OPERATION & MAINTENANCE OF THE LEBANESE UNIVERSITY CAMPUS - HADATH



VOLUME 2: TECHNICAL DOCUMENTS
SECTION 2.1 – GENERAL TECHNICAL VOLUME

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1. INTRODUCTION

The present agreement refers to the Operation and Maintenance of the Lebanese University Campus in accordance with the Terms and Conditions of the Contract Documents.

The following chapter of this document provides a general introduction to the components of the Campus and to the sub-division of the Works into Work Packages, a sub-division that is incorporated into the various contract documents.

An overall summary of the scope of works required from the Contractor is presented in chapter 3 of this document. The detailed description of the scope can be found in the remaining contract documents

2. COMPOSITION OF THE CAMPUS

2.1 General Presentation of the Campus

The Lebanese University Campus is a multi-building university campus with a large area of grounds. It is located in Hadath, Southern suburbs of Beirut. The campus covers a total land surface area of 705,000 m², and is expected to host up to 21,000 students. Attachment A4 overleaf provides a general data sheet of the Campus, its location on Beirut's aerial view and a plan of the Campus.

A4 – Data sheet

Project In Numbers:

- Land Area : 705,000 m²

Built Up Area : 300,000 m²

- No. Of Students : 25,000 Students

- Underground Parking : 1,551
- Self Service Restaurant : 3,000 Seats
- Cafeterla : 1,000 Seats
- Dormitories : 1,030 Rooms
- Main Conference Center : 900 Seats

- Central Catering : 8,000 Meals/Day

- Utility Tunnel Length : 1,800 m

-Sports Complex : 7,000 Seats, Total Area : 60,000 m2
1- Football Field : 1 (Natural Grass, Official Size,
Synthetic Track & Field)

2- Multipurpose Courts
3- Basket Ball Courts
4- Tennis Courts
5- Swimming Pool
6- Diving Pool
2 (Synthetic Floor)
11 (Official Size)
1 (Olympic Size)
1 (Olympic Size)

Project In Numbers:

EXTERNAL WORKS:

 - External Parking
 : 2,100

 - Road
 : 7 Km

 - Bicycle Line
 : 3 Km

 - Paved Walkways
 : 65,000 m²

 - Green and Landscaped Area
 : 320,000 m²

 - Trees
 : 7,000 Trees

 - Shrubs
 : 60,000 Shrubs

Ground Covers
 Irrigation Network
 225,000 Ground Covers
 115 km of Irrigation Lines
 2,500 Pop Ups & Sprinklers

117 Valves

9 Automatic Control Panels

WATER NETWORK:

- Underground Water Reservoir : 5,000 m³
- Pumping Station Production : 3 x 90 l/s
- Sewage Network : 15 l/s
- Storm Water Network : 27,000 ml
- Irrigation Water Consumption : 700 m³/day

Domestic & Fire water Consumption. : Max: 2,400 m³/day, Average: 1,000 m³/day

Drinking Water Consumption : Max :80 m³/day , Average 15 m³/day

Project In Numbers:

COOLING/ HEATING:

- Cooling Capacity : 8,000 T.R Total building

2,000 T.R Stand-by

- Heating Capacity 4,000 Boiler Horse power

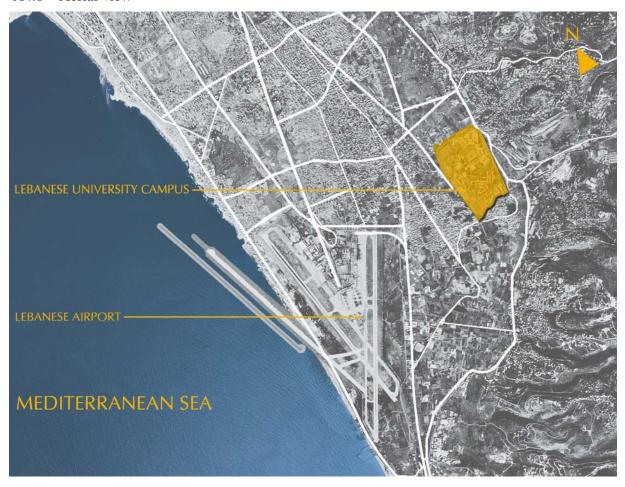
ELECTRICAL NETWORK:

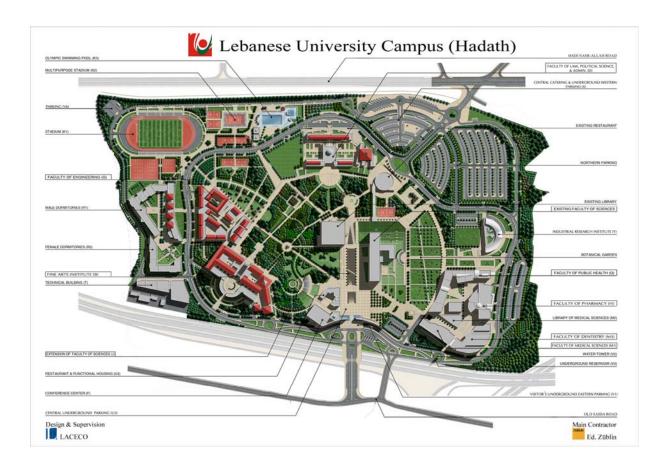
- Emergency Power 6 Mega Watts 20 Mega Watts 15,000 - Electrical Load

- B.M.S Points - Access Points 4,000

- Telephone Lines 600 External / 3,000 Internal

A4.1 – Aerial view





2.2 Components of the Campus

The project covers various facilities; namely:

- Faculties

National School of Fine Arts (Building B)

Faculty of Law and Political Sciences &

Faculty of business and Administration (Building D)
Faculty of Engineering (Building G)
School of Pharmacy (Building H)

Extension of the Faculty of Sciences

& Doctorial School (Building J)

Faculty of Medicine (Building M11 M12)
Faculty of Dentistry (Building M13 M14)

Faculty of Public Health (Building Q)
Faculty of Sciences (Building FOS)

- Supporting Facilities:

Functional Buildings

Conference Center (900 seats) (Building F) Open-air Football-Athletics Stadium (Building K1) Olympic Multi-Purpose Stadium (Building K2) Olympic Swimming Pool (Building K3) Library of Medical Sciences (Building M2) Male Dormitories (Building R1) Female Dormitories (Building R2) Restaurant and Functional Housing (Building U2) Central Parking (Building U3) **Eastern Parking** (Building V1)

Underground Western Parking and Central Catering

FOS Library

FOS Cafeteria

Steel Hangar

Steel Portable Cabinets

(Building X)

Technical Buildings -

Water Tower (Building V2)
Underground Reservoir (Building V3)
Utility Tunnel (Building V4)
Underground Storm water Reservoir (Building V6)

Central Thermal and Power Plant - Laundry – Technical zone (Building T1, T2, T3),

External Works

Landscaping, Planting, Urban Furniture, External Lighting, Roads and Walkways, Signage, Fencing, Utilities networks (gas, irrigation, sewage and storm water).

Existing operational building

Industrial Research Institute (outside the scope of this Agreement)

The various above components (except the existing operational buildings) are described in greater detail in the following pages (attachments A5 and A6), which include, for each building, a data sheet, a location plan within the Masterplan and a set of plans of the building.

3. COMPOSITION OF THE TECHNICAL VOLUME OF THE CONTRACT DOCUMENTS

The Contract Documents are composed of three volumes, as identified in the Contract Agreement. The Technical volume is composed of the following documents:

- The present General Technical Volume (Section 3.1)
- Work Packages WP1 to WP7 (Sections 3.2 to 3.8)
- The set of Operation and Maintenance Manuals (Section 3.9)
- The set of As-Built Drawings Section 3.10

The present General Technical Volume introduces these various components.

3.1 Summary of the Sub-Division of the Works into Work Packages

The scope of services making up the Operation and Maintenance of the Lebanese University Campus is broken down into 7 Work Packages in order to efficiently manage the operation and maintenance cycles. The Work Packages are generally defined in relation to a trades sub-division, except work package 7 which reflects a functional identification.

The following sections identify this subdivision and provide a summary of the main components of each work package.

3.2 Work Package 1 – Mechanical Works

3.2.1 LEBANESE UNIVERSITY CAMPUS

3.2.1.1 HVAC

- Central air conditioning is achieved by chilled/hot water pipes received from thermal plant through utility tunnel, then connected to secondary pumps (located at the basement mechanical rooms inside the building) where air handling units are fed by chilled/hot water.
- Cold/hot air will distributed inside spaces from air handling units through ducts and variable air volume terminals (some spaces as amphitheaters are constant volume).
- Some small spaces as security rooms, garbage rooms, etc. are air-conditioned by mean of mini splits or fan coil units.
- Mechanical ventilation is used for toilets, stores, archives and parking by mean of fans (roof, or centrifugal).
- Mechanical smoke exhaust is used to extract fumes in case of fire for some critical spaces such as amphitheaters and parking.

3.2.1.2 PLUMBING

- Domestic/potable cold water is achieved by water pipes received from the water tower by gravity or by direct boosting from the main pumping station through utility tunnel, then distributed inside the building to plumbing fixtures / drinking fountain.
- Domestic hot water, distributed inside the building to plumbing fixtures, is generated by the hot water storage tanks located inside.
- Liquefied petroleum gas is distributed inside the building (to laboratories benches), coming from the six external gas tanks.
- Compressed air / vacuum is generated by pumps located in the basement mechanical rooms, then distributed inside the building.
- Wastewater is discharged to the external network by gravity or sump pumps located in pits.
- Fire fighting ability is provided through fire hose cabinets, and fire extinguishers.

3.2.2 FACULTY OF SCIENCES

3.2.2.1 HVAC

- Cold/hot air will distributed inside spaces through split and DX units.
- Mechanical ventilation is used for toilets, stores, and archives by mean of fans (roof, or centrifugal).

3.2.2.2 PLUMBING

- Domestic water is achieved by water pipes received from the water tower by gravity or by direct boosting from the main pumping station through utility tunnel, then distributed inside the building to plumbing fixtures.
- Wastewater is discharged to the external network by gravity or sump pumps located in pits.
- Fire fighting ability is provided through fire hose cabinets, and fire extinguishers.

3.3 Work Package 2 – Electrical Works

- Uninterruptible Power Supply (UPS) is interposed within each building between normal AC power supply and critical load to secure a minimum period of continuity of non-break battery backup for 15 minutes in case of failure of normal AC supply
- MCC's and EMCC's are feeding the mechanical equipments (pump's, fan's, AHU's,..) and are protected by a transformer call linked to building T outgoing.
- Step Down transformers are located within most building, fed in medium voltage power from building T. The transformers are feeding the MDB's and EMDB's in the main electrical room inside the building.

- Lighting fixtures and sockets outlets are fed from SLP's or ESLP (according to priorities)
- SLP's and ESLP are fed from DB's or EPP's.
- DB's and EPP's are fed from EMDB's.
- Ring main unit is fed from MV loop linked to building T and feeding the MV transformer located in the transformer room.
- MCC's and EMCC's feed all mechanical equipment within a given building.
- The fire alarm detectors/manual stations are connected to the Fire Alarm Control Panel (FACP) in multi-loops like configuration.
- The Control Modules are Connected to FACP
- o Bells and door holders are linked to the Control Modules
- O Cameras are installed in most of the buildings and they are connected to the faculty matrix switchers

3.4 Work Package 3 - Plants and networks –

3.4.1 Chilled and Heating Water Supply

- Five centrifugal chillers, with all related accessories and pumps, of 10,000 T.R capacity water cooled by cooling towers, are located in thermal plant area (building T), and produce chilled water at 5.5°C. The chilled water is distributed to buildings via pre-insulated pipes running inside the utility tunnel (V4) and connected at each building to secondary pumps inside buildings mechanical rooms.
- Four hot water boilers, with all related accessories and pumps, of 4,000 BHP capacity are located in thermal plant area, and which produce hot water at 90°C distributed to buildings via pre-insulated pipes inside utility tunnel then connected to secondary pumps/heat exchangers inside buildings mechanical rooms.
- One steam boiler, located in the technical building (building T), is used to produce steam for laundry.

3.4.2 Water Supply System

- Domestic water received from water wells located on site is stored inside underground water reservoirs, located in the main pumping station, after being treated and disinfected, then it will be pumped to elevated tank in order to be discharged by gravity through pipes inside utility tunnel to serve buildings.
- Potable water process will be same as above for domestic water but water will be desalinated through reverse osmosis.
- Fire fighting water will be received from domestic water but stocked inside an independent elevated tank.
- Irrigation water will be received from the same elevated domestic water tank

3.4.3 Emergency Power Pant

- Main Fuel Tanks delivers fuel to the Daytanks whose in its turn are connected to the Gensets
- Genset are diesel type with a rated output power of 1500, 1000, & 250 KVA.

3.4.4 Telephone Distribution Network

- The Main PABX installed in Building T is linked to Ogero by 450 Trunks
- The Main PABX installed in the Faculty of Sciences is linked to Ogero by 100 Trunks
- The Star Configured Network that links the Main PABX installed in building T and the Individual building PABX's ensure the vehiculation of communication between the Campus and the outside world and between the buildings themselves.

3.4.5 Data Distribution Network

- The redundant core switches aer linked to the individual faculties switches in star configuration
- Faculty switches are connected to the floor switch(es)
- Floor switches are connected to the individual end user outlets

3.4.6 Building Management System (BMS)

 The standalone building BMS controllers are cascaded to router(s) and fiber optic interface and then the local system is linked in a loop configuration of fiber optic cables to the central security and surveillance center

3.5 Work Package 4 – Finishing and civil works

- The structure consists of vertical elements (concrete walls), and solid slabs or PRS (pre stressed reinforced rib slabs).
- Some steel structural elements consists of canopies, bridges, stairs etc.
- Internal finishing is composed of:
 - o Floor: Agglomerated tiles, ceramic tiles, vinyl and/ or rubber tiles, antidust paint
 - o Walls: Masonry, Aluminum panels and/or painting walls...
 - o Ceiling: Suspended ceiling (mineral fiber, aluminum, steel, gypsum boards),
- External finishing is composed of:

- o Natural stone, marble and Stucco finish. Aluminum windows doors and curtain walls. Aluminum skylight and grating
- **3.6** Work Package 5 Special technical equipments and furniture
 - Kitchen equipments, cafeteria, swimming pool treatment equipment, water fountains treatment equipments, laboratories benches, laundry, lifts, crane, flow meters, fire fighting, amphitheater seats, sliding boards, fixed board, movable partitions, fixed partitions, external internal signs, video projector, and sound systems.

3.7 Work Package 6 – External Works

• Infrastructure including all the services networks (water supply, gas, irrigation, medium and low voltage, sewage and storm water), landscaping including (structural works, roads and parkings, pavements and walkways, plantation, urban furniture and external lighting).

3.8 Work Package 7 – Services

• Services includes all facilities that are used by the students, faculty and staff members, such as cleaning, security, and waste collection

3.9	List of Guarantees / Warrantees

	Item	Duration	1 ^(*)	2 (**)	3 (***)	Special Requirements
			Start from	Start from	Start from	
Concrete Works	Jacks	2 Year				
	Structural Bearing	20Years	Jan. 2004	Jun. 2004	Oct. 2004	
Frame works &	Protective Coating	10Years	Jan. 2004	Jun. 2004	Oct. 2004	
Canopies	Materials & Product					
	Steel Work	10Years	Jan. 2004	Jun. 2004	Oct. 2004	Covered By Insurance Company
Water proofing &	Materials	10Years	Jan. 2004	Jun. 2004	Oct. 2004	Covered By Insurance Company
joints	Workmanship	10Years	Jan. 2004	Jun. 2004	Oct. 2004	Covered By Insurance Company
xternal aluminum	Materials	5 Years	Jan. 2004	Jun. 2004	Oct. 2004	
& glazing	Workmanship	5 Years	Jan. 2004	Jun. 2004	Oct. 2004	
	Full System	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	National Certification from AABC
HVAC	Equipments	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
	Extended Warranty	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
	Full System	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
Plumbing	Equipments	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
=	Water pressure booster	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
	MV Switchgear	1 Year			Oct. 2004	
	Ring Man Unit	1 Year			Oct. 2004	
	Tools And Instruments	1 Year			Oct. 2004	
	Transformers	1 Year			Oct. 2004	
	Tools And Instruments	1 Year			Oct. 2004	
						Spare Ports for 2000 h operation
	Generators	1 Year			Oct. 2004	Spare Parts for 2000 h operation
	Overhead crane	1 Year			Oct. 2004	
High voltage &	Earthing System	N/A				
lectrical systems	Lighting : Indoor	N/A				
	Lighting : Outdoor	N/A				
	Lightning System	N/A				
	Wires And Cable feeders	N/A				
	MDBs	N/A				And/ Or a maintenance Contract w/ listed spare part
	DBs, SDBs, Final Branch	N/A				
	UPS	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
	Batteries (UPS)	10 Year	Jan. 2004	Jun. 2004	Oct. 2004	
	Spare Parts for UPS are provided	2000 H	Jan. 2004	Jun. 2004	Oct. 2004	Tools and Instrument
Low current	Telephone System: Equipments and Material	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	Must certify in writing the availability of Spare Parts
systems	Computer Network : Equipments & Material	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	Must certify in writing the availability of Spare Parts
	Full System	2 Year	Jan. 2004	Jun. 2004	Oct. 2004	
BMS	Equipments	2 Year	Jan. 2004	Jun. 2004	Oct. 2004	
	Software Modification (BMS)	5 Years	Jan. 2004	Jun. 2004	Oct. 2004	
	Materials	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	Specifically for this project
Elevators	Workmanship	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
	Materials	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
itchens & laundry equipment					Oct. 2004	
	Workmanship	1 Year	Jan. 2004	Jun. 2004		
	Materials	1 Year			Oct. 2004	
Swimming pools		1 Year			Oct. 2004	
Decorative	Status of Water				-	
fountains	Equipment	1 Year			Oct. 2004	
Restaurant & amphitheaters	Materials	3 Year	Jan. 2004	Jun. 2004	Oct. 2004	
furniture's	Workmanship	3 Year	Jan. 2004	Jun. 2004	Oct. 2004	
Library furniture's	Materials	3 Year	Jan. 2004	Jun. 2004	Oct. 2004	
	Workmanship	3 Year	Jan. 2004	Jun. 2004	Oct. 2004	
Scientific	Materials	3 Year	Jan. 2004	Jun. 2004	Oct. 2004	
laboratories	Workmanship	3 Year	Jan. 2004	Jun. 2004	Oct. 2004	
Carpentry &	Materials and Workmanship					
	Materials	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
oor & walls tiling	Workmanship	1 Year	Jan. 2004	Jun. 2004	Oct. 2004	
Internal signs &	Materials	3 Year	Jan. 2004	Jun. 2004	Oct. 2004	
boards	Workmanship	3 Year	Jan. 2004	Jun. 2004	Oct. 2004	
				2004	JUL 2004	T.
specialties (White		3 Year	Jan. 2004	Jun. 2004	Oct. 2004	

¹ $^{(\prime)}$: Guarantees Starting dates for Buildings H, J, T, V2, V3, V4 and Y

² $^{(\mbox{\tiny (**)}}\colon$ Guarantees Starting dates for Buildings Q, U2, U3, V1/V5 and X

^{3 (***):} Guarantees Starting dates for Buildings B, D, F, K, M, R1, R2 and Z

4. INFO SHEETS FOR CAMPUS BUILDINGS

A.1 A.2 A.3 A.4 A.5	List of tra List of Fa General I	Work Parcels Definition List of trades List of Faculties & Supporting Buildings General Description List Of Faculties				
	A.5.1	National School of Fine Arts	(building B)			
	A.5.2 A.5.3	Faculty of Law and Political Sciences & Faculty of business and Administration Faculty of Engineering	(building D) (building G)			
	A.5.4	School of Pharmacy	(building H)			
	A.5.5	Extension of the Faculty of Sciences & Doctorial School	(building J)			
	A.5.6	Faculty of Medicine	(building M11 M12)			
	A.5.7	Faculty of Dentistry	(building M13 M14)			
	A.5.8	Faculty of Public Health	(building Q)			
	A.5.9	Faculty of Sciences	(building FOS)			
A	.6 List of S	Supporting Buildings				
	A.6.1 Co	nference Center (900 seats)	(Building F)			
	A.6.2-1 Open-air Football-Athletics Stadium (Buildin					
	A.6.2-2 (Olympic Multi-Purpose Stadium	(Building K2)			
	A.6.2-3 (Olympic Swimming Pool	(Building K3)			
	A.6.3 Lit	orary of Medical Sciences	(Building M2)			
	A.6.4 Ma	le & Female Dormitories	(Building R1&R2)			
	A.6.5 Technical Building		(Building T)			
	A.6.6 Restaurant and Functional Housing		(Building U2)			
	A.6. 7 Eastern Parking 1		(Building U3)			
	A.6.8 Eastern Parking 2		(Building V1)			
	A.6.9 Water Tower		(Building V2)			
	A.6.10 Pumping Station		(Building V3)			
	A.6.11 Utility Tunnel		(Building V4)			
	A.6.12 Underground Storm Water Reservoir		(Building V6)			
	A.6.13 U	nderground Western Parking & Central Catering	(Building X)			
	A.6.14 F	OS Library				
	A.6.15 F	OS Cafeteria				

A.6.16 Steel Hangar

A.6.17 Steel Portable Cabinets

(Building V1)

5. KEY PLAN DRAWINGS FOR CAMPUS BUILDINGS

National School of Fine Arts (building B)

Faculty of Law and Political Sciences &

Faculty of business and Administration (building D)

Conference Center (900 seats) (Building F)

Faculty of Engineering (building G)

School of Pharmacy (building H)

Extension of the Faculty of Sciences (building J)

Open-air Football-Athletics Stadium (Building K1)
Olympic Multi-Purpose Stadium (Building K2)

Olympic Swimming Pool (Building K3)

Faculty of Medicine (building M11 M12)

Library of Medical Sciences (Building M2)

Faculty of Dentistry (building M13 M14)

Faculty of Public Health (building Q)
Faculty of Sciences (Building FOS)
Male Dormitories (Building R1)
Female Dormitories (Building R2)
Restaurant and Functional Housing (Building U2)
Technical Building (Building T)
Eastern Parking 1 (Building U3)

Water Tower (Building V2)
Pumping Station (Building V3)

Utility Tunnel (Building V4)

Underground Storm Water Reservoir (Building V6)
Underground Western Parking & Central Catering (Building X)

Underground Western Parking & Central Catering Faculty of Sciences Library

Faculty of Sciences Cafeteria

Eastern Parking 2

GENERAL

A.1 Work Parcels definition

The project is divided into 8 work parcels grouping the components of LUC into coherent packages as follows:

Serial	Work parcel	Description of scope
WP1	Mechanical works	HVAC - Central Air conditioning is achieved by Chilled/Hot water pipes received from thermal plant through utility tunnel, then connected to secondary pumps (located at the basement mechanical rooms inside the building) where Air Handling Units are fed by Chilled/Hot water. - Cold/Hot air will distributed inside spaces from Air Handling Units through ducts and Variable Air Volume terminal (some spaces as amphitheaters are constant volume). - Some small spaces as security rooms, garbage rooms, are air-conditioned by mean of Mini Splits or Fan Coil Units. - Mechanical Ventilation is used for toilets, stores, archives and parking by mean of Fans (Roof, or centrifugal). - Mechanical Smoke exhaust is used to extract fumes in case of fire for some critical spaces such as amphitheaters and parking.
		PLUMBING - Domestic/Potable cold water will be achieved by water pipes received from the Water tower by gravity or by direct boosting from the main pumping station through utility tunnel, then ditributed inside the building to plumbing fixtures / drinking fountain. - Domestic Hot water, ditributed inside the building to plumbing fixtures, will be heated by the hot water storage tanks loacted inside the mechanical rooms, where the Heating water will be generated by mean of the main hot water network, coming from the thermal plant. - Liquiffied Petroleum Gas will be ditributed inside the building (to laboratories benches), coming from the external gas tanks located on site. - Compressed air / vacuum will be generated by pumps located in the basement mechanical rooms, then ditributed inside the building (to laboratories benches). - Waste water will be discharged to the external network by gravity or sump pumps located in pits. - Fire fighting will be through fire hose cabinets, and fire extinguishers. Faculty of Sciences HVAC - Cold/hot air will distributed inside spaces through split and DX units. - Mechanical ventilation is used for toilets, stores, and archives by mean of fans (roof, or centrifugal). PLUMBING - Domestic water is achieved by water pipes received from the water tower by gravity or by direct boosting from the main pumping station through utility tunnel, then distributed inside the building to plumbing fixtures.
		 Wastewater is discharged to the external network by gravity or sump pumps located in pits. Fire fighting ability is provided through fire hose cabinets, and fire extinguishers.
WP2	Electrical works	Electrical -Uninterruptible Power Supply (UPS) is interposed within each building between normal AC power supply and critical load to secure a minimum period of continuity of non-break battery backup for 15 minutes in case of failure of normal AC supply -MCC's and EMCC's are feeding the mechanical equipments (pump's, fan's, AHU's,) and are protected by a transformer call linked to building T outgoing. - 20KV/04KV Step Down transformers are located within most building, fed in medium voltage power from building T. The transformers are feeding the MDB's and EMDB's in the main electrical room inside the building. - Lighting fixtures and sockets outlets are fed from SLP's or ESLP (according to priorities) - SLP's and ESLP are fed from DB's or EPP's. - DB's and EPP's are fed from EMDB's. - Ring main unit is fed from MV loop linked to building T and feeding the MV transformer located in the transformer room. - MCC's and EMCC's feed all mechanical equipment within a given building. Low Current - The fire alarm detectors/manual stations are connected to the Fire Alarm Control Panel (FACP) in multi-loops like configuration. - The Control Modules are Connected to FACP - Bells and door holders are linked to the Control Modules - Cameras are installed in most of the buildings and they are connected to the faculty matrix switchers

GENERAL

A.1 Work Parcels definition

WD2	Dianta and naturalis	T
WP3	Plants and networks	Chilled and Heating Water Supply - Five centrifugal chillers, with all related accessories and pumps, of 10000 T.R capacity water cooled by cooling towers, are located in thermal plant area, and which produce chilled water at 5.5 deg.C distributed to buildings via pre-insulated pipes inside utility tunnel then connected to secondary pumps inside buildings mechanical rooms Four Hot water boilers, with all related accessories and pumps, of 4000 BHP capacity are located in thermal plant area, and which produce hot water at 90 deg.C distributed to buildings roin pre-insulated pipes inside utility tunnel then connected to secondary pumps/heat exchangers inside buildings mechanical rooms One steam boiler is used to produce steam for laundry. Water Supply System - Domestic water received from water wells located on site will be stoked inside underground water reservoirs, located in the main pumping station, after treatment and disinfections, then it will be pumped to elevated tank in order to be discharged by gravity through pipes inside utility tunnel to serve buildings Potable water process will be same as above for domestic water but water will be desalinated through reverse osmosis Fire fighting water will be received from domestic water but stoked inside an independent elevated tank Irrigation water will be received from the same elevated domestic water tank. Emergency Power Pant - Main Fuel Tanks delivers fuel to the Daytanks whose in its turn are connected to the Gensets - Genset are diesel type with a rated output power of 1500, 1000, & 250 KVA. Telephone Distribution Network - The Main PABX installed in Building T is linked to Ogero by 450 Trunks - The Star Configured Network that links the Main PABX installed in building T and the Individual building PABX's ensure the vehiculation of communication between the Campus and the outside world and between the buildings themselves. Data Distribution Network - The redundant core switches aer linked to the individual faculties switches in star conf
WP4	Finishing and civil works	The structure consists of vertical elements (concrete walls), and solid slabs or PRS (pre stressed reinforced rib slabs). Some steel structural elements such as canopies, bridges, stairs etc Internal finishing is composed of: Floor: Agglomerated tiles, ceramic tiles, vinyl and/ or rubber tiles, anti-dust paint. Walls: Masonry, Aluminum panels and/or painting walls Ceiling: Suspended ceiling (mineral fiber, aluminum, steel, gypsum boards). External finishing is composed of: Natural stone, marble and Stucco finish, Aluminum windows doors and curtain walls, Aluminum skylight and grating
WP5	Special technical equipments and furniture	Kitchen equipments, Cafeteria, Swimming pool treatment equipment, Water fountains treatment equipments, Laboratories benches, Laundry, Lifts, cranes, flow meters, Fire fighting, Amphitheater seats, Sliding boards, Fixed board, Movable partitions, Fixed partitions, External And Internal Signs, Video Projectors and Sound System
WP6	External works	Infrastructure including all the services networks (water supply, gas, irrigation, medium and low voltage, sewage and storm water), landscaping including (structural works, roads and parking, pavements and walkways, plantation, urban furniture and external lighting).
WP7	Services	Services includes all facilities that are used by the students, faculty and staff members, such as cleaning, security, and waste collection.

GENERAL

A.2 List of Trades

This section summarises the trades which make up the works and which relate the 8 work parcels. These trades will be reffered to in describing the scope of works covered by the operation and management contract.

Trade: Site Works

Trade	Trade Description	Related Work Parcel
A03	Roads	WP6
A04	Water Wells	WP3
A05	Main pumping station	WP3
A61	Domestic Water	WP3
A62	Potable Water	WP3
A63	Fire Fighting	WP3
A64	Irrigation	WP6
A71	Storm Water	WP6
A72	Waste Water	WP6
A08	Pavement	WP6
A09	Planting	WP6
A10	Urban furniture & External Works	WP6
A11	External Signs & Boards	WP6
A12	concrete Works	WP6
A13	Electrical network	WP3
A14	Low current	WP2 / WP3
A15	Chilled & Heating Water	WP3

Trade: Structural And Outboards

Trade	Trade Description	Related Work Parcel
B01	Concrete Works	WP4
B02	Frame Works & canopies	WP4
B03	Waterproofing & Joints	WP4
B04	External Wall Cladding	WP4
B05	External Aluminum & Glazing	WP4
B06	Curtain Wall	WP4
B08	Roofing	WP4

Trade: Technical Equipments

Trade	Trade Description	Related Work Parcel
C10	H.V.A.C.	WP1
C20	Plumbing	WP1
C31	Transformer Room & MV Switch Gear	WP2
C32	Power outlet and UPS layout	WP2
C33	Lighting	WP2
C35	Earthling & Lightning Protection	WP2
C37	Panel Boards	WP2
C40	Video Projector	WP5
C41	Telephone and Computer (ATA) system	WP3
C44	Access Control System & Sound System	WP3 / WP5
C45	Fire Alarm & Clock system	WP2 / WP5
C46	Time Attendance System	WP2
C47	CCTV	WP2
C48	Master Antenna System	WP2
C50	Central supervisor & Security system general	WP3
C60	Elevator	WP5

GENERAL

A.2 List of Trades

This section summarises the trades which make up the works and which relate the 8 work parcels. These trades will be reffered to in describing the scope of works covered by the operation and management contract.

Trade: Special Technical Equipments

Trade	Trade Description	Related Work Parcel
D01	Kitchen and Restaurant Equipment	WP5
D02	Swimming Pool Treatment Equipment and Accessories	WP5
D04	Decorative Fountains	WP5
D12	Laundry Equipment	WP5

Trade: Finishes

Trade	Trade Description	Related Work Parcel
E01	Masonry	WP4
E02	Plastering and Screed	WP4
E03	Gypsum, Insulation & Partition	WP4 / WP5
E04	Carpentry & Joinery Works	WP4
E05	Metal Works/Ironmongery	WP4
E06	Floor & Wall Rigid Tiling	WP4
E07	Flexible flooring	WP4
E08	Raised Floors	WP4
E09	Athletic Floor Finishes	WP6
E10	Suspended Ceiling	WP4
E11	General Glazing	WP4
E12	Painting & fabric Covering	WP4
E13	Internal Signs & Boards	WP5
E14	Specialties	WP5

GENERAL

A.3 List of Faculties & Supporting Buildings

This section summarises the buildings making up the Lebanese University Campus, grouped by type (Faculties, Supporting Buildings, Site). These buildings are referred to in the various work parcels, each of which covers at least some of the buildings.

Faculties

Building	Building Description	Section Number
В	Fine Arts Institute	A.5.1
D	FACULTY OF LAW AND POLITICAL SCIENCES	A.5.2
G	FACULTY OF ENGINEERING	A.5.3
Н	SCHOOL OF PHARMACY	A.5.4
J	EXTENSION OF THE FACULTY OF SCIENCES	A.5.5
M1	FACULTY OF MEDICINE	A.5.6
M3	FACULTY OF DENTISTRY	A.5.7
Q	FACULTY OF PUBLIC HEALTH	A.5.8
FOS	FACULTY OF SCIENCES	A.5.9

Supporting Buildings - Functional

Building	Building Description	
F	CONFERENCE CENTER	A.6.1
K1	STADIUM	A.6.2-1
K2	OPEN AIR MULTIPURPOSE STADIUM	A.6.2-2
K3	OLYMPIC SWIMMING POOL	A.6.2-3
M2	LIBRARY OF MEDICAL SCIENCES	A.6.3
U2	RESTAURANT & FUNCTIONAL HOUSING	A.6.7
U3	PARKING	A.6.8
V1	EASTERN PARKING	A.6.9
X	CENTRAL CATERING AND WESTERN PARKING	A.6.14
	FOS CAFETERIA	A.6.15
	FOS Library	A.6.16
	STEEL HANGAR	A.6.17
	STEEL PORTABLE CABINETS	A.6.18

Supporting Buildings - Residential

Building	Building Description	
R1	MALE DORMITORIES	A.6.4
R2	FEMALE DORMITORIES	A.6.5
U2	RESTAURANT & FUNCTIONAL HOUSING	A.6.7

<u>Supporting Buildings</u> - Technical

Building	ling Building Description	
T	TECHNICAL BUILDING	A.6.6
V2	WATER TOWER	A.6.10
V3	UNDERGROUND RESERVOIR	A.6.11
V4	UTILITY TUNNEL	A.6.12
V6	UNDERGROUND STORM WATER RESERVOIR	A.6.13

<u>Site</u>

Building	Building Description	

Lebanese University Campus - Hadath		
GENERAL		
A.3 List of Faculties & Supporting Buildings		
Ī	Γ	
Z	SITE	

GENERAL

A.4 General Description

DATA

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE

NUMBER OF STUDENTS :	33,000
LAND SURFACE AREA:	705000 m ²
BUILT-UP AREA:	250000 m ²

DESCRIPTION OF PROJECT:

The Lebanese University Campus will regroup the various teaching faculties, presently scattered around Beirut, into a single, multidisciplinary facility, with 10 faculty buildings altogether. It aims to become the pedagogic centre of excellence in the country, hosting around 33,000 students by the year 2017.

The campus's master plan places the faculties within a protected and landscaped environment, which can foster the growth of a real university community with all support facilities, service buildings and external works. The urban integration of the University campus within the Master Plan of the metropolitan region of Beirut will also help to create a regional pole of development.

<u>Faculties and schools of :</u> medical sciences, dentistry, public health, pharmacy, law and political sciences, business administration and economical sciences, fine arts, doctorial school, engineering and the faculty of sciences

<u>Supporting facilities:</u> functional housing, men & women dormitories (1200 bedrooms), conference centre (900 seats), sport complex, underground parkings (2500 cars), central catering, Restaurants.

<u>Service buildings</u>: water tower, utility tunnel (1,4 Km long), central thermal and power plant, underground reservoir, underground storm water reservoir

External works: infrastructure including all the services networks (water suply, gas, irrigation, medium and low voltage, sewage and storm water), landscaping including (structural works, roads and parkings, pavements and walkways, plantation, urban furniture and external lighting).

Lebanese University Campus - HadathGENERAL A.4.1 Site Location Plan



Lebanese University Campus - hadath GENERAL A.4.2 Master Plan



GENERAL

A.5 List of Faculties

This section provides the location a detailed description and key plans of each Faculties as listed below.

Section	Building	Faculty Name
A.5.1	В	Fine Arts Institute
A.5.2	D	Faculty of Law & Political Sciences
A.5.3	G	Faculty of Engineering
A.5.4	Н	Faculty of Pharmacy
A.5.5	J	Extension of the Faculty of Sciences
A.5.6	M11-M12	Faculty of Medicine
A.5.7	M13-M14	Faculty of Dentistry
A.5.8	Q	Faculty of Public Health
A.5.9	FOS	Faculty of Sciences

GENERAL

A.5.1 Fine Arts Institute - Bldg (B)

BUILDING DATA

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE

TOTAL BUILT-UP AREA (m2):	20,687.00
NUMBER OF STUDENTS:	1,476
NUMBER OF PROFESSORS:	148

MAIN SPACES : BAS. FLOOR :

GR. FLOOR:

1st FLOOR:

2nd FLOOR:

Mechanical Zone

Studios, Computer Lab., Construction Lab., Offices.

Studios, Computer Lab., Language Lab., Audio visual Lab., Multipurpose Rooms.

Studios

GENERAL

A.5.2 Faculty of Law and Political Sciences - Bldg (D)

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE

TOTAL BUILT-UP AREA (m2):	20,139.00
NUMBER OF STUDENTS:	7,300
NUMBER OF PROFESSORS:	244

MAIN SPACES :	BAS. FLOOR:	Parking - Mechanical rooms.
	GR. FLOOR:	Amphitheaters - Workshops.
		Amphitheaters - Multipurpose rooms - Classrooms - Computer lab's - Language lab's - Registrar office.
	2nd FLOOR:	Student offices - Library - Classrooms - Professors offices - Offices - Multipurpose rooms.
	3rd FLOOR:	Library - Professors offices - Multipurpose rooms.

GENERAL

A.5.3 Faculty of Engineering - Bldg (G)

1st FLOOR:

BUILDING DATA

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	SLEIMAN HABIB HADDAD
CONTROL BUREAU:	APAVE

TOTAL BUILT-UP AREA (m2):	14,000.00
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	

MAIN SPACES: BAS. FLOOR:

Hydraulic lab - Aerodynamic lab - Turbo machinery lab - Automobile mechanic lab - Soil

mechanical lab - Public work lab - Metal workshop - Welding workshop - Joinery workshop - Stack
room - Mechanical room

Amphitheater 300 seats - 8 Amphitheaters 120 seats - 3 Physique lab's - Structural lab -

Amphitheater 300 seats - 8 Amphitheaters 120 seats - 3 Physique lab's - Structural lab - Topography lab - Geology lab - 2 Language lab's - 15 Class rooms - 4 Multipurpose rooms 2

Studios - Library - Cafeteria - Offices

Physic lab - 9 Electrical lab's - 2 Biochemistry lab's - 9 Computer lab's - 7 Class rooms - 4 Multipurpose rooms - Workshop - Library - Documentation research services - Research lab's - Offices

GENERAL

A.5.4 Faculty of Pharmacy - Bldg (H)

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE

TOTAL BUILT-UP AREA (m2):	5,179.00
NUMBER OF STUDENTS:	200
NUMBER OF PROFESSORS:	20

MAIN SPACES : BAS. FLOOR :	Parking - Mechanical rooms.
GR. FLOOR :	Amphitheaters - Offices.
1st FLOOR:	Research lab's - industrial lab's - Computer lab's.
2nd FLOOR:	Multipurpose - Audio-visual - language lab's - Scientific lab's.

GENERAL

A.5.5 Extension of the Faculty of Sciences - Bldg (J)

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE
TOTAL BUILT-UP AREA (m2):	15,620.00
NUMBER OF STUDENTS:	7,500
NUMBER OF PROFESSORS:	
MAIN SPACES: 2nd BAS. FL.:	Amphitheaters - Classrooms - Computer lab's - Mechanical rooms
1st BAS. FL. :	Offices - Amphitheaters - Classrooms
1st FLOOR:	-
2nd FLOOR:	-

GENERAL

A.5.6 Faculty of Medicine - Bldg (M11-M12)

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE

TOTAL BUILT-UP AREA (m2):	12,290.00
NUMBER OF STUDENTS:	1,380
NUMBER OF PROFESSORS:	69

MAIN SPACES : BAS. FLOOR :	Technical zone
GR. FLOOR :	Scientific lab's - Research offices - Multi-purpose Rooms - Computer Lab's - Workshops.
1st FLOOR:	Amphitheaters - Scientific lab's -Offices -Operation rooms
2nd FLOOR:	Amphitheaters - Scientific lab's - Offices - Professors Offices - Scientific lab's - Language lab's

GENERAL

A.5.7 Faculty of Dentistry - Bldg (M13-M14)

BUILDING DATA

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE

TOTAL BUILT-UP AREA (m2):	12,290.00
NUMBER OF STUDENTS:	1,380
NUMBER OF PROFESSORS:	69

MAIN SPACES : BAS. FLOOR : Technical zone

GR. FLOOR : Scientific lab's - Dentist cabinets - Research offices - Multi-purpose Rooms - Computer Lab's - Workshops.

1st FLOOR: Amphitheaters - Scientific lab's - Dentist Cabinets - Offices - Operation rooms

2nd FLOOR: Amphitheaters - Scientific lab's - Offices - Professors Offices - Sientific lab's - Language lab's

GENERAL

A.5.8 Faculty of Public Health - Bldg (Q)

BUILDING DATA

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE

TOTAL BUILT-UP AREA (m2):	10,837.00
NUMBER OF STUDENTS:	1,000
NUMBER OF PROFESSORS:	100

MAIN SPACES: 2nd BAS. FL.: Technical room

1st BAS. FL.:

GR. FLOOR:

1st FLOOR:

Mechanical workshop - Therapeutic pools - Scientific lab's

Amphitheaters - Scientific lab's - Offices - Nurses Medicare lab's - Research lab's - Computer

Offices - Research lab's - Classrooms - Scientific lab's

GENERAL

A.5.9 Faculty of Sciences - Bldg (FOS)

DOILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	
BUREAU DE CONTROL :	
TOTAL BUILT-UP AREA (m2):	42,356.00
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	
MAIN SPACES : BAS. FLOOR :	Mechanical Zone
GR. FLOOR :	Multi-purpose rooms - Offices
1st FLOOR:	Scientific lab's - Offices - Professors Offices - Scientific lab's
2nd FLOOR:	Scientific lab's - Offices - Professors Offices - Scientific lab's
3rd FLOOR:	Scientific lab's - Offices - Professors Offices - Scientific lab's
4th FLOOR:	Scientific lab's - Offices - Professors Offices - Scientific lab's
5th FLOOR:	Scientific lab's - Offices - Professors Offices - Scientific lab's

GENERAL

A.6 List of Supporting Buildings

This section provides the location a detailed description and key plans of each Supporting Building as listed below.

Section	Building	Building Name
A.6.1	F	Conference Center
A.6.2-1	K1	Stadium
A.6.2-2	K2	Open Air Multipurpose Stadium
A.6.2-3	K3	Olympic Swimming Pool
A.6.3	M2	Library of Medical Sciences
A.6.4	R01 & R02	Male Dormitories & Female Dormitories
A.6.5	T1, T2 & T3	Technical Area
A.6.6	U2	Restaurant & Functional Housing
A.6.7	U3	Central Parking
A.6.8	V1	Eastern Parking
A.6.9	V2	Water Tower
A.6.10	V3	Pumping Station
A.6.11	V4	Utility Tunnel
A.6.12	V6	UNDERGROUND STORM WATER RESERVOIR
A.6.13	X	Underground Western Parking and Central Catering
A.6.14		FOS Library
A.6.15		FOS Cafeteria
A.6.16		Steel Hangar
A.6.17		Steel Portable Cabinets

GENERAL

A.6.1 Conference Center - Bldg (F)

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE
TOTAL BUILT-UP AREA (m2):	6,233.00
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	
MAIN SPACES: 2nd BAS. FL.:	Amphitheaters - Workshops - Storages - Musicians area.
1st BAS. FL. :	Meeting rooms - Cafeteria - Mechanical rooms.
GR. FLOOR :	Theaters (850 Seats)
1st FLOOR:	Theaters void - Library.
2nd FLOOR:	Offices

GR. FLOOR : Athletics and public facilities

GENERAL

A.6.2-1 Stadium - Bldg (K1)

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE
BUREAU DE CONTROL :	APAVE
TOTAL BUILT-UP AREA (m2):	21,000.00

GENERAL

A.6.2-2 Open Air Multipurpose Stadium - Bldg (K2)

BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE
TOTAL BUILT-UP AREA (m2):	2,925.00
NUMBER OF SPECTATORS :	2,000
NUMBER OF PROFESSORS:	-
MAIN SPACES : 1st BAS. FL. :	-
GR. FLOOR :	Athletics and public facilities

GENERAL

A.6.2-3 Olympic Swimming Pool - Bldg (K3)

1st BAS. FL.:

BUILDING DATA

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER :	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE
TOTAL BUILT-UP AREA (m2):	4,700.00

Athletics and public facilities.

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GENERAL

A.6.3 Library of Medical Sciences - Bldg (M2)

DUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE
TOTAL BUILT-UP AREA (m2):	1,474.00
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	
MAIN SPACES : BAS. FLOOR :	
GR. FLOOR :	
1st FLOOR:	
	ı I

GENERAL

A.6.4 Male & Female Dormitories - Bldg (R01-R02)

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE

TOTAL BUILT-UP AREA (m2):	49,000
NUMBER OF STUDENTS:	2,060
NUMBER OF PROFESSORS:	

MAIN SPACES: BAS. FL. :	27 rooms, 1Apartment, Health club, Seating area, Service area, parking 198 cars
GR. FLOOR :	193 rooms, 8 Entrances hall, Cafeteria, Administration offices, Service area
1st FLOOR:	248 rooms, Service area
2nd FLOOR:	279 rooms, Service area
3rd FLOOR:	250 rooms, Service area
4th FLOOR:	33 rooms, Services area

Lebanese University Campus - Hadath	
GENERAL	
A.6.5 Technical Building - Bldg (T1, T2, & T3)	
BUILDING DATA	

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE
TOTAL CAPACITY (m3):	5500 m2
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	
MAIN SPACES :	
	<u> </u>

GENERAL

A.6.6 Restaurant & Functional Housing - Bldg (U2)

BUILDING DATA

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE

TOTAL BUILT-UP AREA (m2):	5,000
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	

MAIN SPACES: 2nd BAS. FL.:

1st BAS. FL.:

GR. FLOOR:

1st FLOOR:

9 Apartments

Service area

Dining room, Kitchen, Stack room, Service area

9 Apartments

2nd FLOOR: 8 Apartments

Lebanese University	Campus - Hadath
GENERAL	
A.6.7 Eastern Parking 1	- Bldg (U3)
BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE
TOTAL CAPACITY (m2):	9,000
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	
MAIN SPACES :	

Lebanese University	Campus - Hadath
GENERAL	
A.6.8 Eastern Parking 2 - Bldg (V1)	
BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE
TOTAL CAPACITY (m2):	12,000
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	
MAIN SPACES :	

Lebanese University	Campus - Hadath
GENERAL	
A.6.9 Water Tower - Bldg (V2)	
BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE
TOTAL CAPACITY (m3):	80
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	
MAIN SPACES :	

Lebanese University	Campus - Hadath	
GENERAL		
A.6.10 Pumping Station	A.6.10 Pumping Station - Bldg (V3)	
BUILDING DATA		
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)	
ENGINEER:	L.A.C.E.CO	
CONTRACTOR:	ED. ZUBLIN AG	
CONTROL BUREAU	APAVE	
PRODUCTIVITY:	90 L/S	
NUMBER OF STUDENTS:		
NUMBER OF PROFESSORS:		
MAIN SPACES :		

Lebanese University	Campus - Hadath
GENERAL	
A.6.11 Utility Tunnel - Bldg (V4)	
BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE
TOTAL CAPACITY (m2):	10,000
NUMBER OF STUDENTS :	
NUMBER OF PROFESSORS:	
MAIN SPACES :	

GENERAL

A.6.12 Underground Storm Water Reservoir - Bldg (V6)

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
CONTROL BUREAU	APAVE
TOTAL CAPACITY (m3):	7,000
NUMBER OF STUDENTS:	
NUMBER OF PROFESSORS:	
MAIN SPACES :	

Lebanese	University	Campus -	- Hadath
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GENERAL

A.6.13 Underground Western Parking & Central Catering - Bldg (X)

BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	ED. ZUBLIN AG
BUREAU DE CONTROL :	APAVE
TOTAL BUILT-UP AREA (m2)	8,676.00
NUMBER OF EMPLOYEES:	
MAIN SPACES : BAS. FLOOR :	
GR. FLOOR :	
1st FLOOR:	
2nd FLOOR:	

GENERAL

A.6.14 FOS Library

EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	
BUREAU DE CONTROL :	
TOTAL BUILT-UP AREA (m2):	14,500.00
NUMBER OF EMPLOYEES:	
MAIN SPACES : BAS. FLOOR :	Multi-purpose rooms - Halls
GR. FLOOR :	Offices for Doctorial School
1st FLOOR:	FOS Library
2nd FLOOR:	Scientific lab's - Offices

Lebanese University C	Campus - Hadath
GENERAL	
A.6.15 FOS Cafeteria	
BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	
BUREAU DE CONTROL :	
TOTAL BUILT-UP AREA (m2):	2,300.00
NUMBER OF EMPLOYEES:	

MAIN SPACES : BAS. FLOOR :

GR. FLOOR:

Cafeteria

Lebanese University	Campus - Hadath
GENERAL	
A.6.16 Steel Hangar	
BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	
BUREAU DE CONTROL :	
TOTAL BUILT-UP AREA (m2	370.00
NUMBER OF EMPLOYEES:	
MAIN SDACES . CD ELOOD .	Lebanese Army Usage

MAIN SPACES : GR FLOOR :

Lebanese University	Campus - Hadath
GENERAL	
A.6.17 Steel Portable (Cabinets
BUILDING DATA	
EMPLOYER:	COUNCIL FOR DEVELOPMENT AND RECONSTRUCTION (C. D. R)
ENGINEER:	L.A.C.E.CO
CONTRACTOR:	
BUREAU DE CONTROL :	
TOTAL BUILT-UP AREA (m2): 100.00

Red Cross and Internal Security Forces Usage

NUMBER OF EMPLOYEES:

MAIN SPACES : . GR. FLOOR :

1. KEY PLAN DRAWINGS FOR CAMPUS BUILDINGS

National School of Fine Arts (building B)

Faculty of Law and Political Sciences &

Faculty of business and Administration (building D)

Conference Center (900 seats) (Building F)

Faculty of Engineering (building G)

School of Pharmacy (building H)

Extension of the Faculty of Sciences (building J)

Open-air Football-Athletics Stadium (Building K1)

Olympic Multi-Purpose Stadium (Building K2)

Olympic Swimming Pool (Building K3)

Faculty of Medicine (building M11 M12)

Library of Medical Sciences (Building M2)

Faculty of Dentistry (building M13 M14)

Faculty of Public Health (building Q)
Faculty of Sciences (Building FOS)
Male Dormitories (Building R1)
Female Dormitories (Building R2)
Restaurant and Functional Housing (Building U2)

Technical Building (Building T)

Eastern Parking 1 (Building U3)

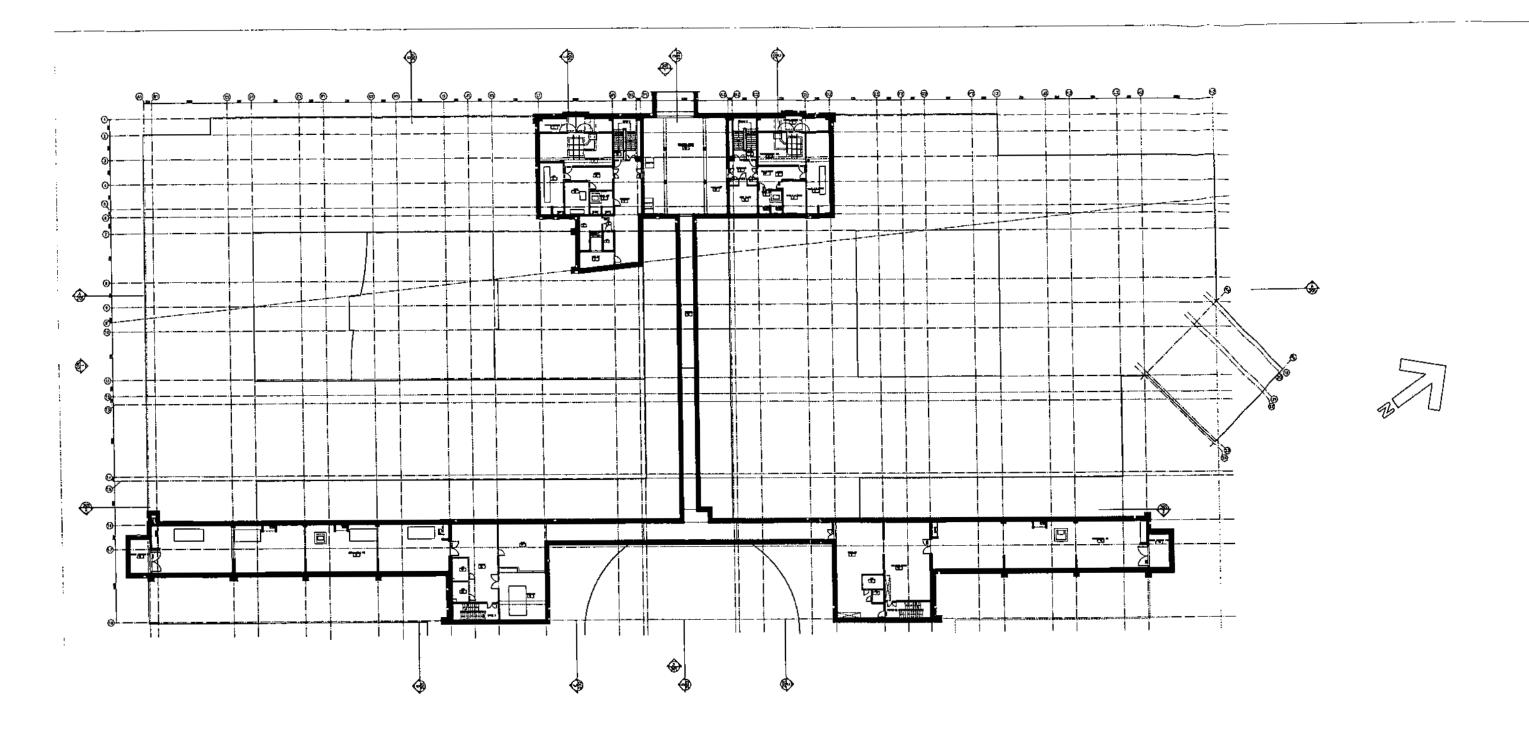
Eastern Parking 2 (Building V1)

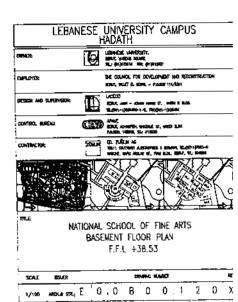
Water Tower (Building V2)
Pumping Station (Building V3)
Utility Tunnel (Building V4)

Underground Storm Water Reservoir (Building V6)

Underground Western Parking & Central Catering (Building X)

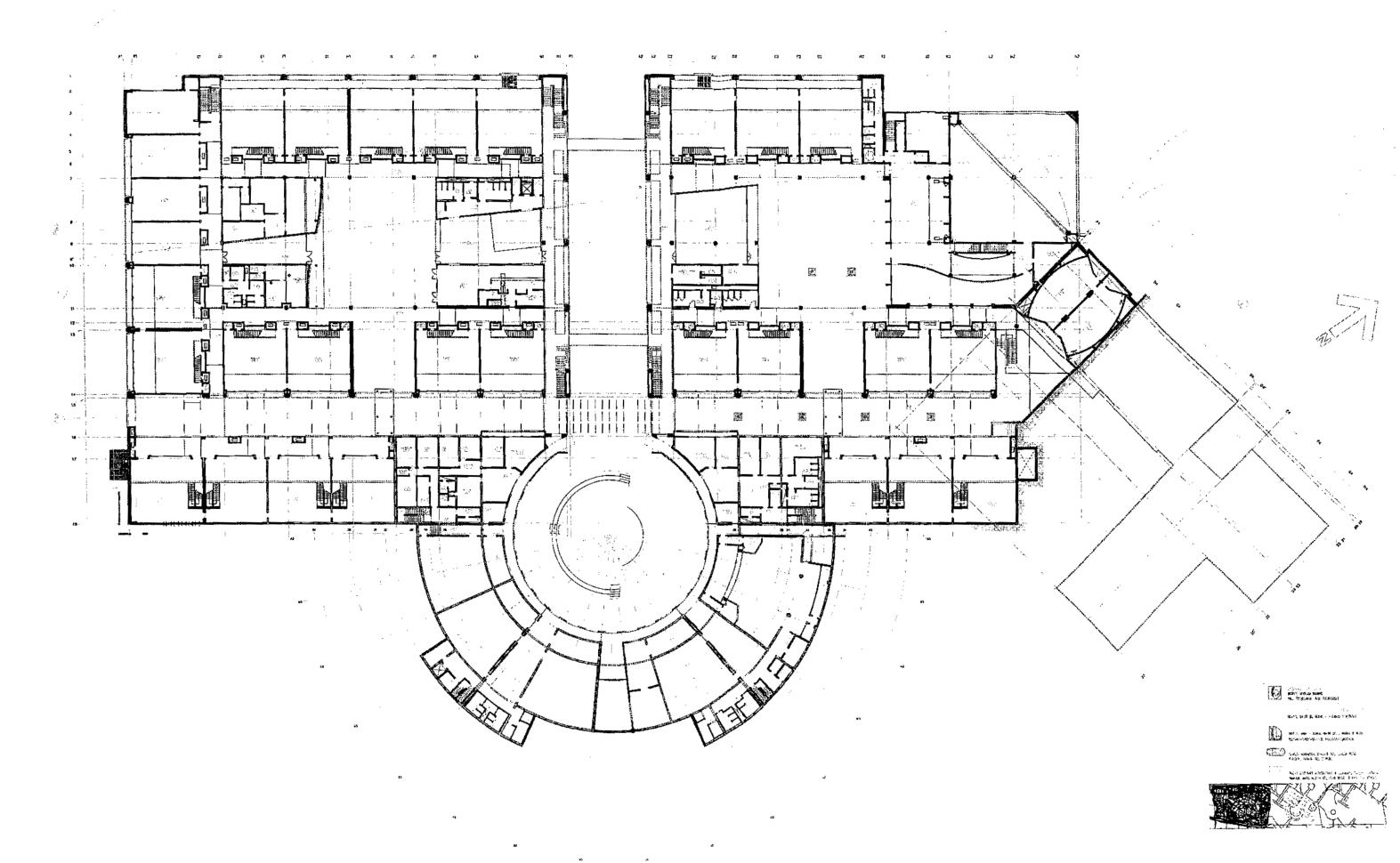
Faculty of Sciences Library
Faculty of Sciences Cafeteria



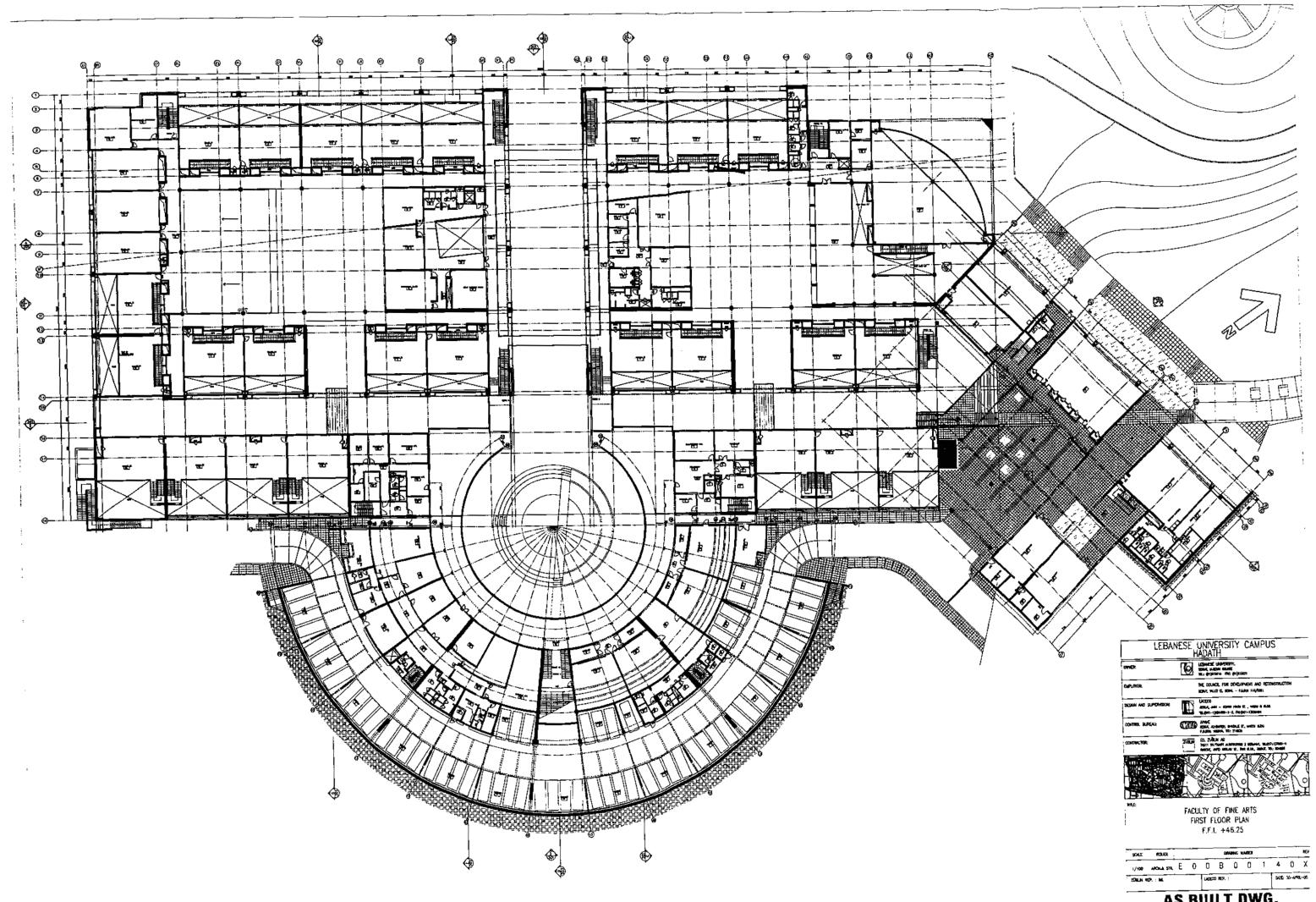


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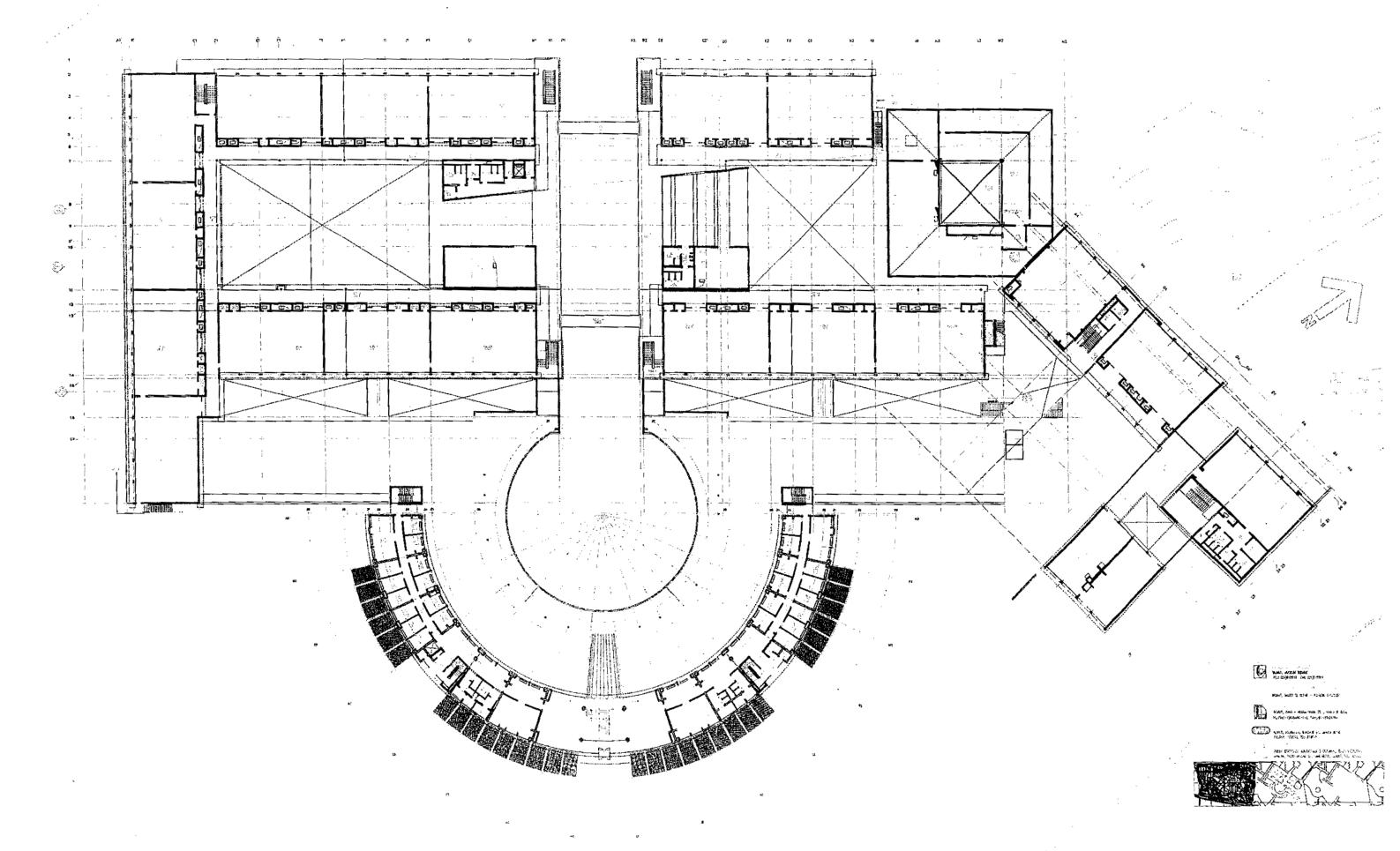
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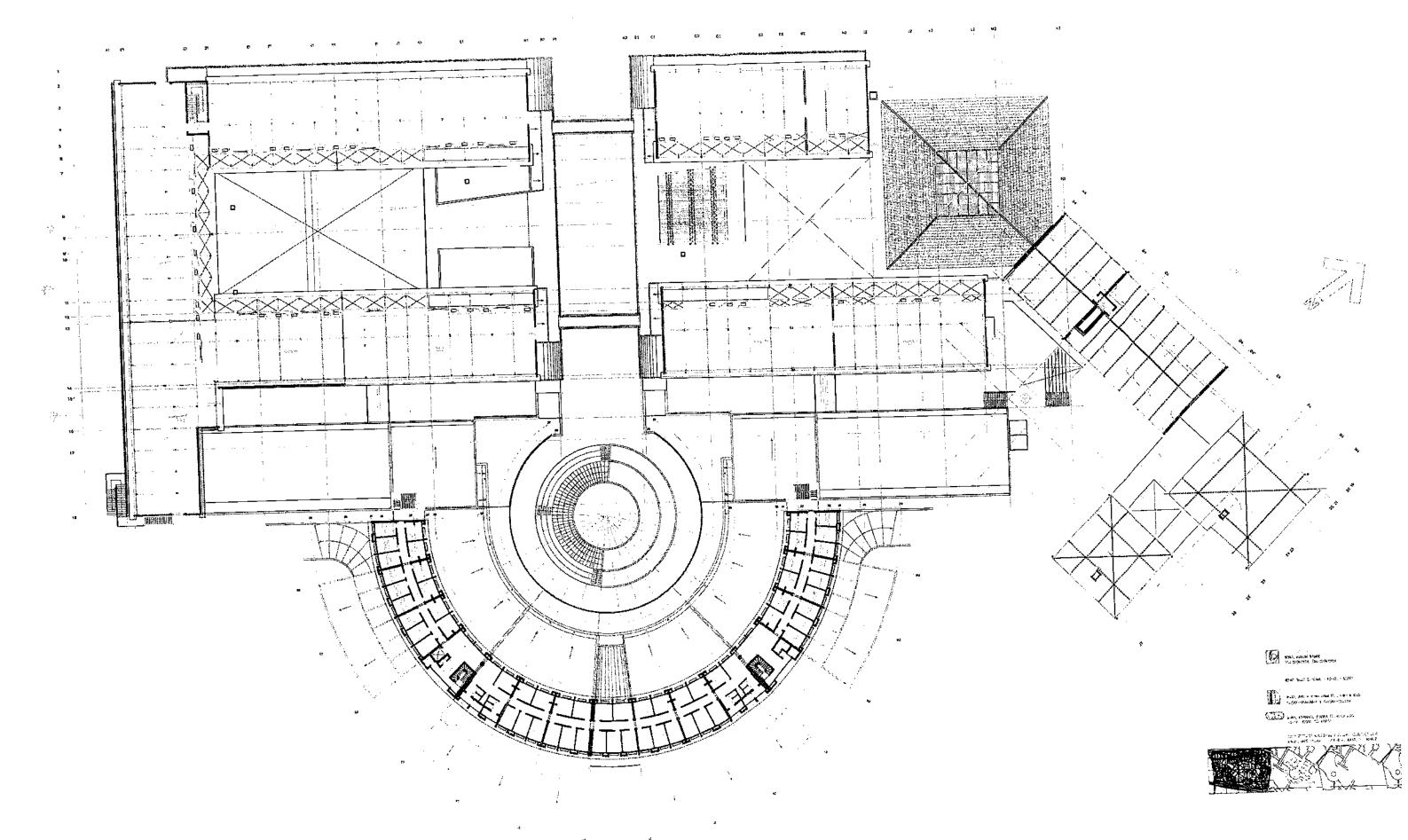


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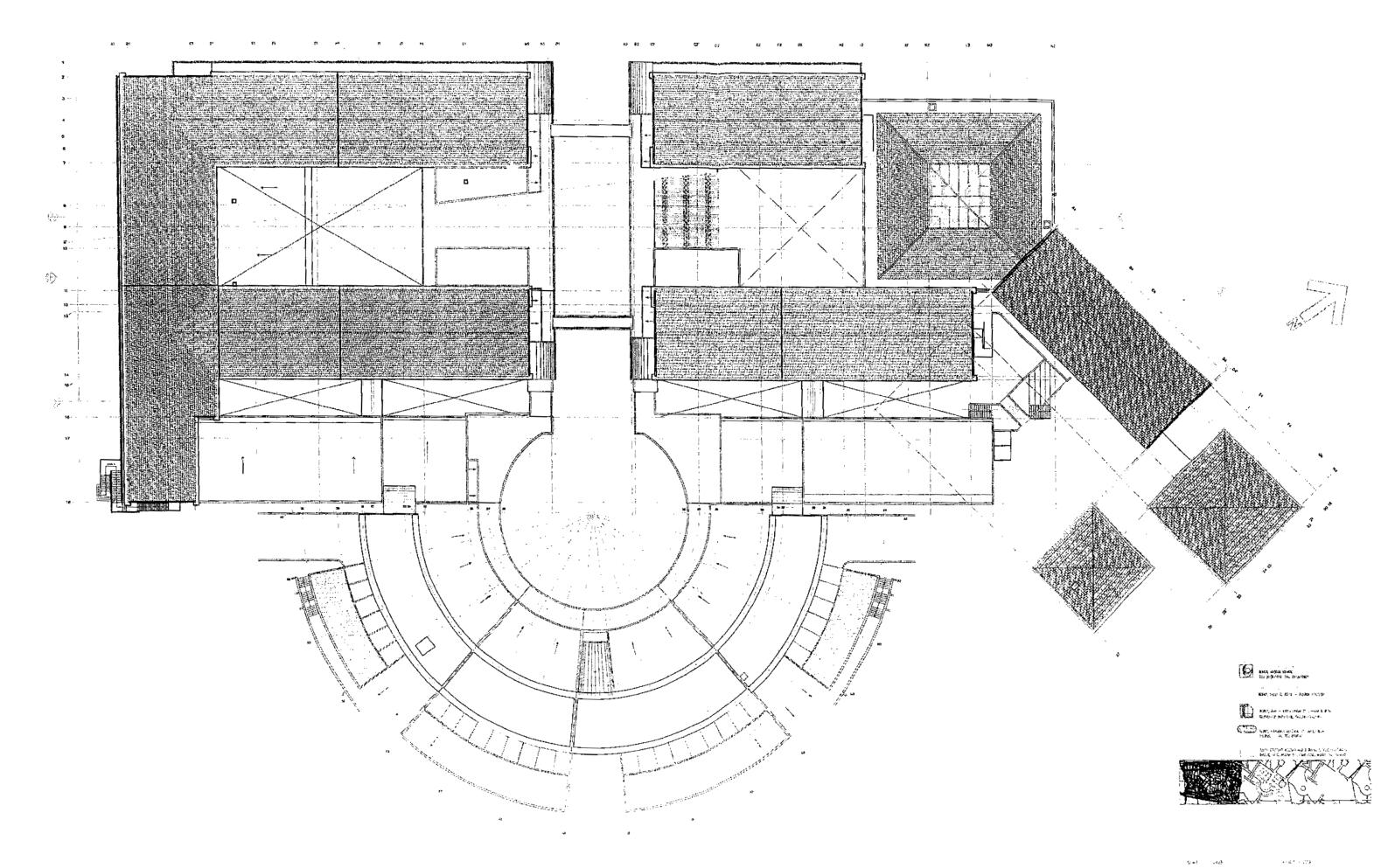


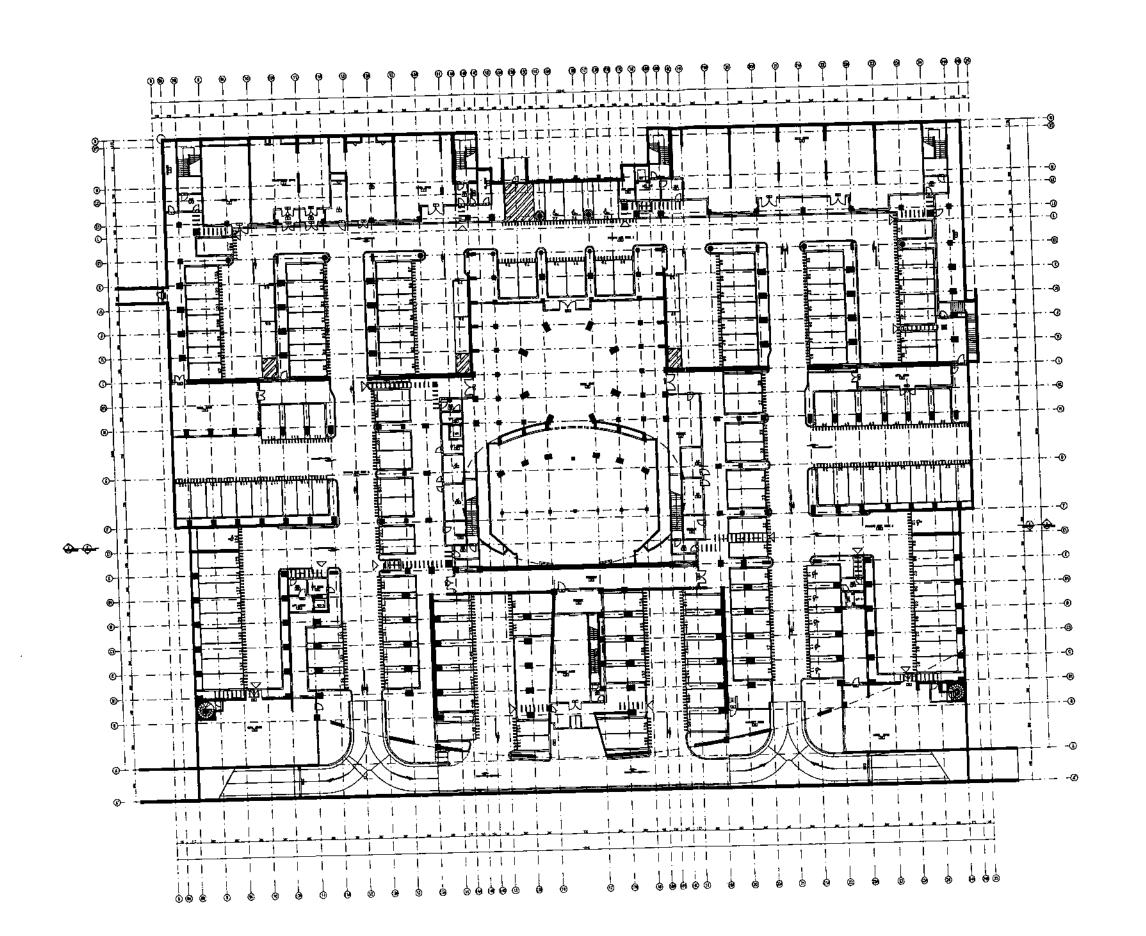
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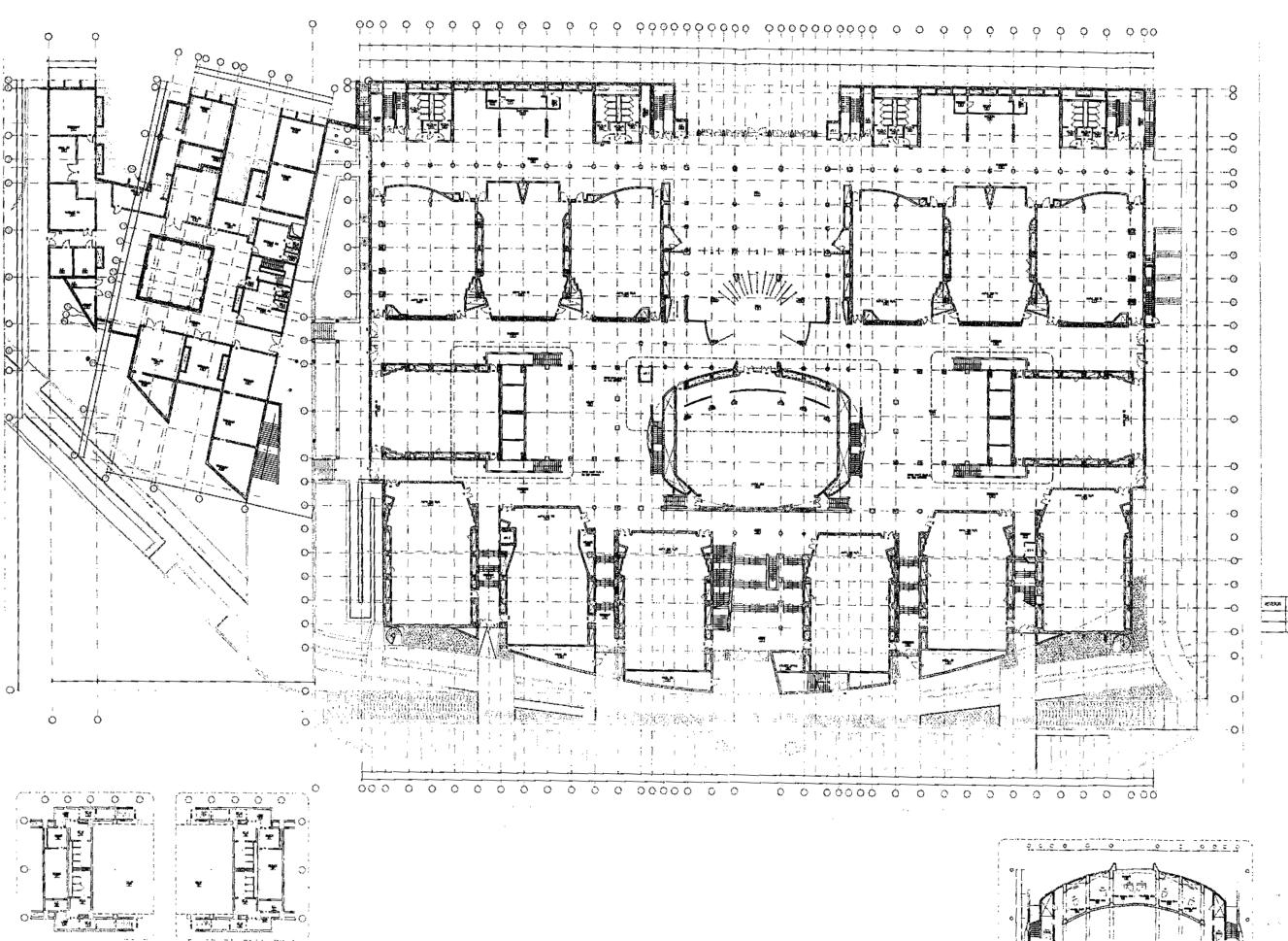




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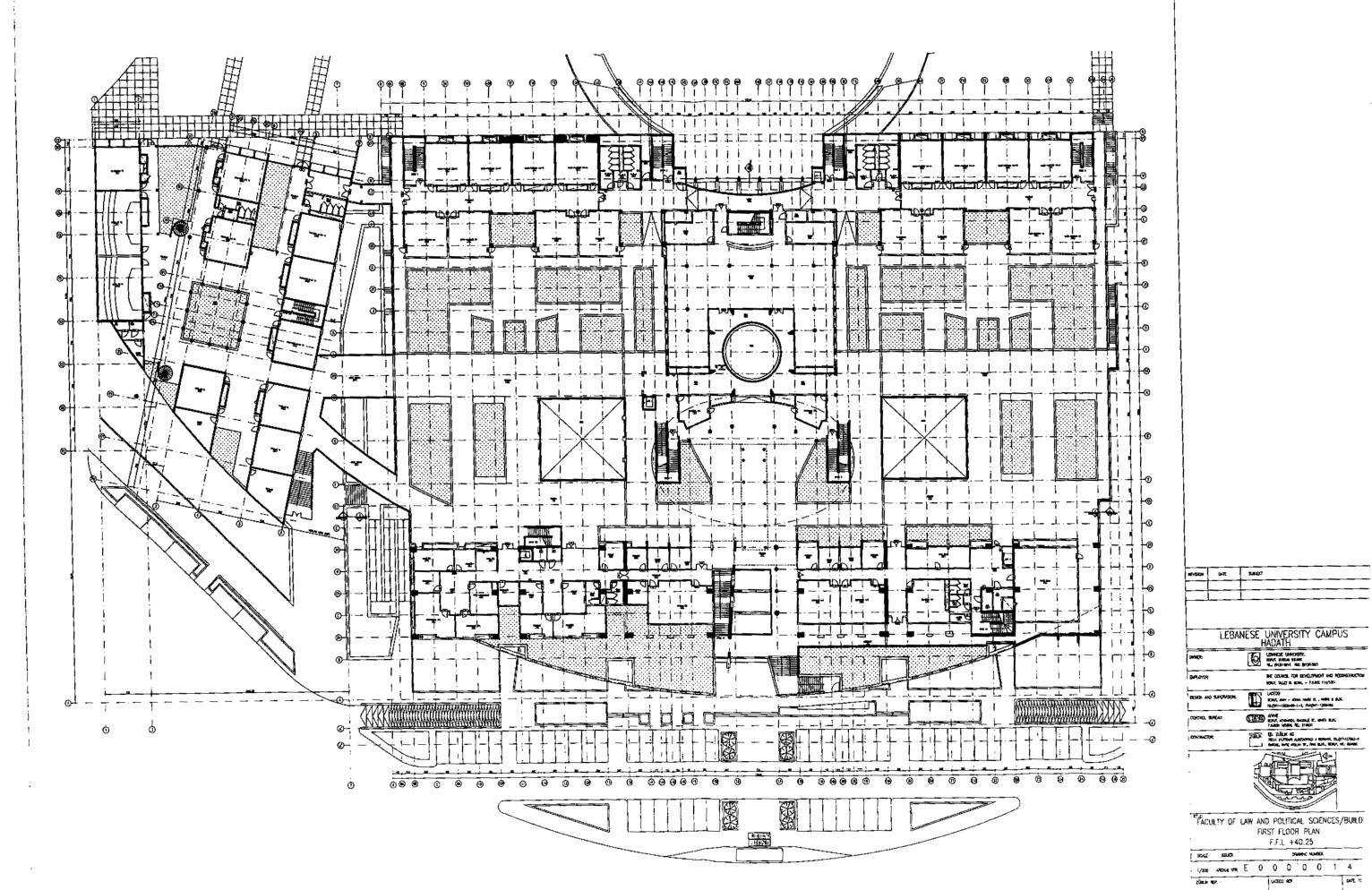
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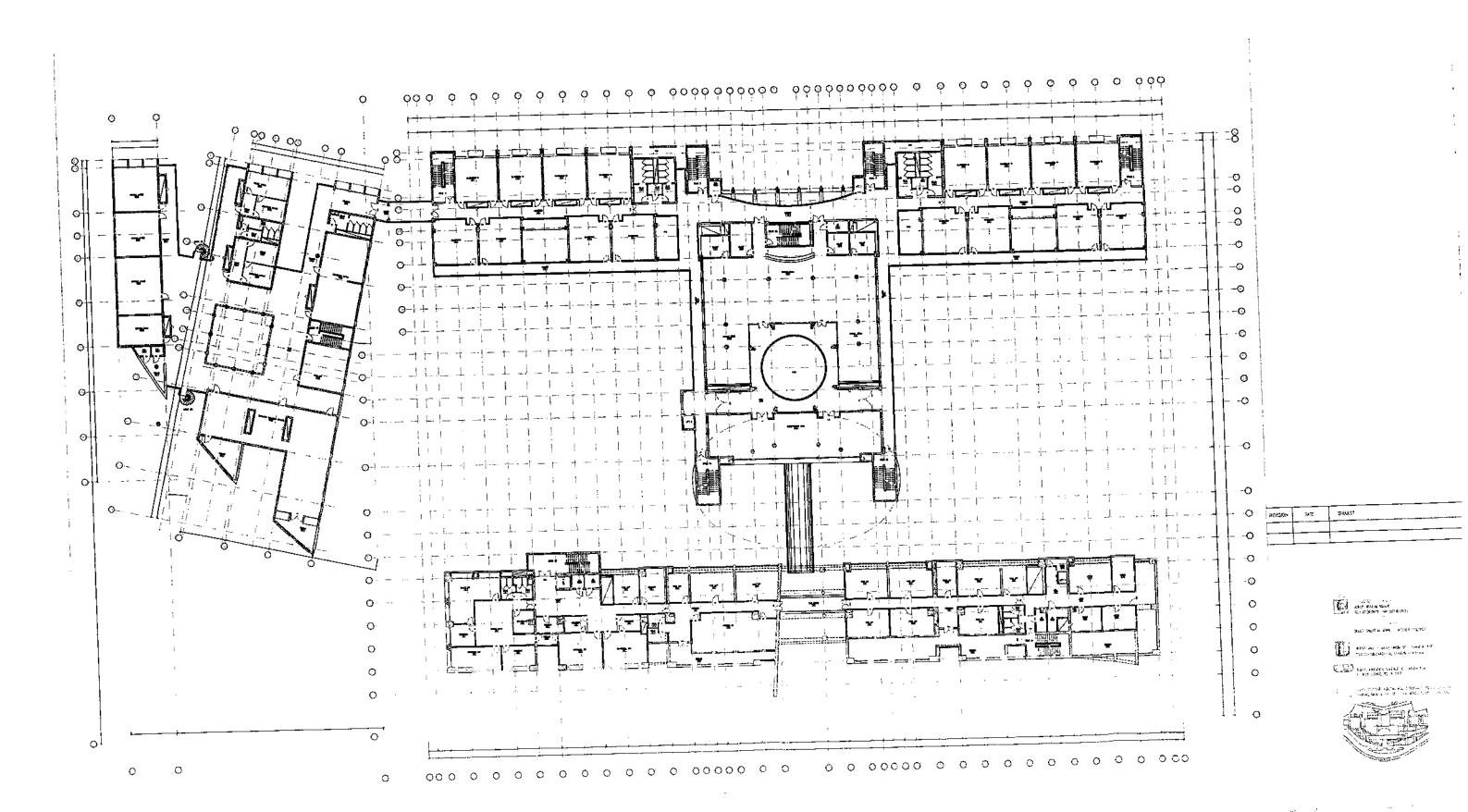
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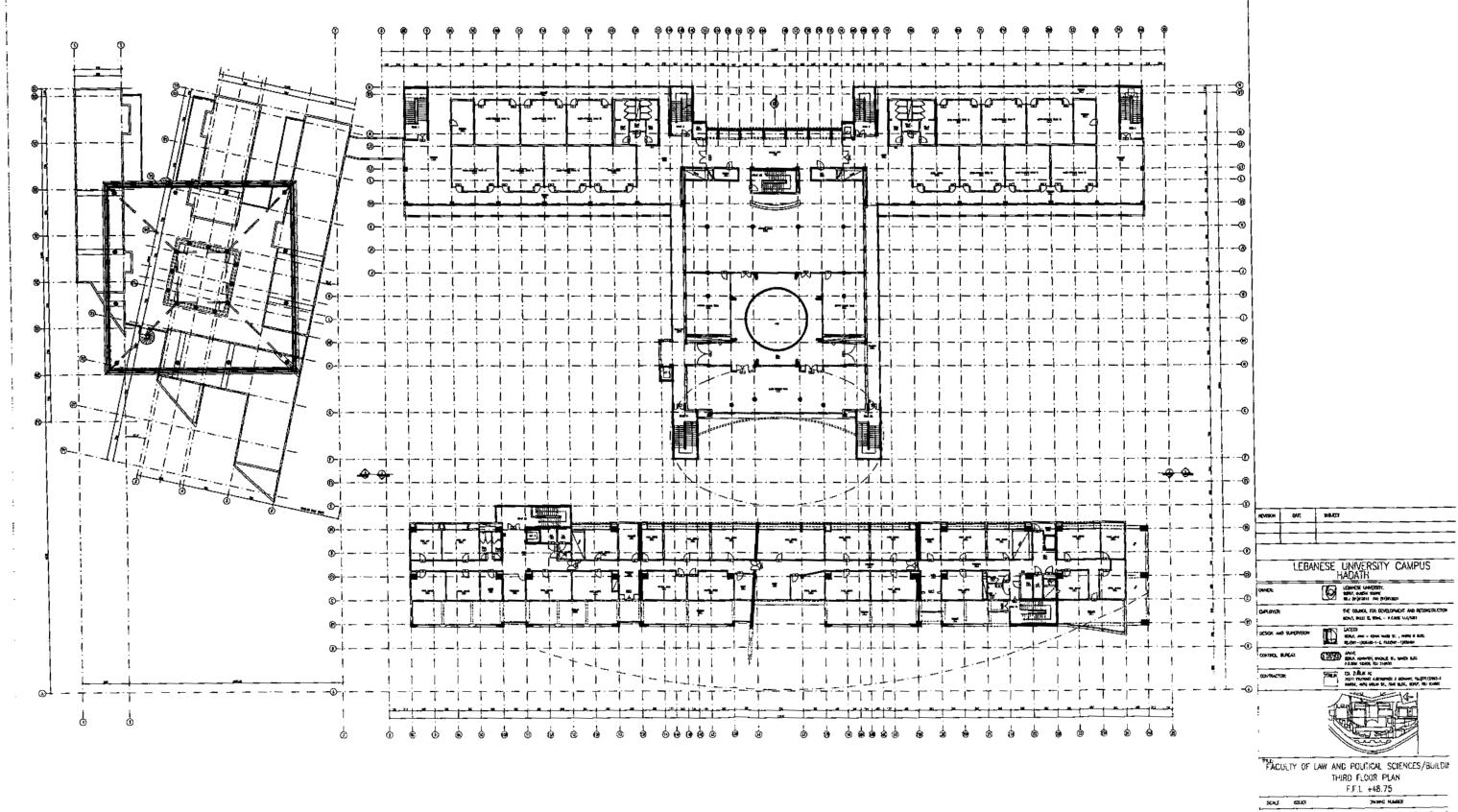
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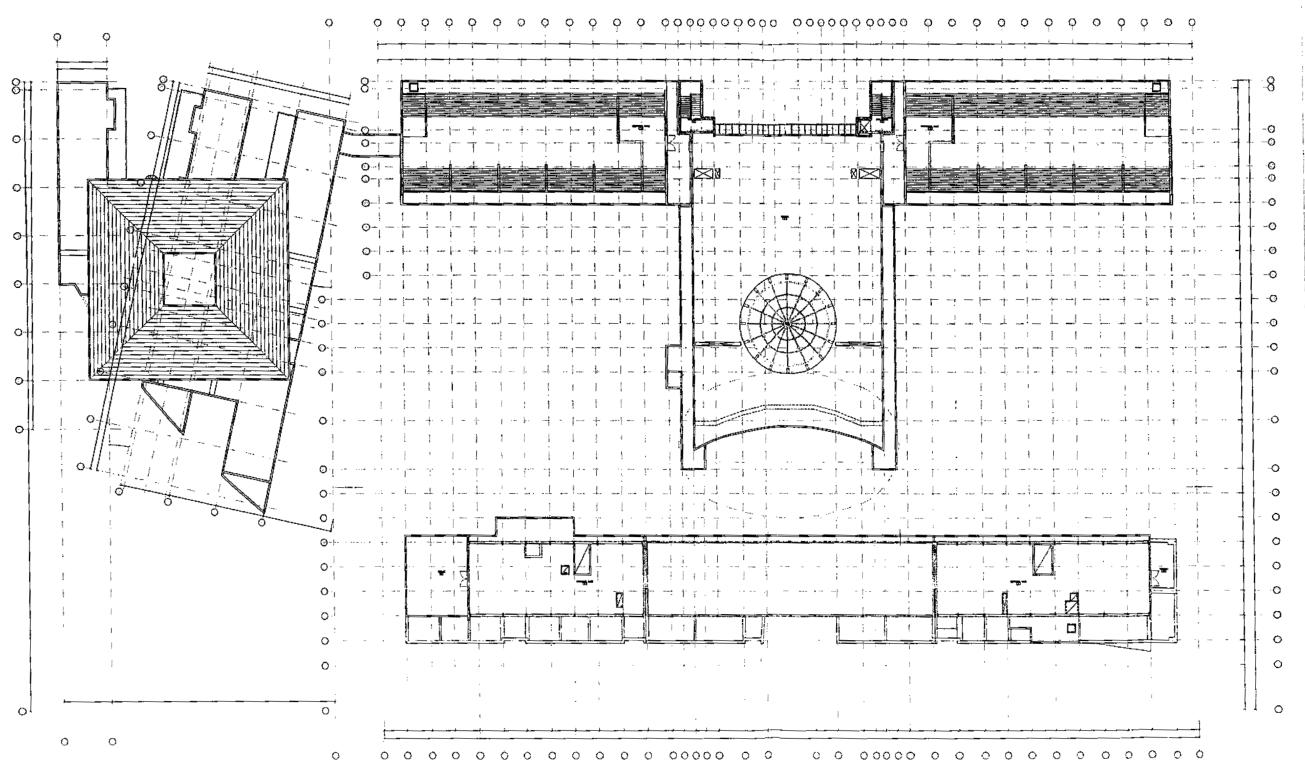
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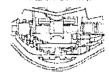


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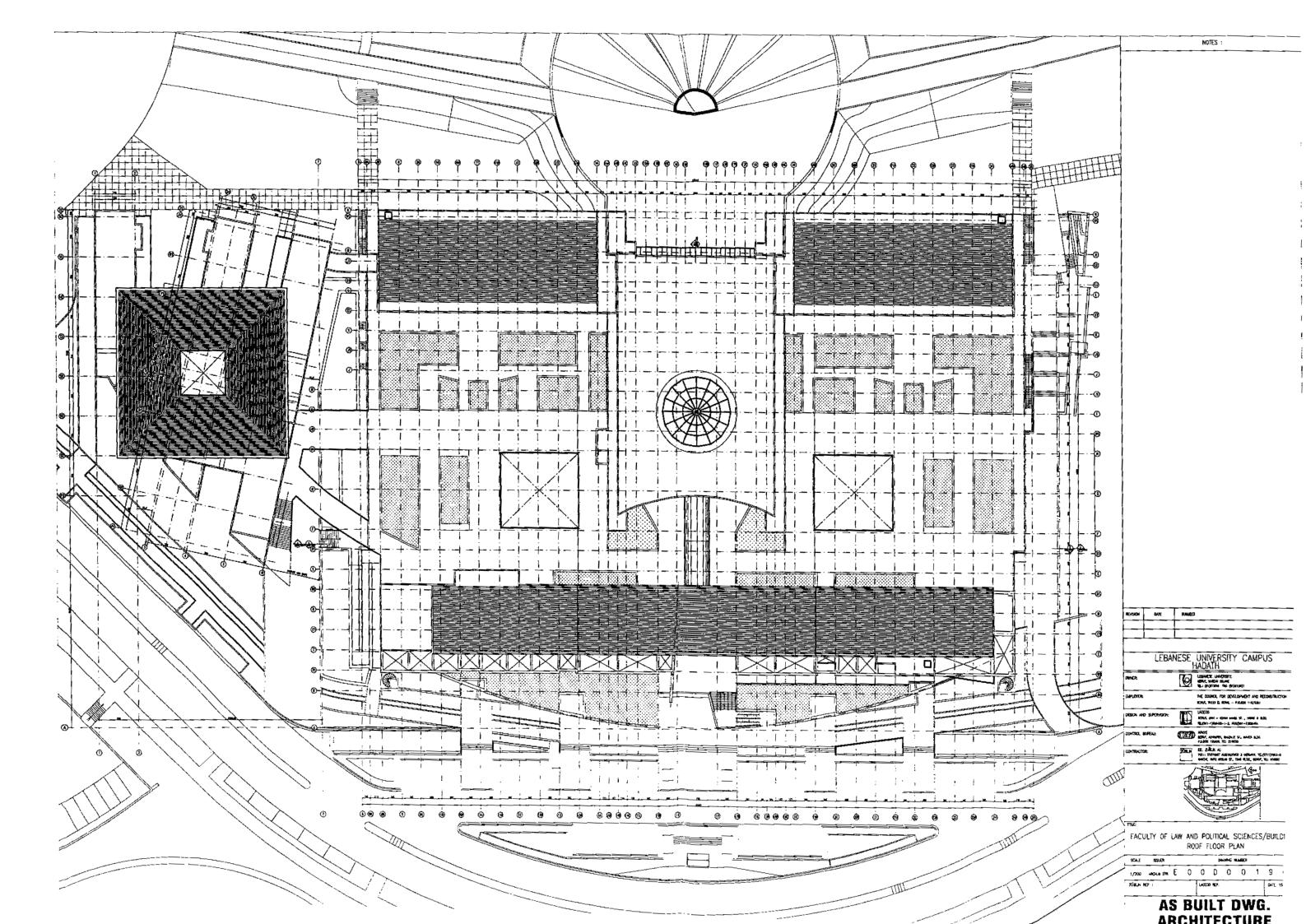
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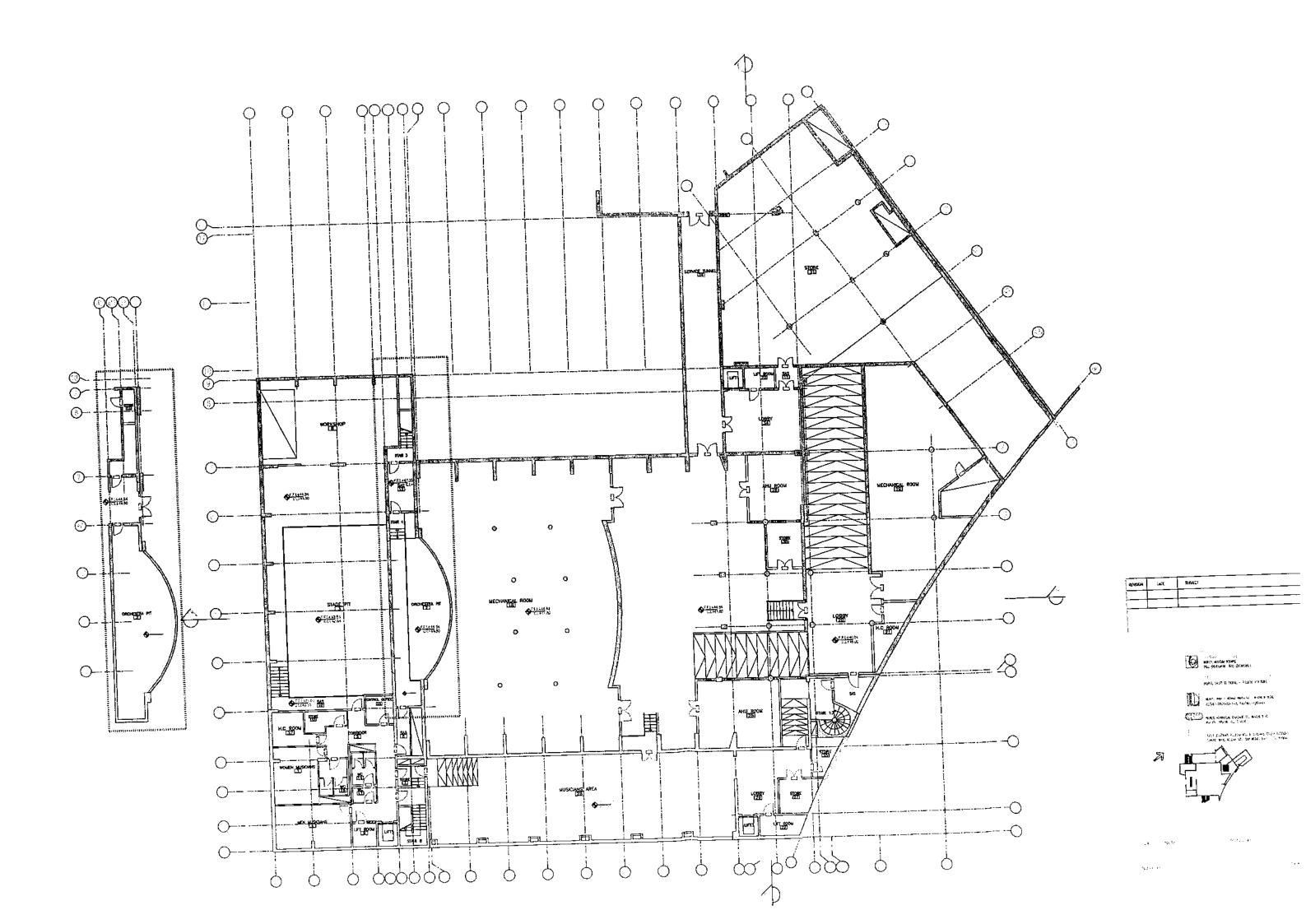


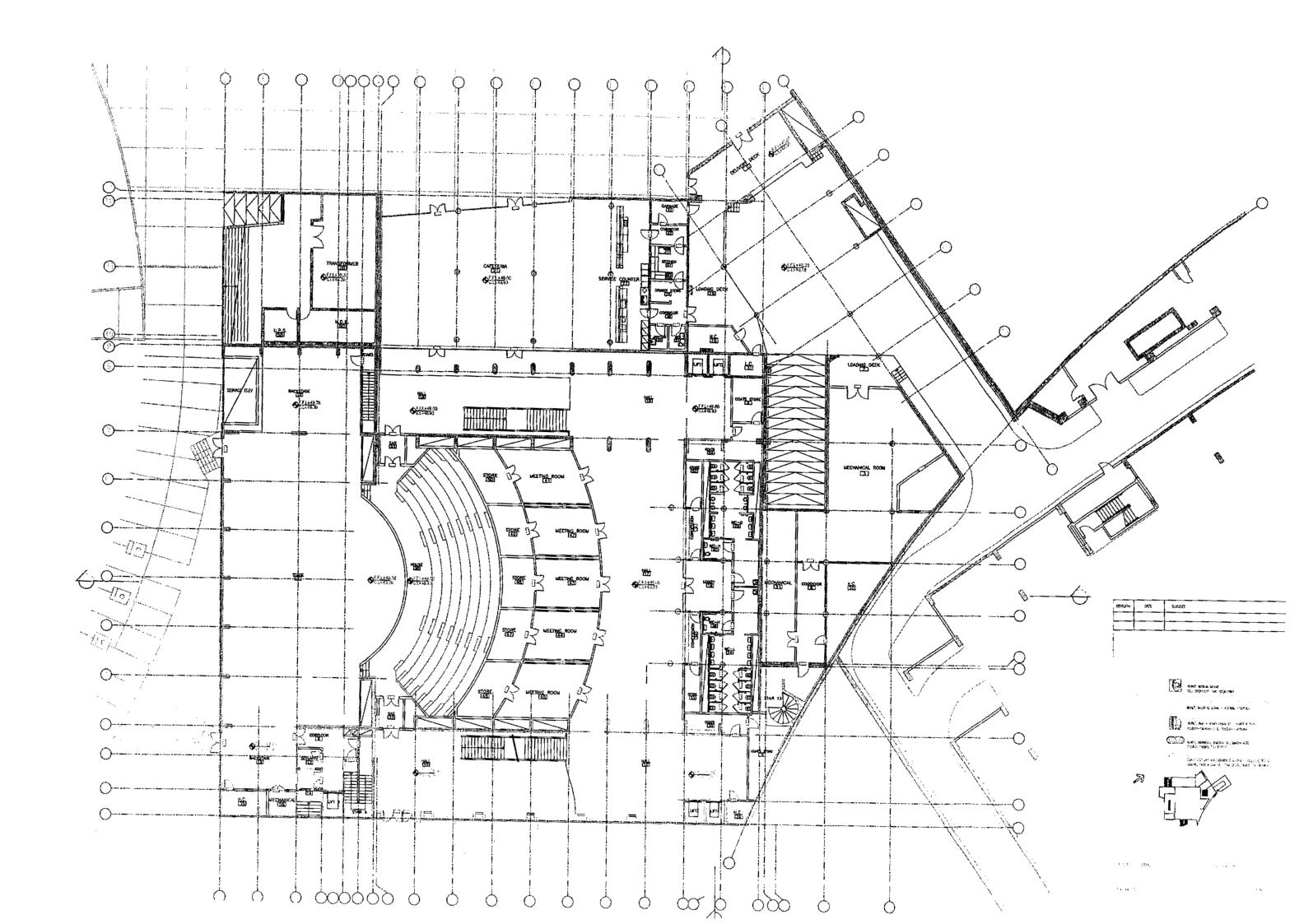


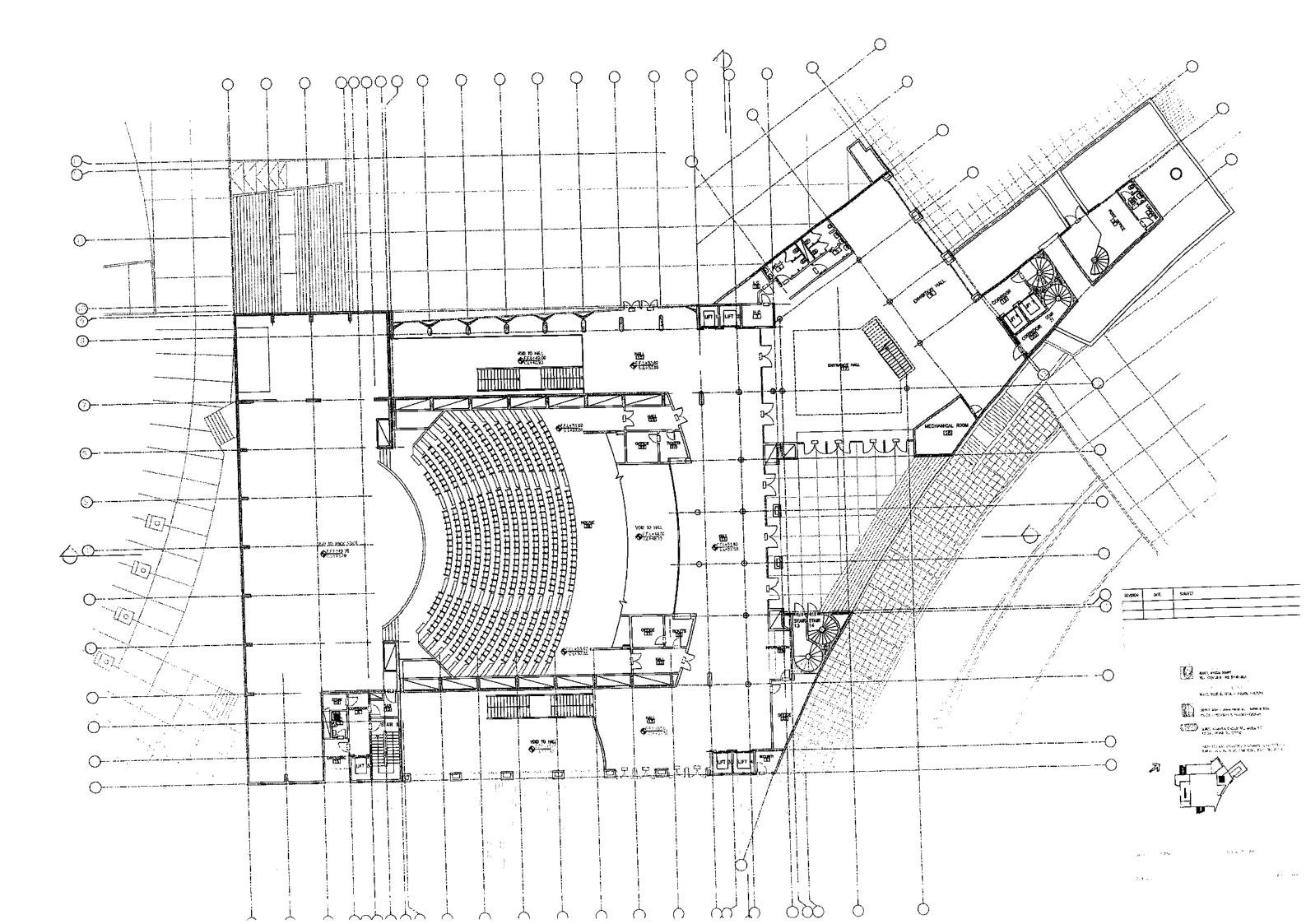
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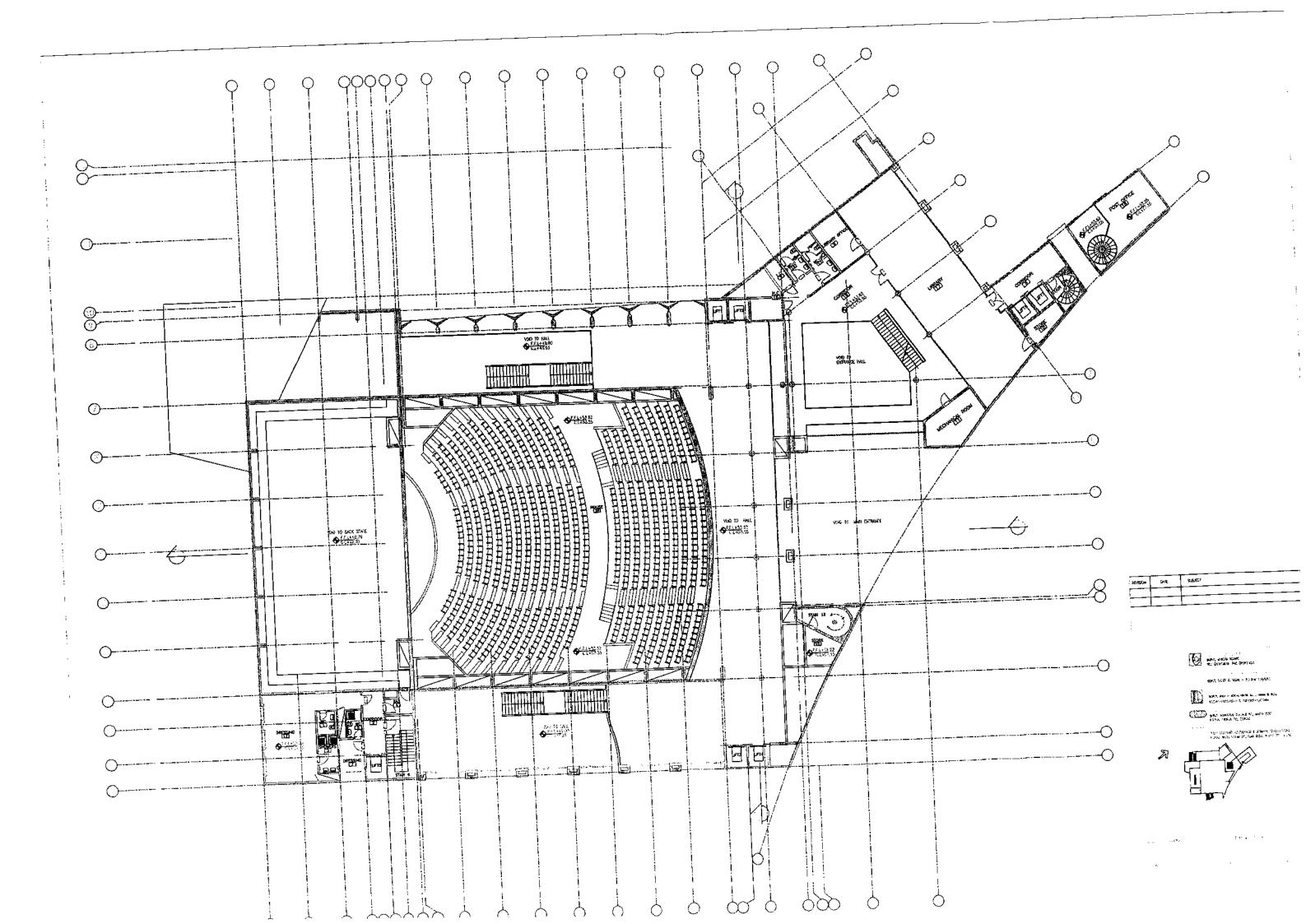
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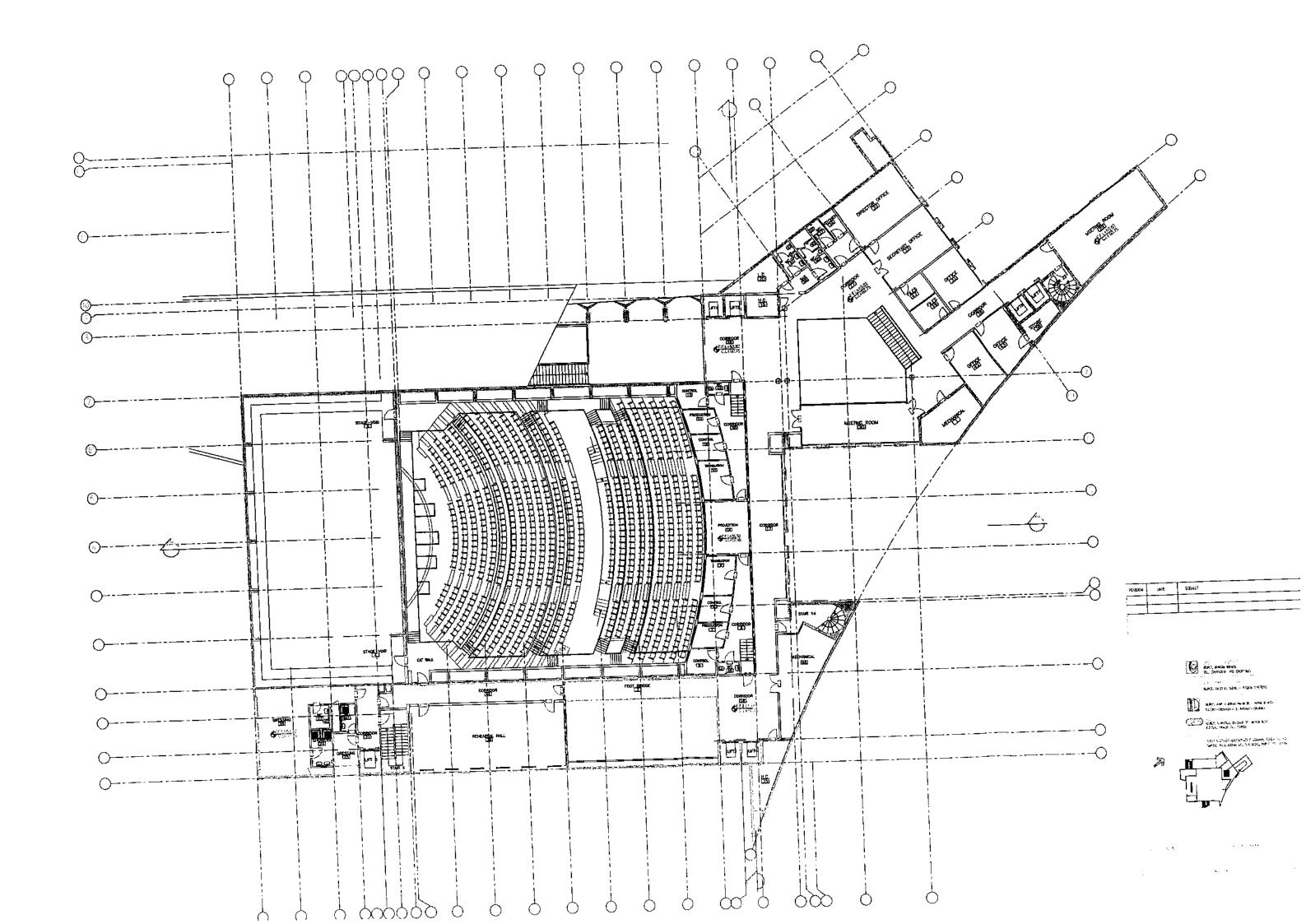


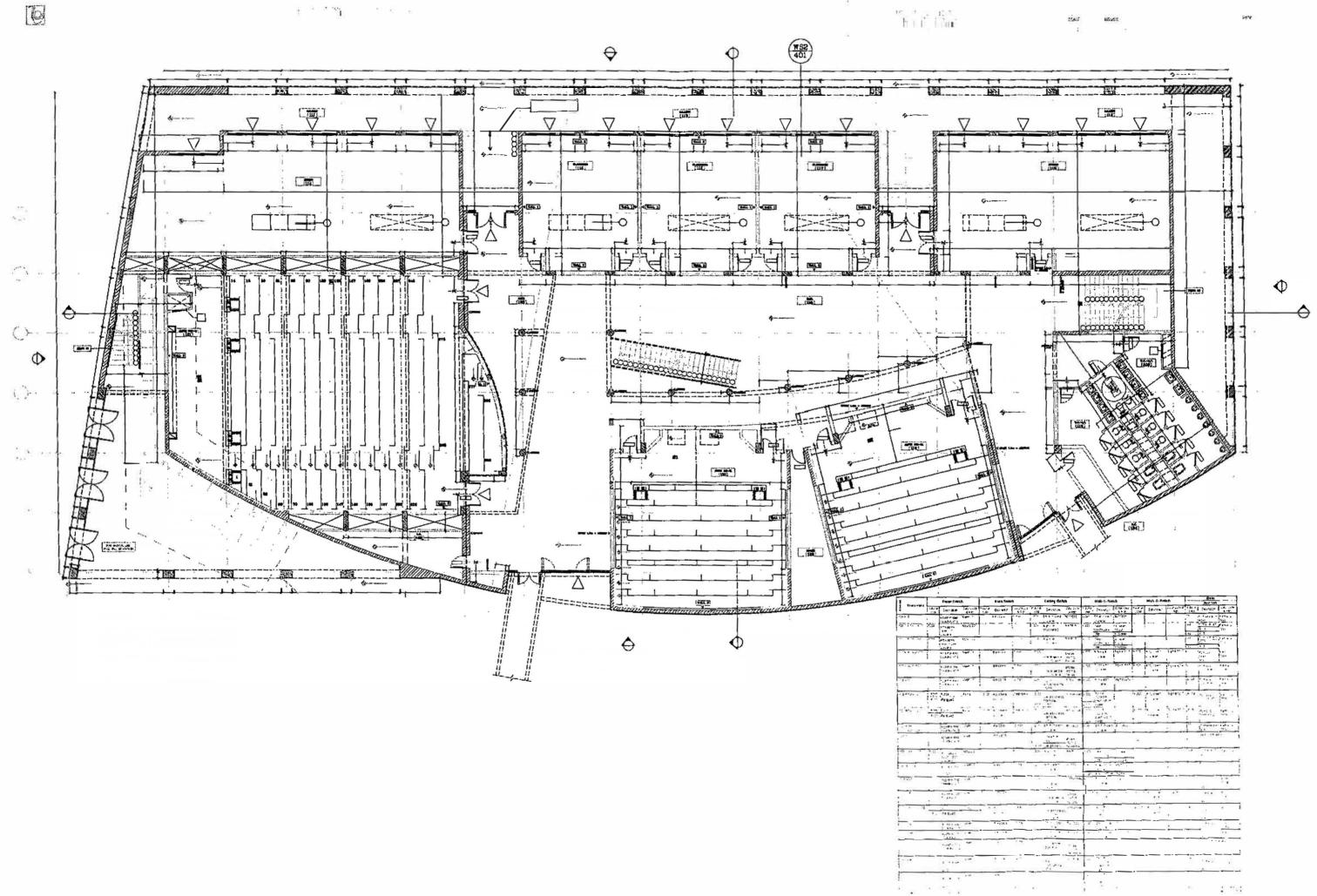


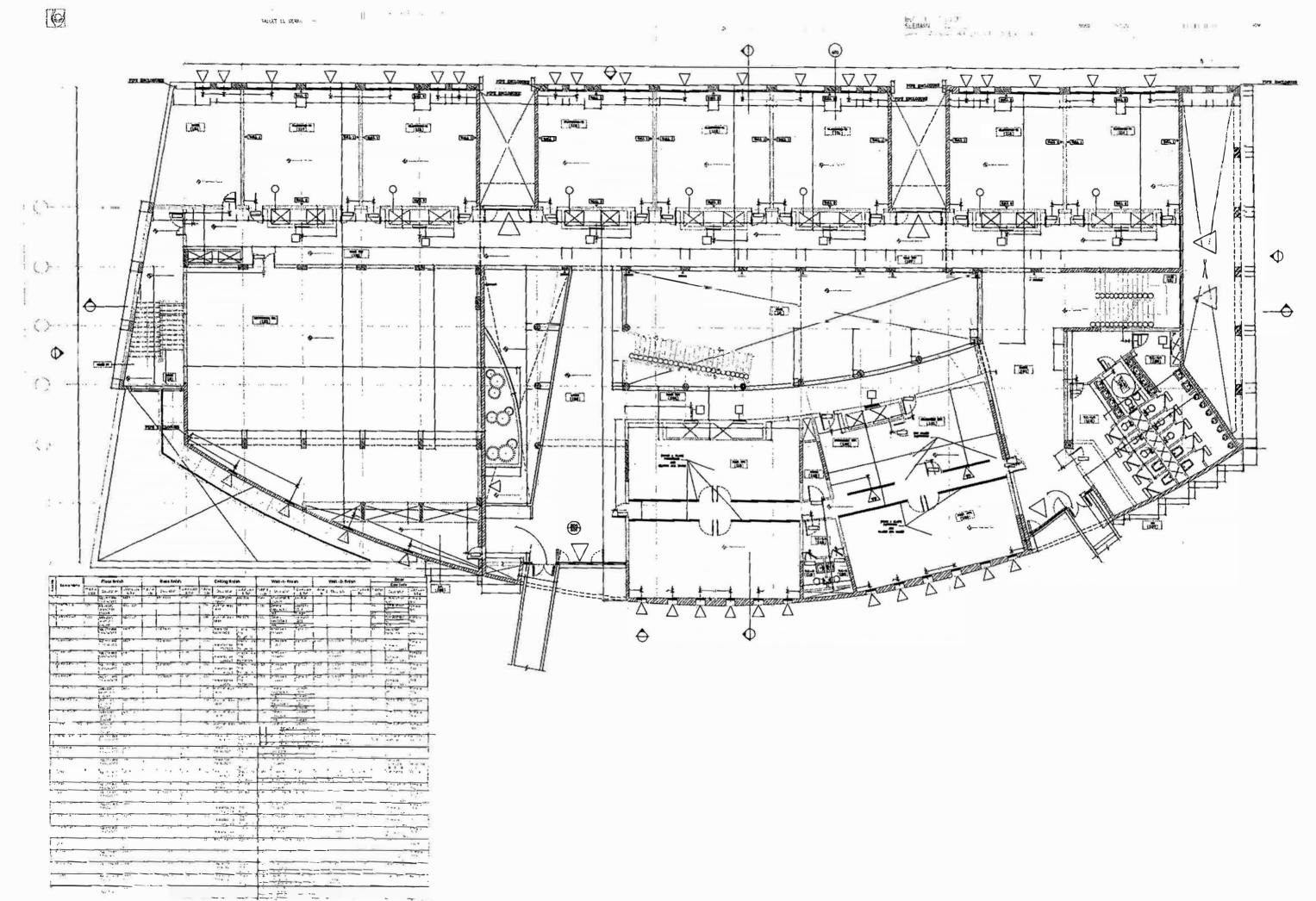










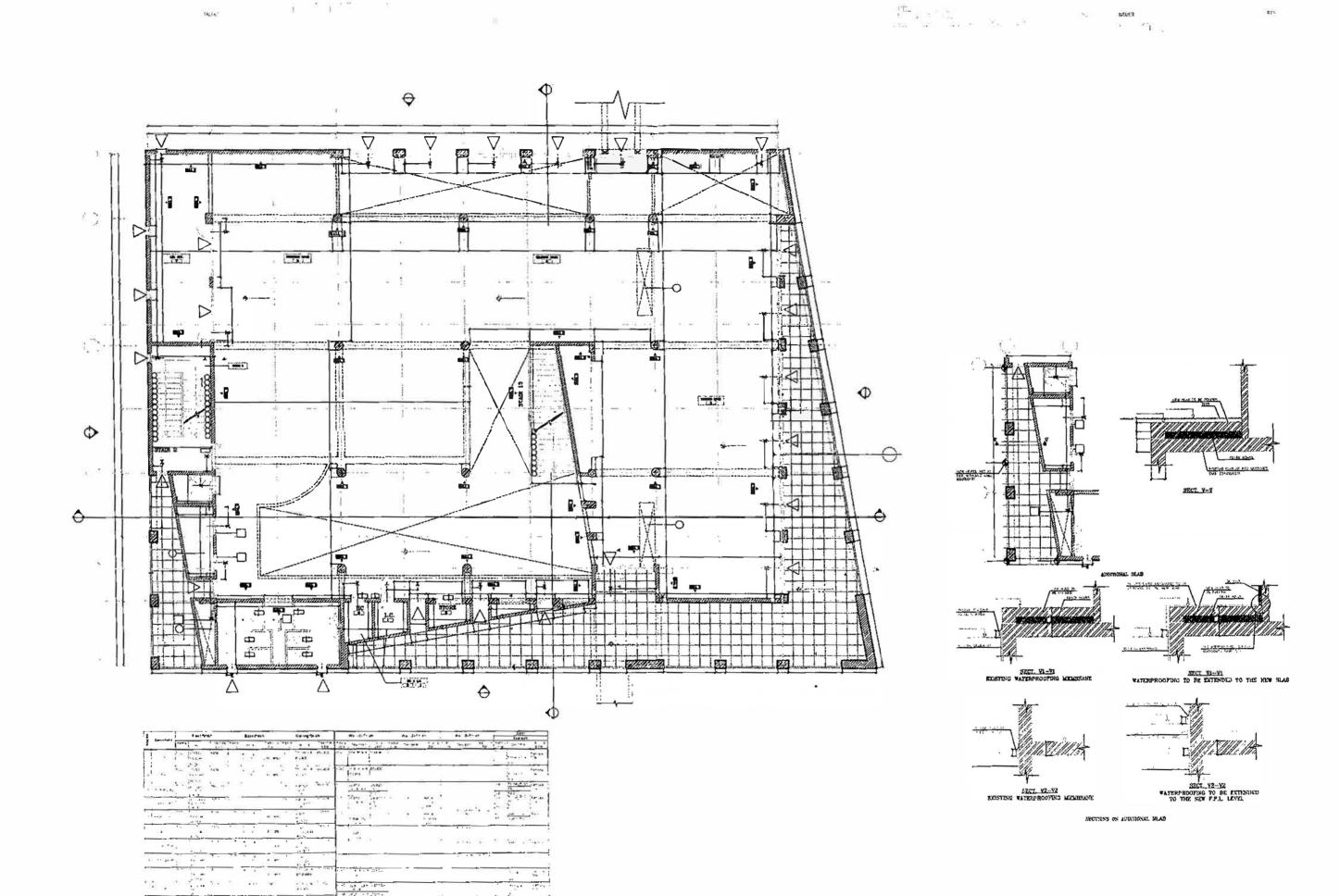


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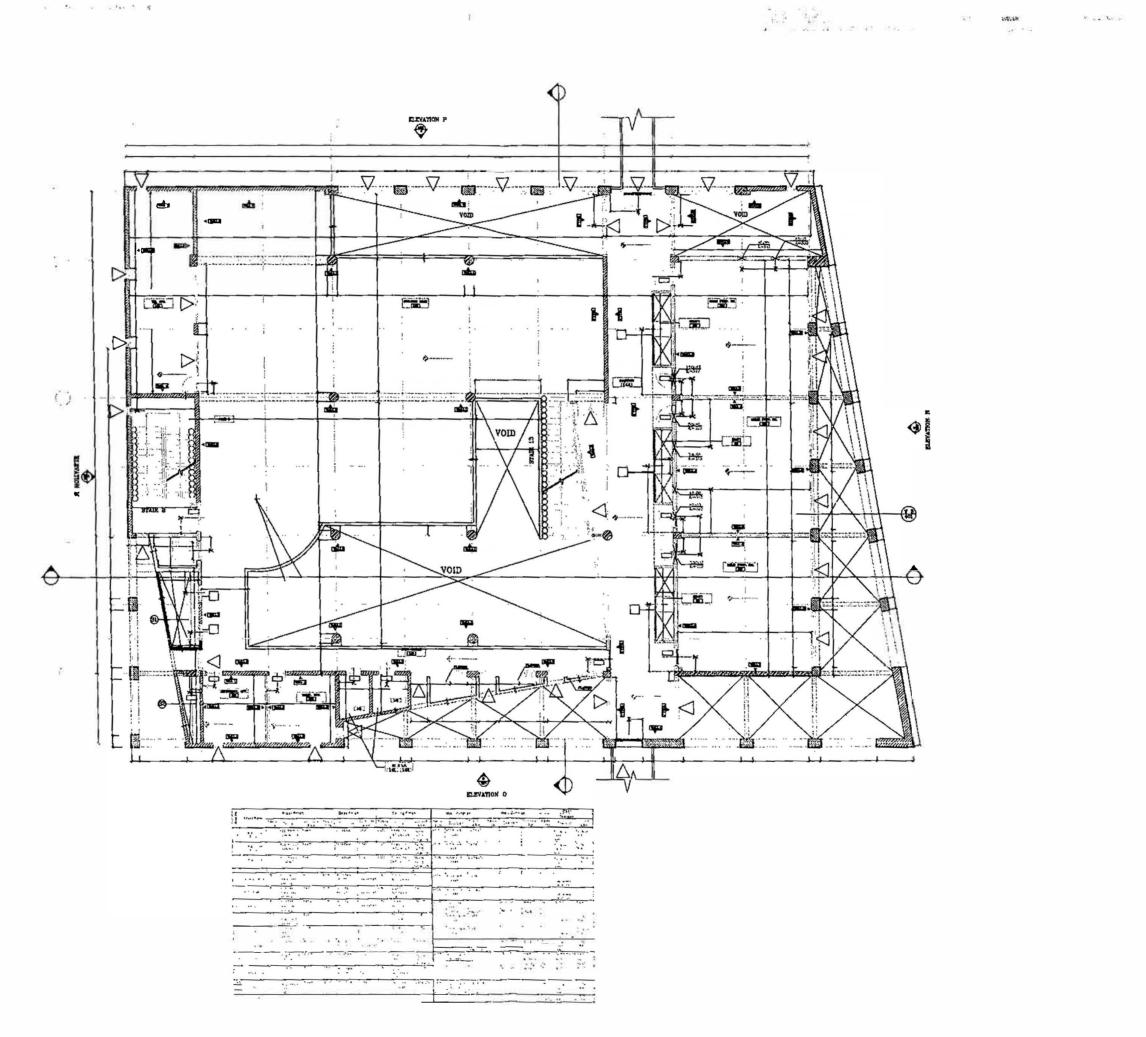
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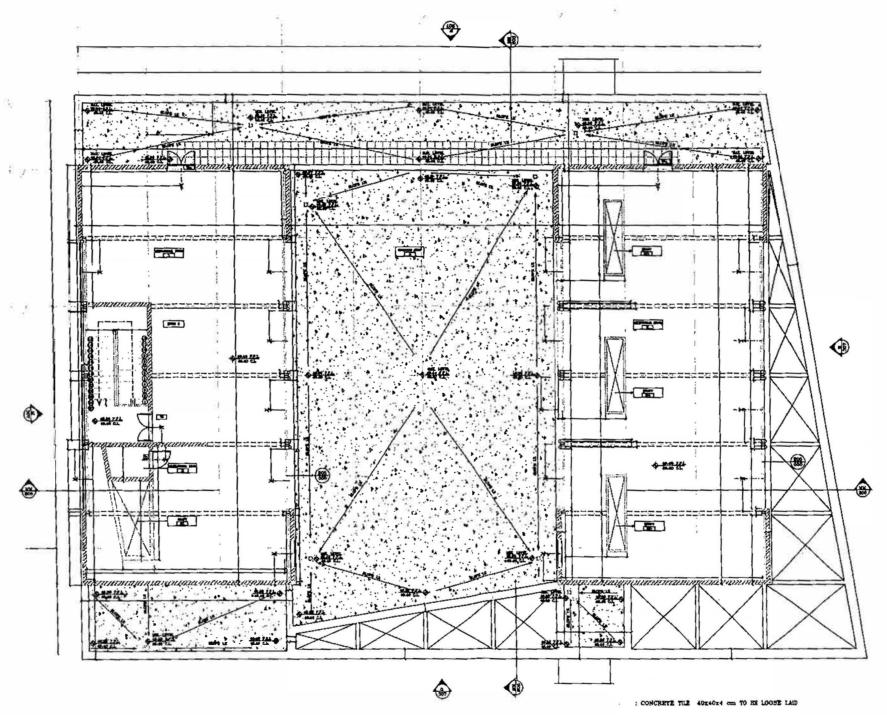
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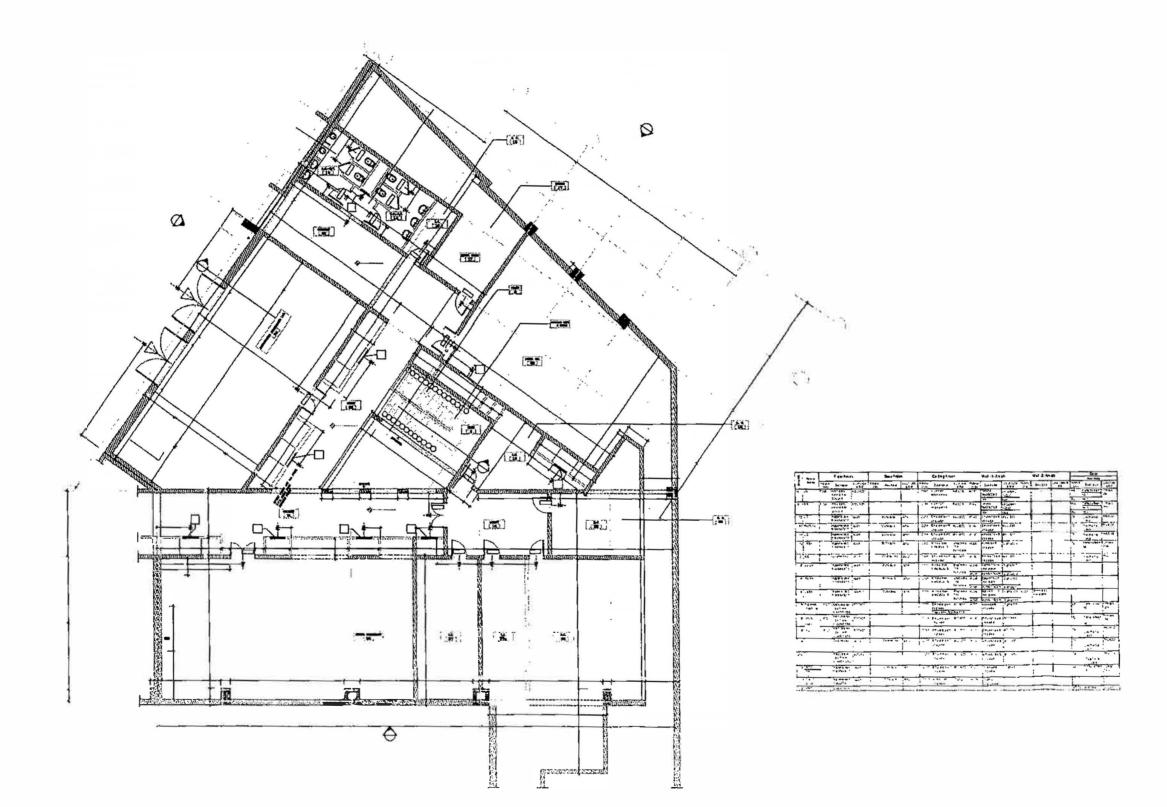




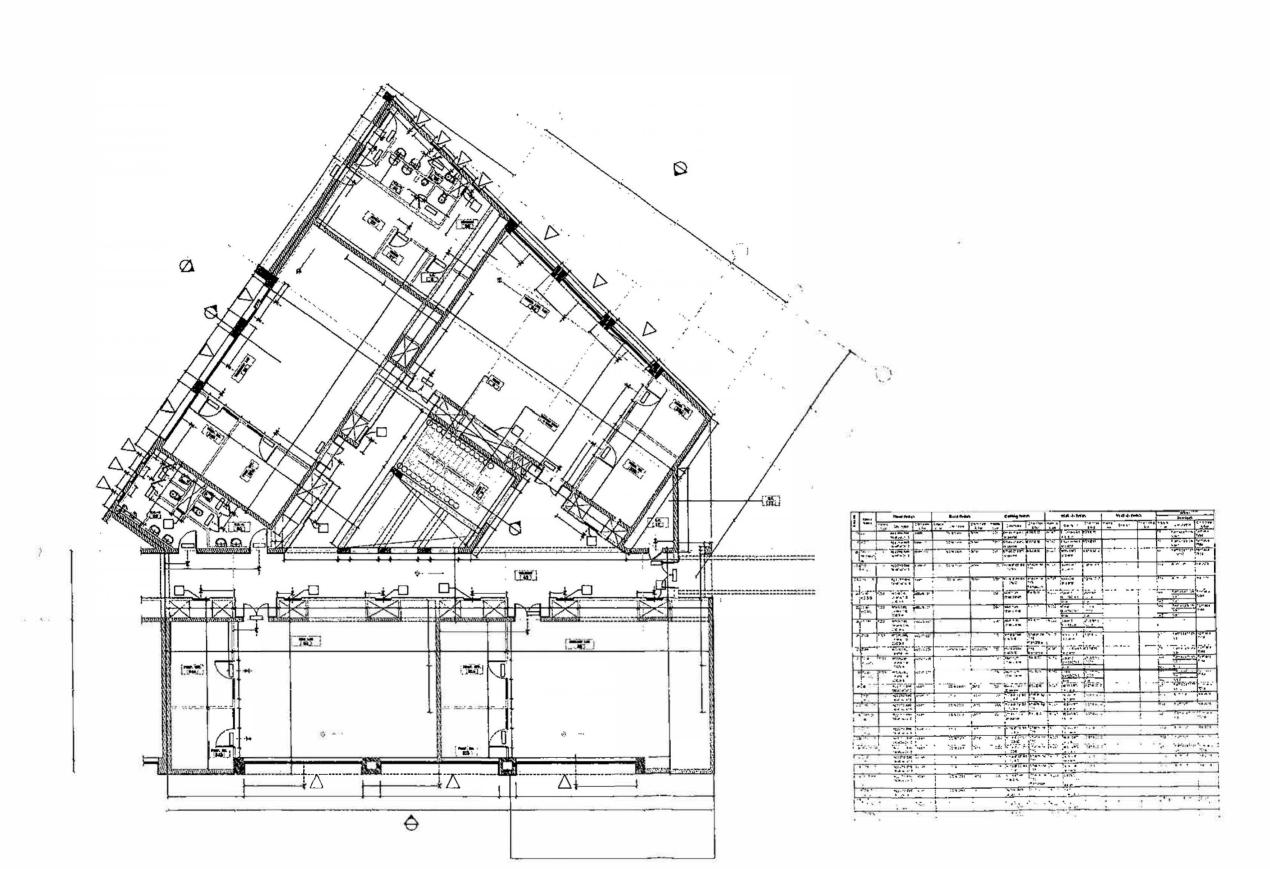
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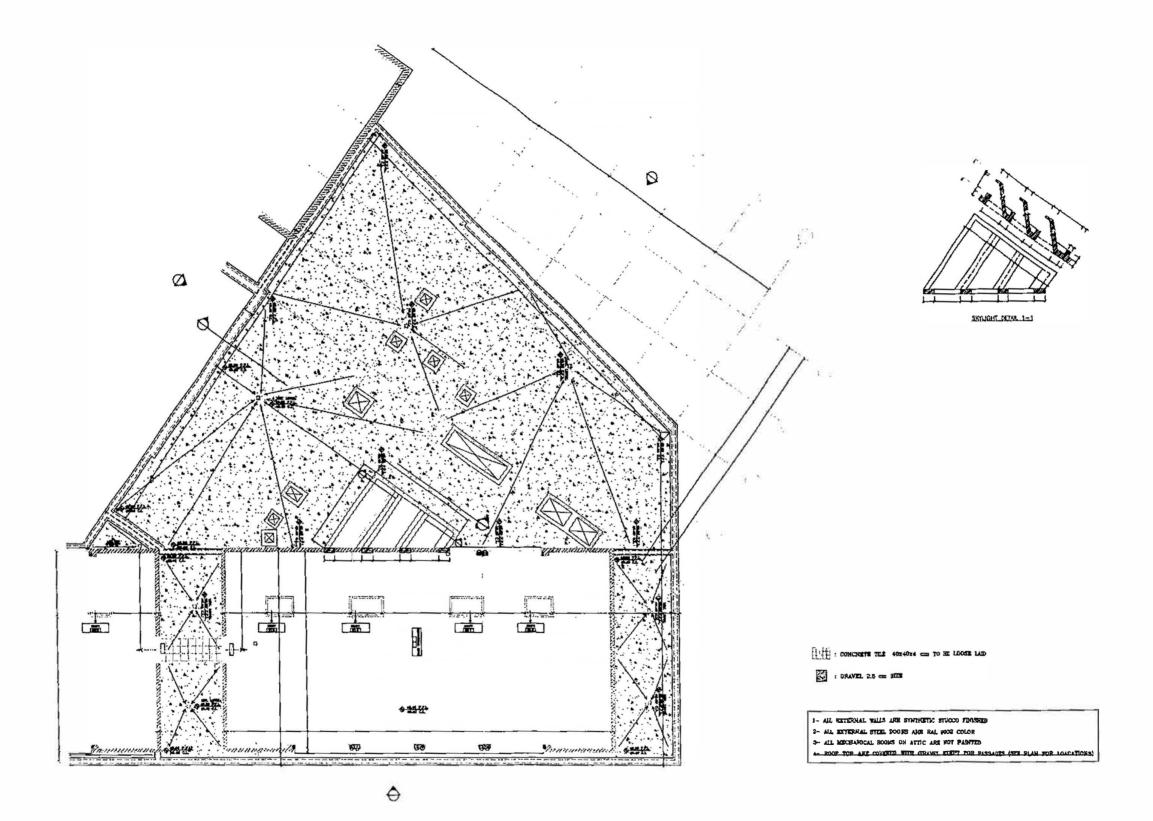
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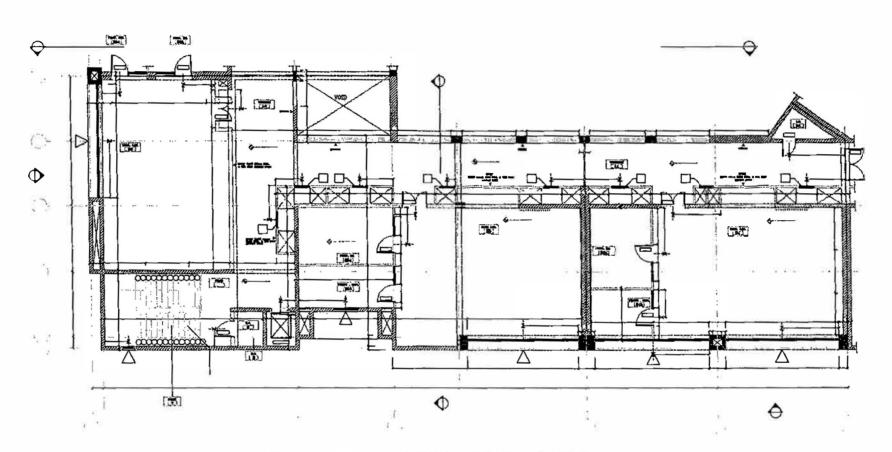
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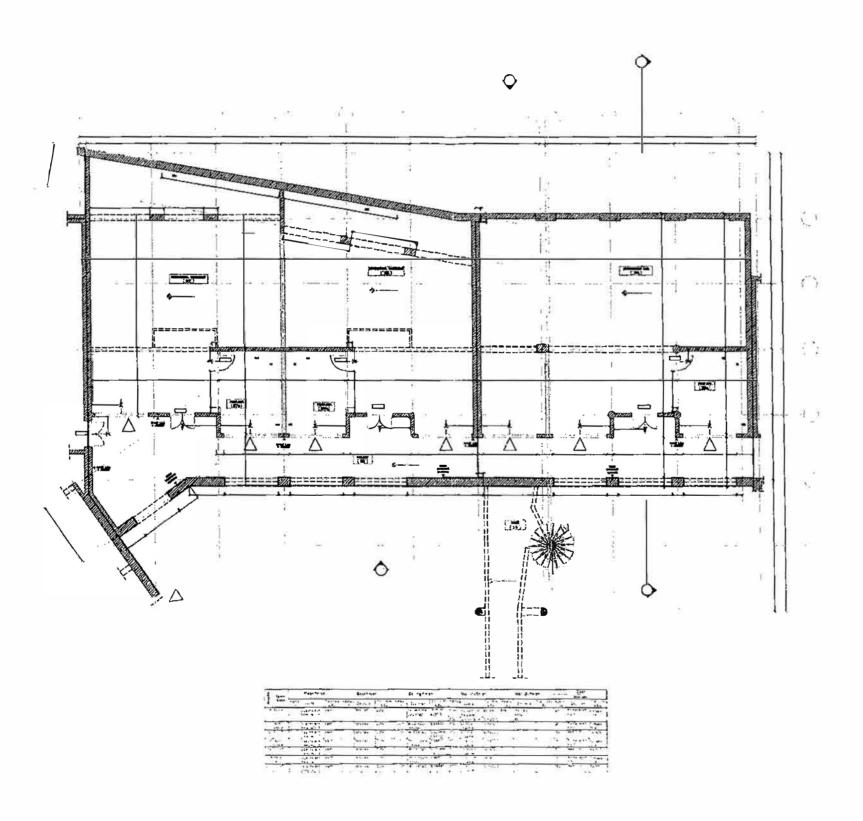
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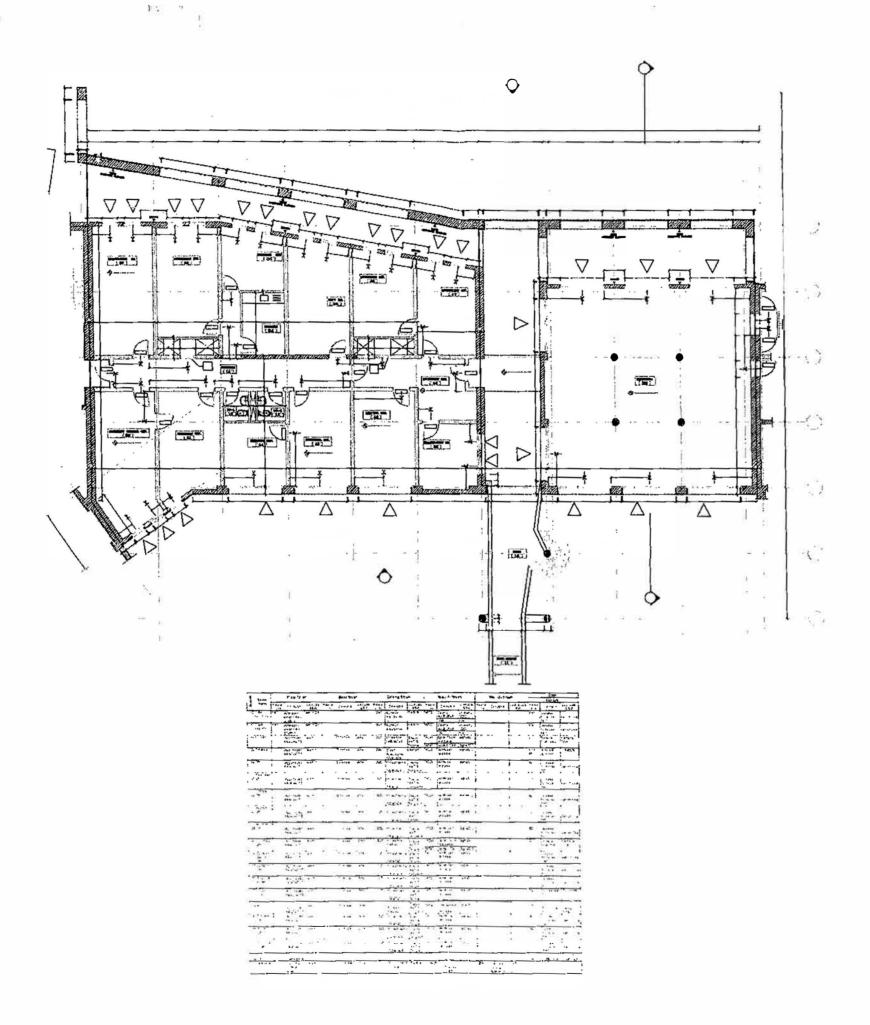
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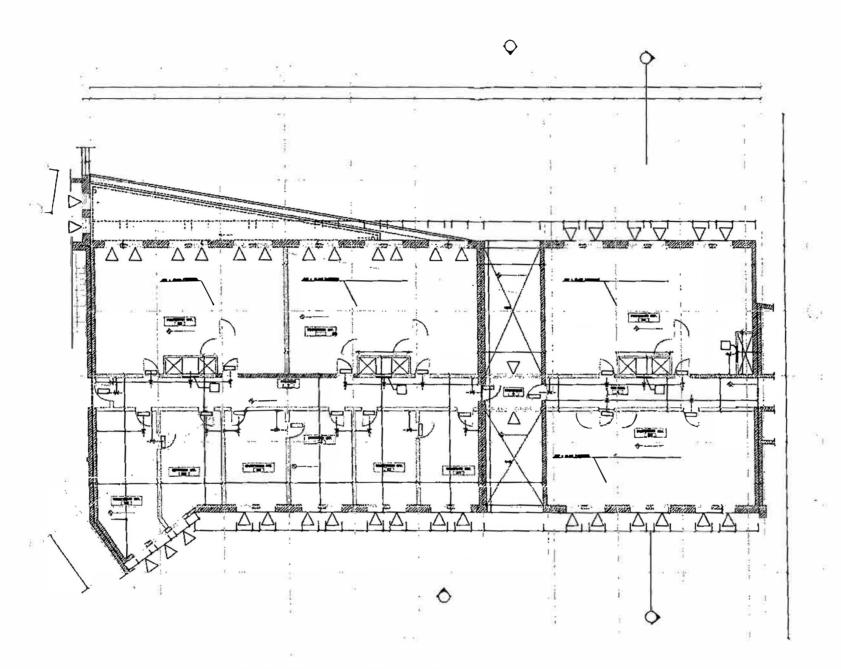
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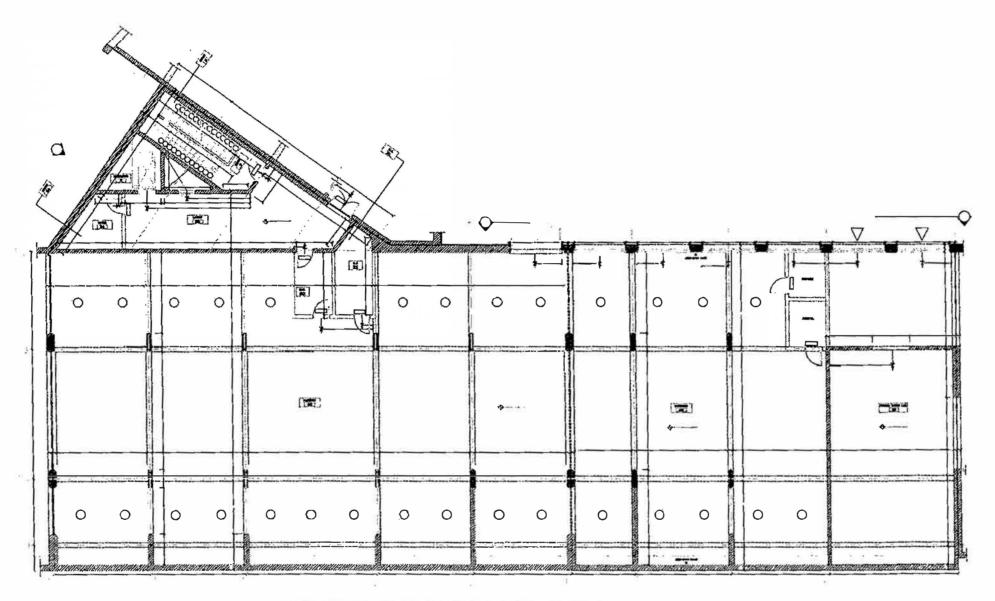
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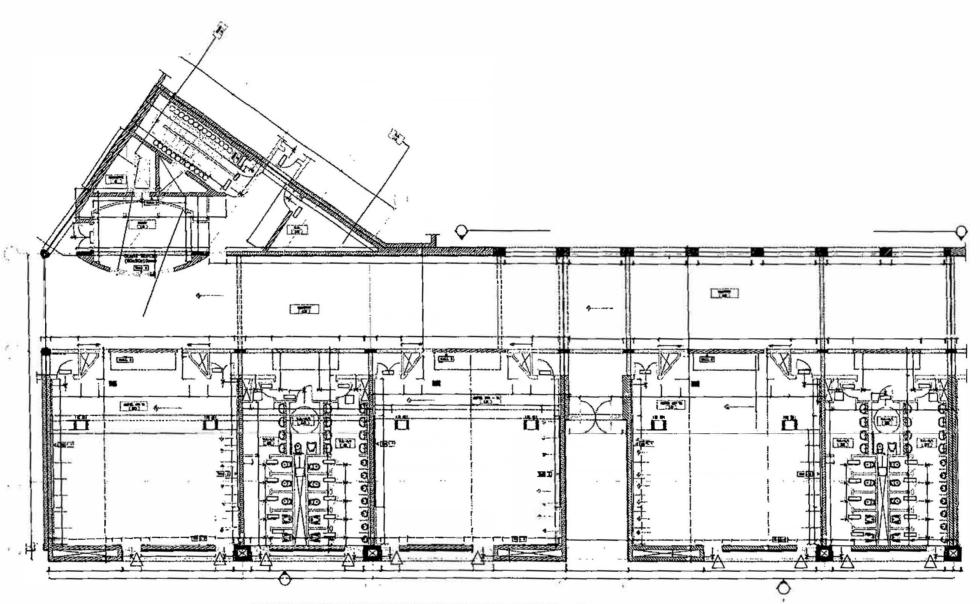
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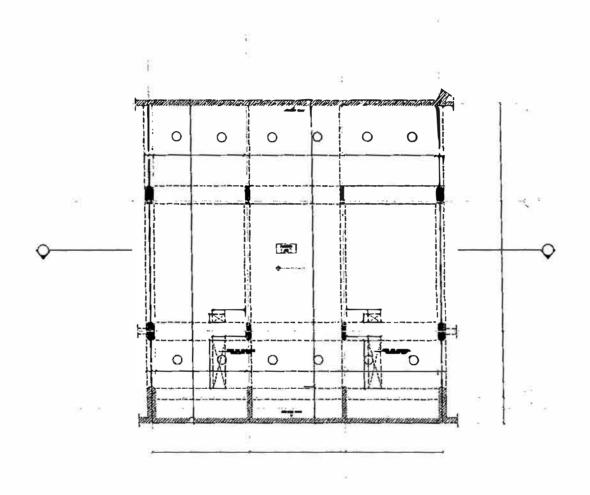
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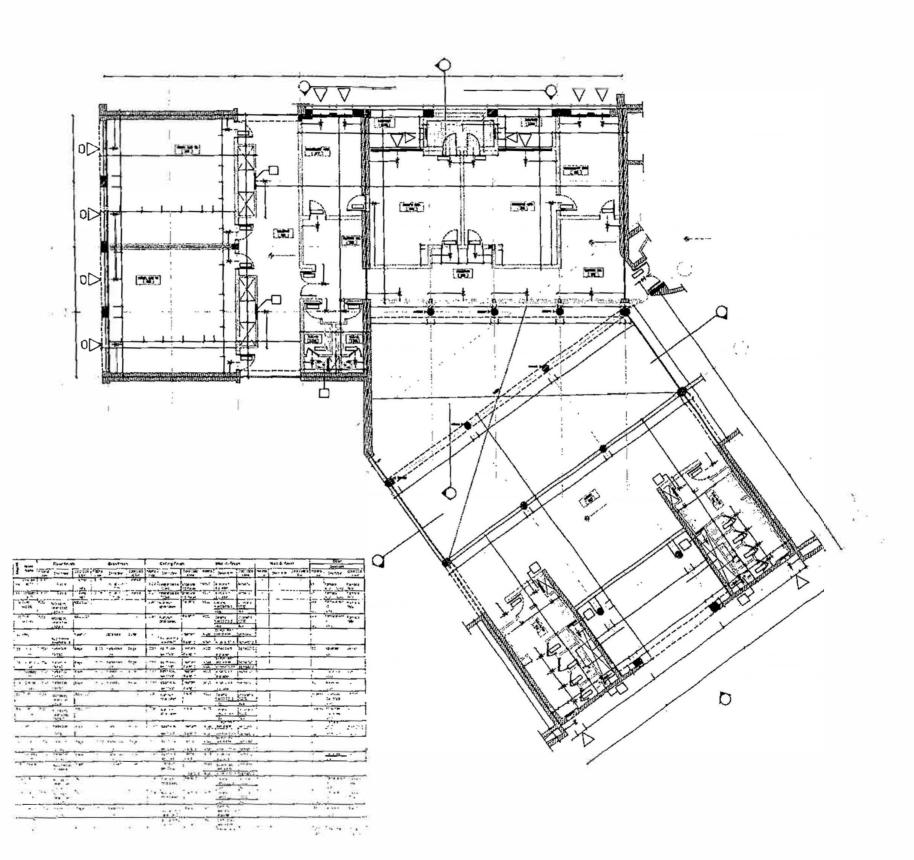


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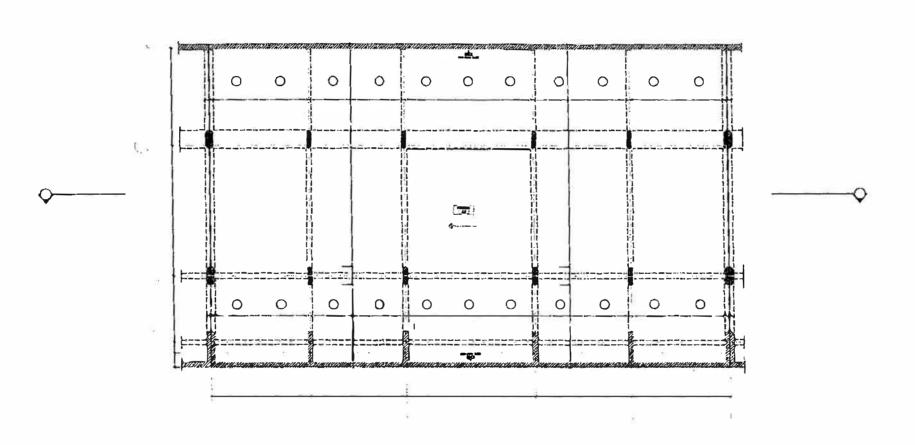
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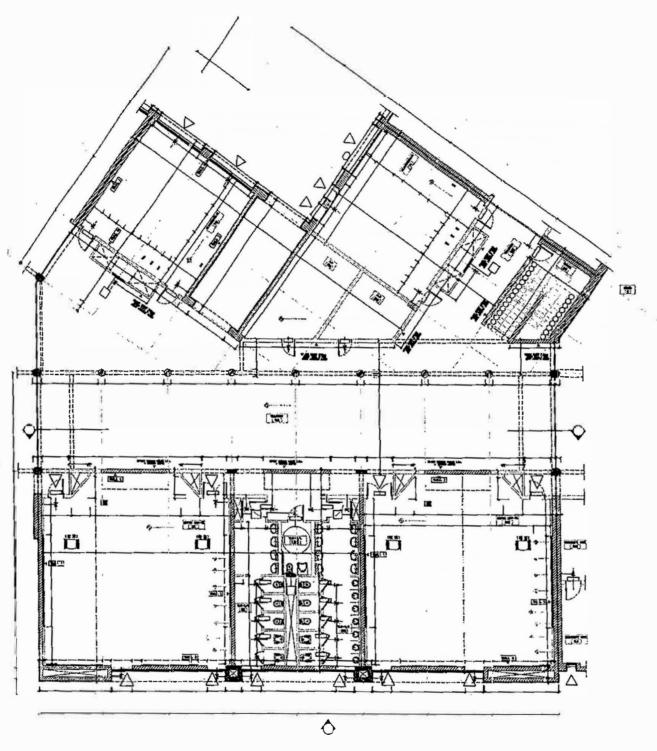
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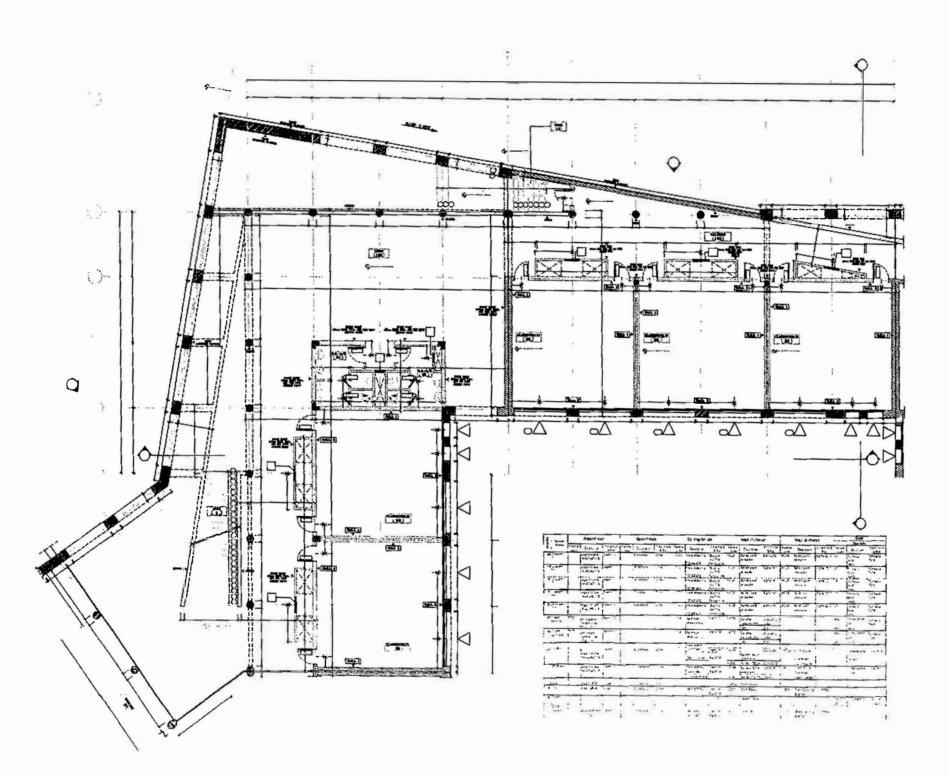
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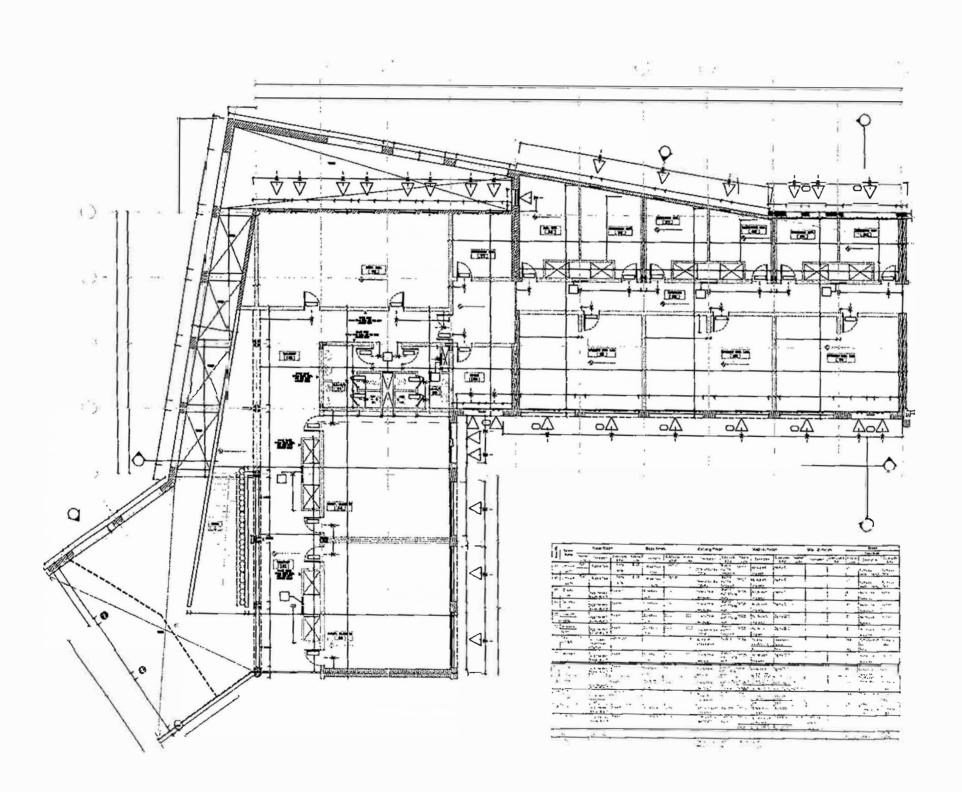
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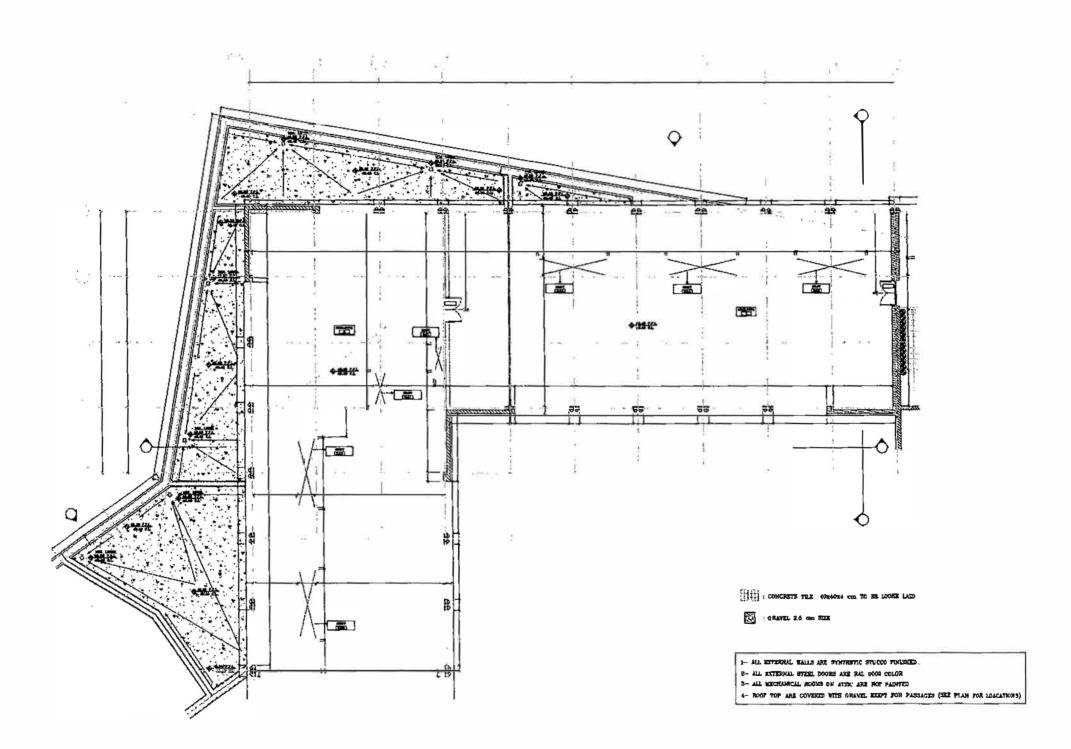
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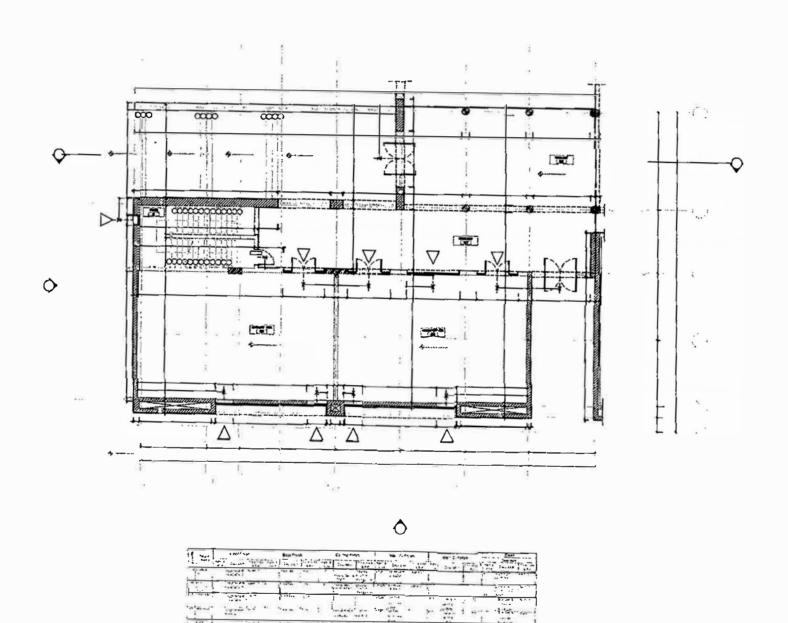
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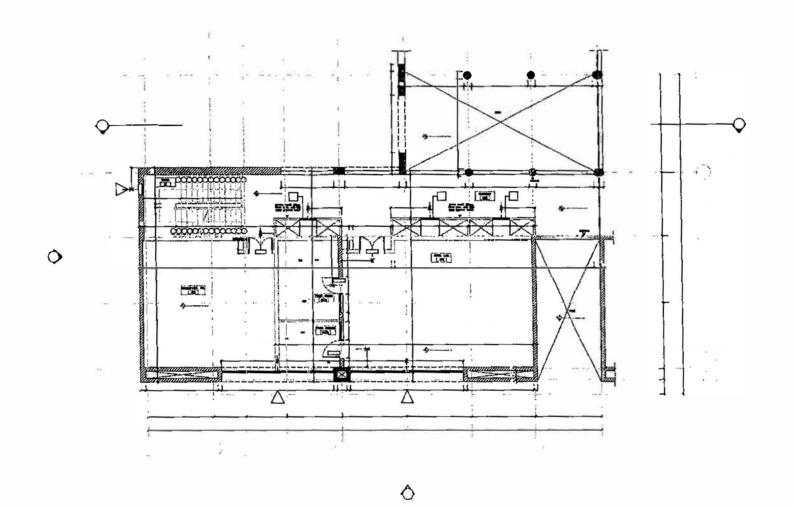
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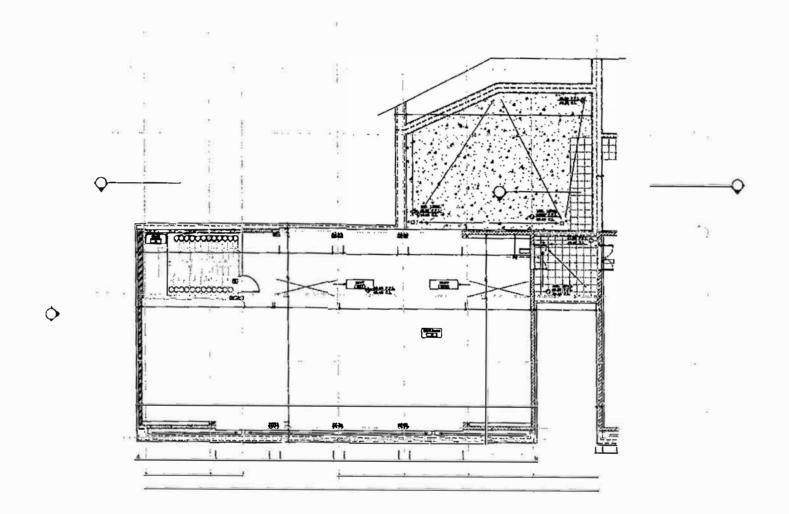
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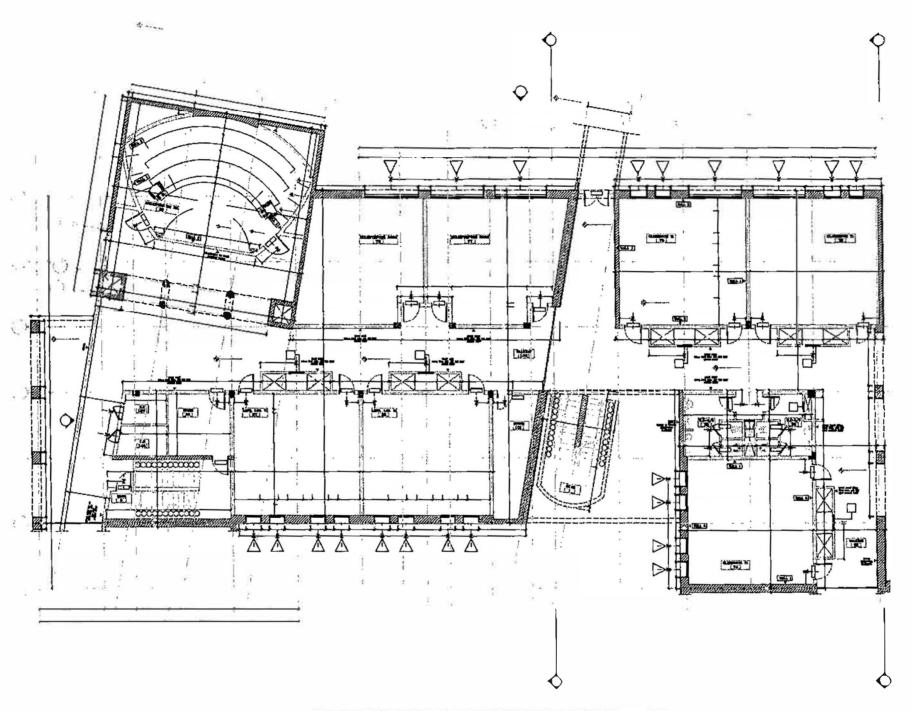
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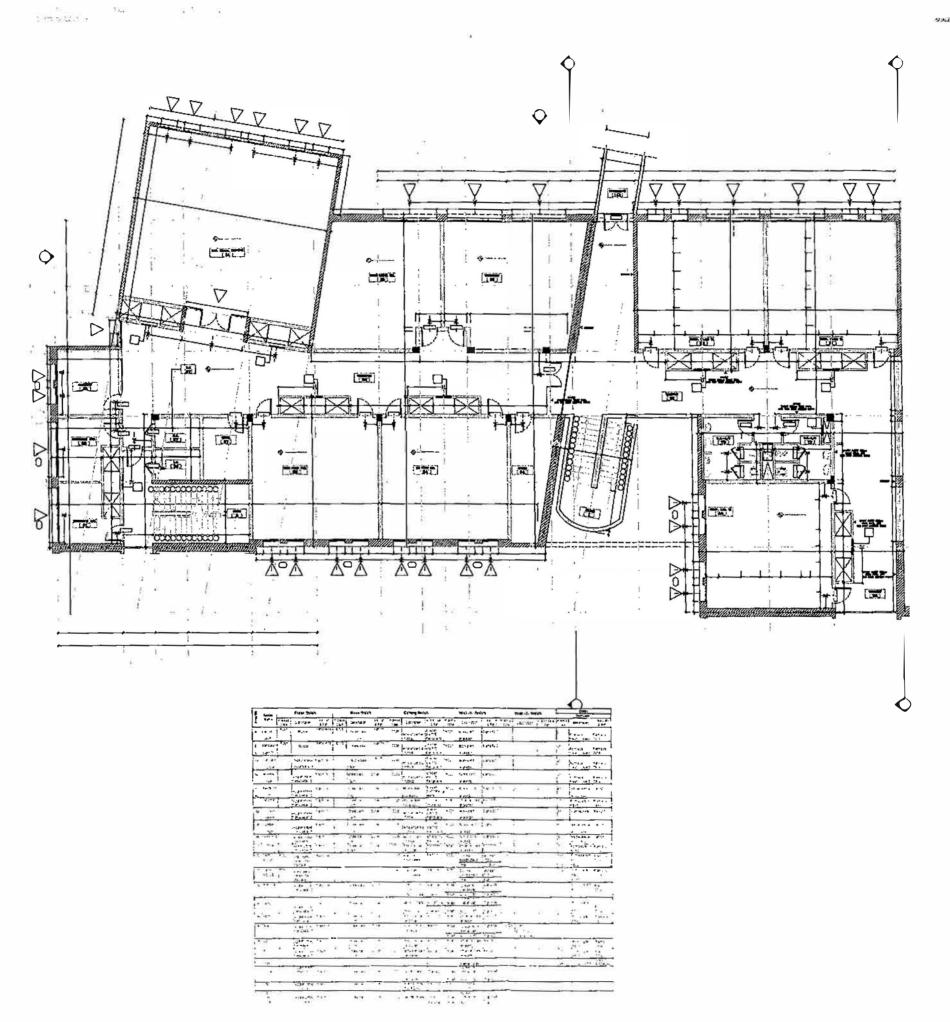
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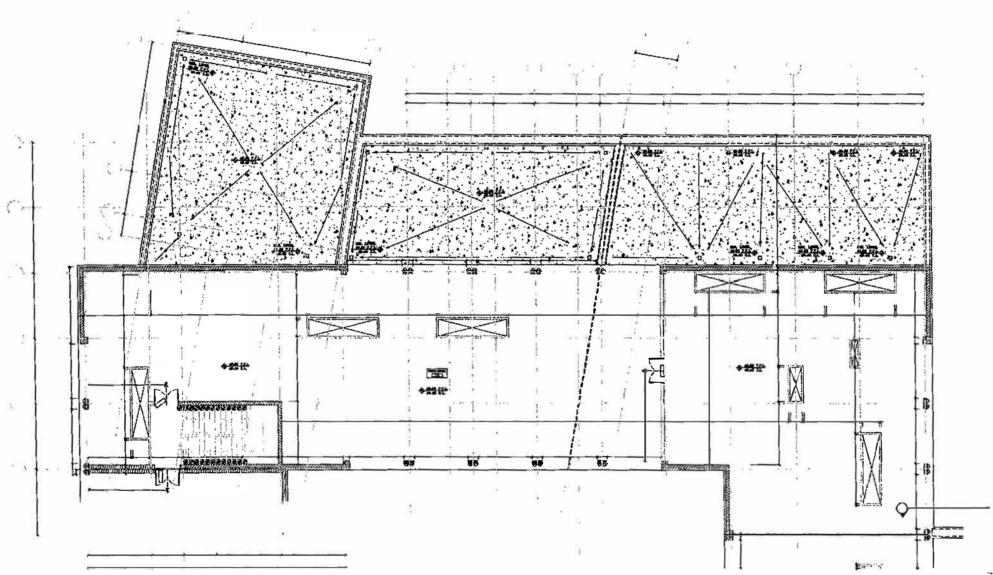
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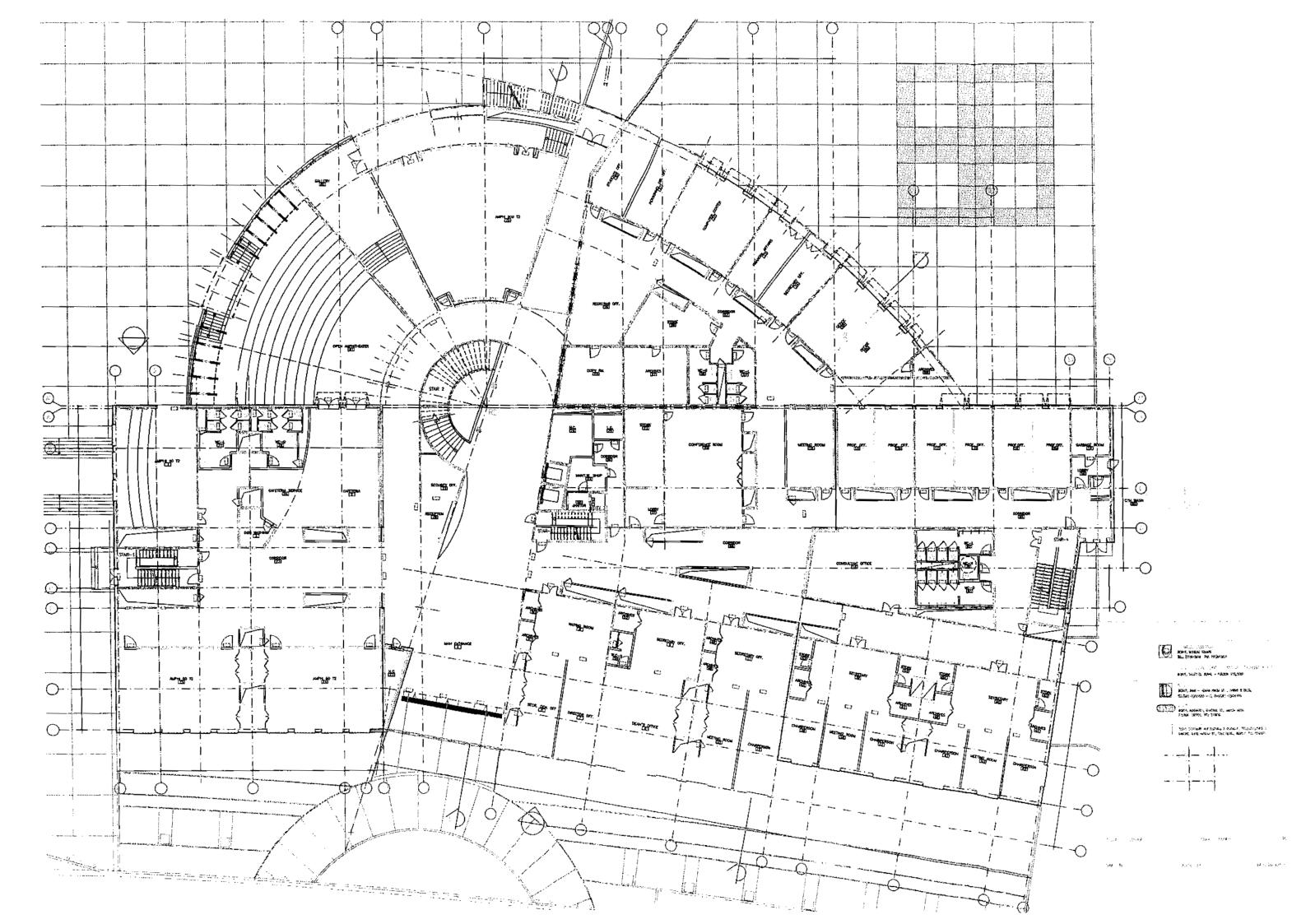
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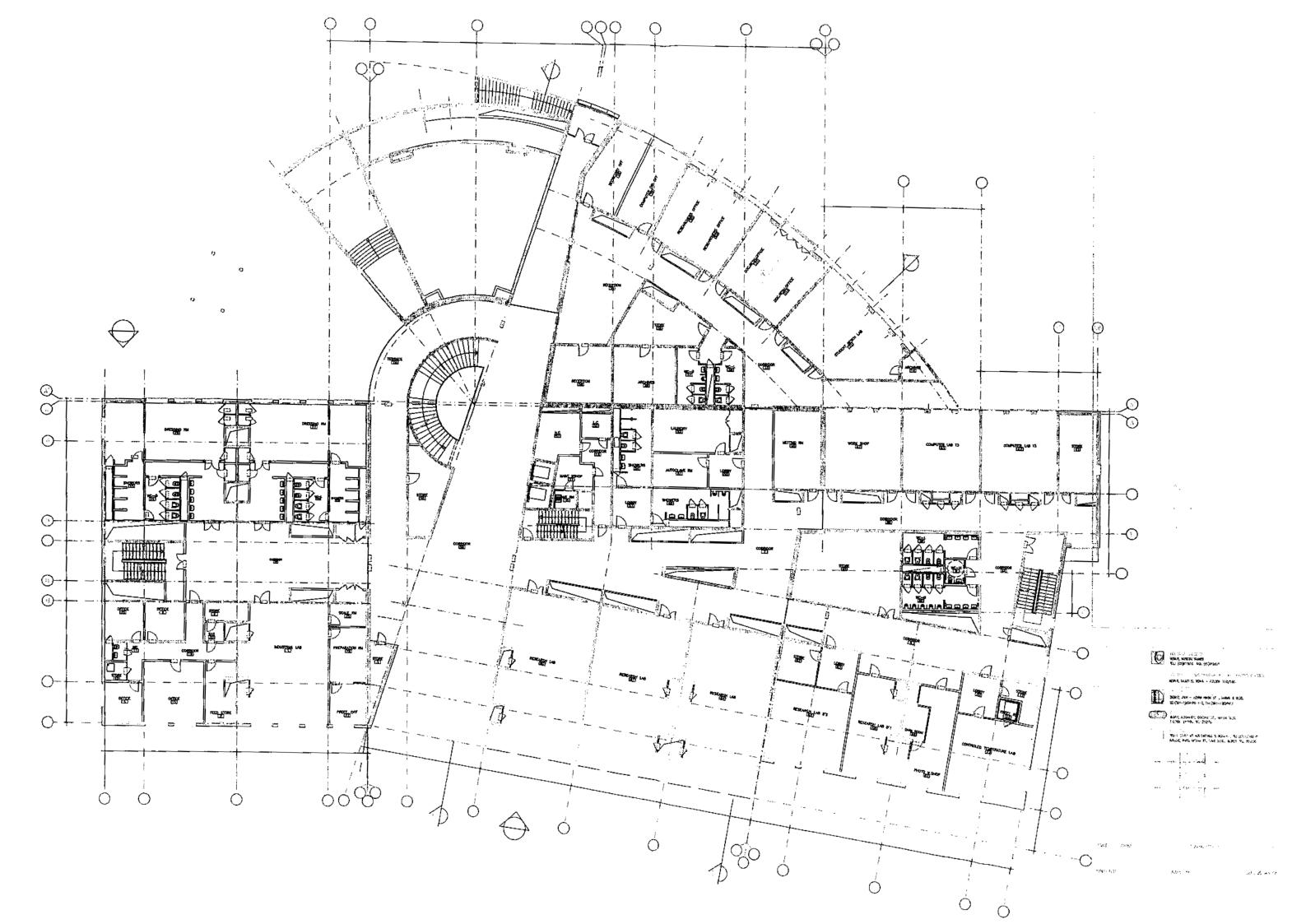
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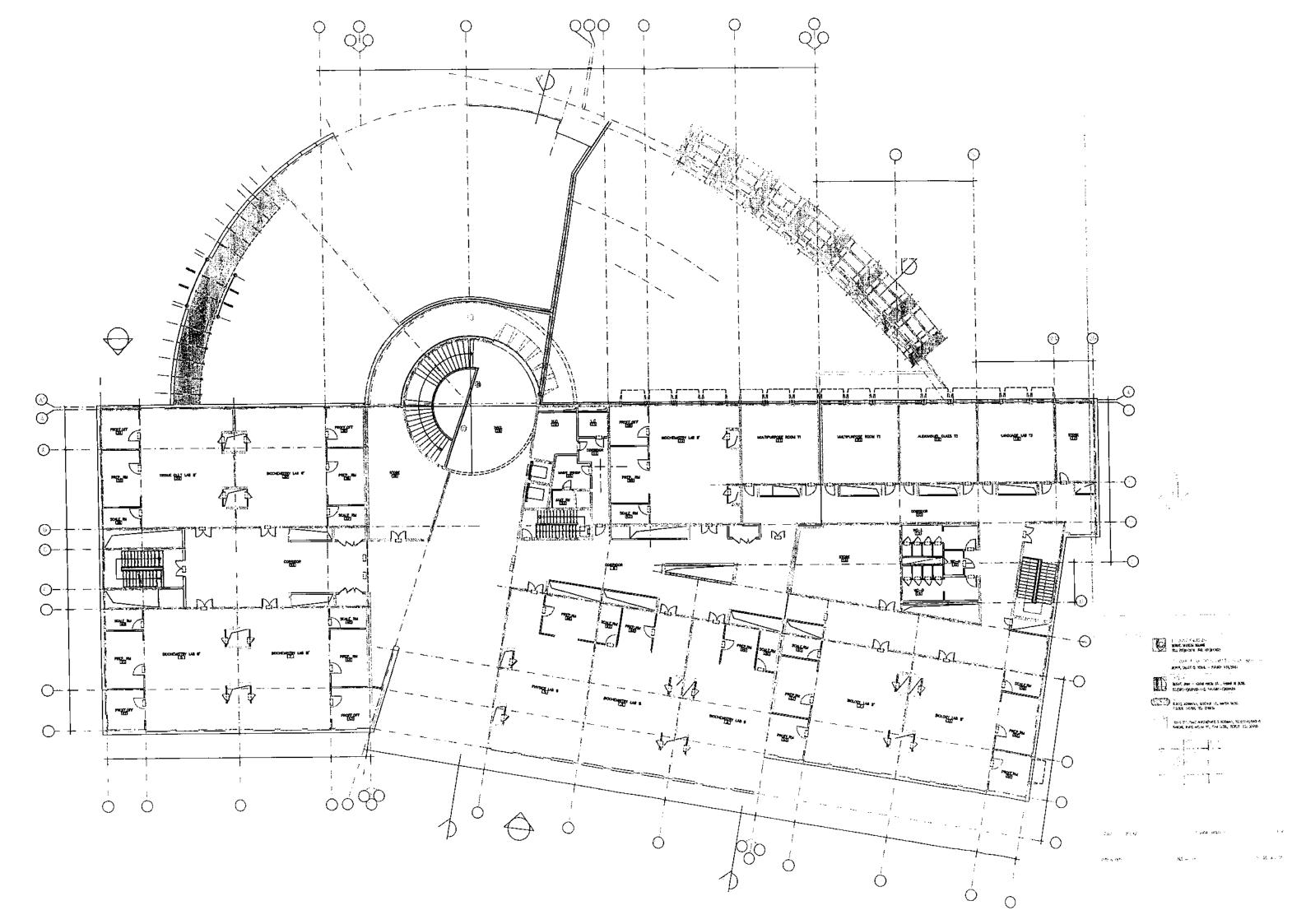
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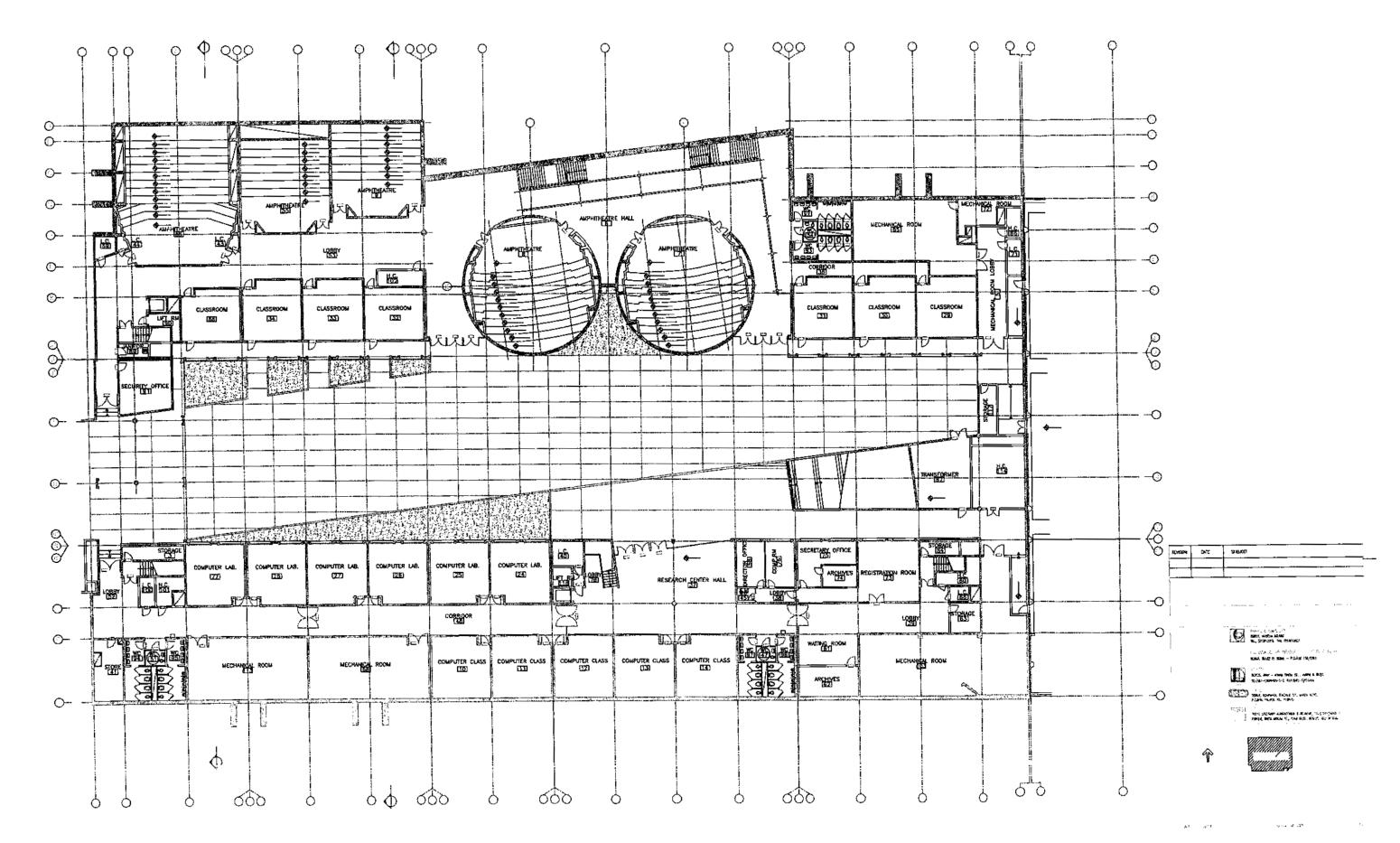
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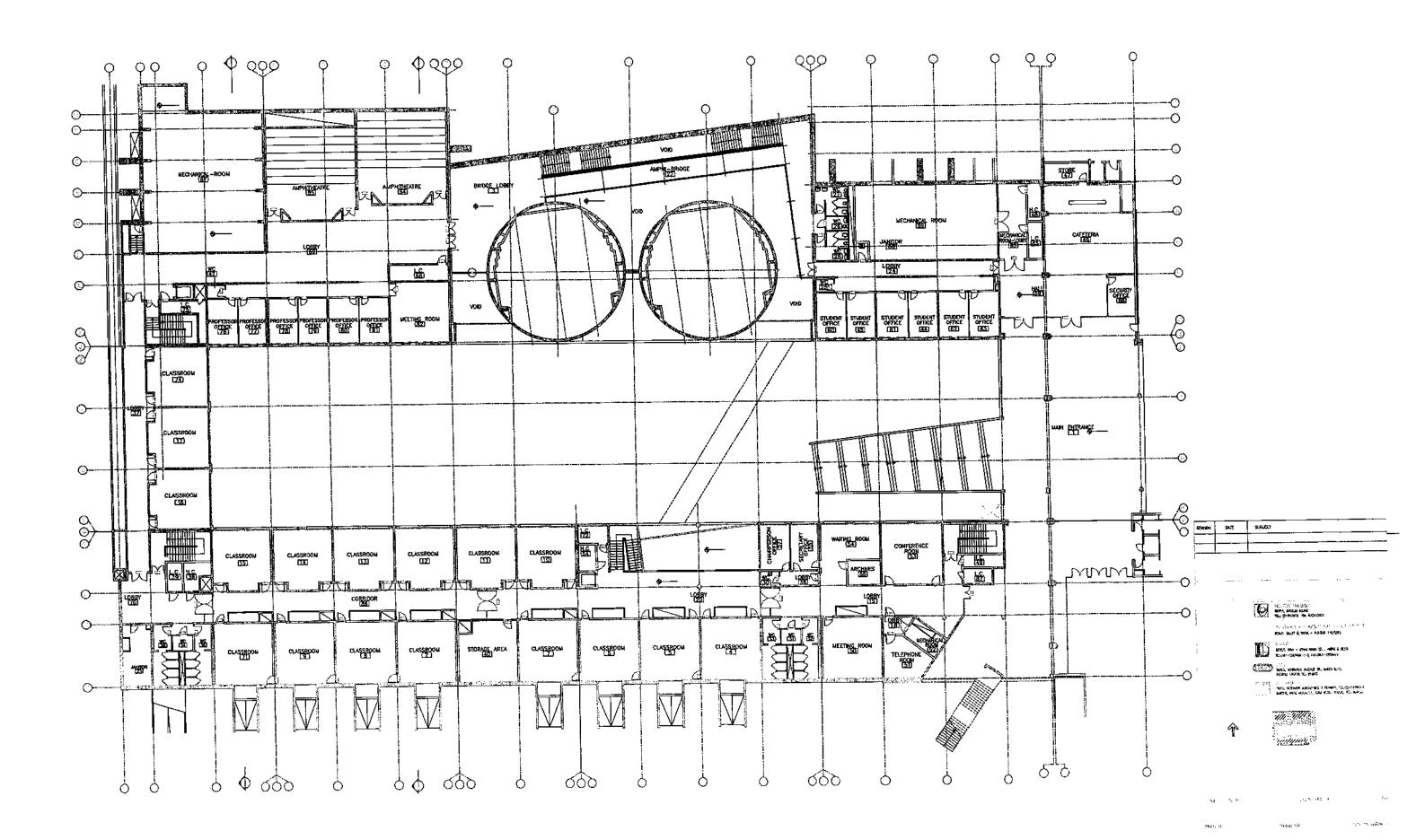


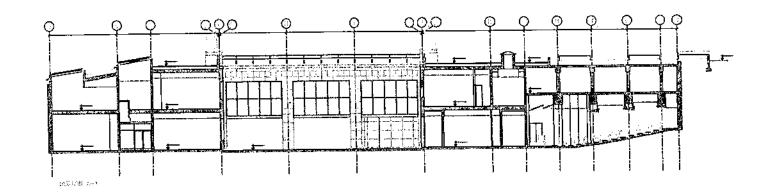


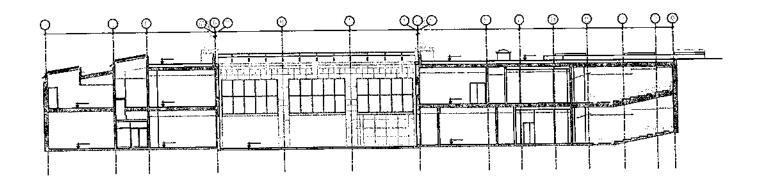














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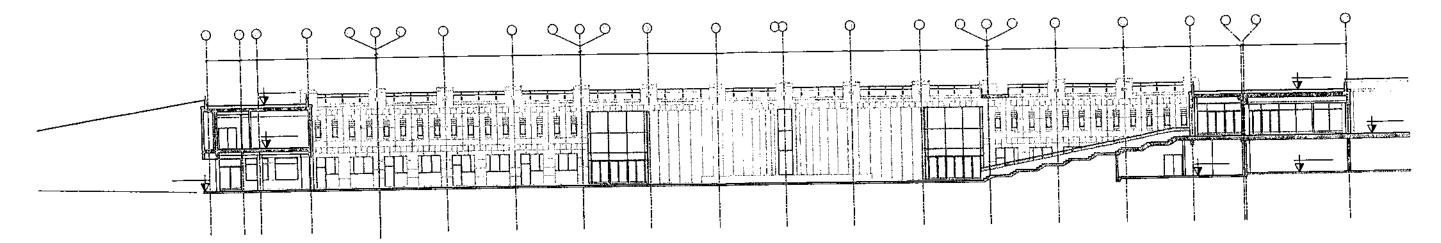
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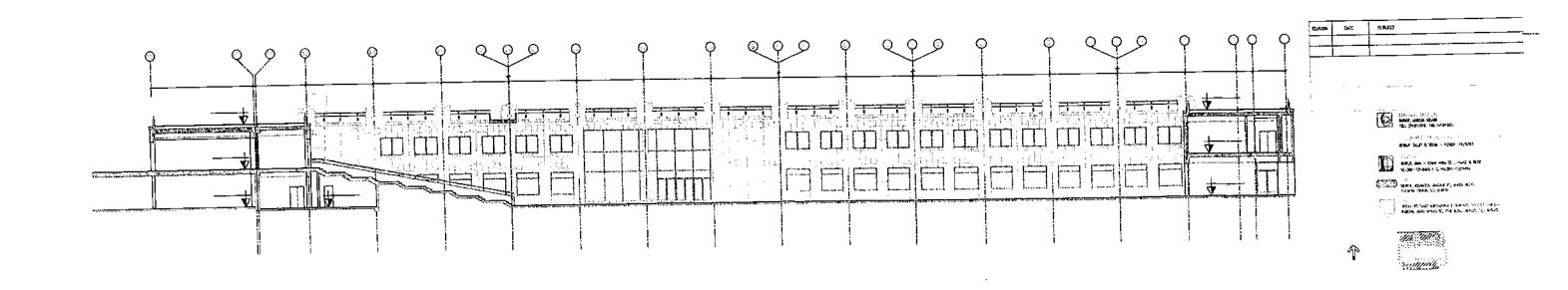
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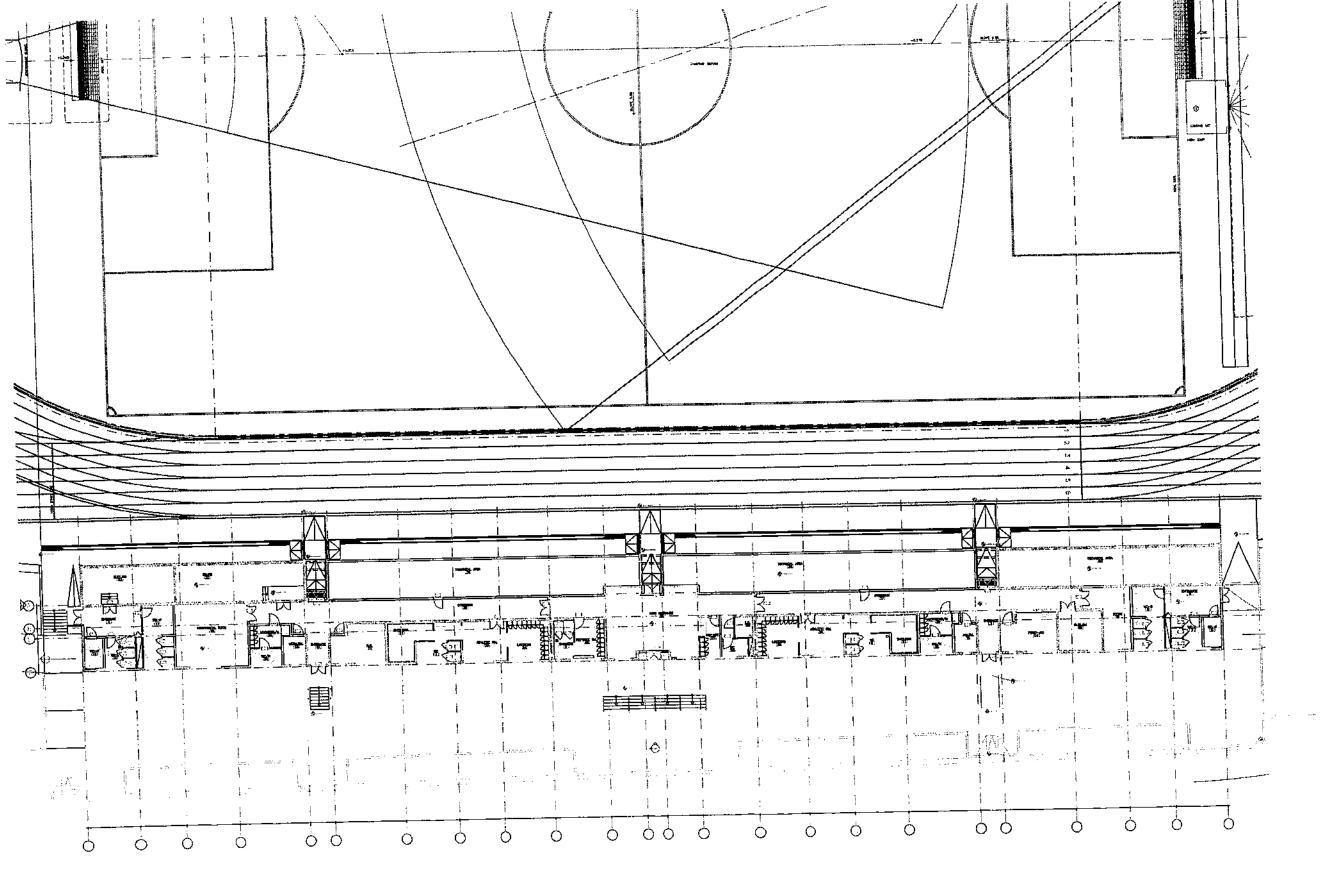


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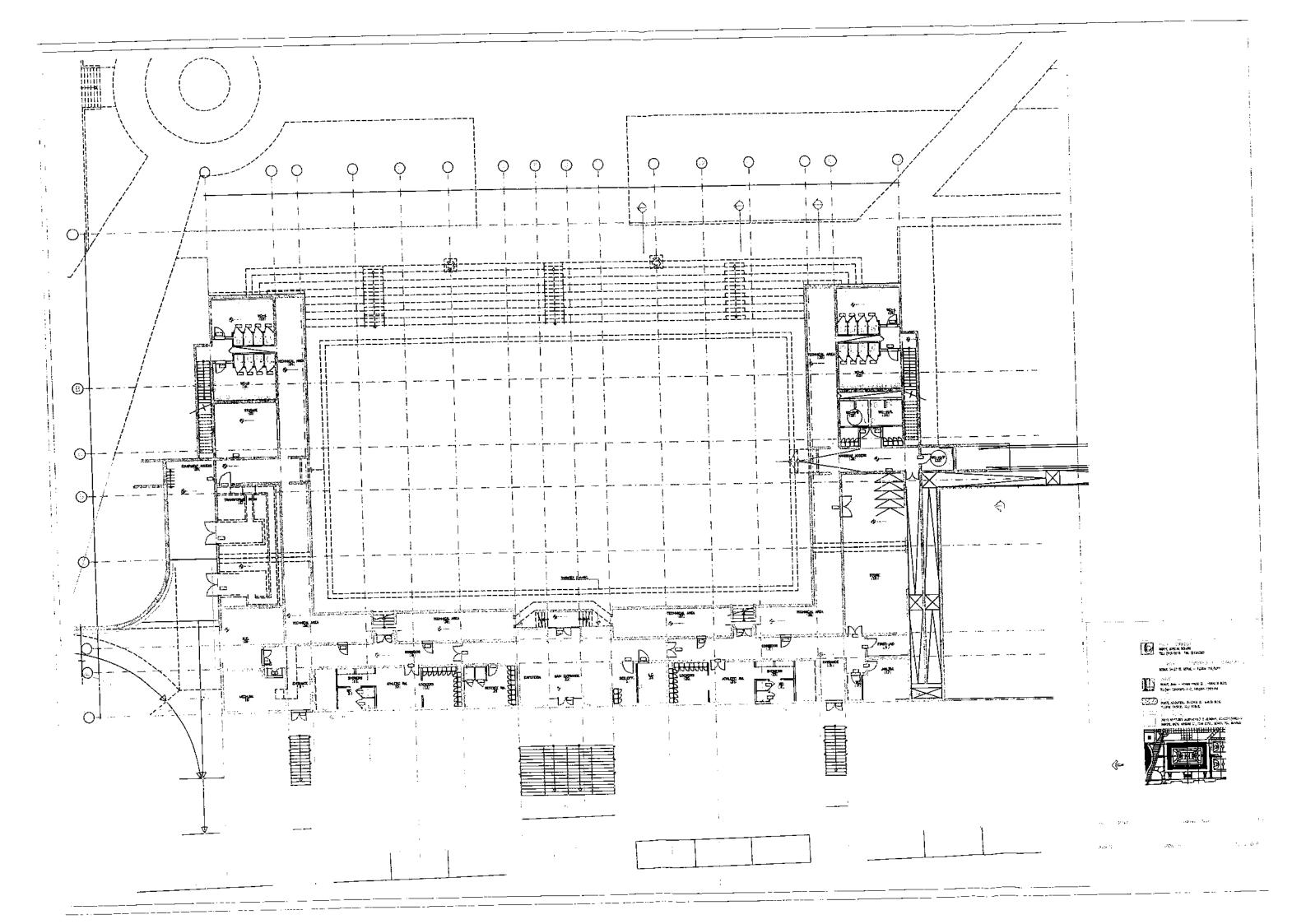
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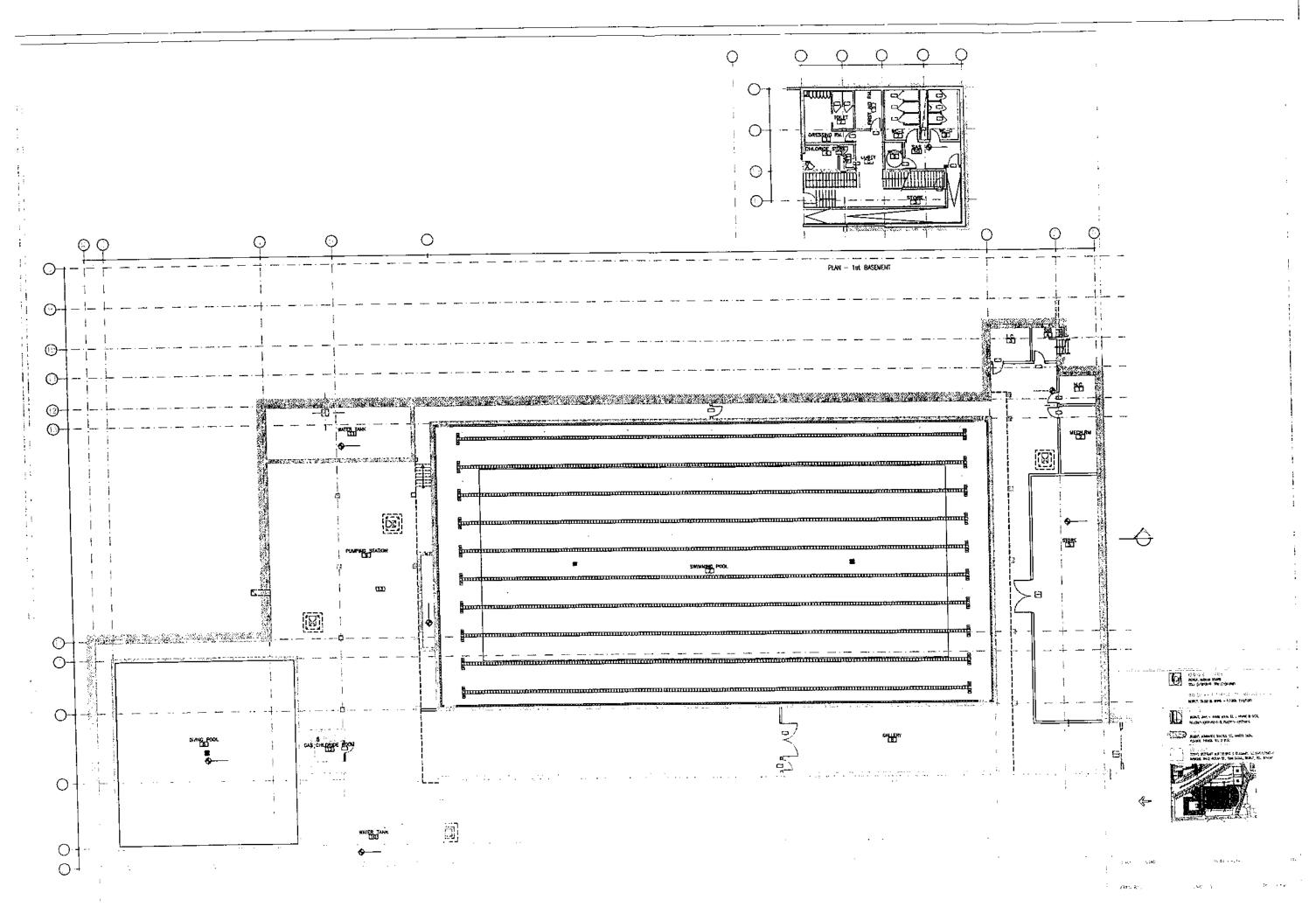


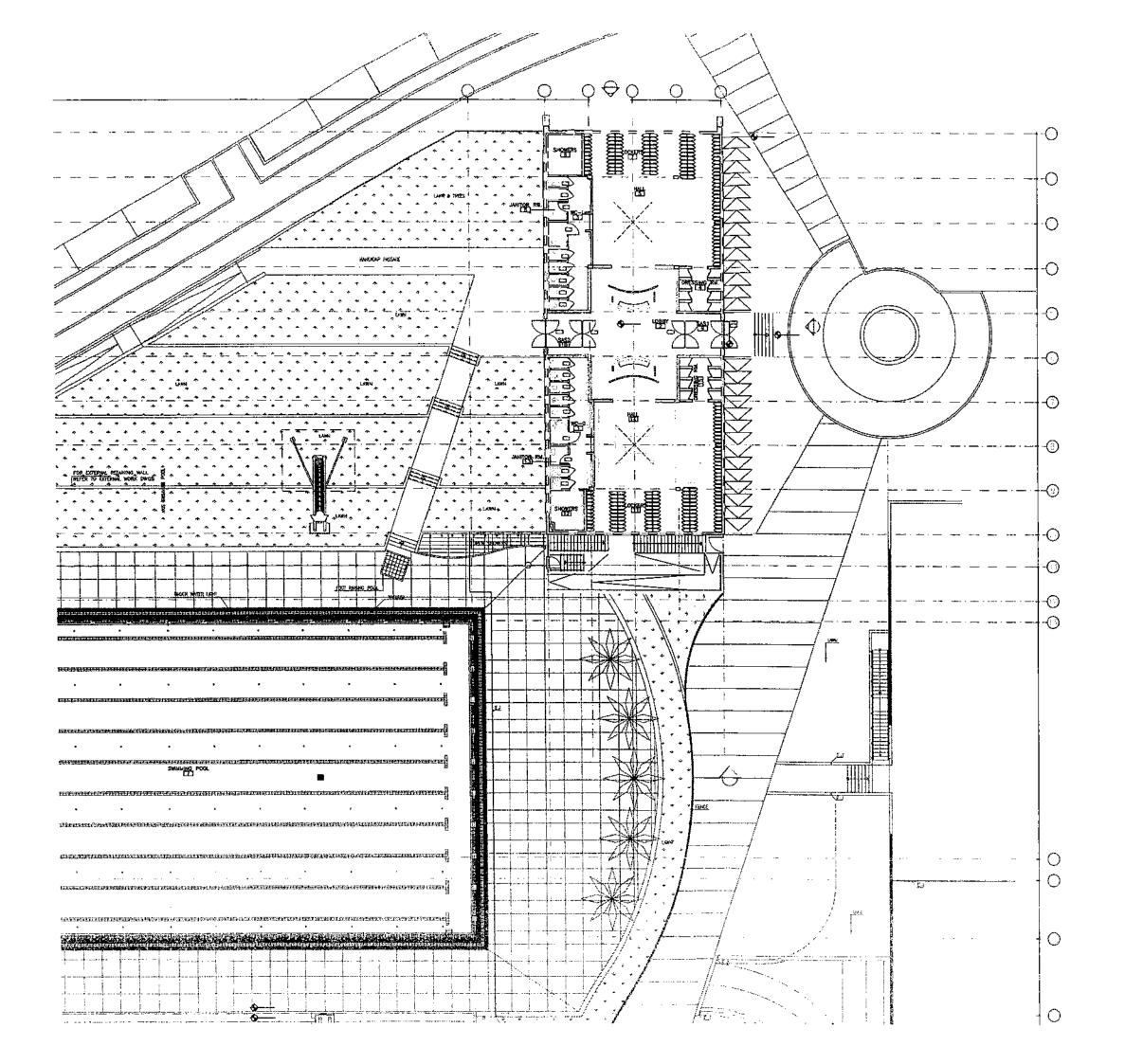


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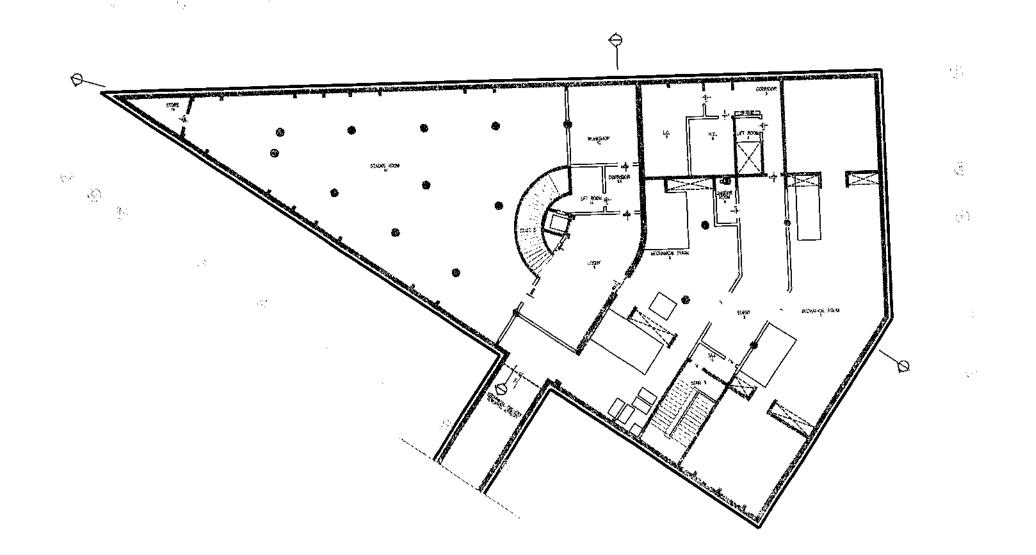
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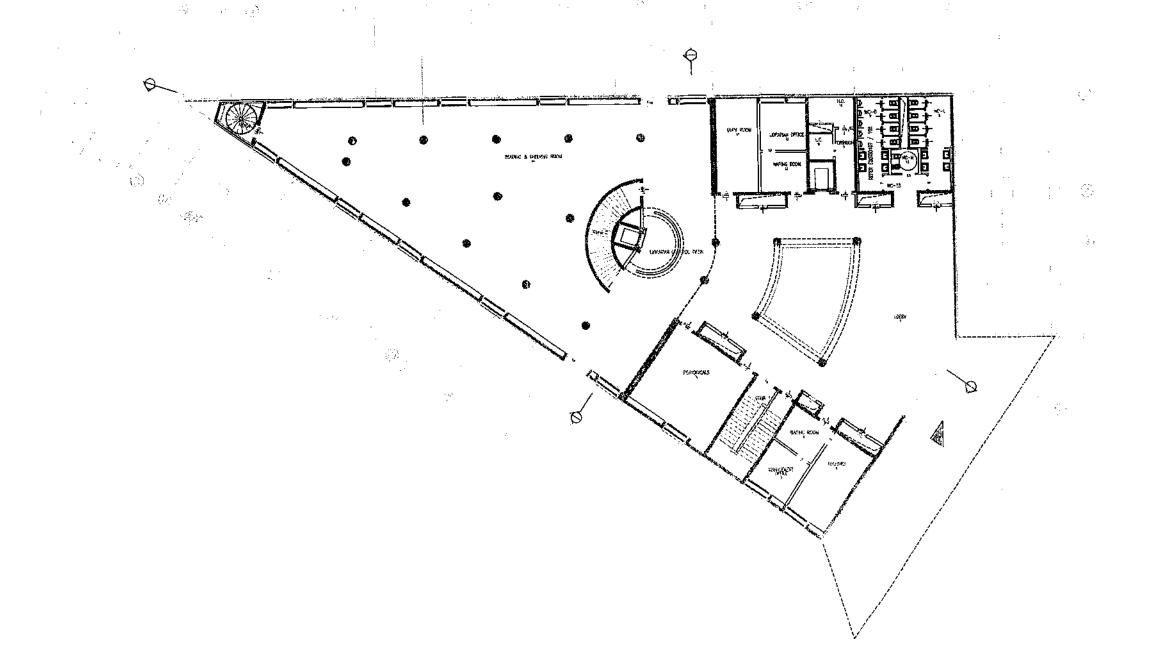




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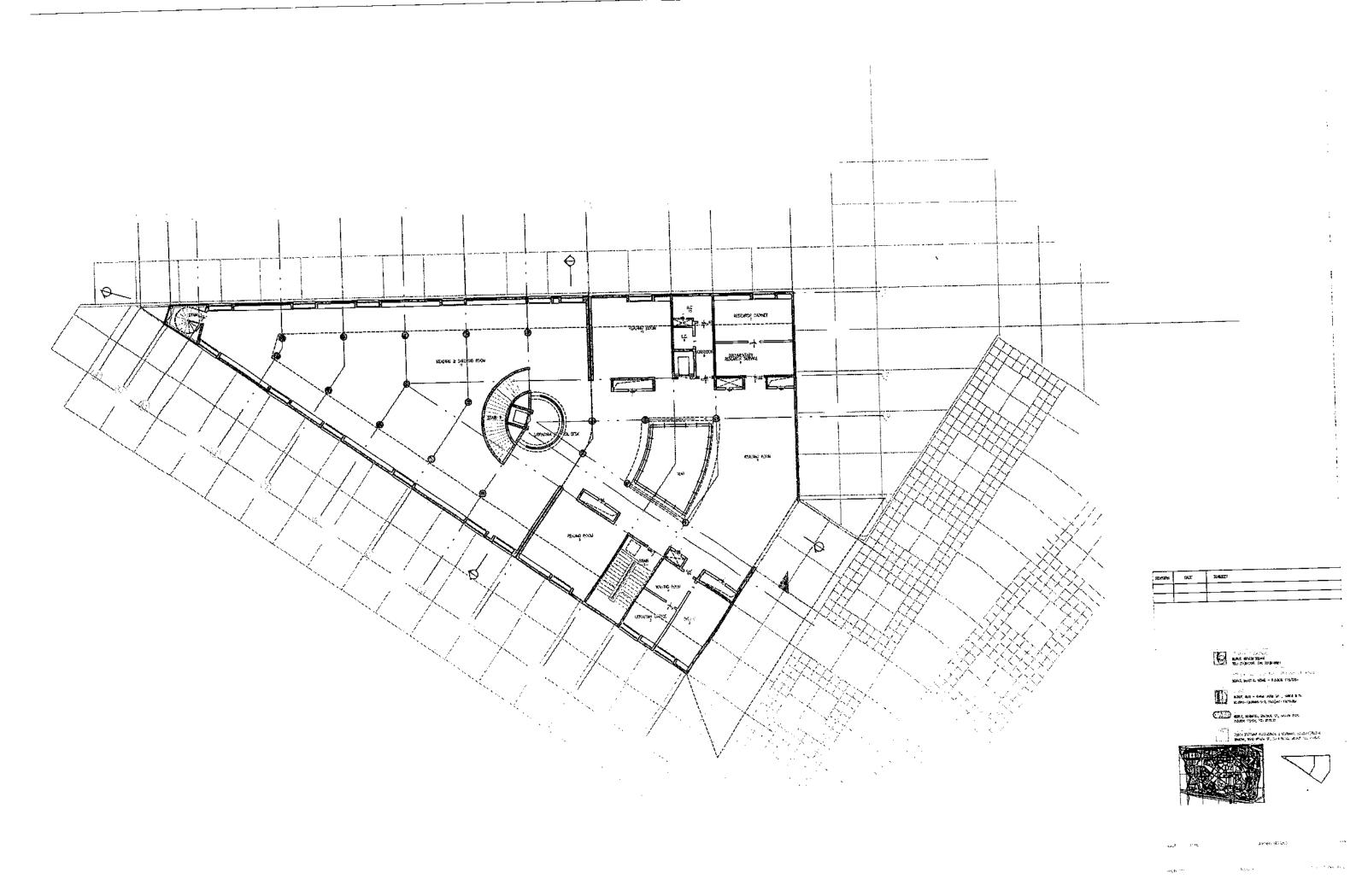
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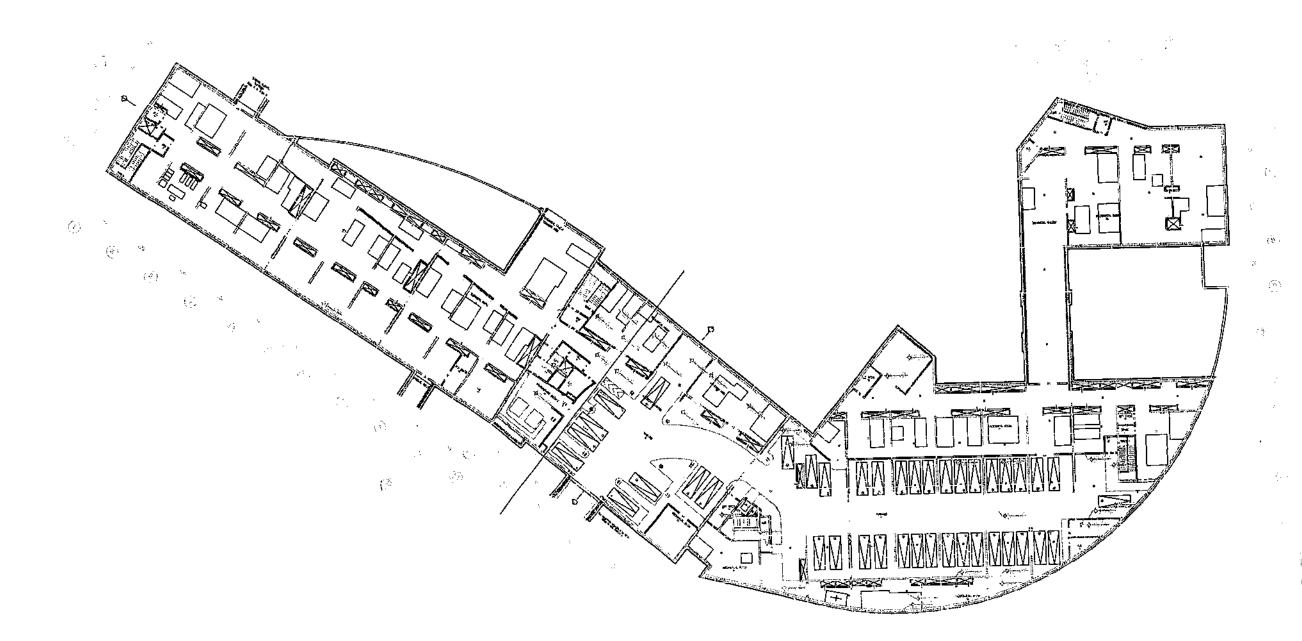
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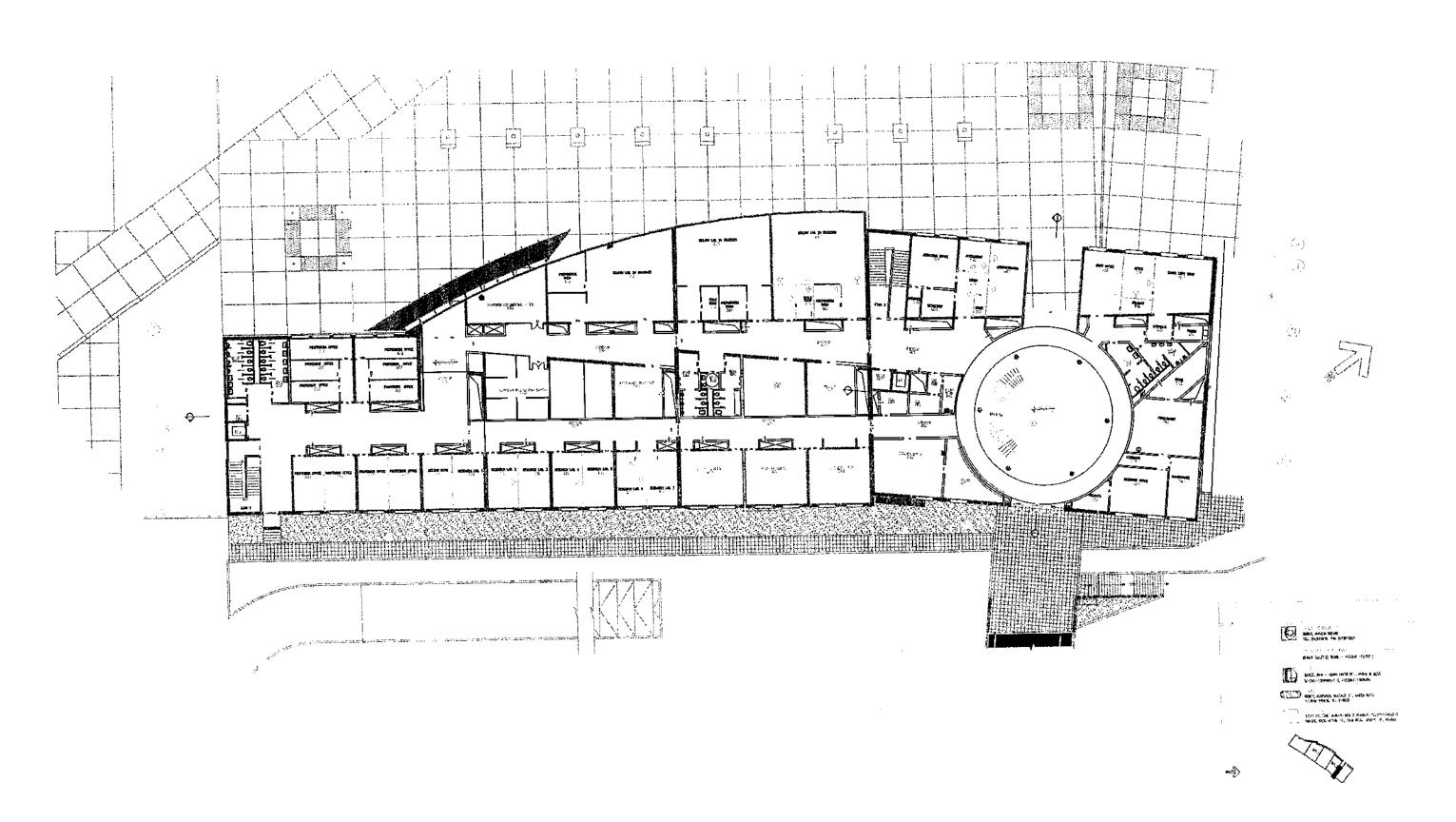


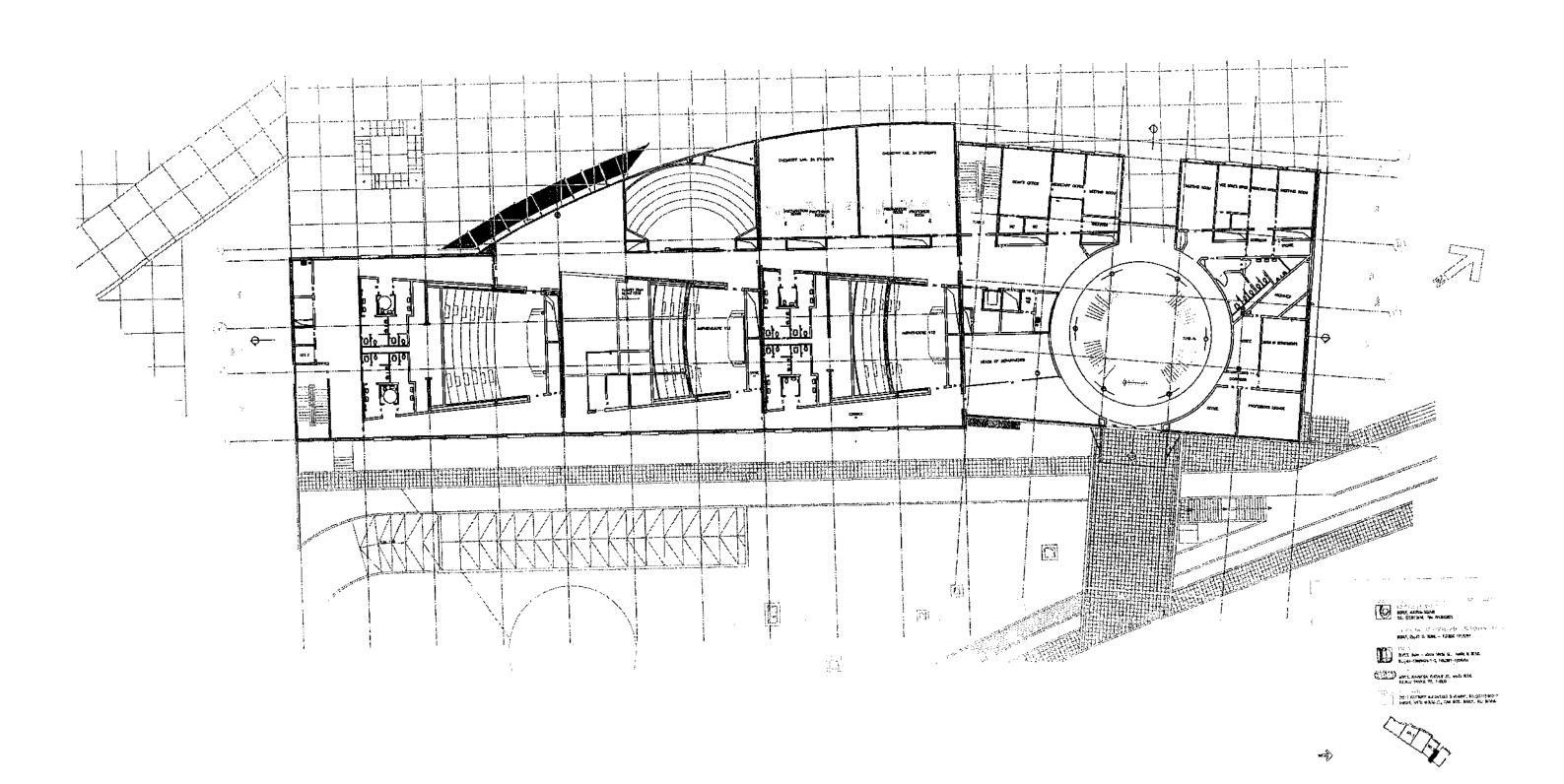


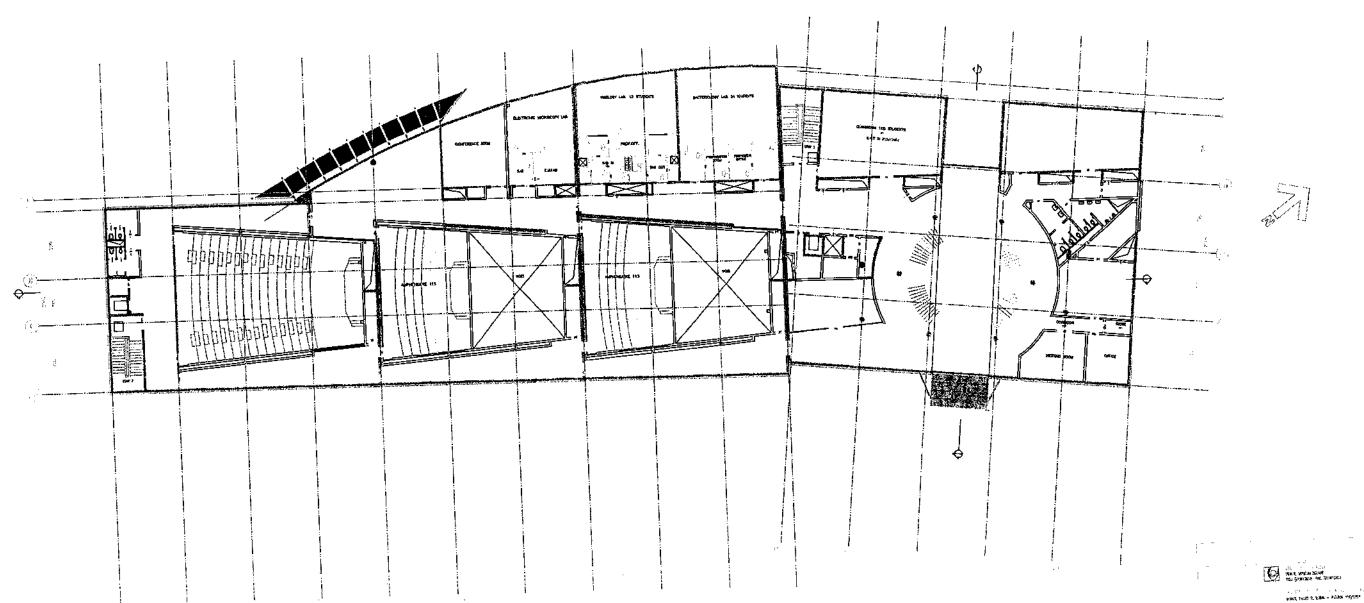


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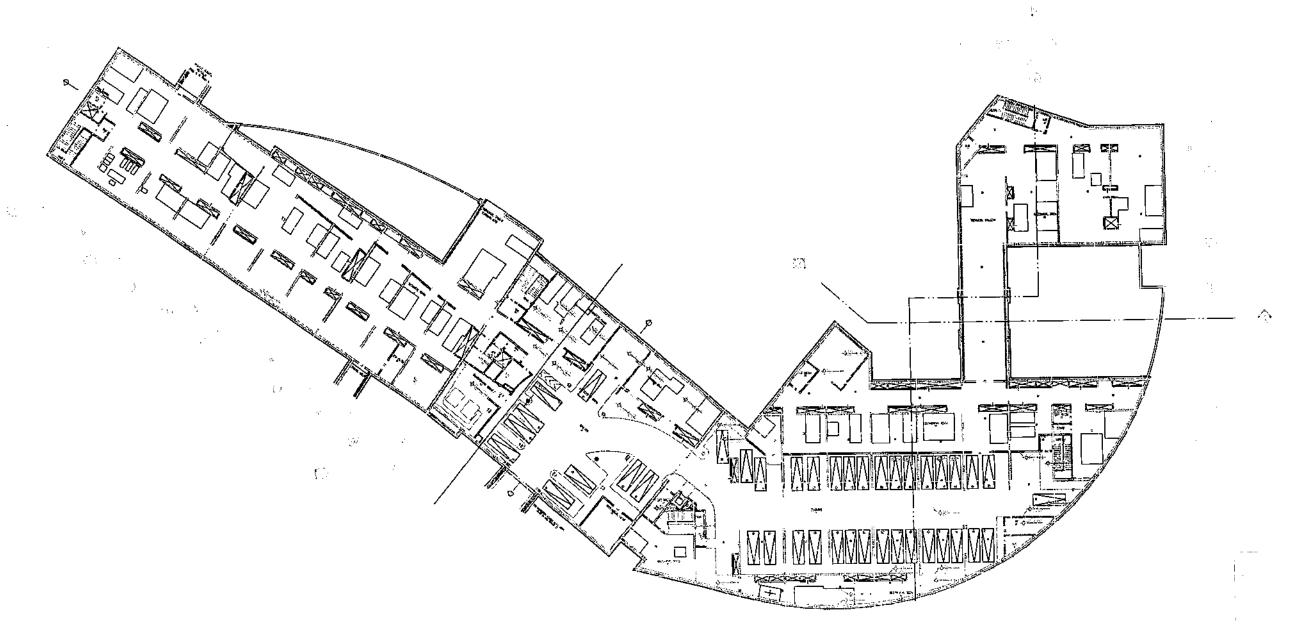


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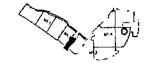
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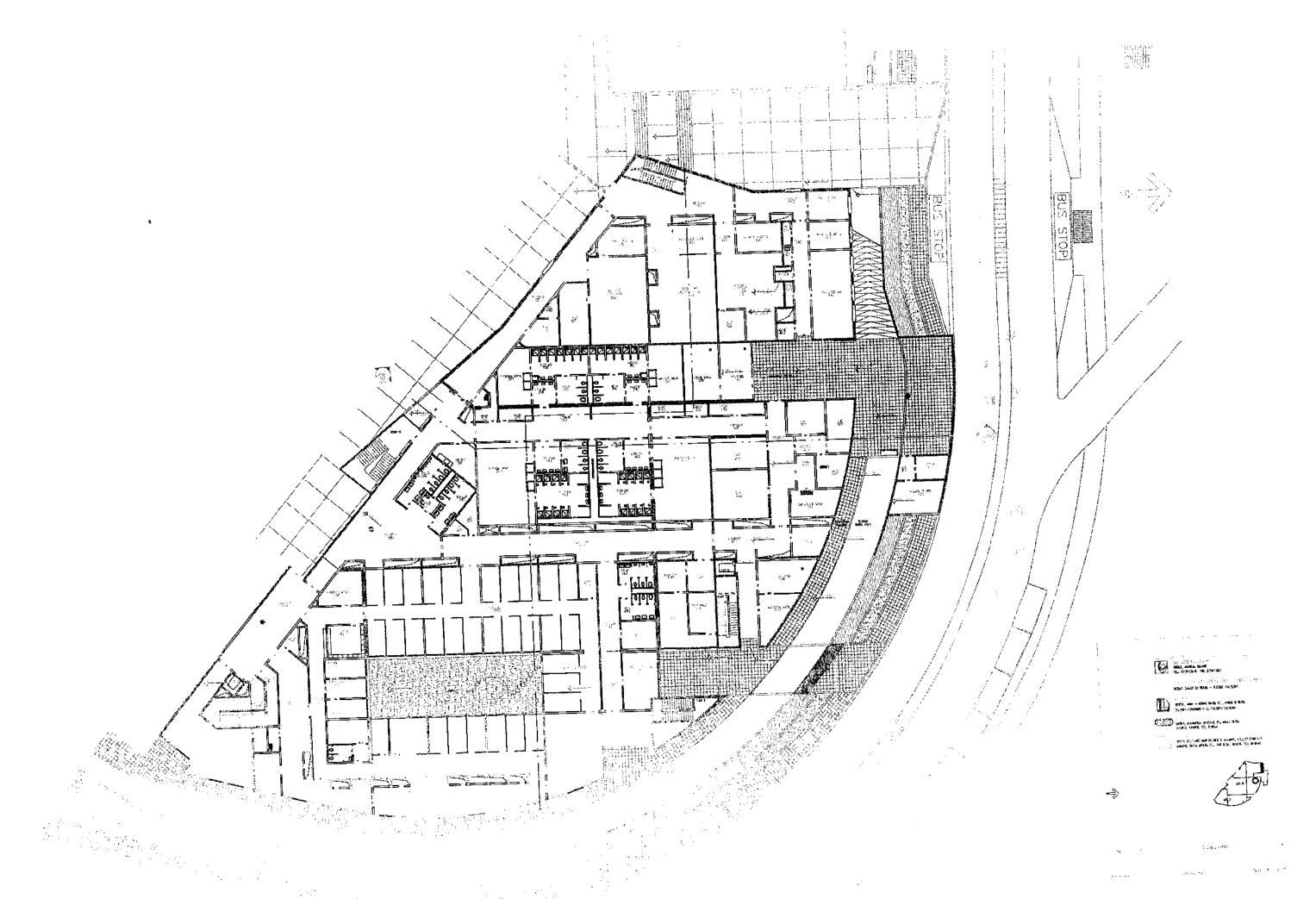
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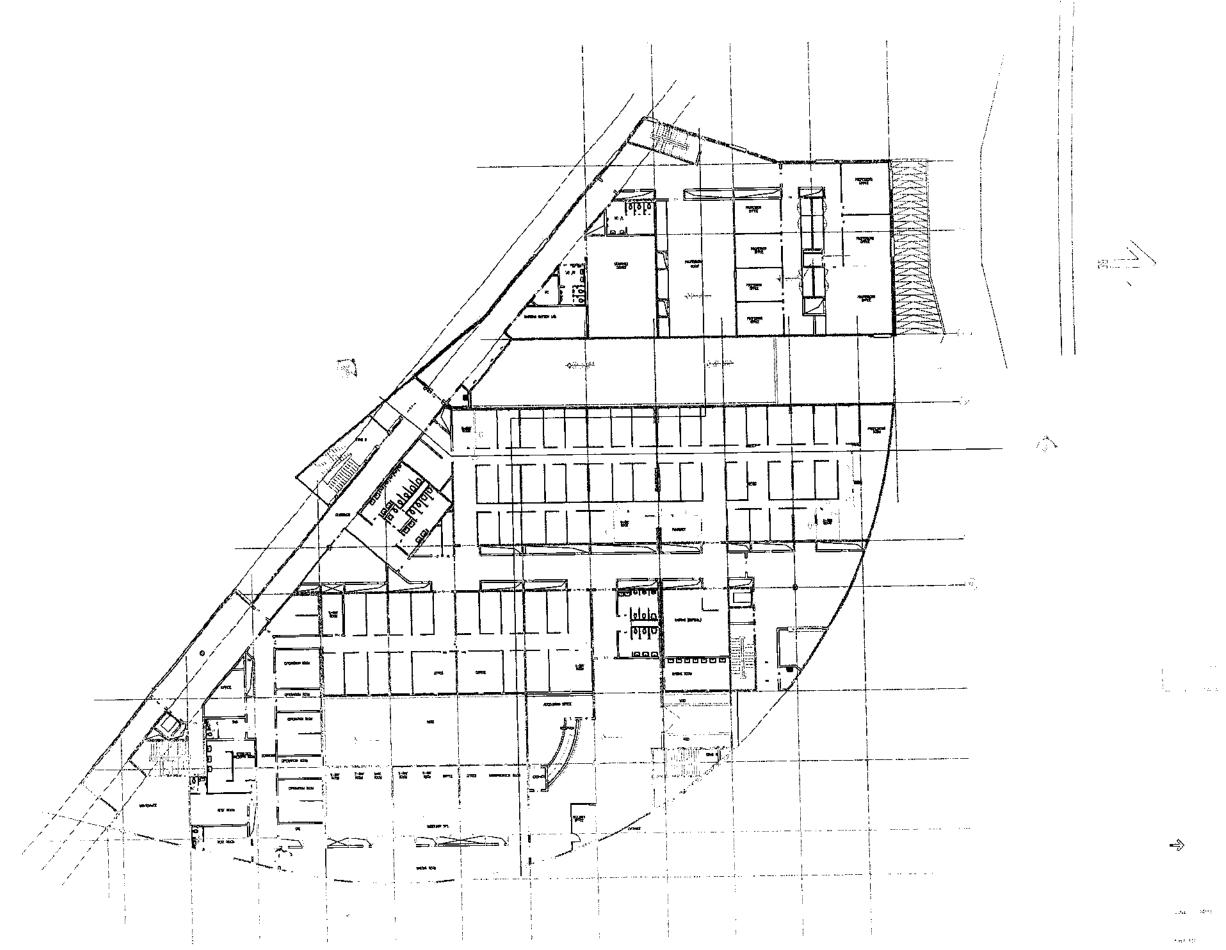
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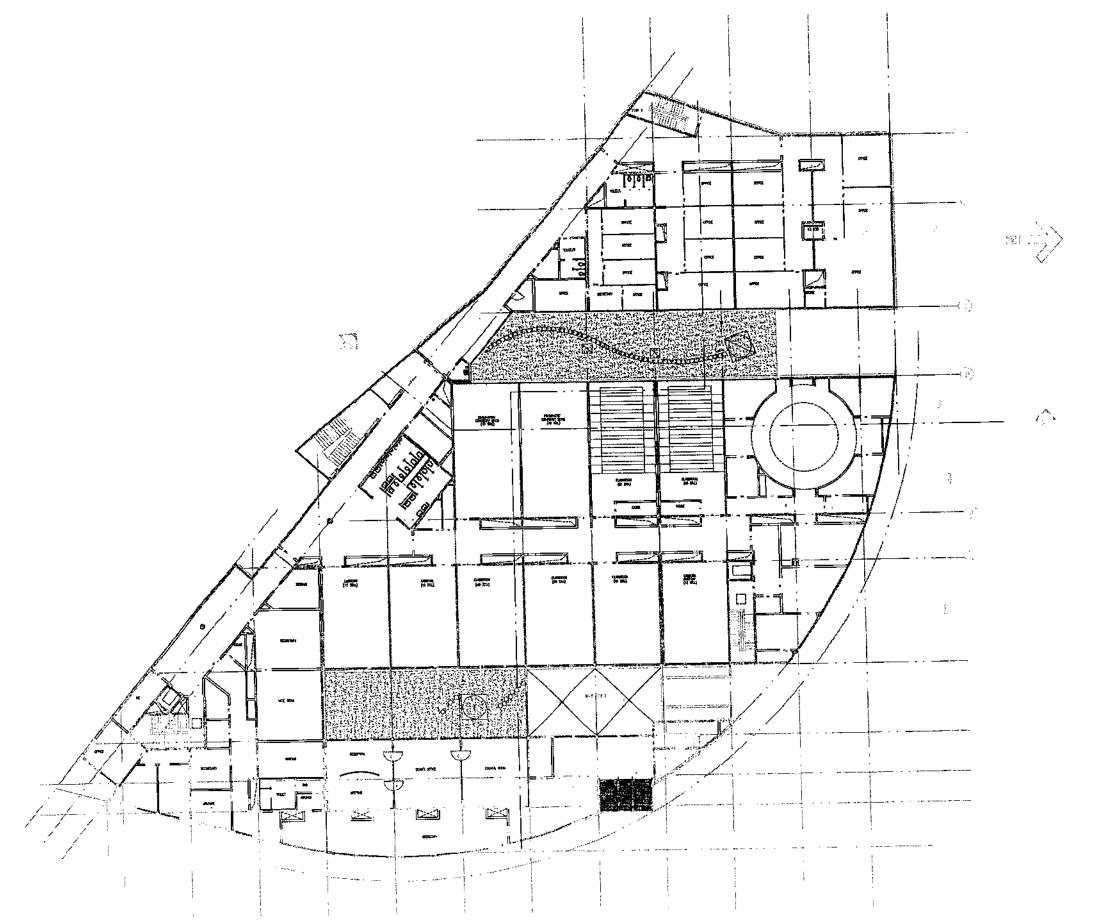
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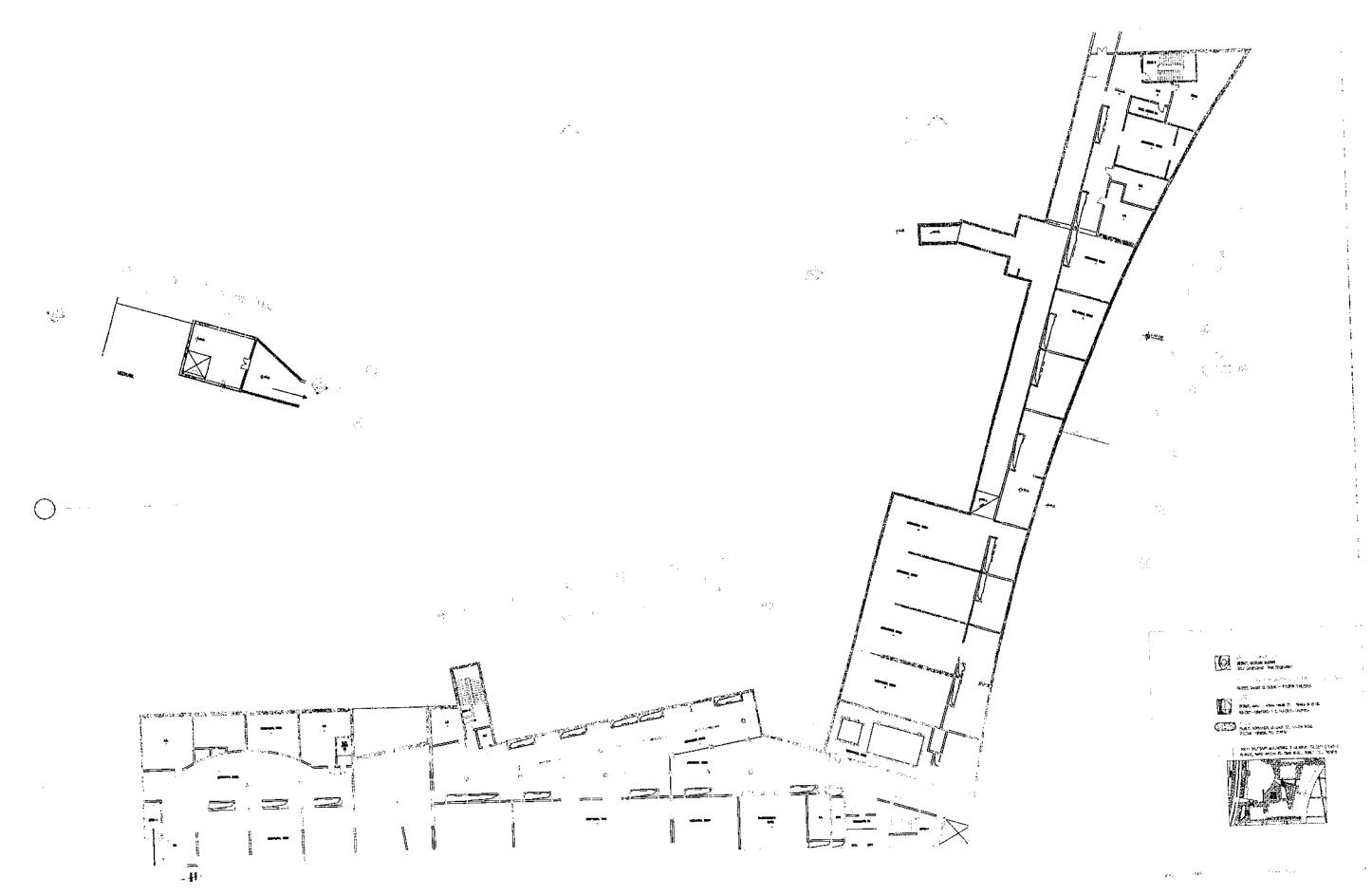
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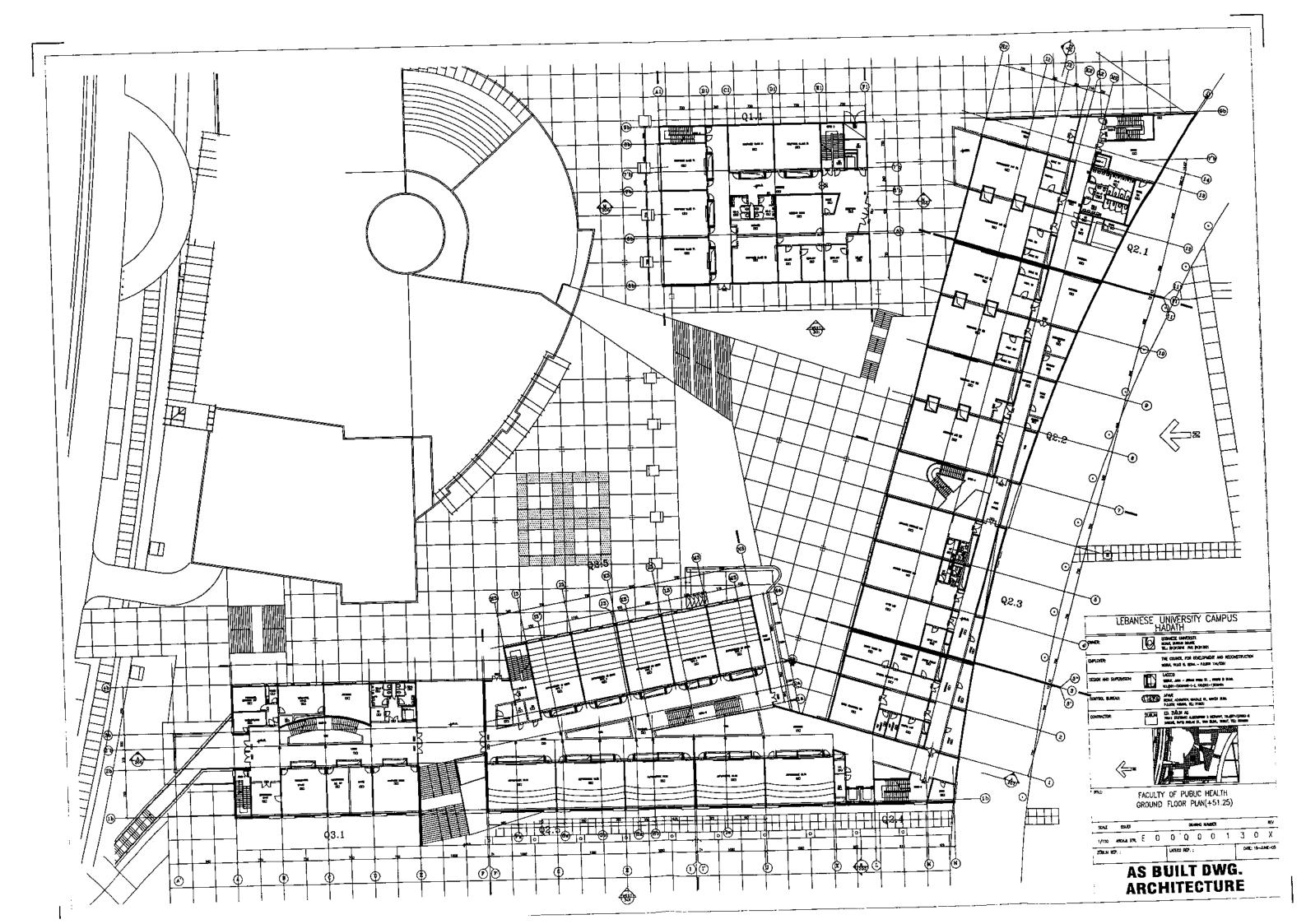
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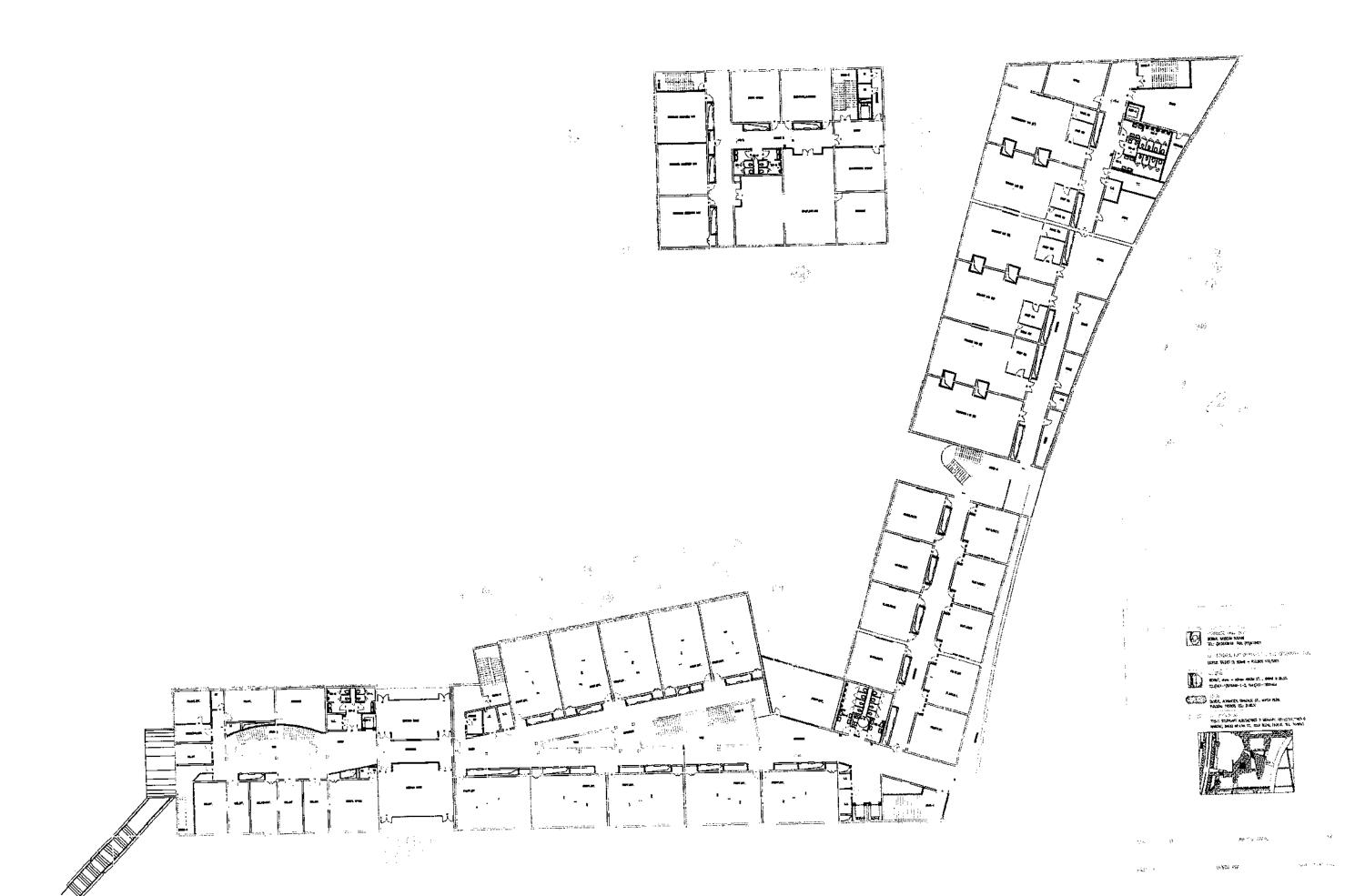


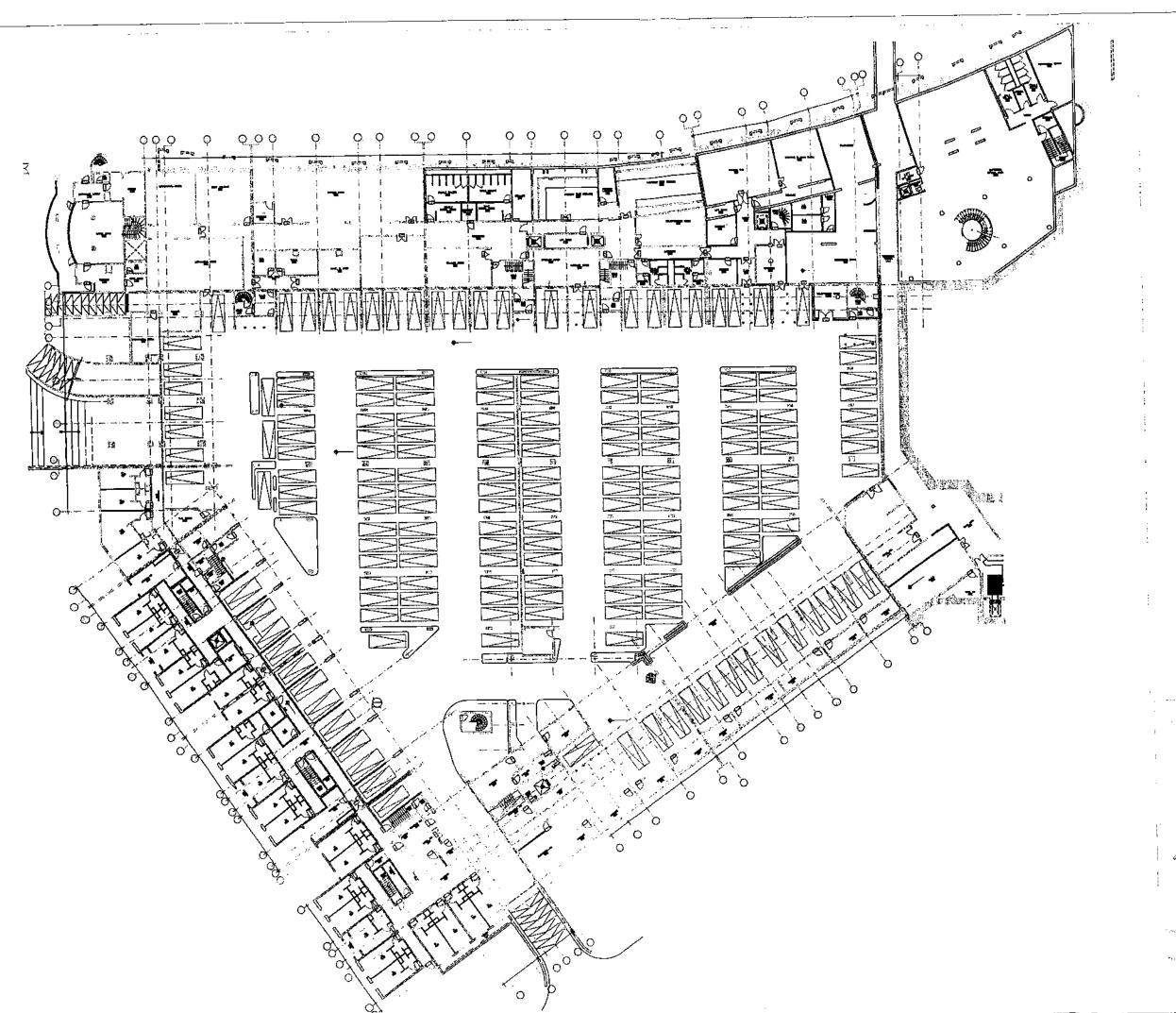
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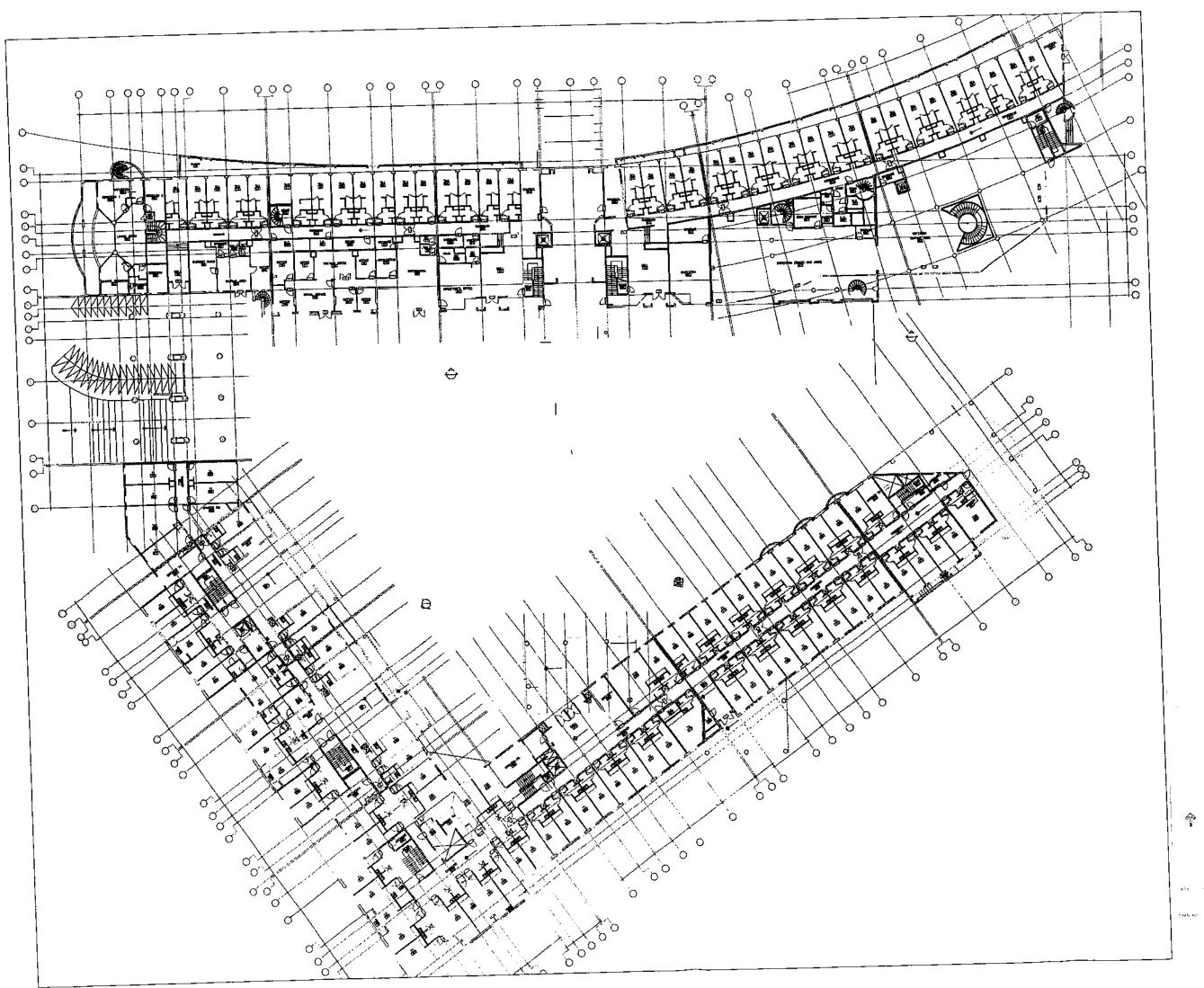
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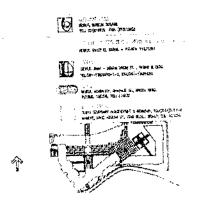
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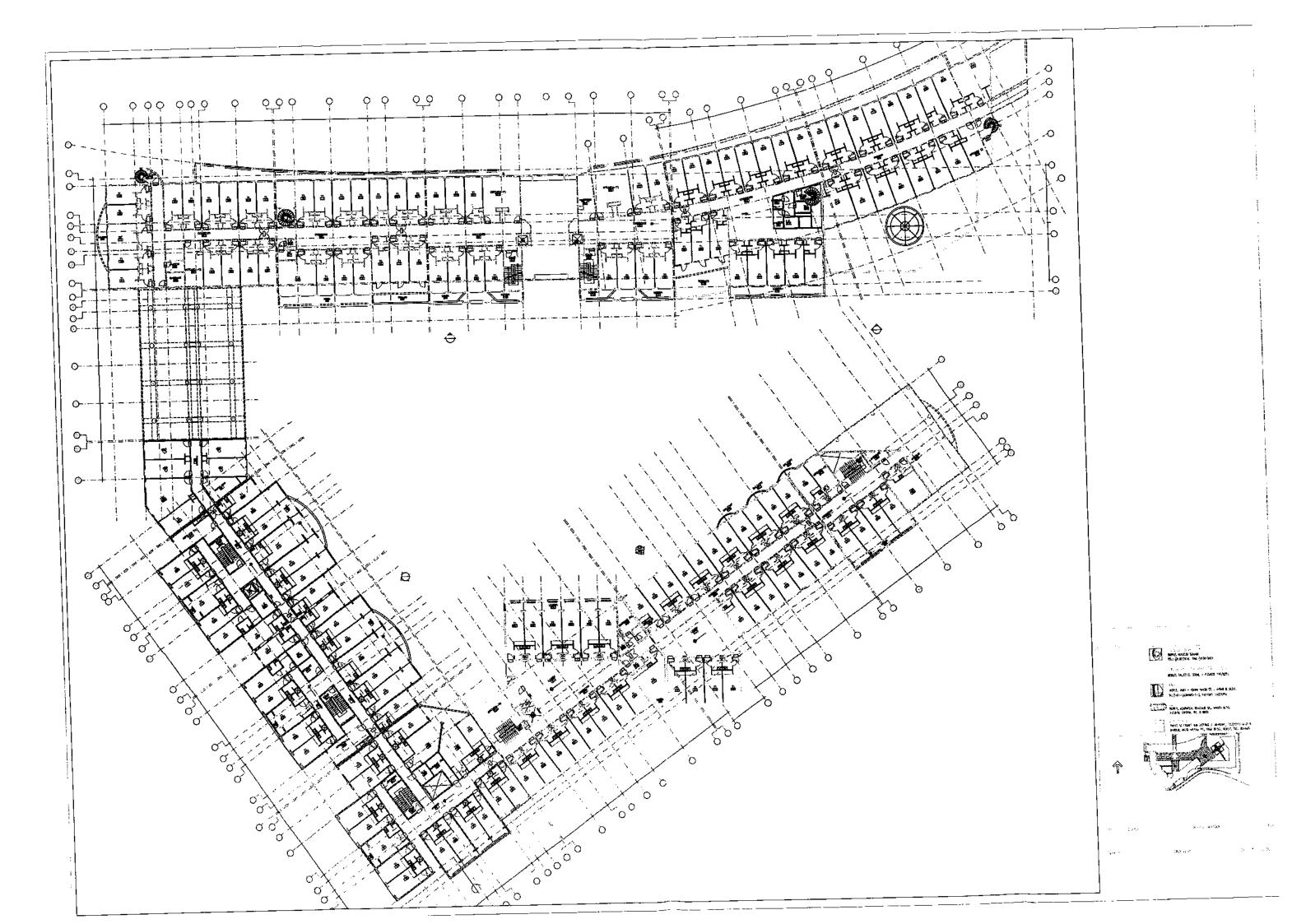
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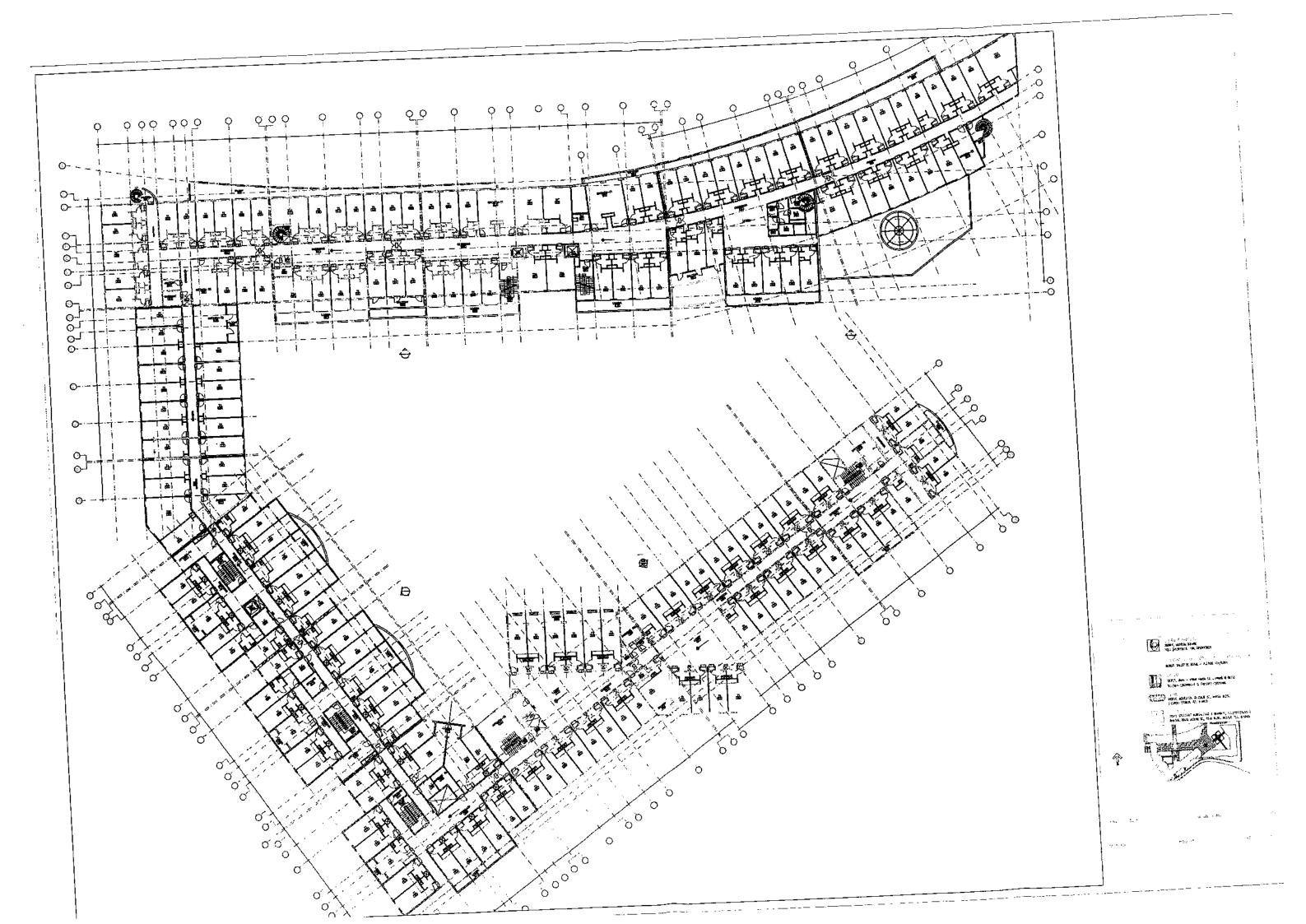
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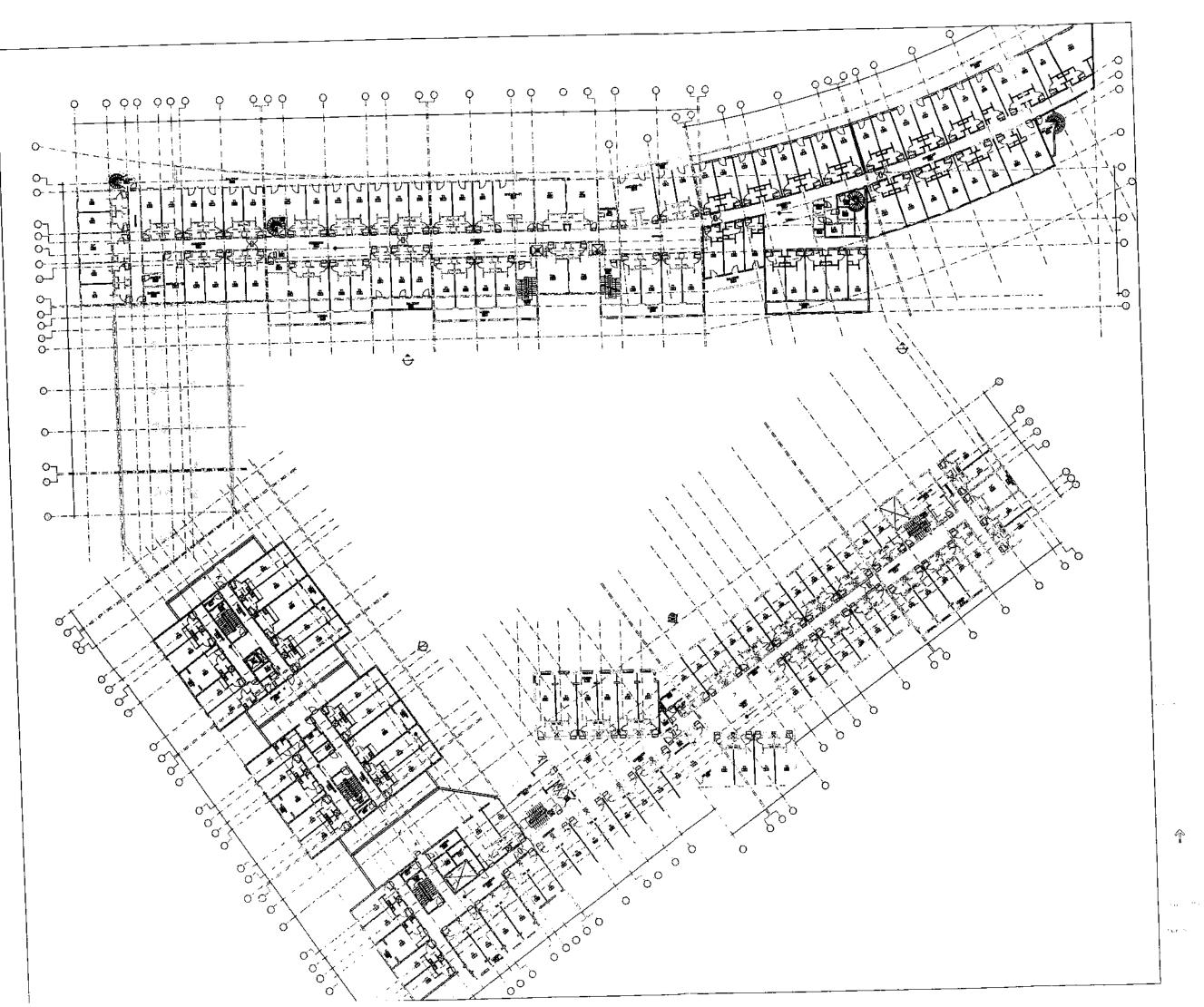
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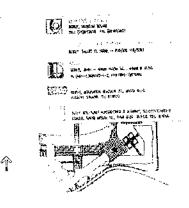




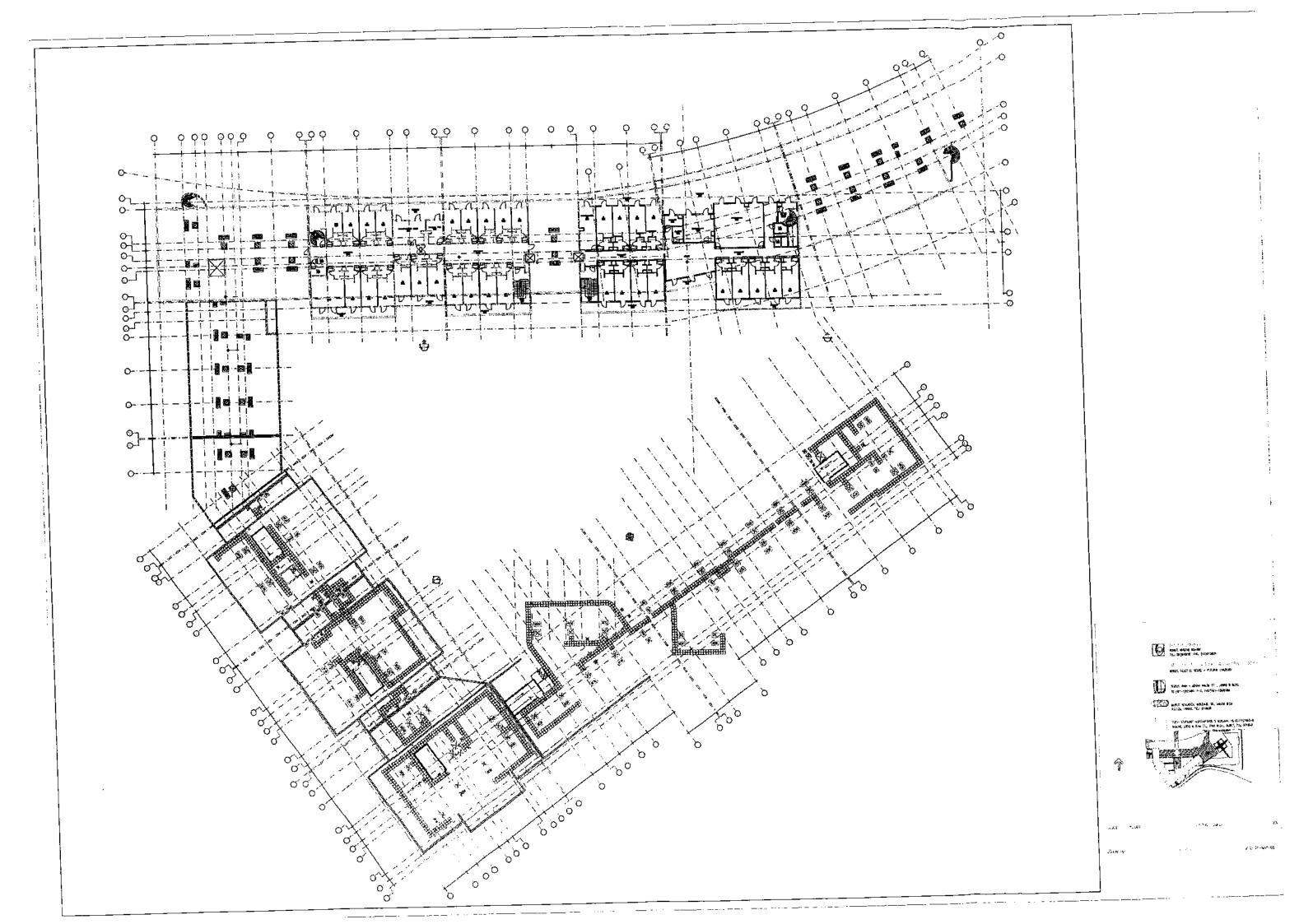


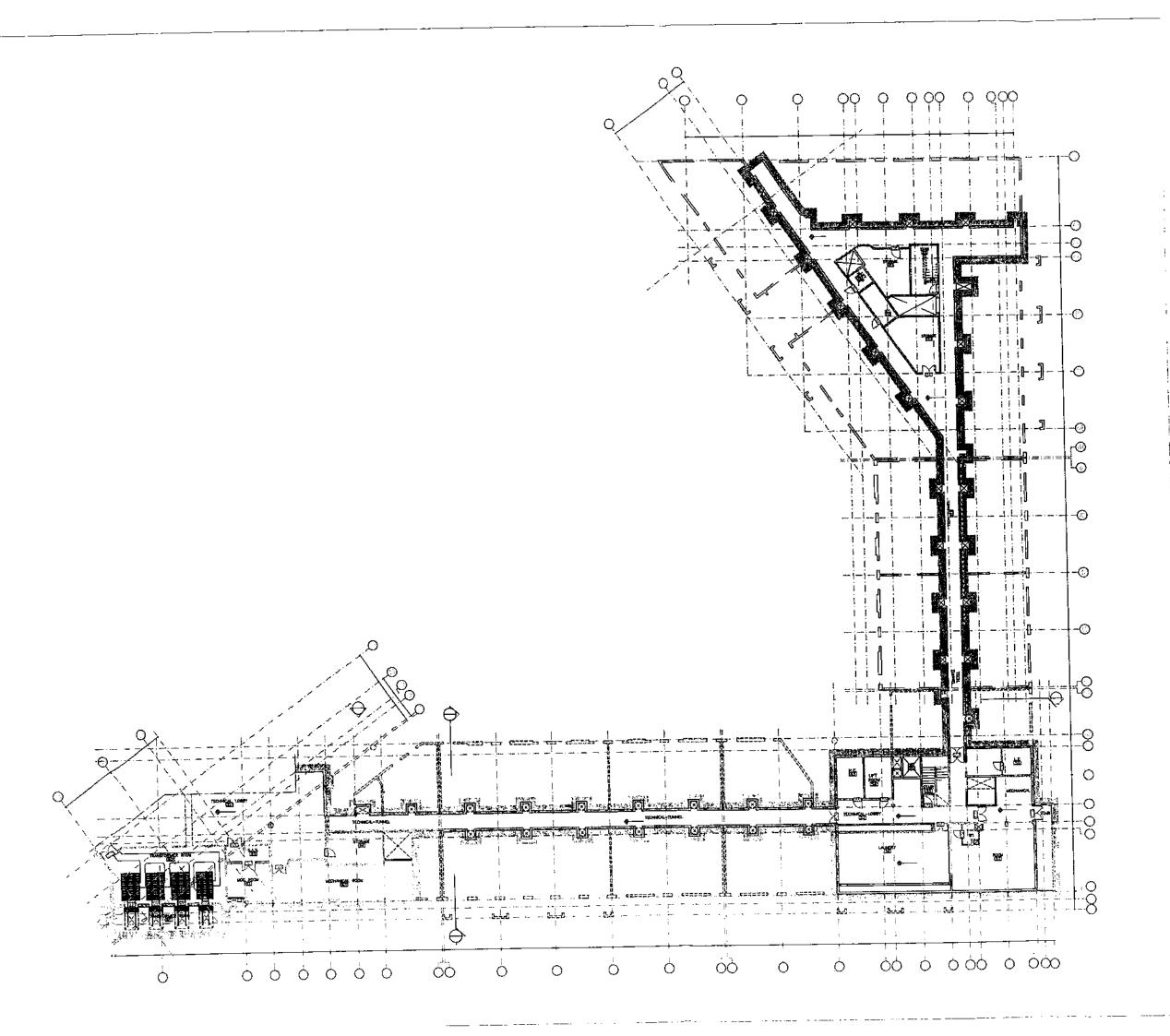


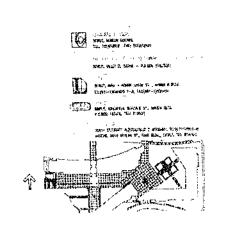




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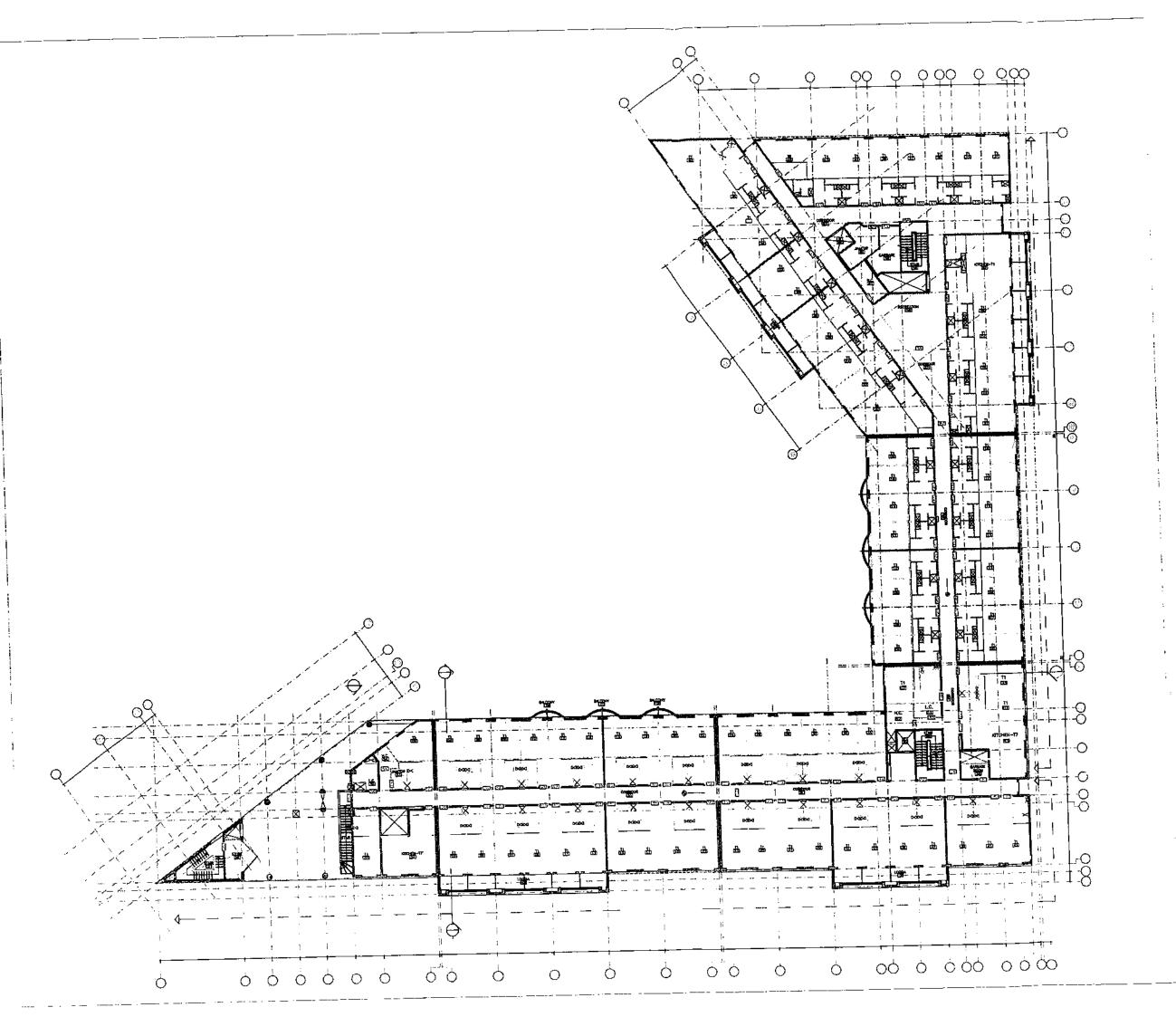




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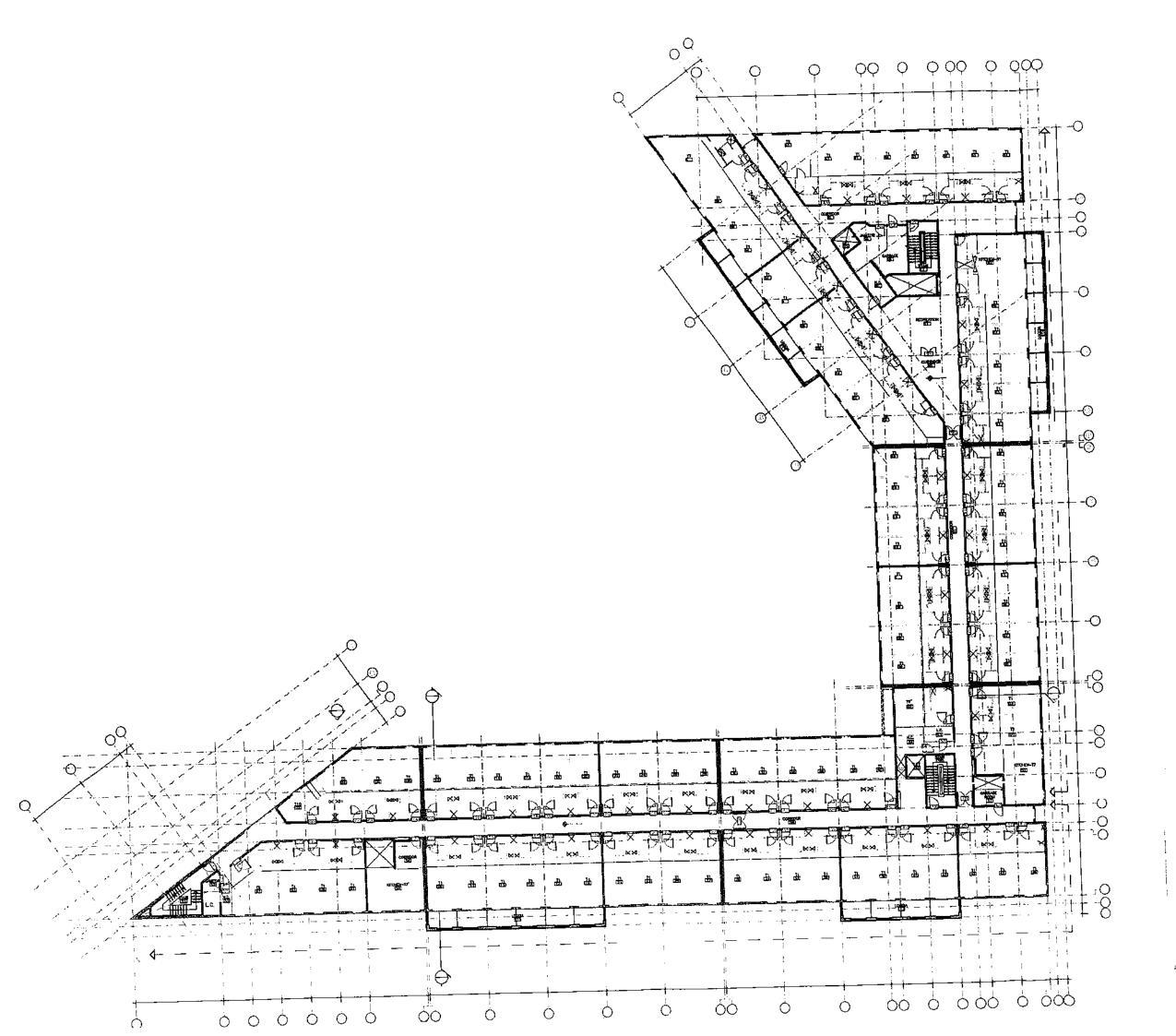


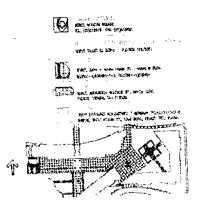


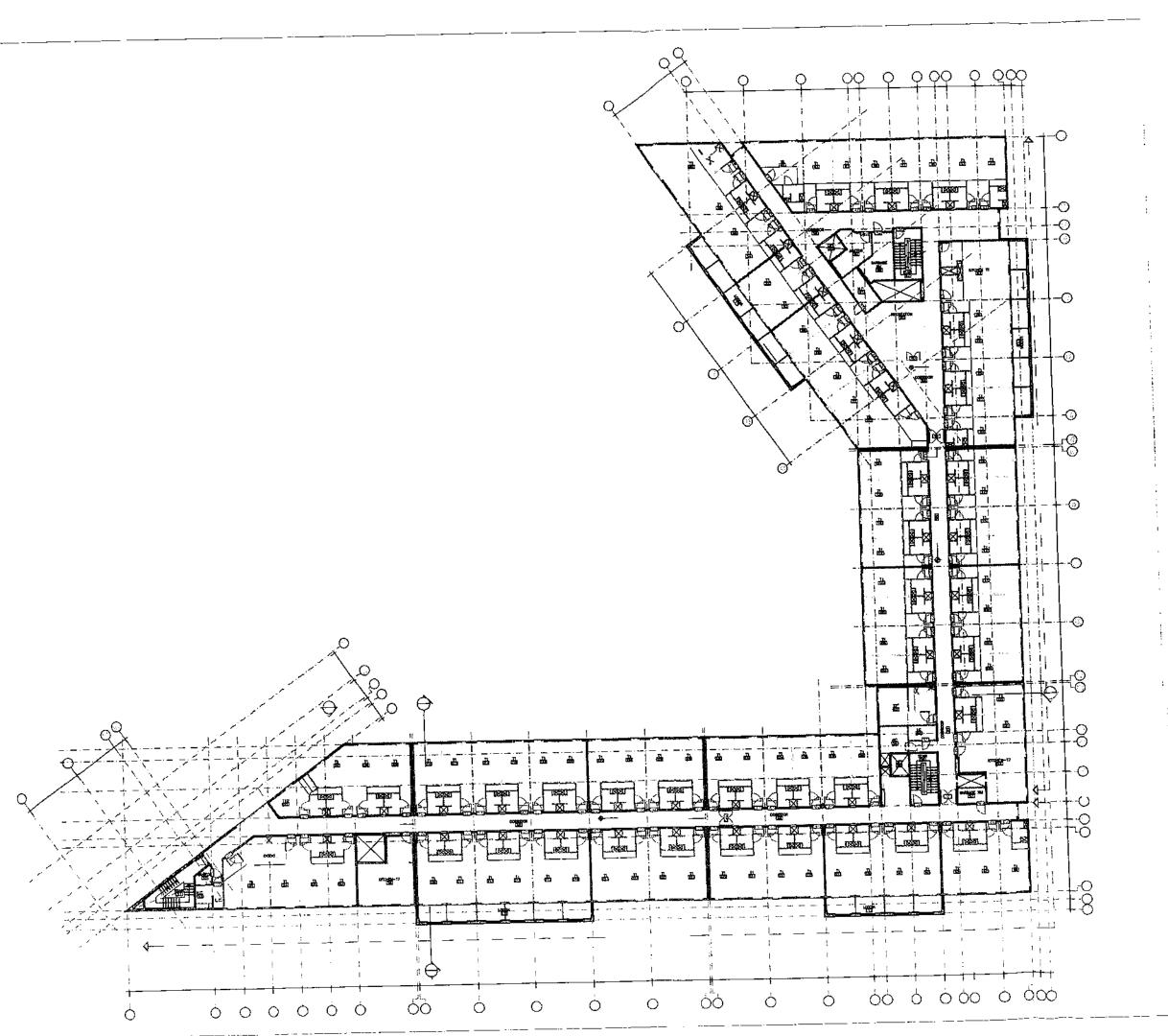
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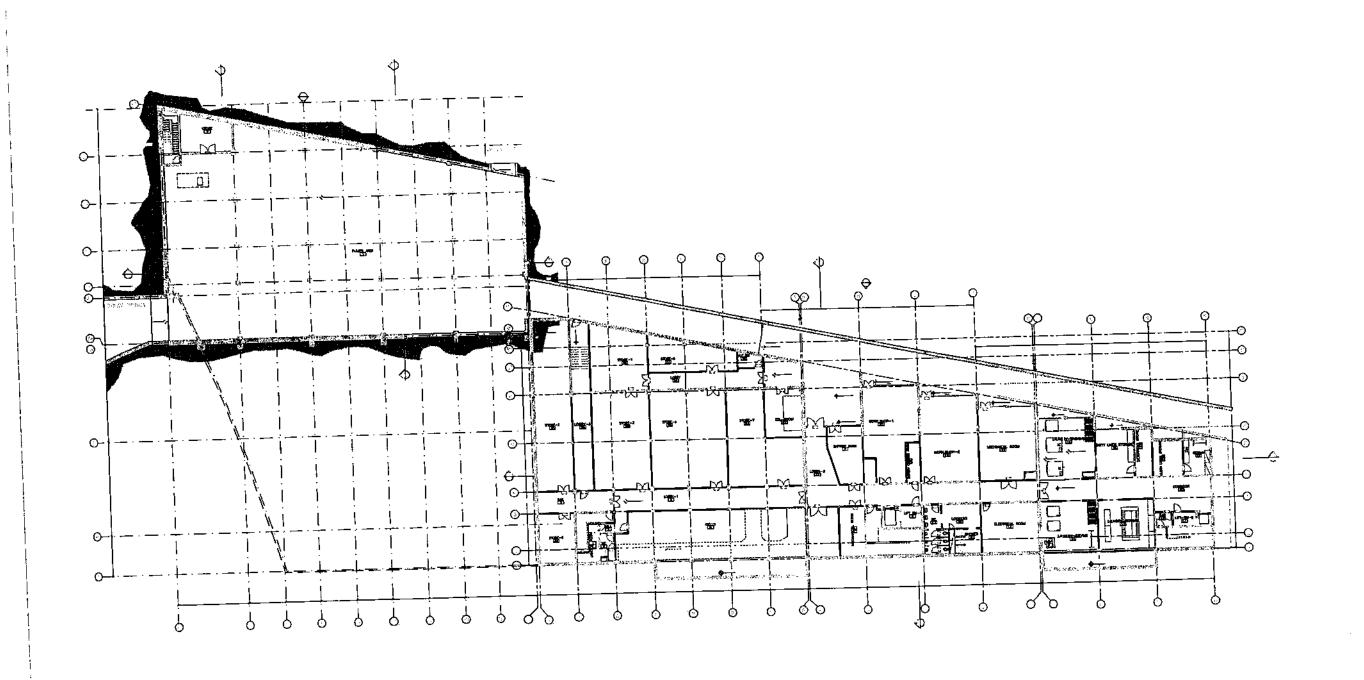


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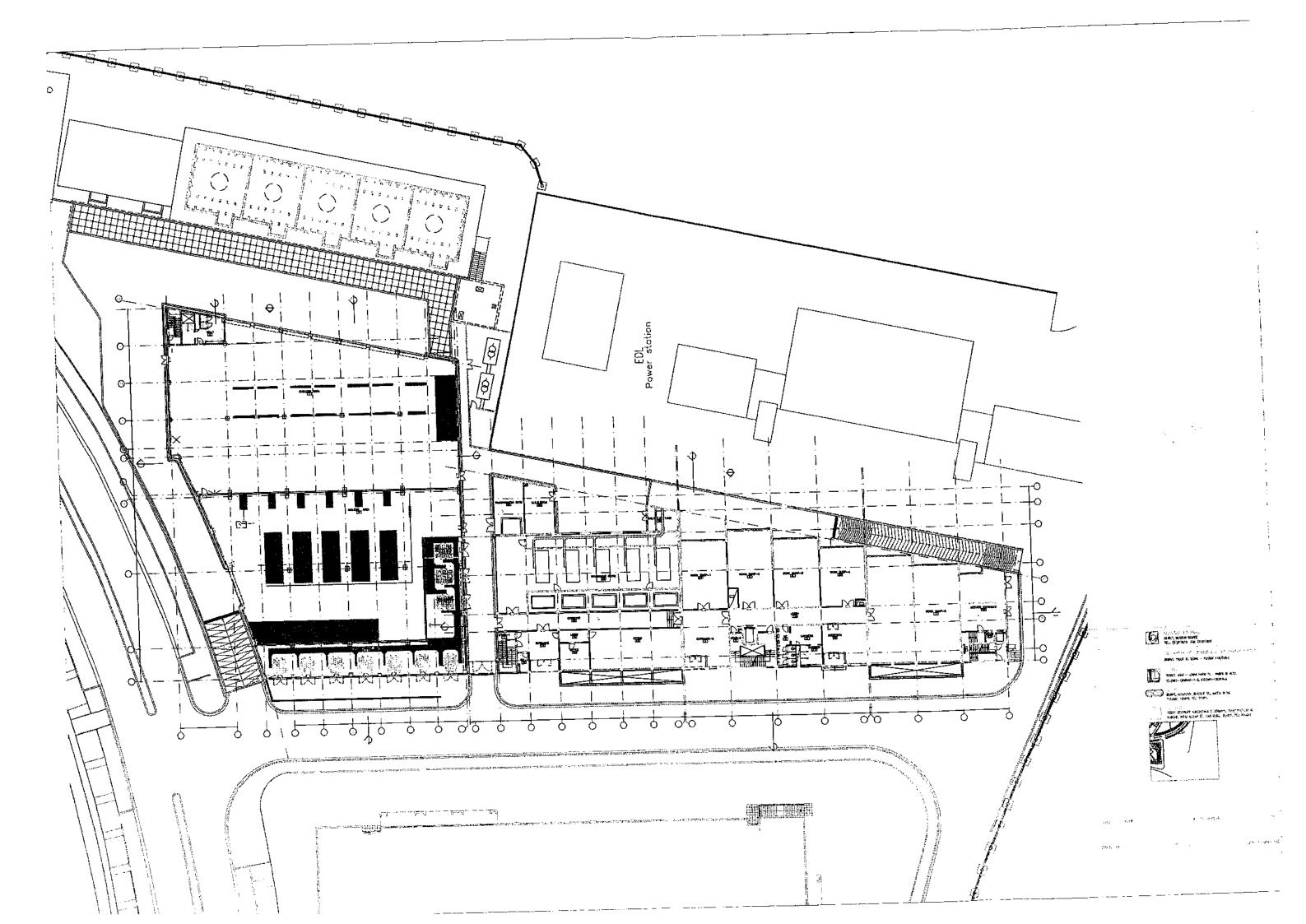
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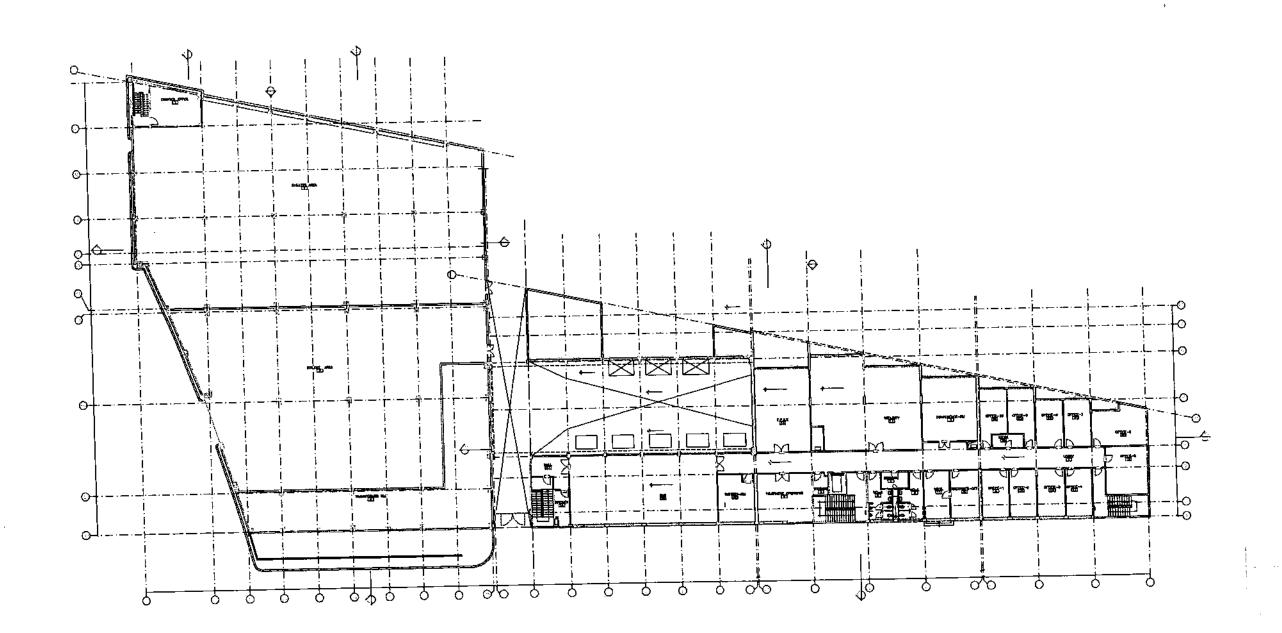
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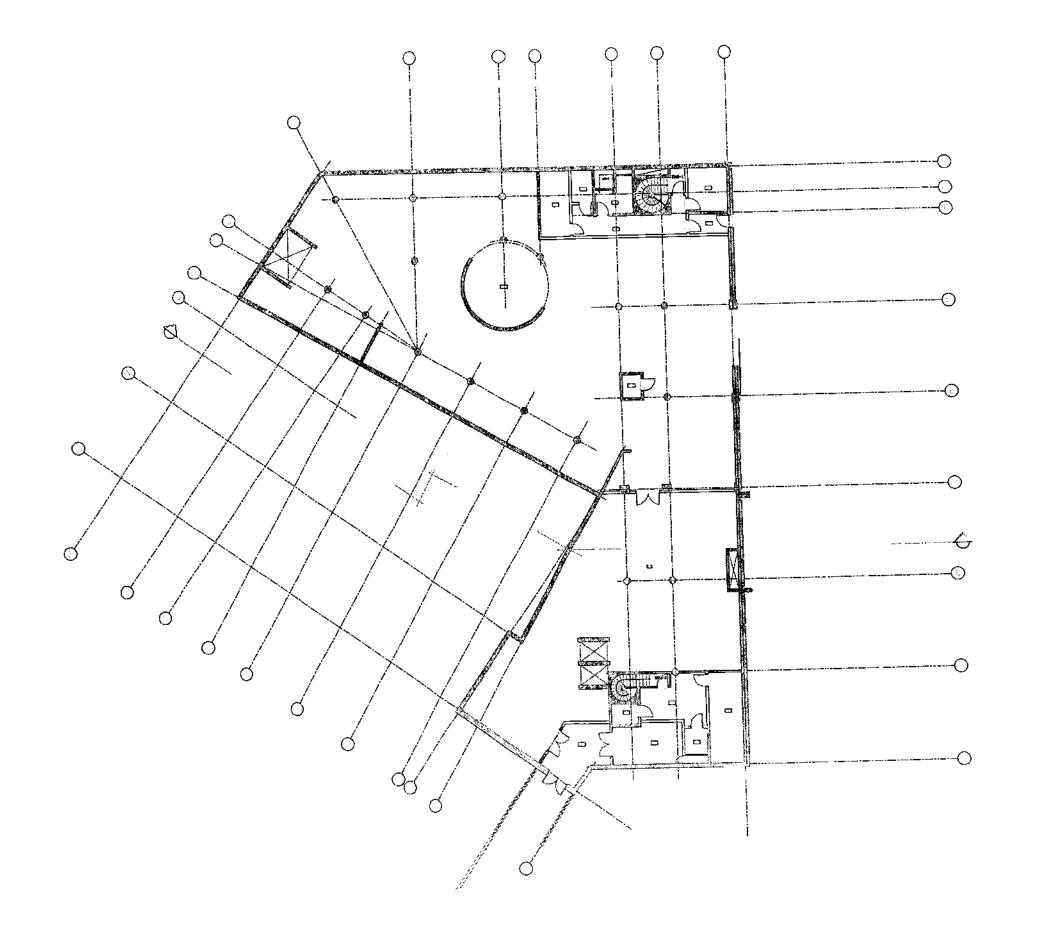
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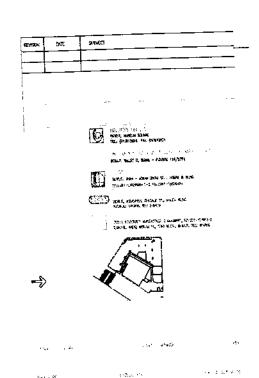
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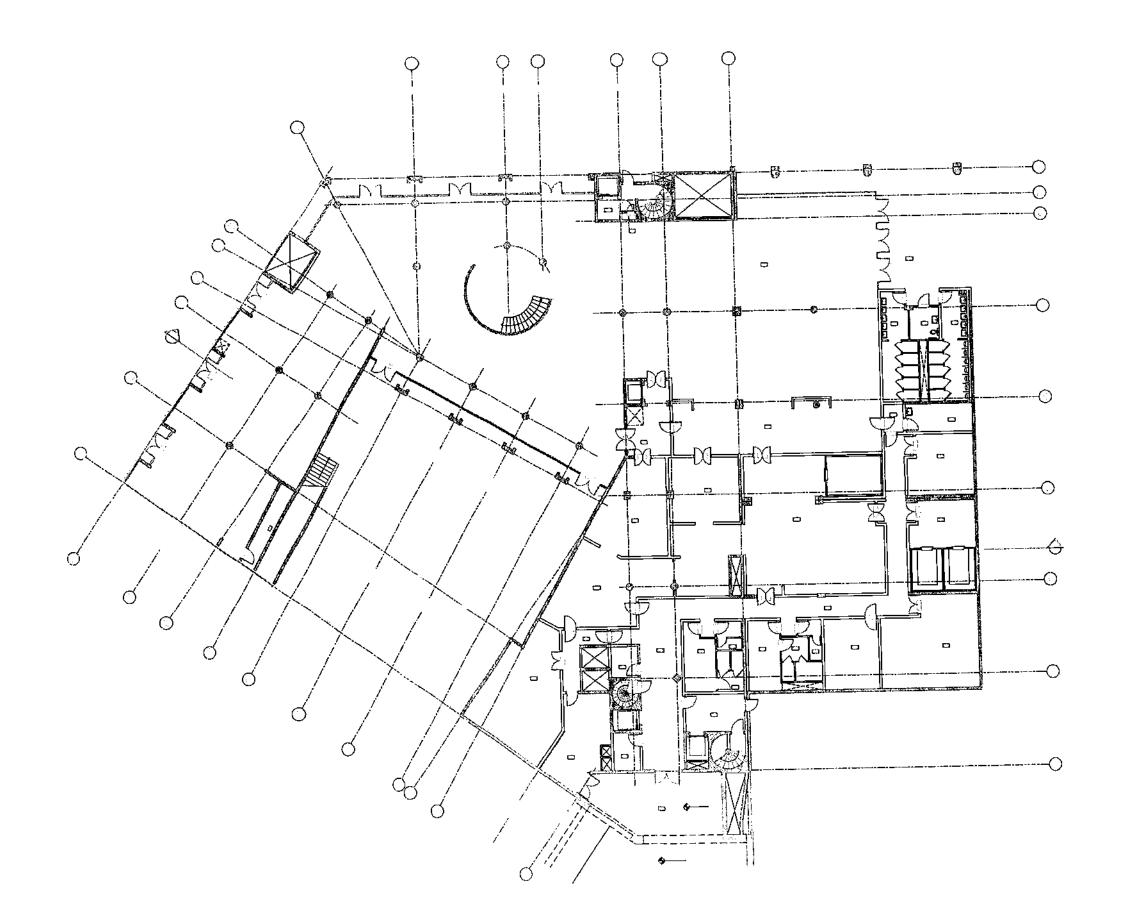
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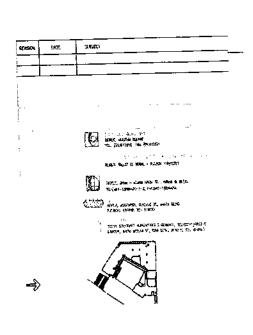
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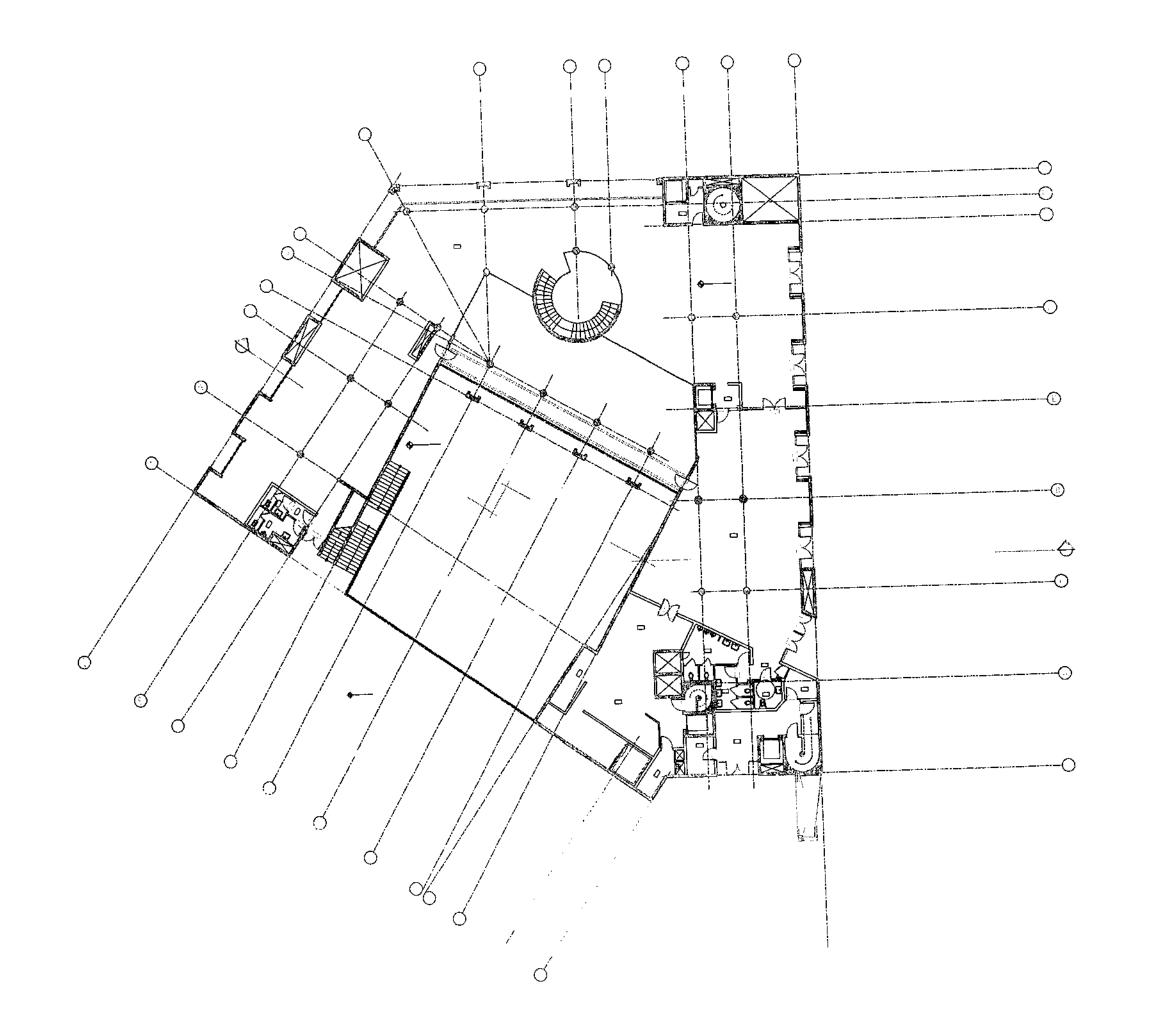


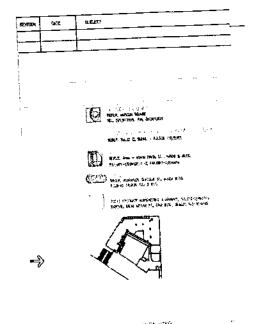


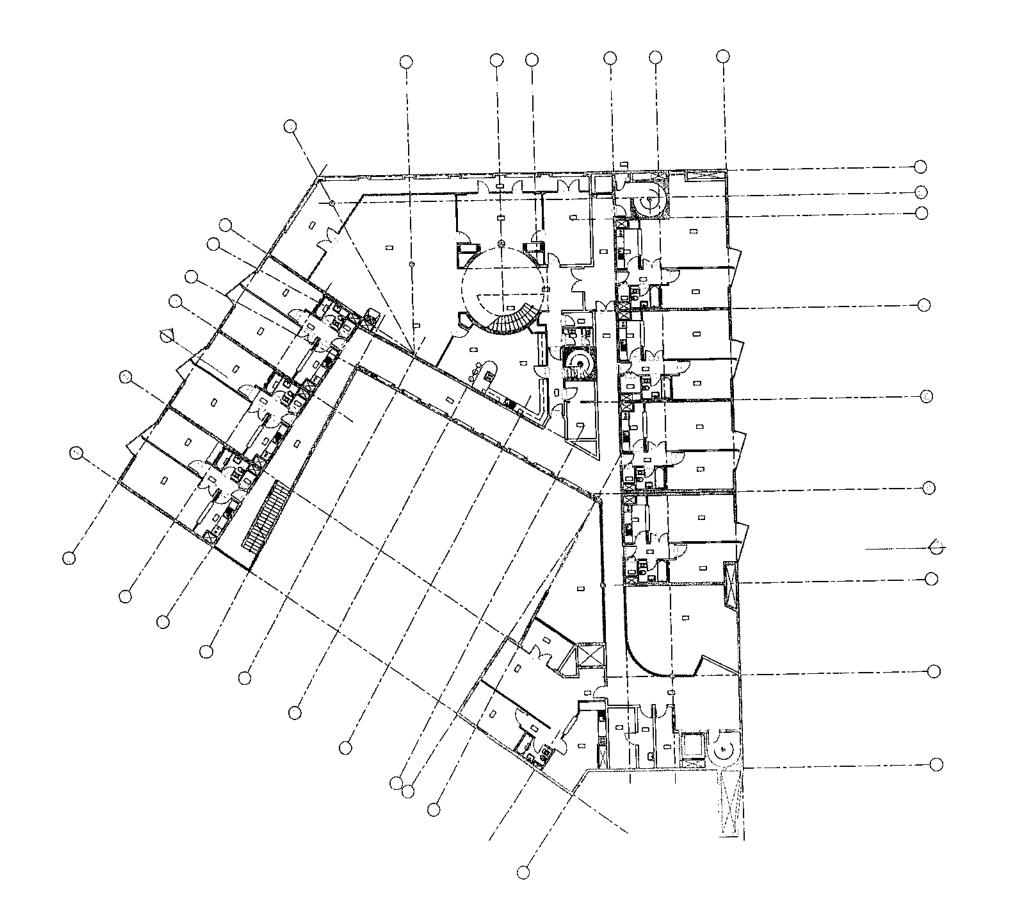
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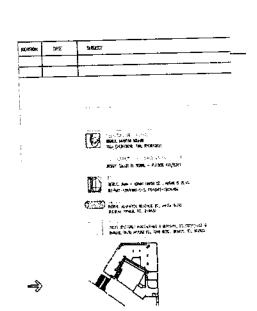






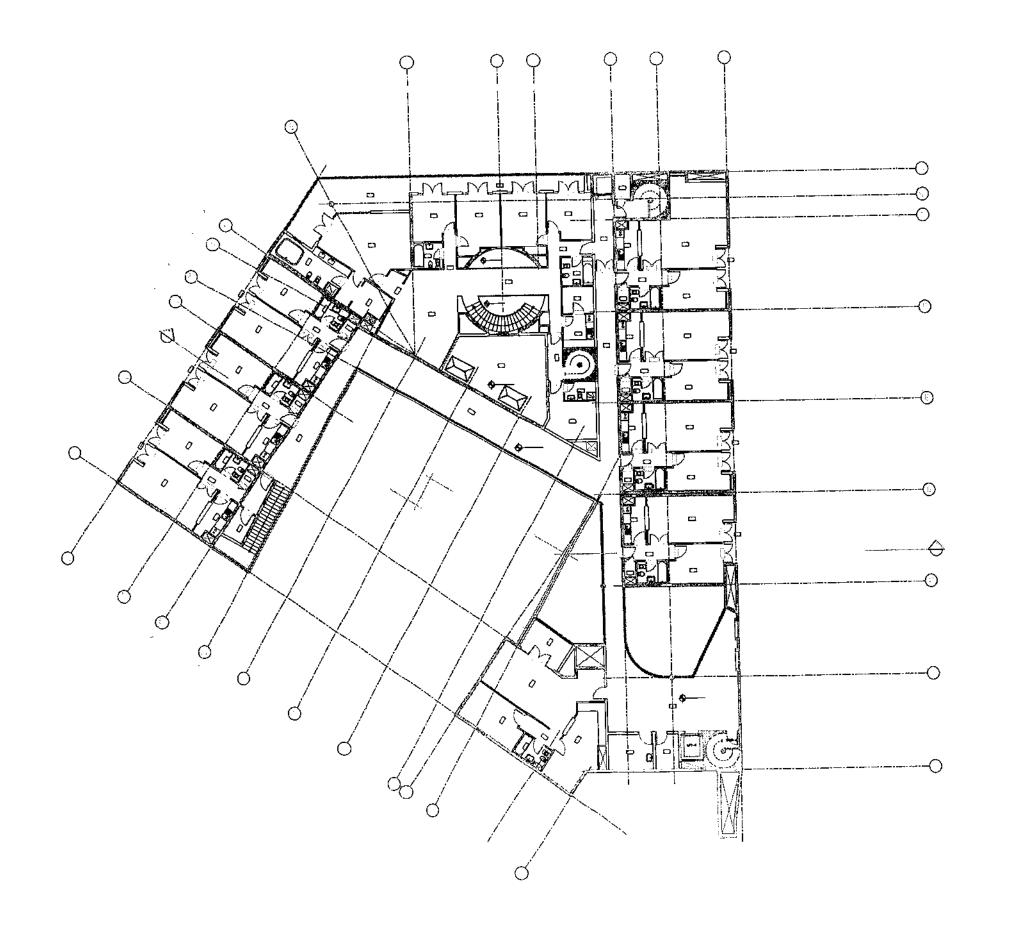


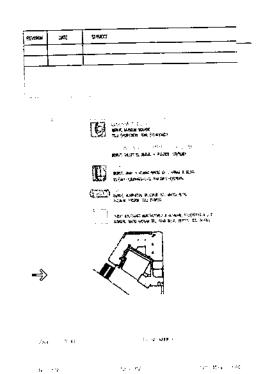


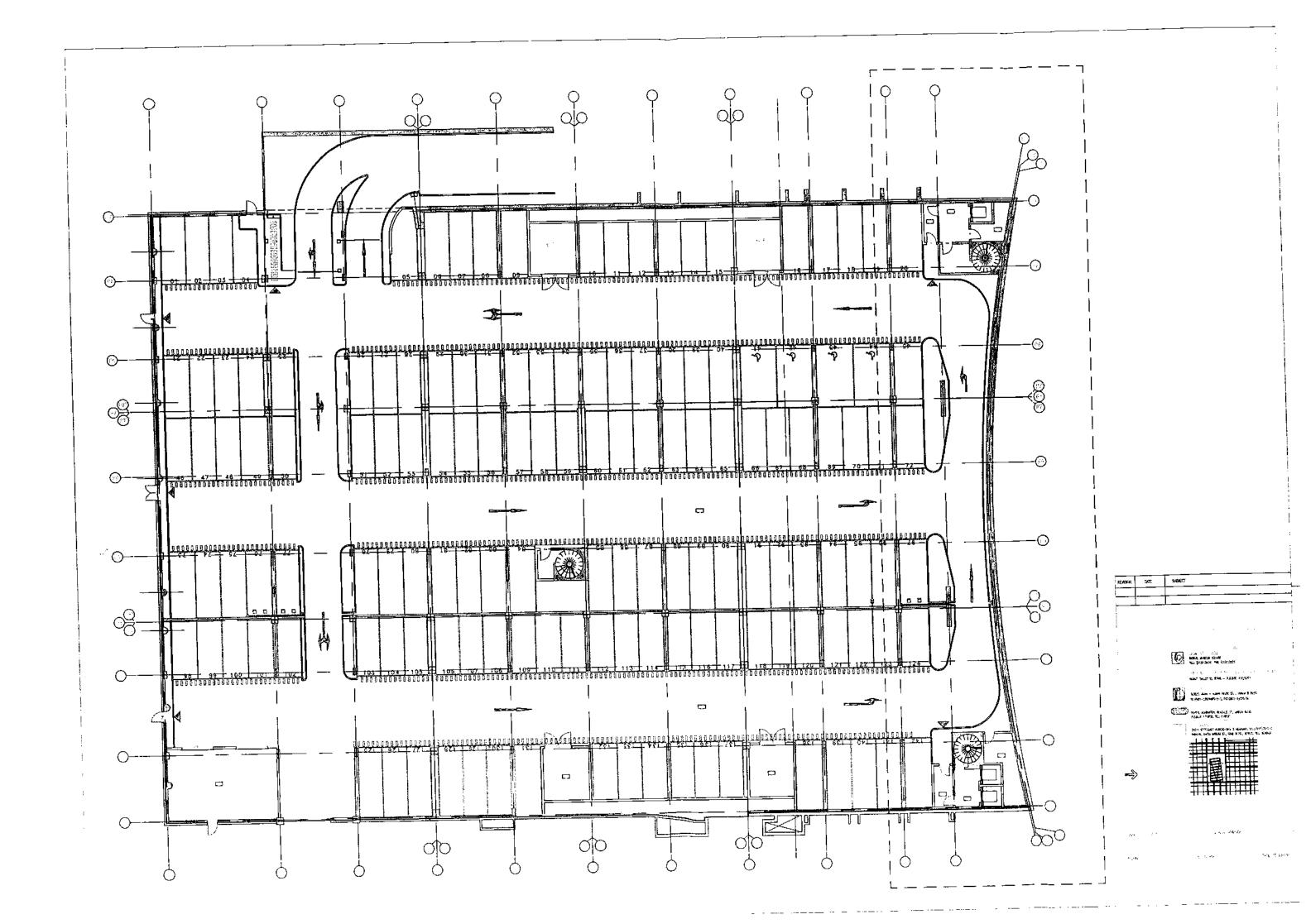


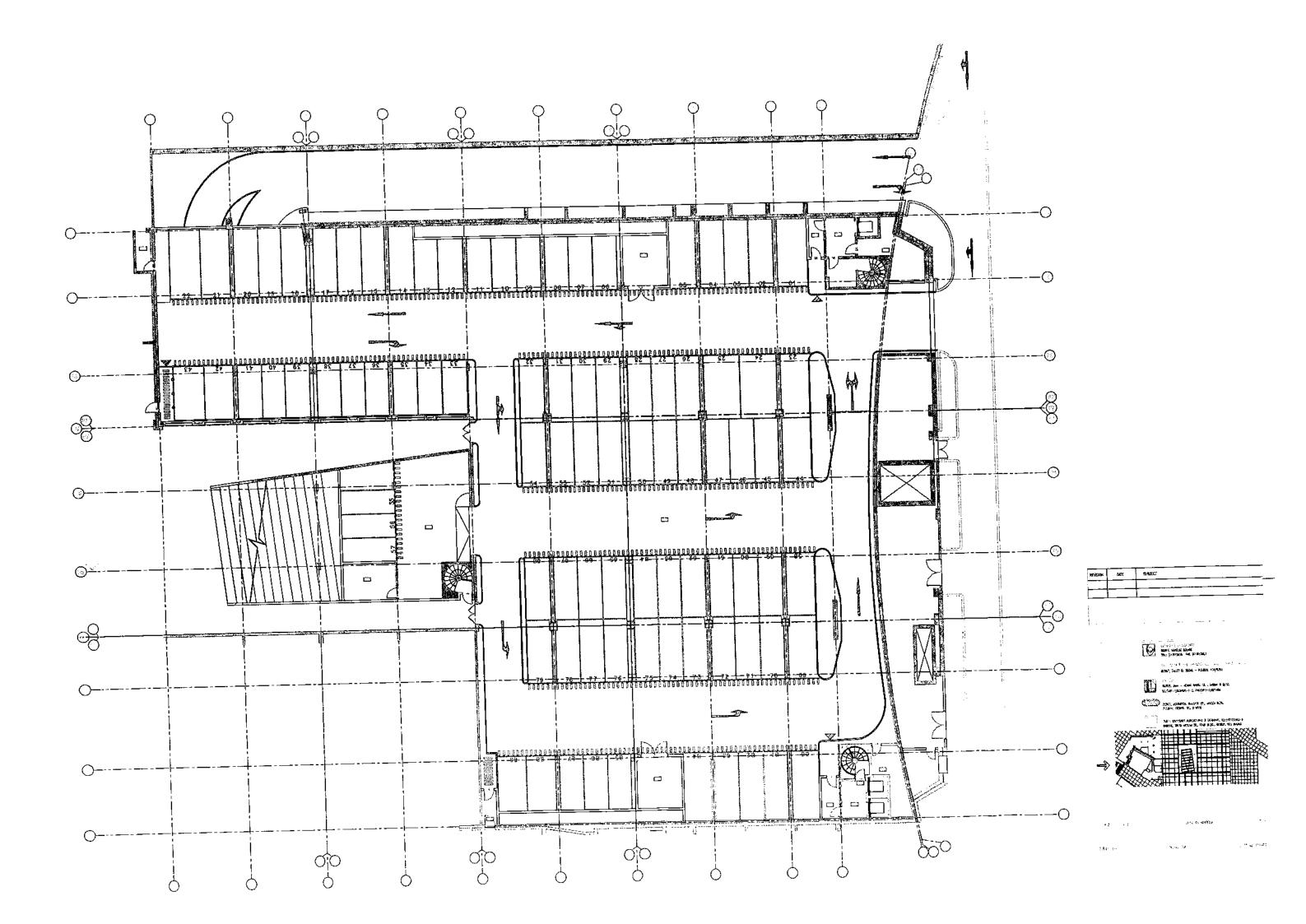
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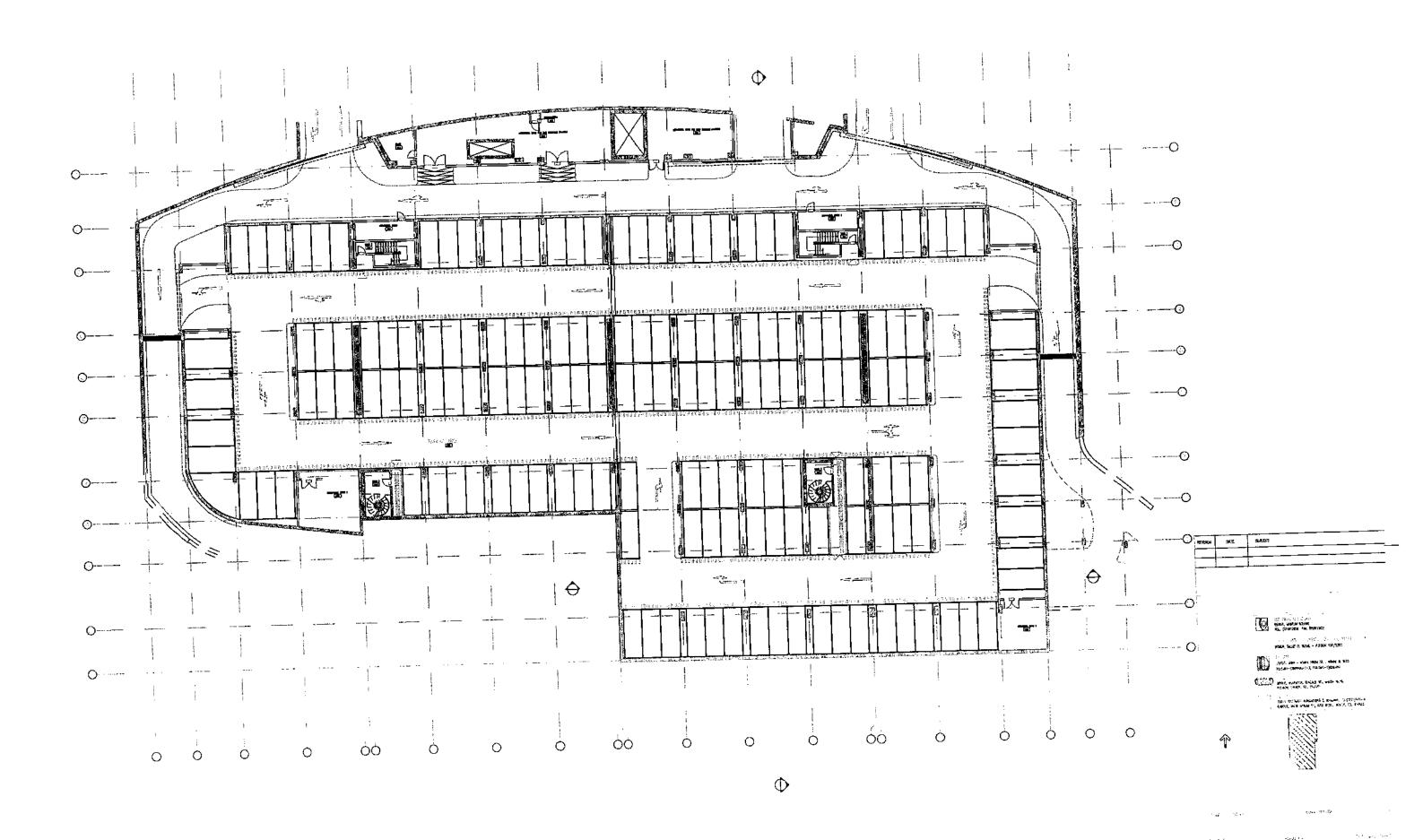
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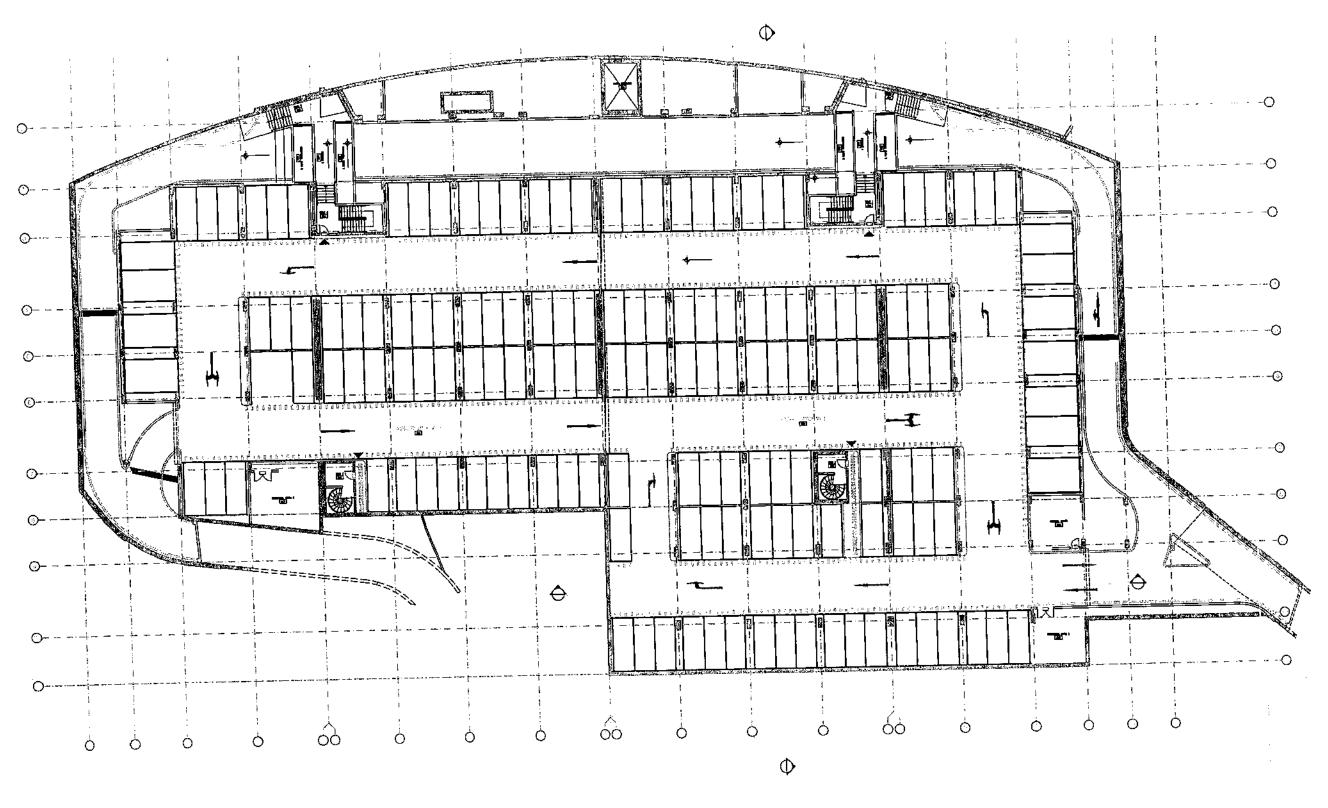












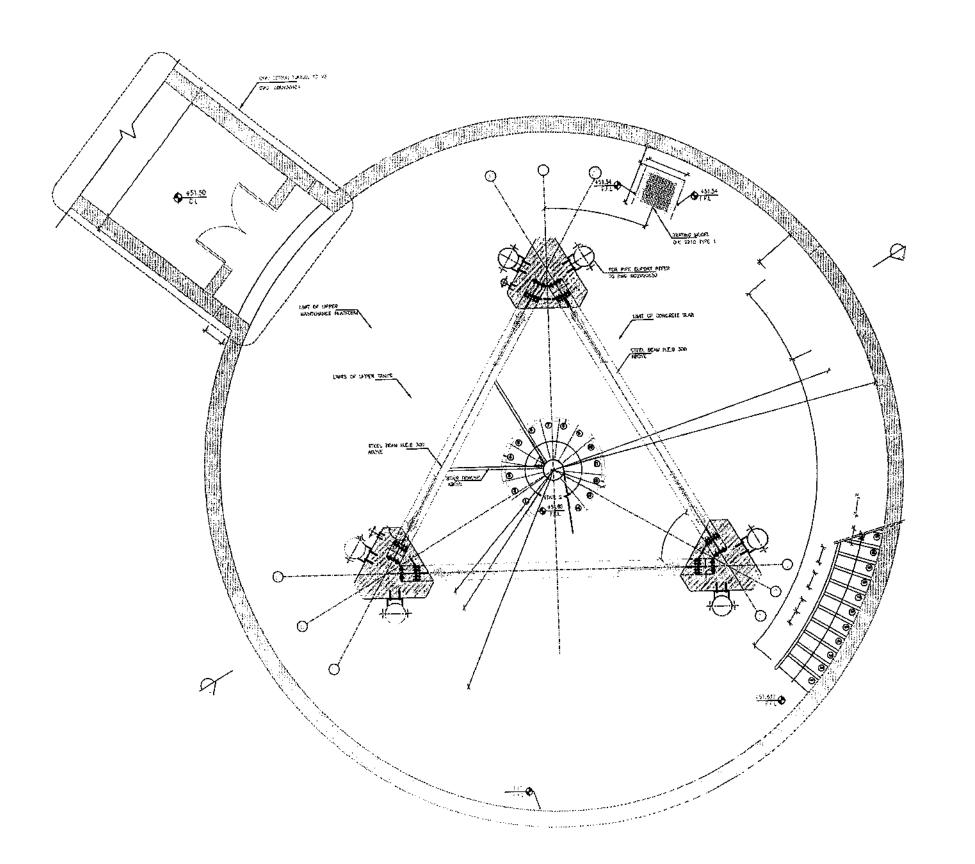
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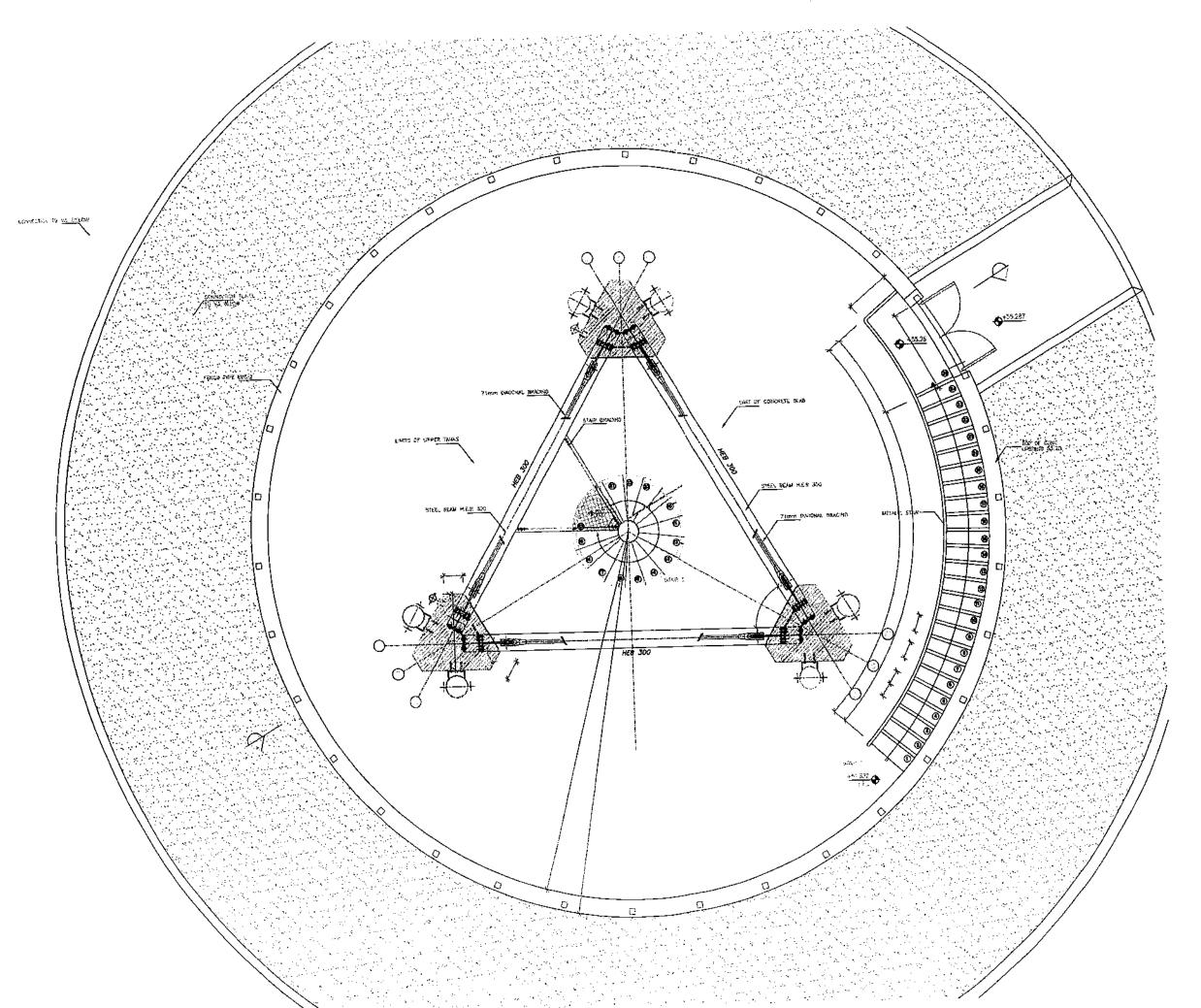
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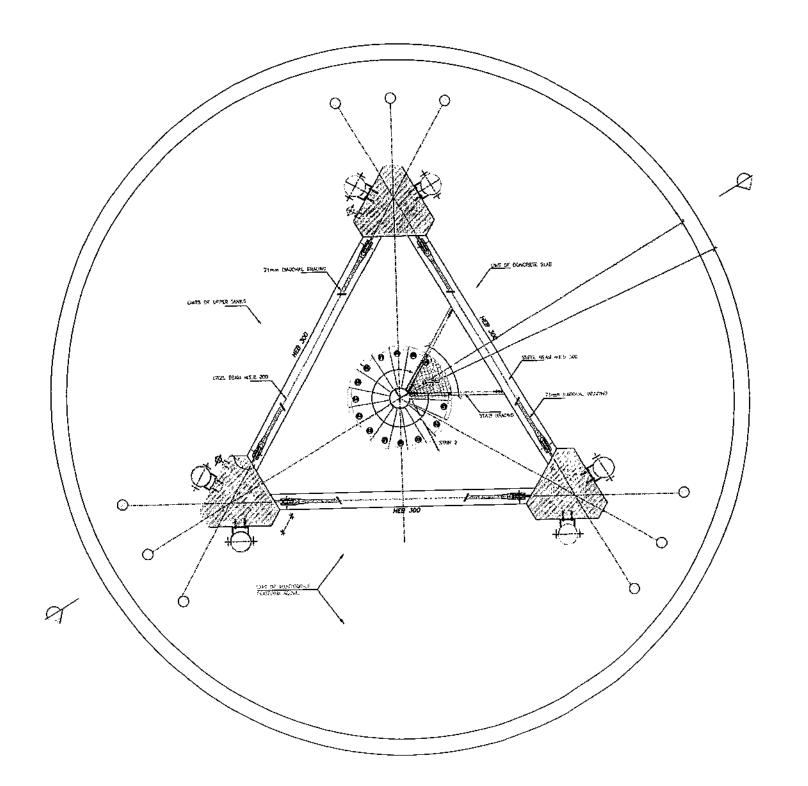
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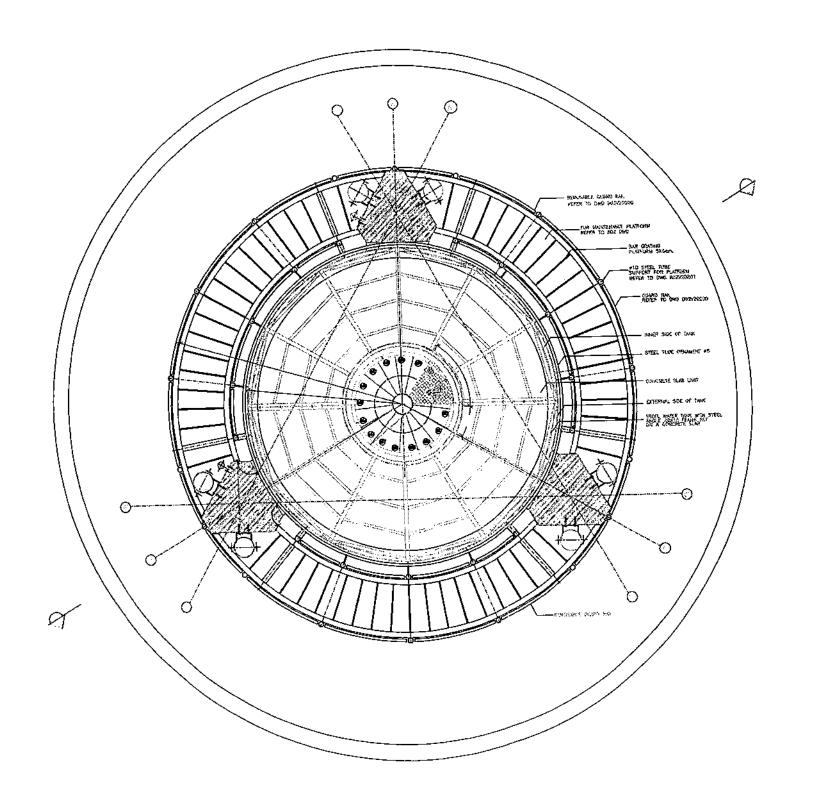


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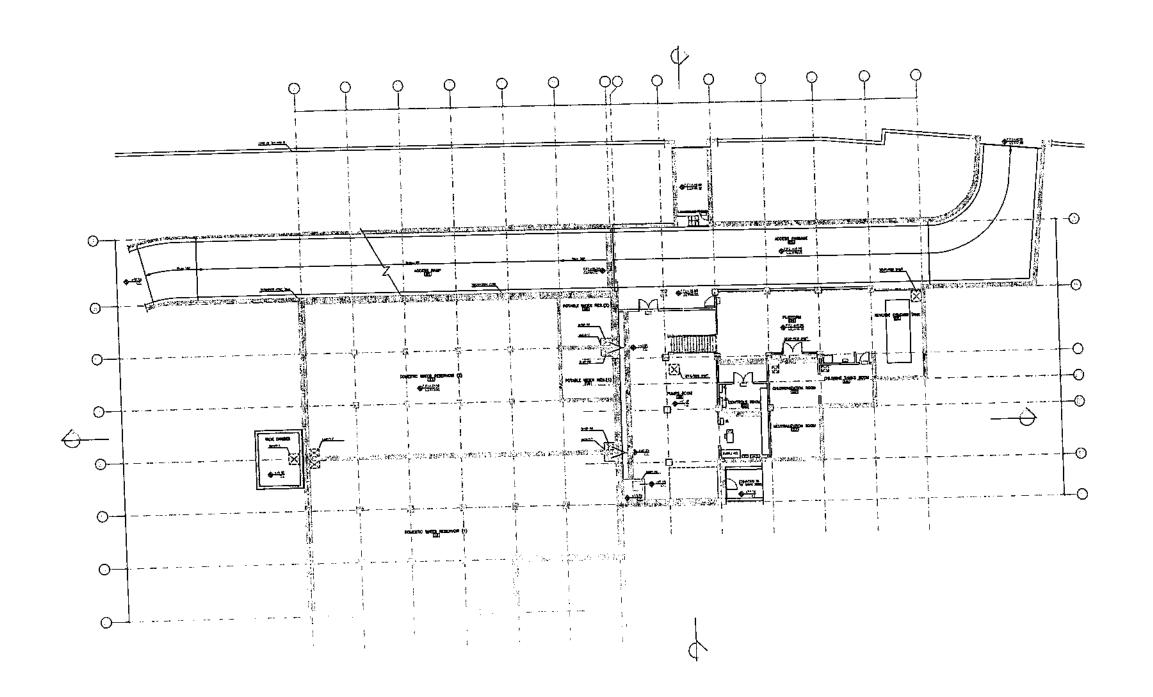


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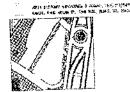
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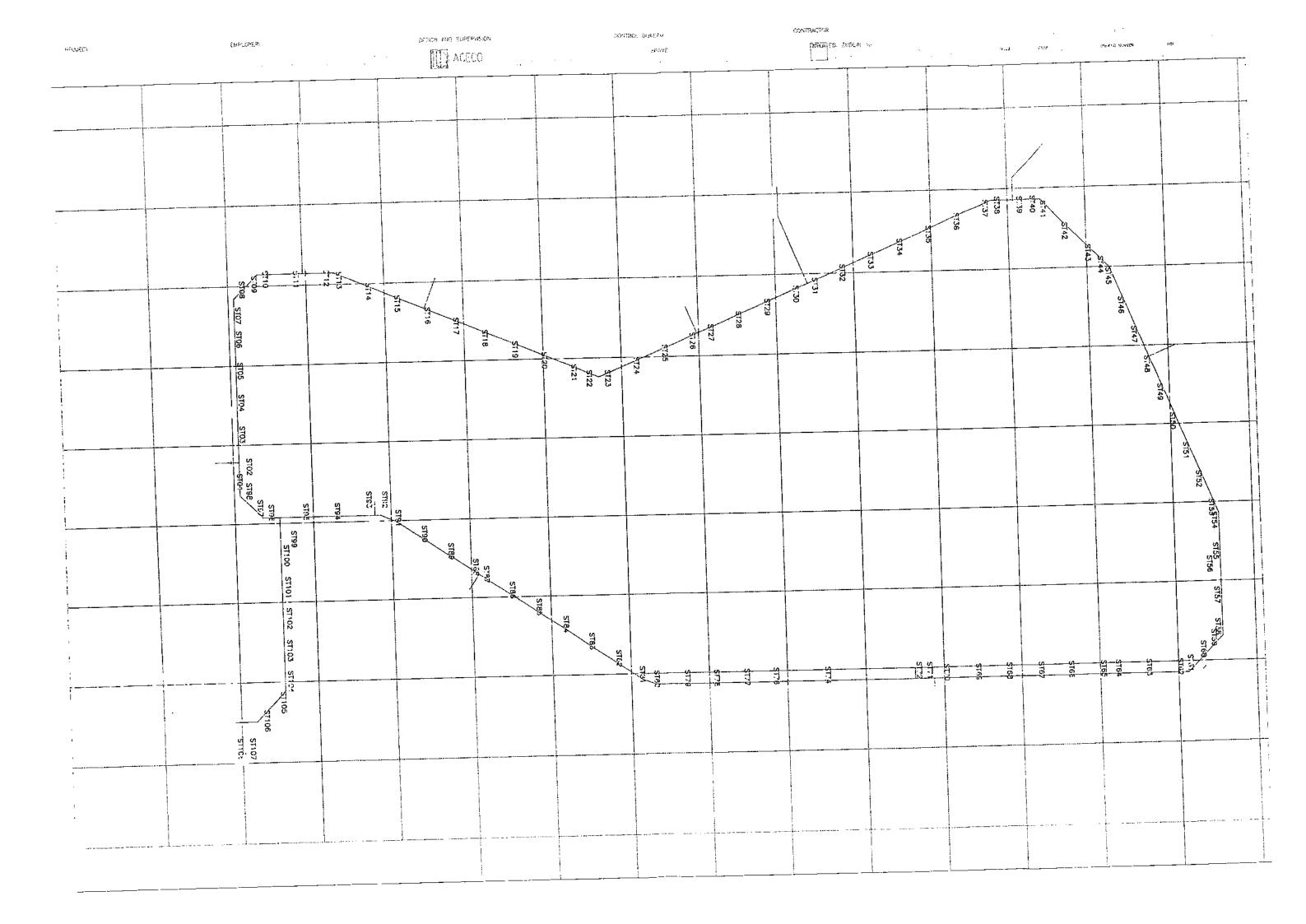


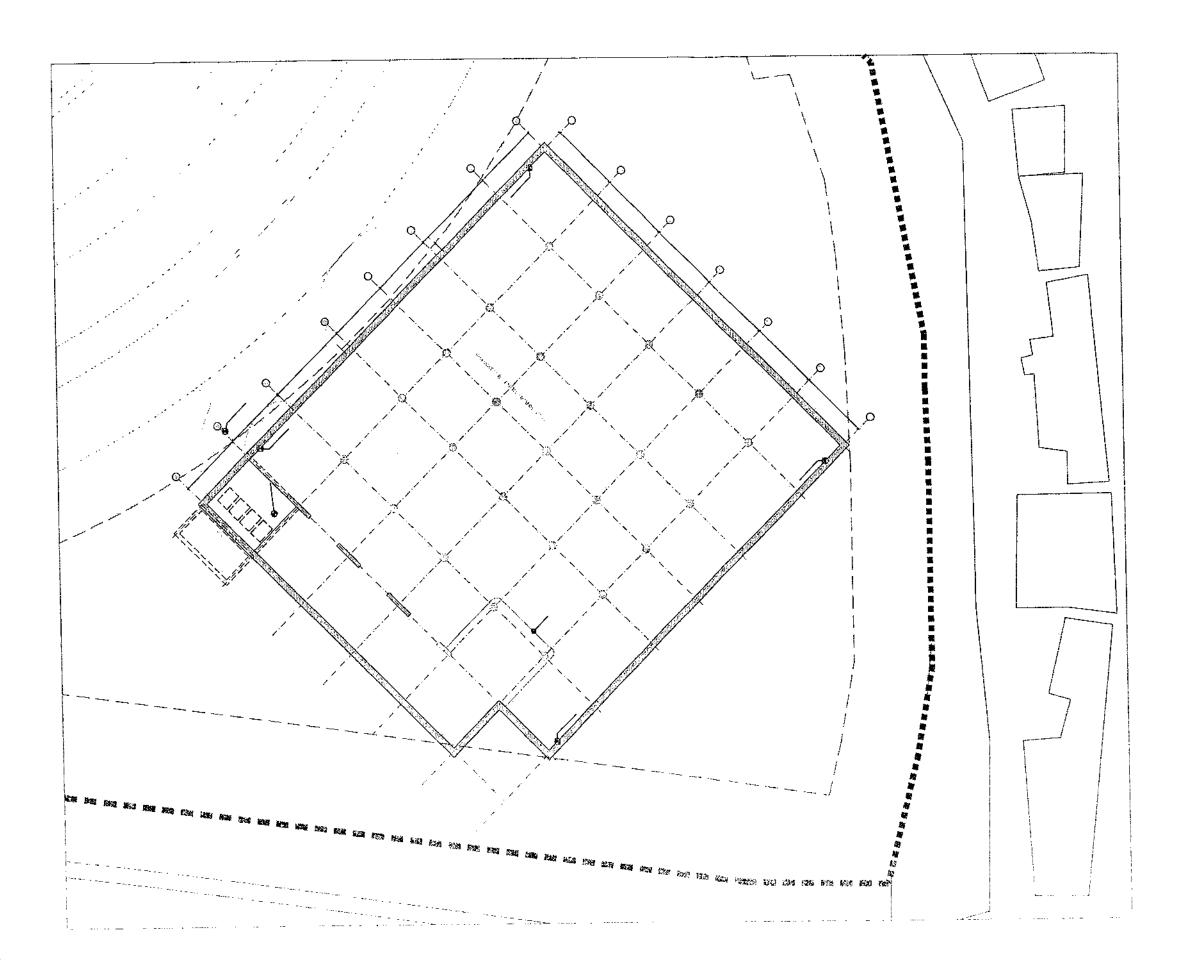
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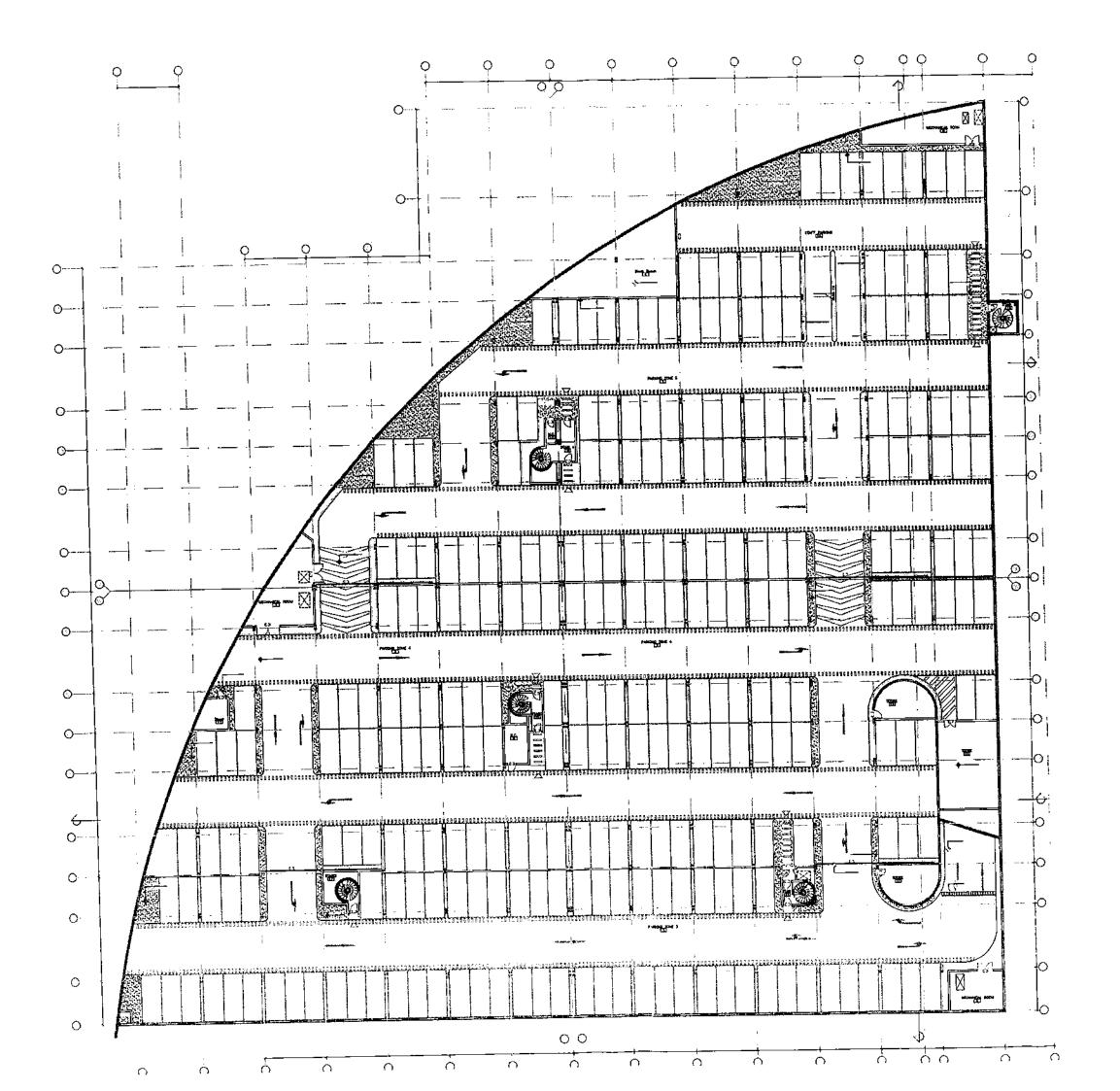
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