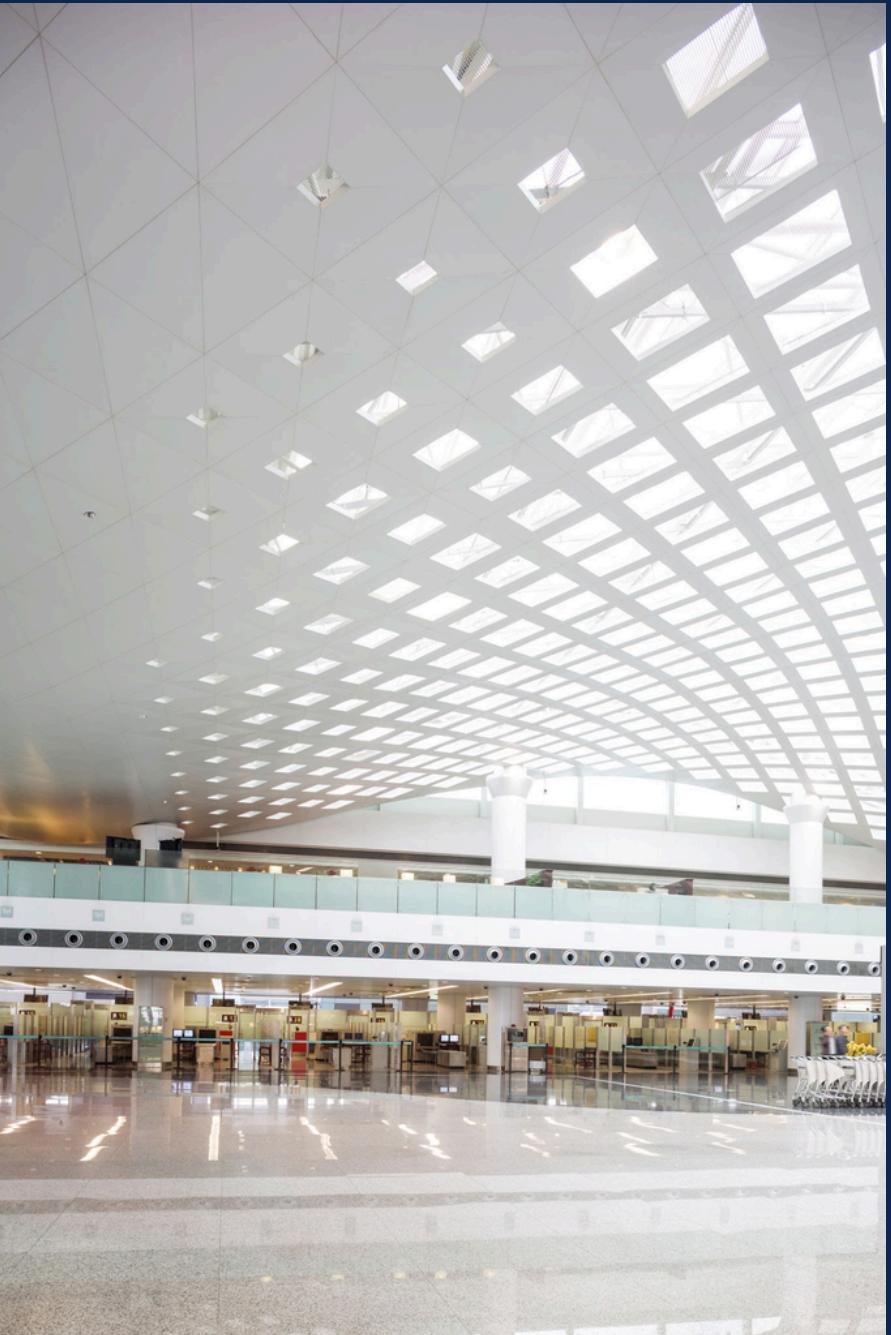


LIGHTING SYSTEMS

Lighting Layers Overview

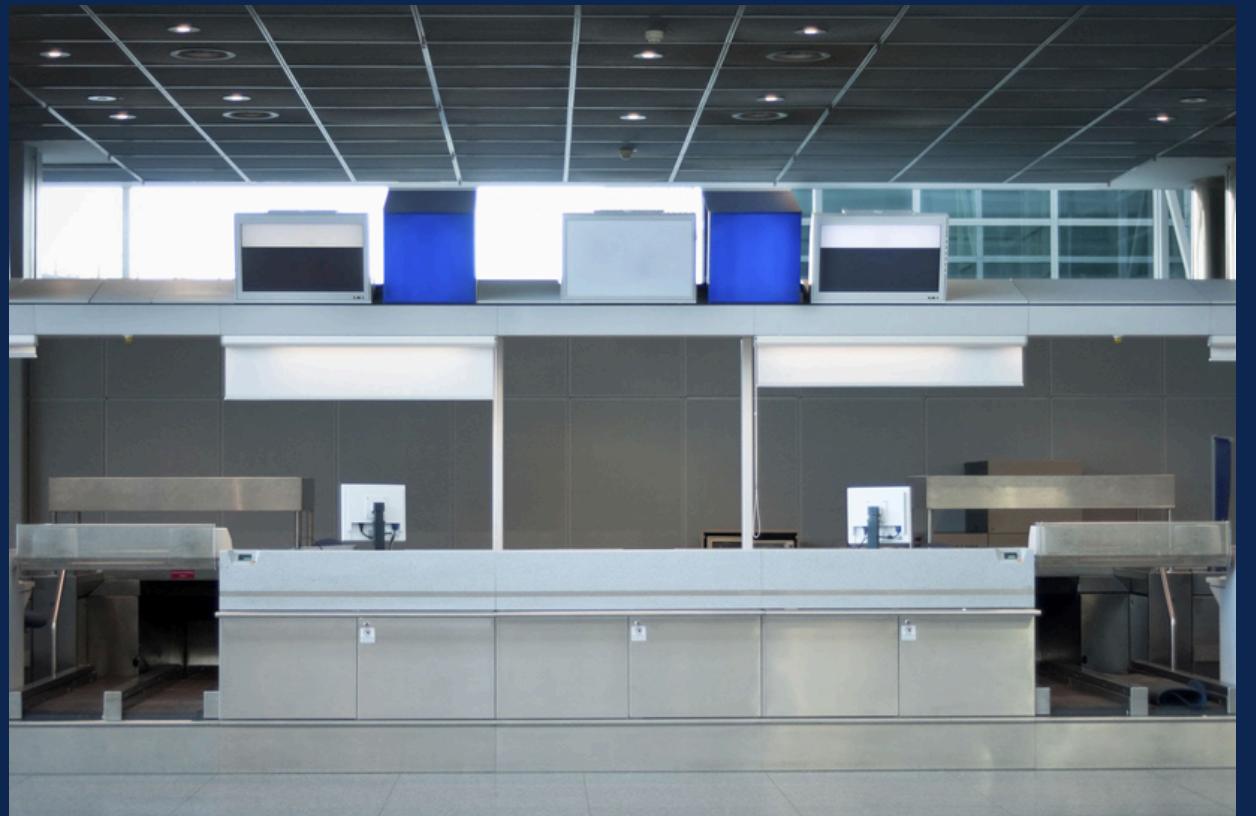
1. Ambient Lighting

- Role: General illumination.
- Function: Provides uniform light for safe navigation in the terminal.



2. Task Lighting

- Role: Focused light.
- Function: Illuminates specific work areas like check-in counters and reading zones.



3. Accent Lighting

- Role: Directional light.
- Function: Highlights architectural features, signage, and artwork.

4. Decorative Lighting

- Role: Aesthetic light.
- Function: Enhances the visual style and atmosphere (e.g., chandeliers).

5. Daylight (Natural Light)

- Role: Sunlight integration.
- Function: Reduces energy consumption and improves passenger well-being.

6. Emergency Lighting

- Role: Safety backup.
- Function: Battery-operated lights that guide exits during power failures.

LIGHTING SYSTEMS

Zone / المنطقة	Space Name / اسم الفراغ	Area (m ²) / مساحة الفراغ (م ²)	Illuminance / (lx) / مستوى الإضاءة (lx)	(W/m ²) / القدرة الكهربائية لكل م ²	(lm/unit) / لومن لكل وحدة (lm/unit)
A	البهو (معرض + استقبال)	1600	300	5	10000
B	القاعة متعددة الاستخدام	225	300	5	6000
C	غرفة قيادة الطائرة	50	500	5	4000
D	المسرح	286	100	5	6000
E	هنقر الطائرات	1125	500	8	15000
F	منطقة الصيانة للطائرات	800	1000	10	18000
G	المكتبة	165	500	5	6000
H	المنطقة التعليمية	600	300	5	6000
I	المنطقة الإدارية	480	300	5	6000
J	منطقة VR + غرفة تجهيز	75	200	5	4000
K	إضاءة الطوارئ	300	50	2	2000
L	إضاءة النهار	500	150	2	0

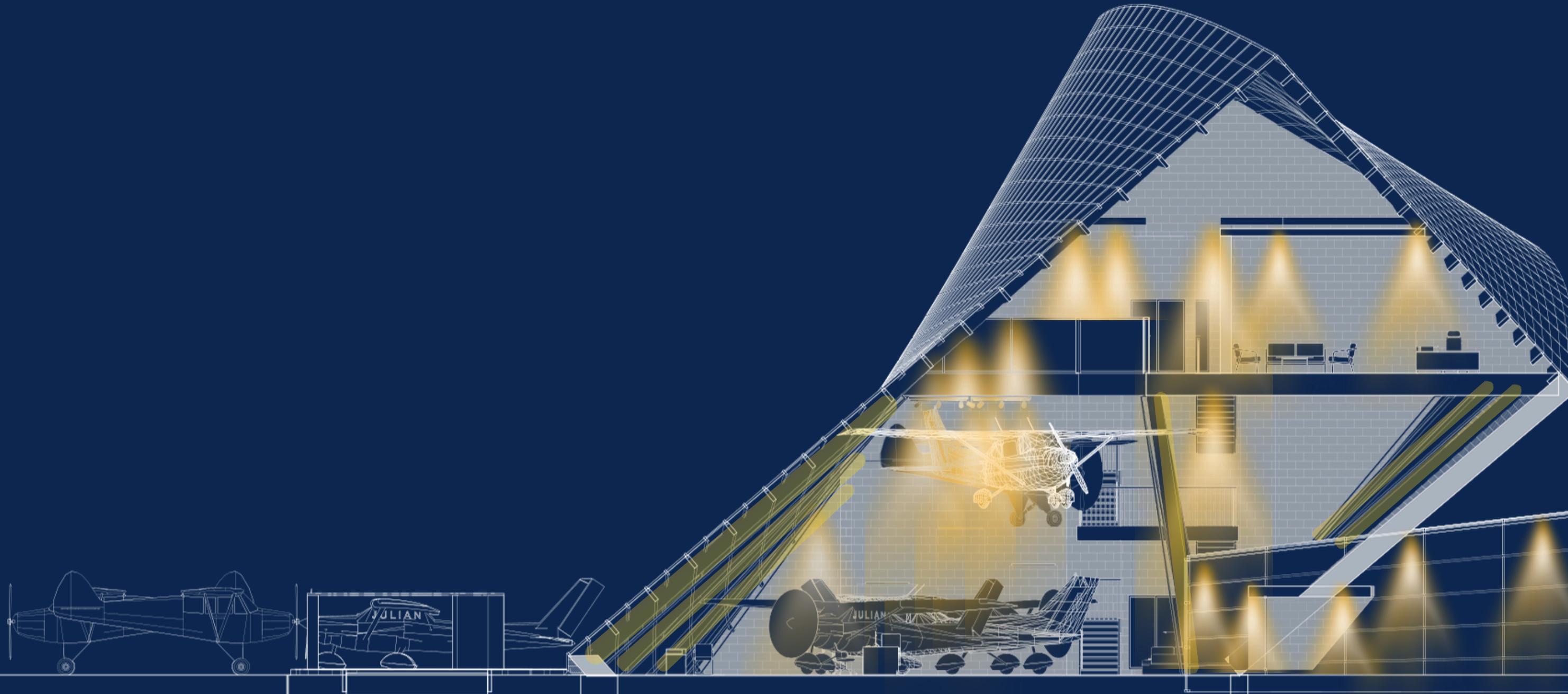
LIGHTING SYSTEMS

معامل فقد الضوء / LLF	القوة الكهربائية (W) (W)	إجمالي الفيض الضوئي (Φ lm) / Total Lumens	عدد أجهزة الإضاءة / Fixtures	نوع التركيب / Mounting Type	المصنع / Manufacturer	درجة حرارة اللون (K) / CCT	طبقة الإضاءة / Lighting Layer
0.6	8000	800000	80	Downlight	EAE	4000	Ambient + Accent + Decorative
0.6	1125	112500	18.75	Recessed	EAE	4000	Ambient + Task
0.7	250	35714.28571	8.928571429	Recessed	EAE	4000	Task + Accent
0.6	1430	47666.66667	7.944444444	Ceiling	EAE	3500	Ambient + Accent
0.5	9000	1125000	75	Industrial Suspended	EAE	4000	Task
0.5	8000	1600000	88.88888889	Ceiling Suspended	EAE	4000	Task
0.7	825	117857.1429	19.64285714	Recessed	EAE	4000	Ambient + Task
0.7	3000	257142.8571	42.85714286	Recessed	EAE	4000	Ambient + Task
0.7	2400	205714.2857	34.28571429	Pendant	EAE	4000	Ambient + Task
0.6	375	25000	6.25	Recessed	EAE	3000	Ambient + Decorative
0.8	600	18750	9.375	Wall Mounted	EAE	5000	Emergency
1	1000	75000	-	Skylight	Natural	6500	Daylight

LIGHTING SYSTEMS



LIGHTING SYSTEMS





ARCHITECTURAL DRAWINGS:

SYSTEMS DRAWING

SECURITY AND SAFETY SYSTEMS

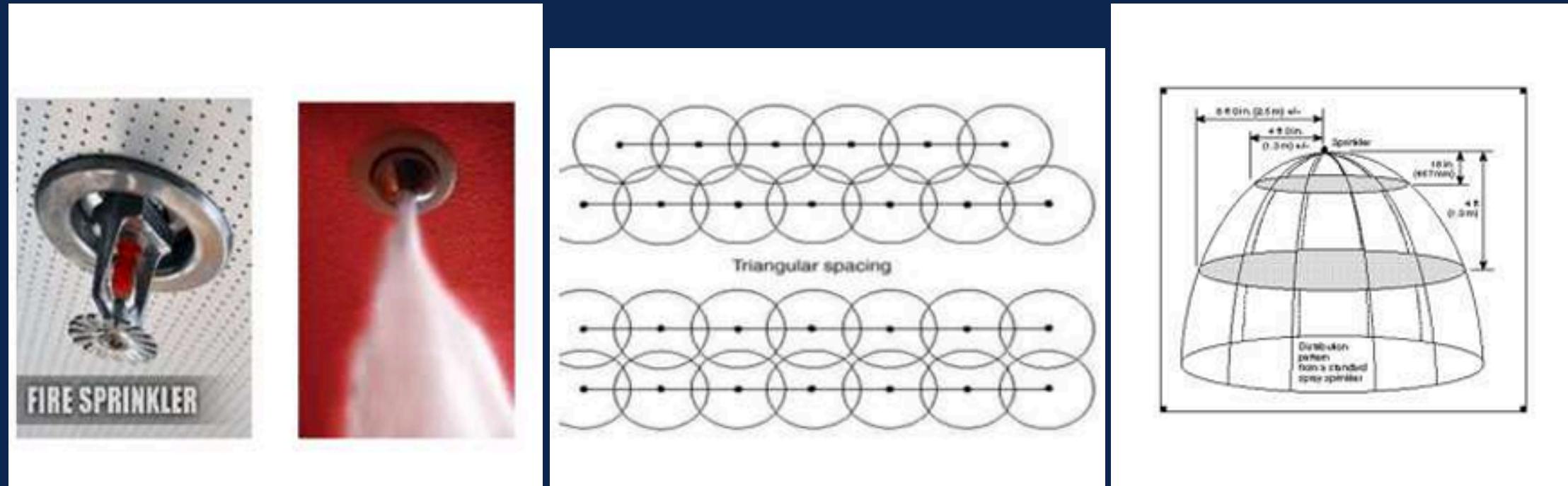
Life Safety Systems

Overview Ensuring occupant safety is the top priority.

The design integrates advanced systems for fire protection and efficient evacuation.

1. Water Sprinkler Systems (Fire Suppression)

- Function: Automatically protects the building by distributing water through fine nozzles.
- Benefit: Provides rapid spray to extinguish fires effectively while minimizing structural damage.



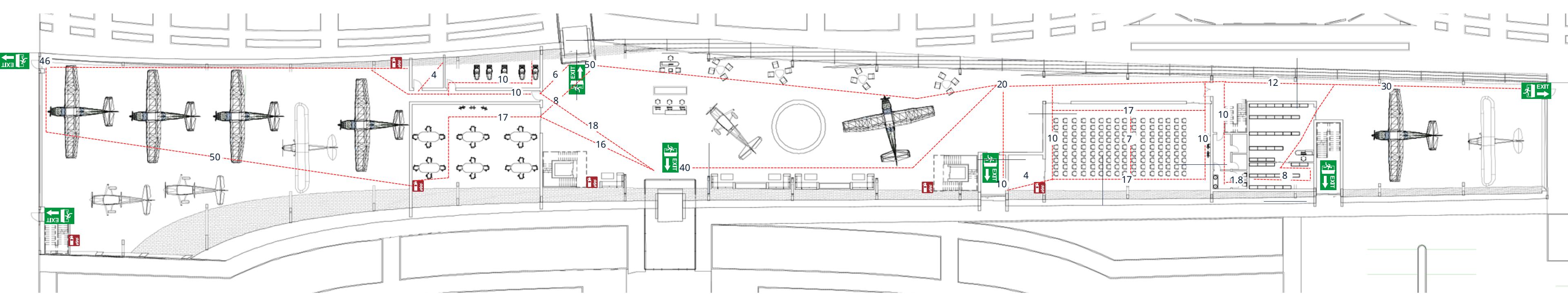
2. Fire Alarm Systems (Detection & Alert)

- Core Components: Smoke and heat detectors linked to a main control panel.
- Action: Triggers immediate alerts (bells/strobes) to facilitate prompt evacuation and manage critical situations.
- Key Devices: Manual call points, fire bells, and illuminated exit signs.

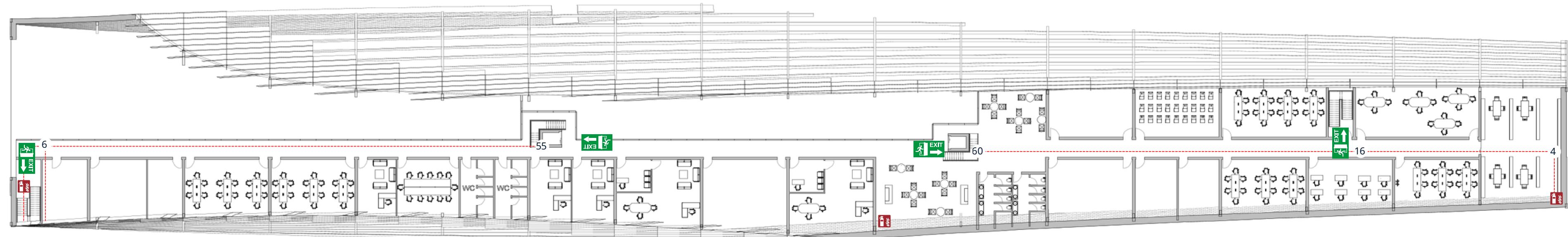


SECURITY AND SAFETY SYSTEMS

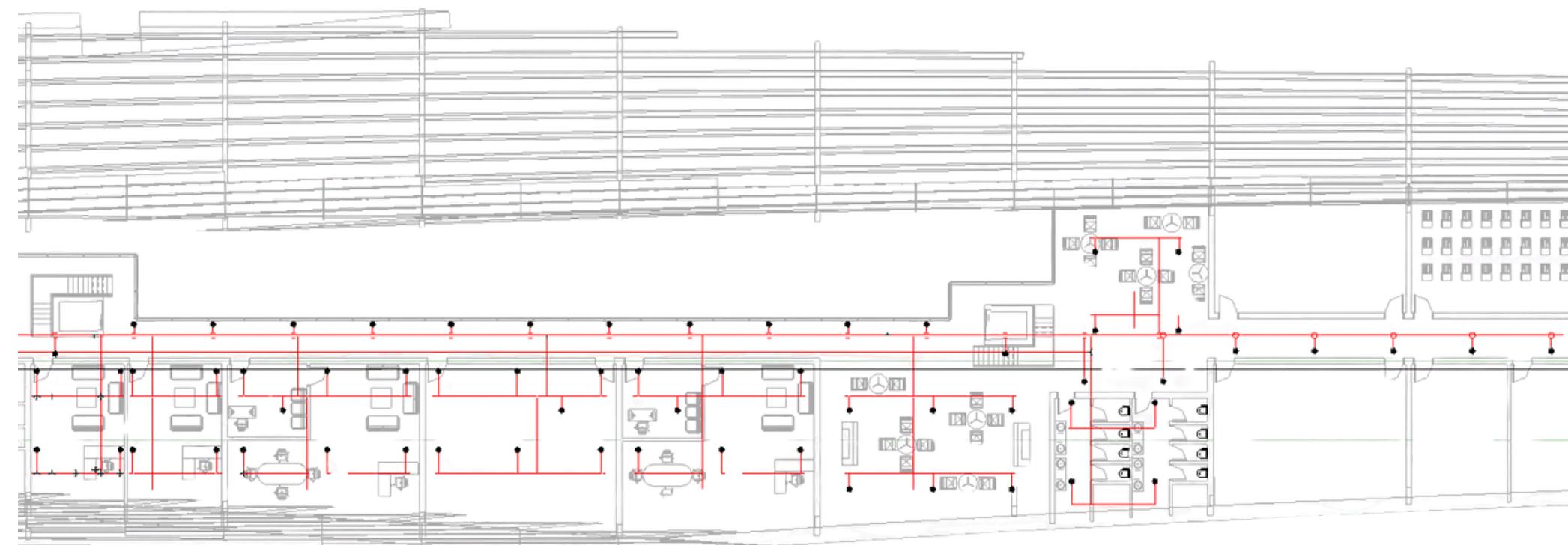
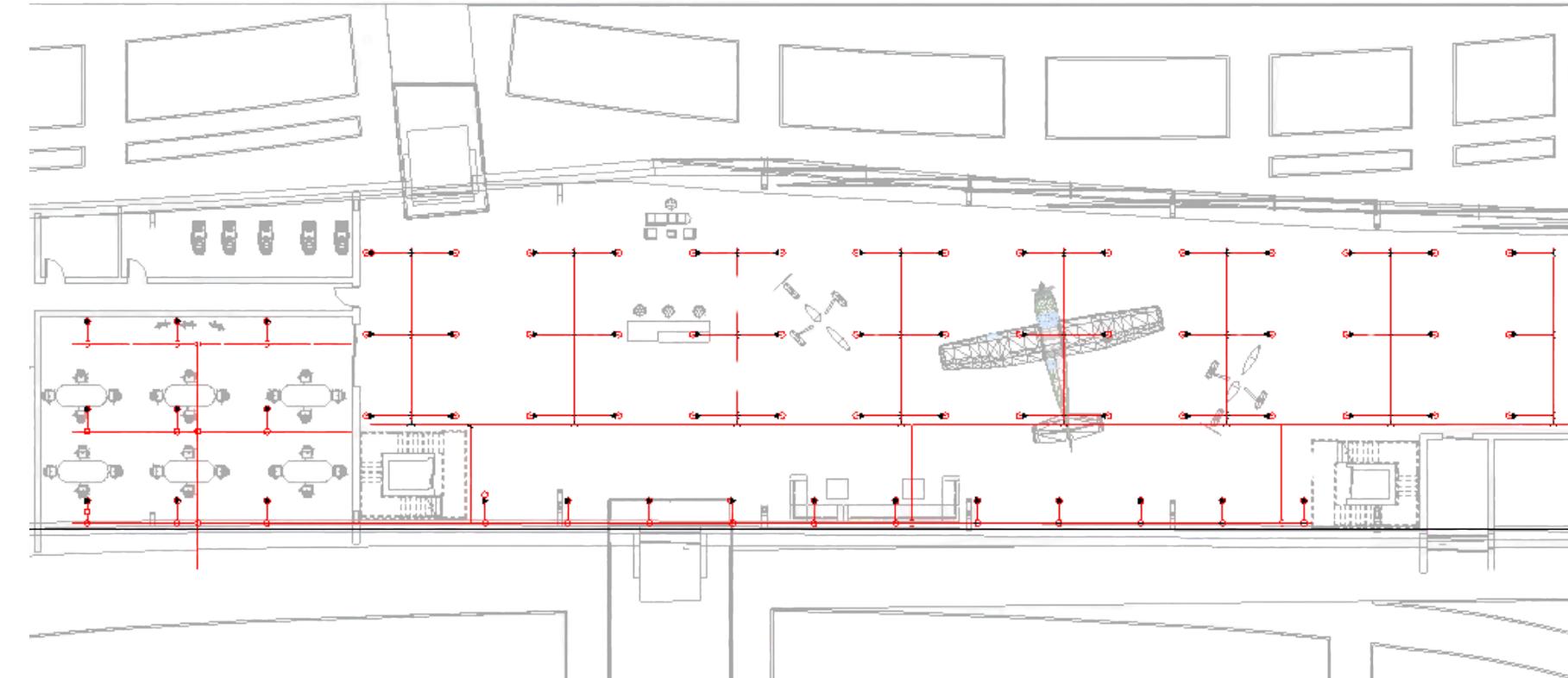
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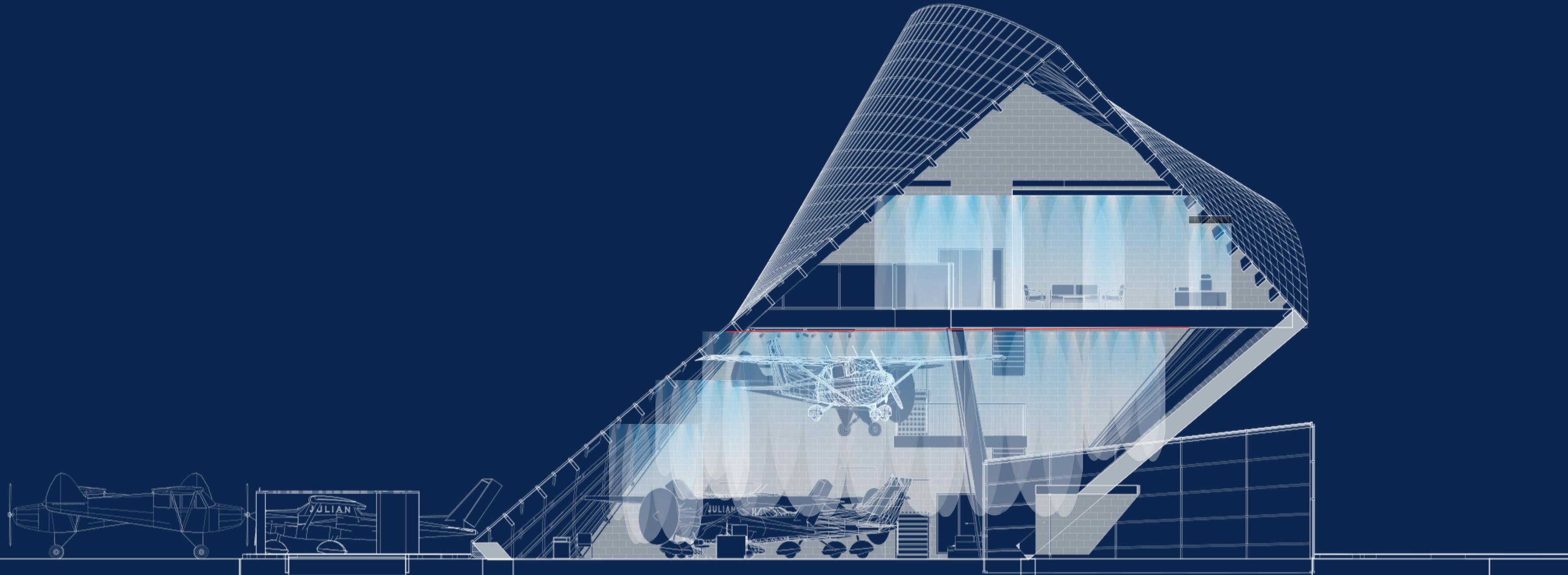
SECURITY AND SAFETY SYSTEMS



SECURITY AND SAFETY SYSTEMS



SECURITY AND SAFETY SYSTEMS





ARCHITECTURAL DRAWINGS:

SYSTEMS DRAWING



SYSTEMS INTEGRATION





THANKS