

Consultation Services for Electrical and Mechanical Installations

ASHRAE

stands for

American Society of
Heating, Refrigerating and
Air-Conditioning Engineers



AUTODESK
AUTOCAD



AUTODESK
REVIT



تیواپترو توان
Tiva Petro Tavan



**Conceptual Design
Basic Design
Detail Design
Shop Drawings**

Tiva Petro Tavan Company with a history of Cooperation in the Design of Installation in different Applications and dimensions, is capable to provide services to Clients in different stages of design and engineering services.



Tiva Top Projects



**Zamiad Automobile
Production Site 2**

**Dana insurance office building
2,000 m²**

**Headquarters building of
Iranian Island
10,000 m²**

**Assef Mall
20,000 m²**

**Farzan Commercial & Office
Building
20,000 m²**

**Central Building of
Pasargad Bank
60,000 m²**

West Tehran Atie Hospital

Atieh Gharb Hospital is one of the most advanced mega hospitals in Tehran, Iran, with Tiva Petro Tavan serving as the electrical and mechanical consultant for the project.

Key details of the hospital include:

- **Nature: Multidisciplinary**
- **Total project area: Over 190,000 square meters**
- **Ground and first class area: 10,951 square meters**
- **26 floors for therapeutic and clinics, 9 floors for parking**
- **Emergency beds: 23**
- **Public spaces and parking: 60,500 square meters**
- **Hospital facilities area: 17,116 square meters**
- **Diagnostic and therapeutic areas: 72,590 square meters**
- **Elevators and stairs area: 8,852 square meters**
- **Specialized clinics area: 37,188 square meters**
- **Welfare spaces area: 11,127 square meters**
- **Total floors: 25 above ground plus a helicopter floor**
- **Floors below ground: 7**
- **Number of elevators: 56**



Barekat Hospital

Barkat Hospital is currently under construction as one of the most advanced cancer centers in Iran and the Middle East, boasting a vast infrastructure spanning 300,000 square meters in Tehran.

Tiva Petro Tavan is responsible for the design and installation of the electrical system for this project, operating under a contract with the general project consultant.



Bushehr mall

Bushehr Mall Complex is currently under construction, featuring 70,000 square meters of floor space and approximately 400 commercial units.



This ambitious project includes a 700-seat concert hall, 3 cinemas with a capacity of around 200 persons each, 2 theater platforms, a hotel with 40 VIP suites, 4 restaurants covering 450 square meters each, a photo gallery, a museum accommodating 450 persons, and a vast parking area spanning 200,000 square meters. Additionally, an amusement park covering 2,200 square meters will be built, making Bushehr Mall the largest cultural, artistic, social, recreational, and commercial project in southern Iran.

Tiva Petro Tavan Company is responsible for consulting on the electrical and mechanical

Central Building of Pasargad Bank

Pasargad Bank Headquarters, known as the Third Millennium Tower, spans approximately 60,000 square meters and is located on Mirdamad Street, the financial and administrative hub of Tehran, Iran.



Tiva Petro Tavan Co. has been tasked with preparing conceptual drawing plans, basic design, shop drawing plans, and providing workshop supervision for the electrical installation under a contract with the project management. For more details, please visit our website.

Specialized Engineering Services

Tiva Petro Tavan has provided specialized engineering services for a variety of systems in various projects. These include smoke control System, earthing, fire alarms, video surveillance, data networks, distribution power grid, and smart and automation systems.

**Smoke control system
Mika-Knots Tower**



**Smoke control system &
Fire Curtain**



**Smart system
Avand commercial treatment
building**

Tiva Petro Tavan Design Specifications

Presenting the plan with an executive view.

Tiva Petro Tavan experience in preparing shop drawing plans and implementing facilities allows it to present plans with an executive-level view and meticulous detail.



Tiva Petro Tavan Design Specifications

Presenting the plan in coordination with the architectural needs

During the design stages of building facilities, our group prioritizes meeting architectural demands and requirements while ensuring compliance with standards. This emphasis on architectural needs is paramount in our planning.

"Tiva Petro Tavan's technical and executive expertise always ensures solutions that meet architectural requirements."



Tiva Petro Tavan Design Specifications

Providing the plan according to the needs of the project schedule:

This company has the ability to adapt to the project schedule due to its flexibility in the allocation of manpower and high capacity.

Making changes in the design process with the initial cost paid:

This company considers changes in the plans of different disciplines of architecture and mechanics in the design process to be an integral part of the design process and will not impose additional costs on the project for changes in the design process.



Providing designs considering the economic requirements of the project:

Given the company's familiarity with the market, material prices, equipment, and implementation costs, Tiva Petro Tavan is capable of presenting designs that meet the economic requirements of the clients.

Lighting system:

Tiva Petro Tavan provides visual materials necessary for decision-making and selecting lighting fixtures, as well as lighting various internal and external spaces of the project for architects and project owners. This is done by presenting lighting modeling in Dialux EVO software. Finally, the lighting system design and technical specifications are provided, considering the economic requirements of the customers.



Video surveillance system (CCTV)

The placement of CCTV cameras is determined based on the client's surveillance needs, considering the field of view and specifications of each camera, and in coordination with the client's economic requirements. The video signal transmission platform, including the necessary data network and rack layout, is designed according to technical and security



Sound and Public Address system

The audio system design, which includes speaker and amplifier specifications and installation locations, is determined based on several factors such as sound quality, installation height, ambient noise, and client preferences for effects, using EASE software for this purpose.

designing a Building Management System (BMS)

At Tiva Petro Tavan, designing a Building Management System (BMS) is a multidisciplinary endeavor and our various departments, including electricity, mechanics, and control-instrumentation, possess extensive knowledge and experience in designing and commissioning smart control and management projects. This breadth of expertise ensures the comprehensive and feasible design of our BMS systems.



Network System

With extensive experience in numerous projects ranging from engineering to support, the company possesses the knowledge and expertise necessary to deliver optimal engineering and economic services to various clients.

In a conventional design, only the general system and passive infrastructure are required. In this regard, Tiva offers a comprehensive plan that includes all active and passive equipment, as well as data center solutions, based on the latest equipment



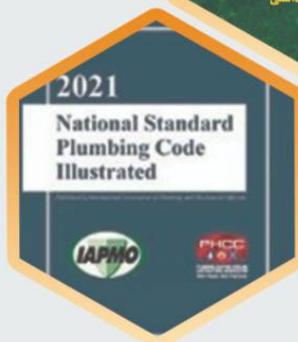
Air Conditioning System

At Tiva Petro Tavan, we understand the critical importance of a reliable and efficient air conditioning system for both comfort and productivity in any environment. With a commitment to excellence and innovation, our company has established itself as a leading provider of cutting-edge air conditioning solutions. From commercial buildings to residential complexes, our expertise covers a wide range of applications, ensuring that our clients receive tailored solutions that meet their specific needs.



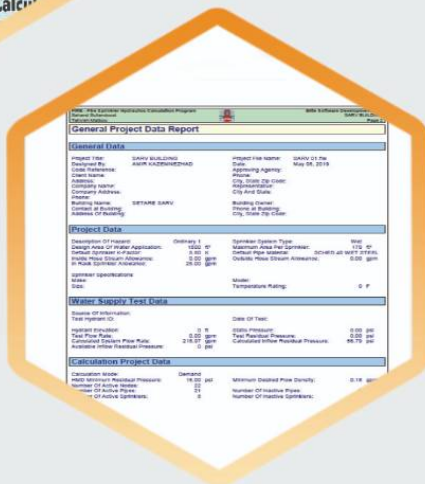
Water Supply and Sewage Systems

Tiva Petro Tavan understand the critical importance of safe and efficient water supply and sewage systems for communities and industries. Our team of experts is highly trained and knowledgeable in both international best practices and Iranian regulations, ensuring that our solutions not only meet but exceed the highest standards of quality and safety.

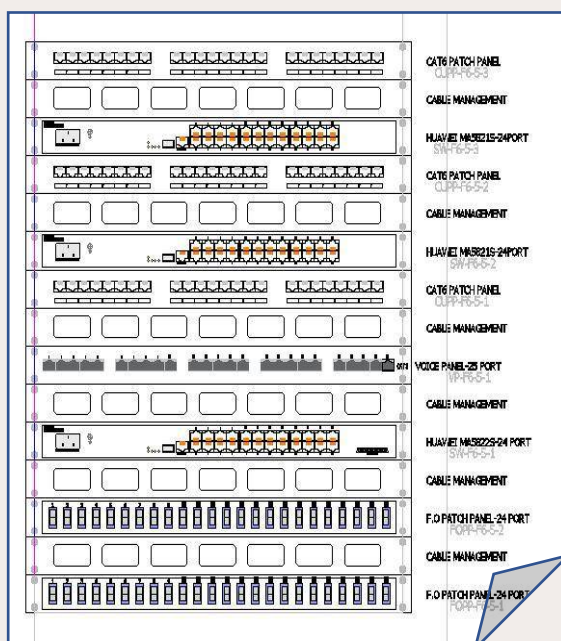
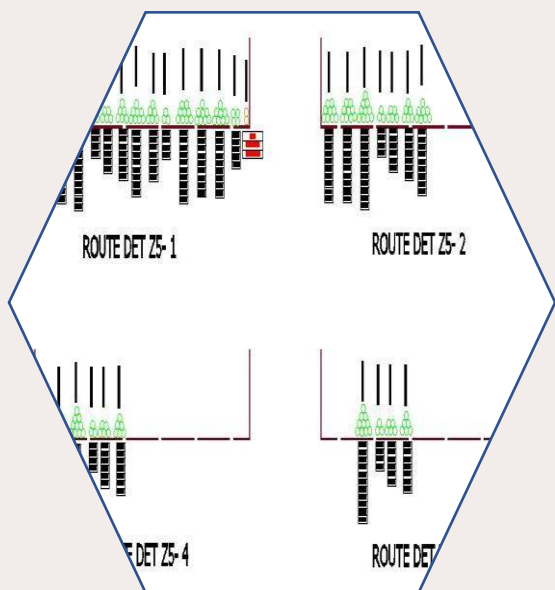
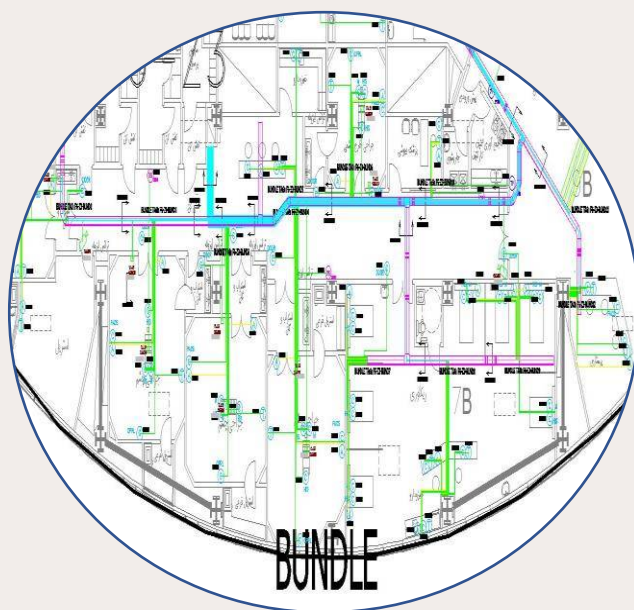
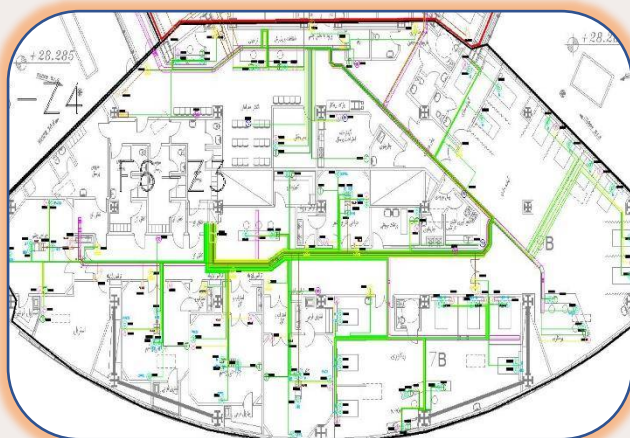


Fire Fighting System

Our team of highly skilled engineers and technicians is equipped with the latest knowledge and expertise in fire protection technology. We adhere to international standards and regulations to guarantee the highest level of safety and performance in every project we undertake.

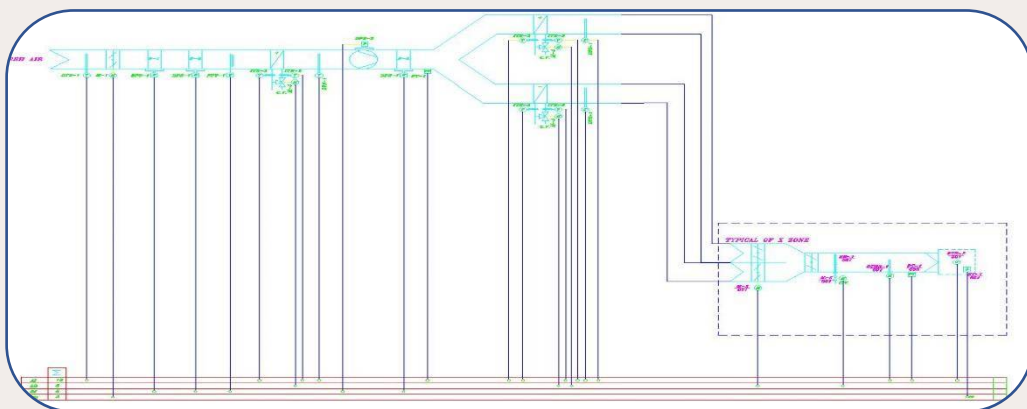
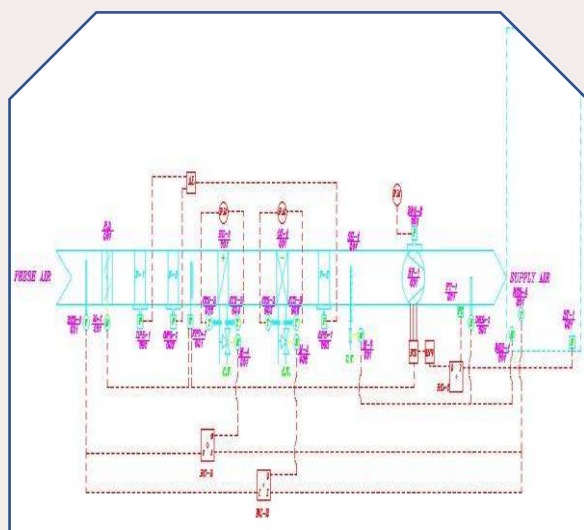
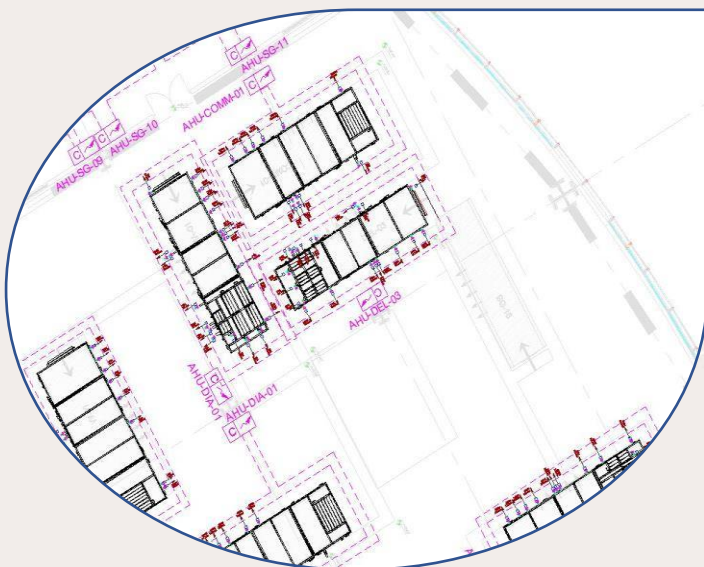


Atie Hospital Project Network System



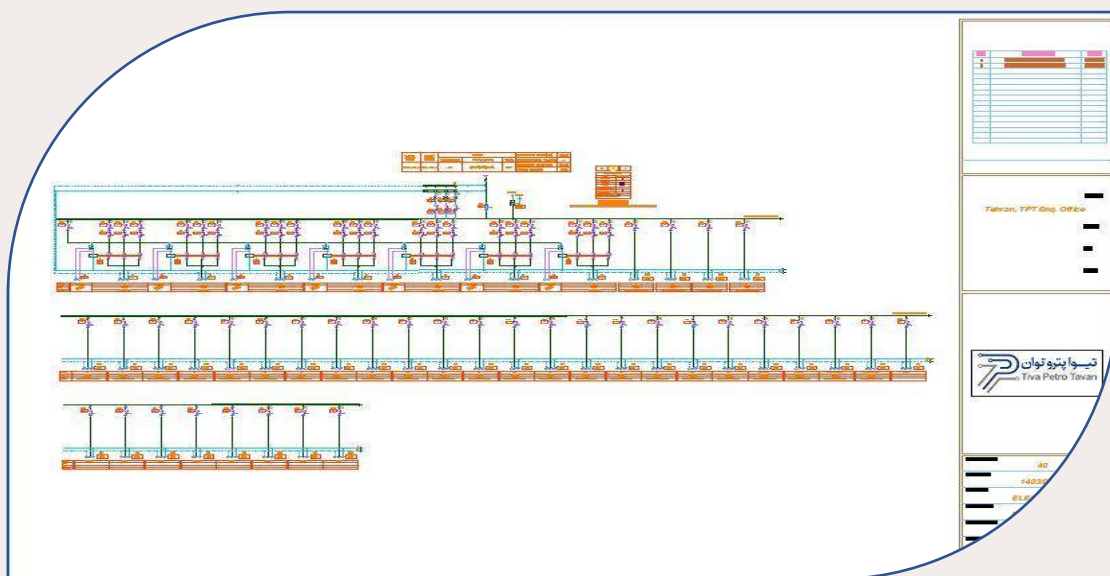
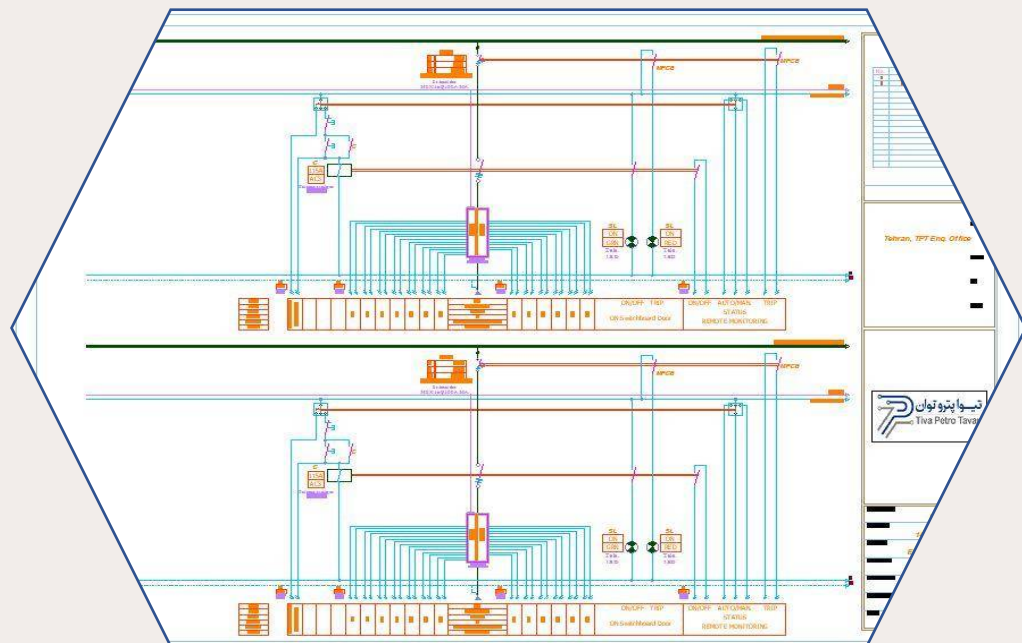
Atie Hospital Project

BMS System



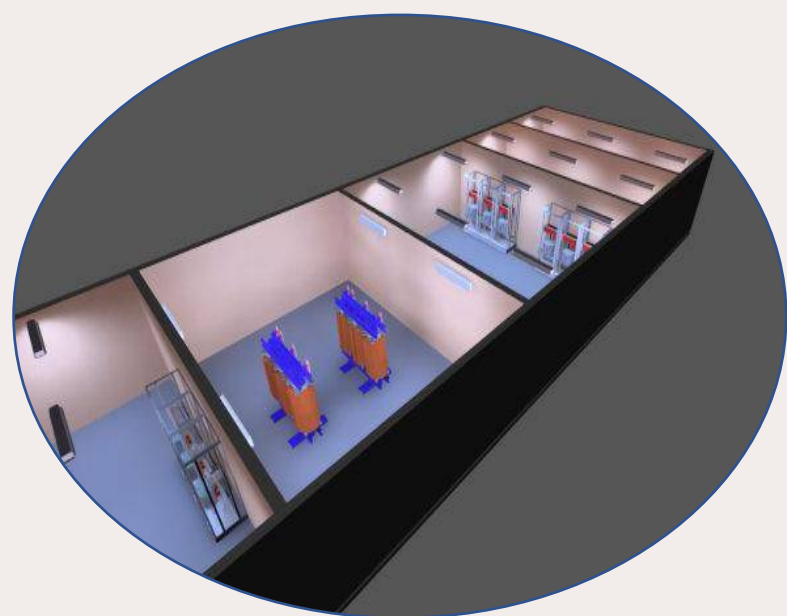
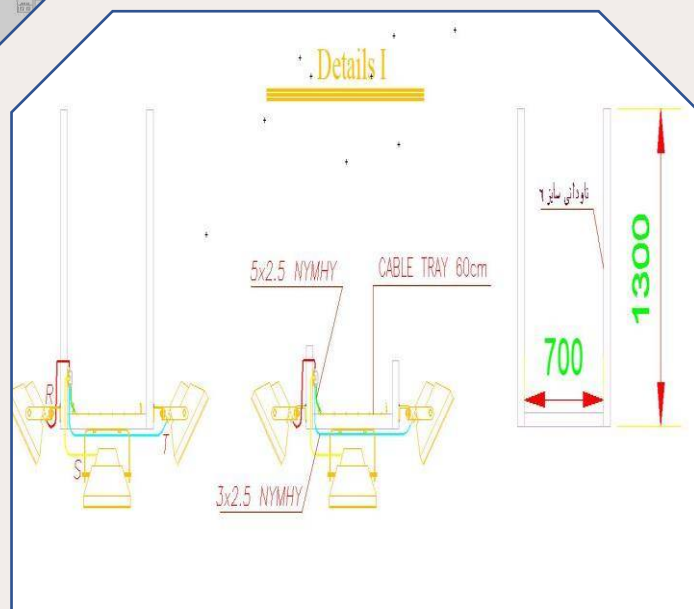
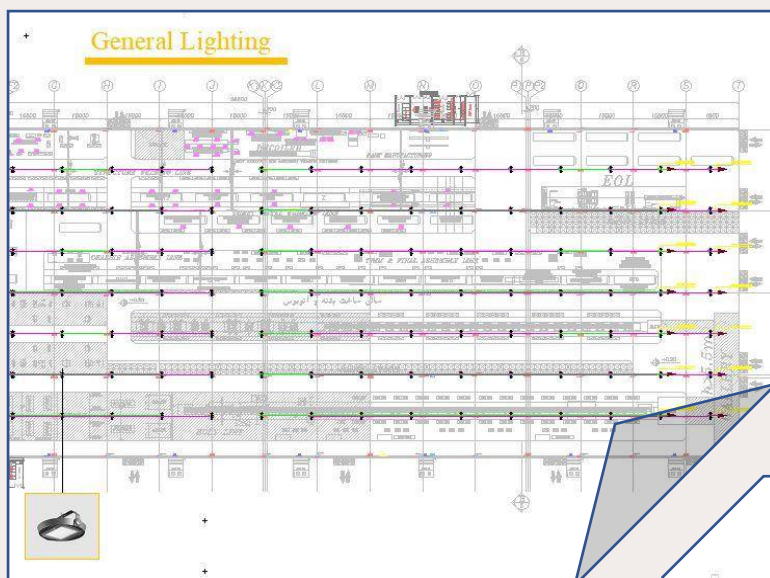
Atie Hospital Project

Single Line Diagram



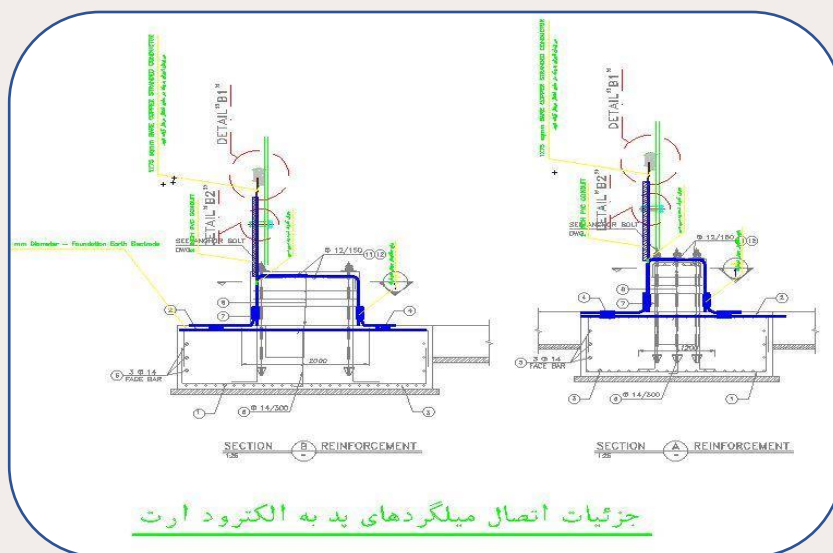
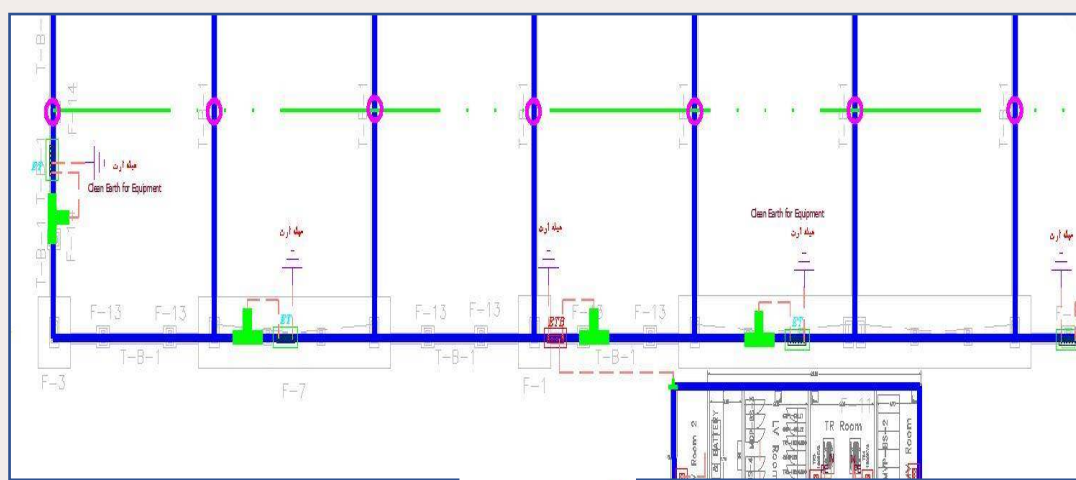
Zamyad 2

Lighting System for Production Hall



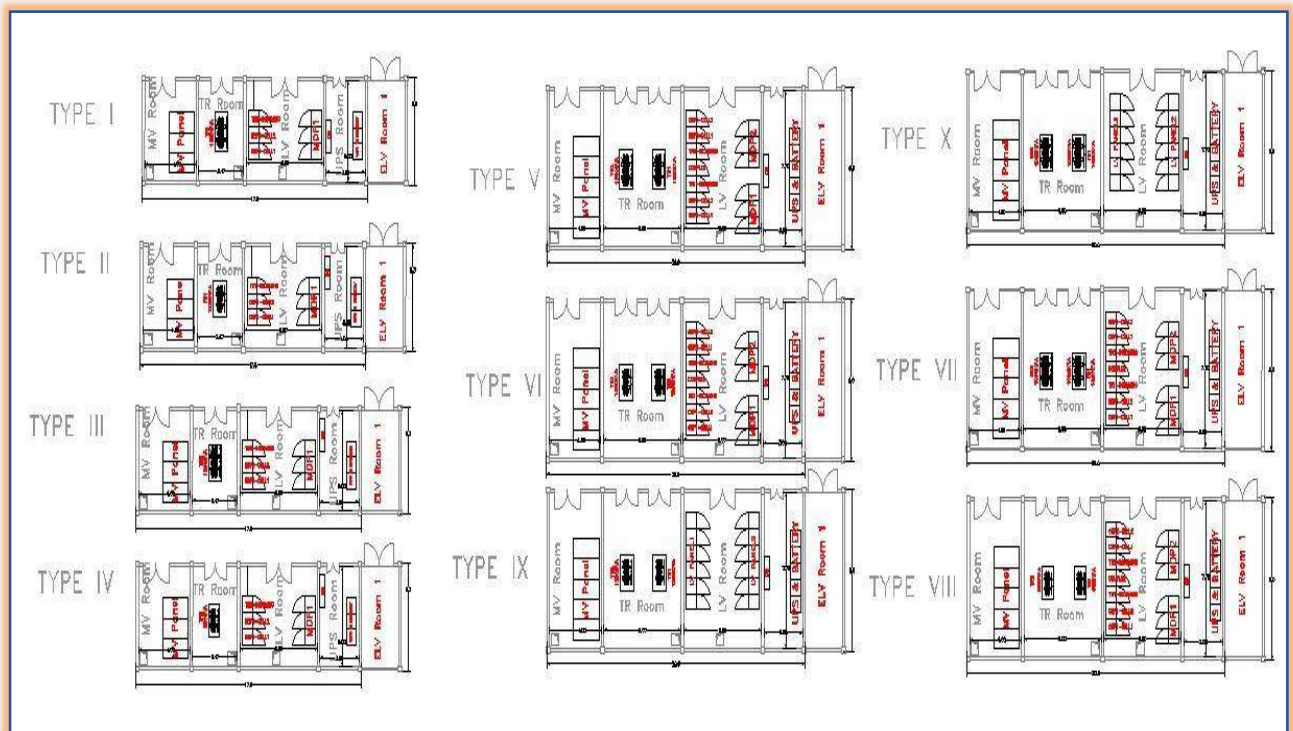
Zamyad 2

Earthing & Bopnding System



Zamyad 2

Classification of Electrical Substations



Data Center Design

Electrical Specification Report

According to the Figure 7, the designed data center comprises various parts, each of which is as follows:

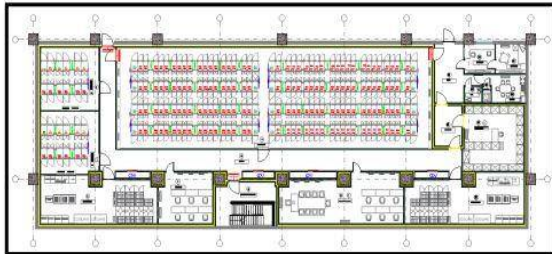


Figure 7: Designed data center.

6.3 ER/MDA

This section is indeed a combination of the Entrance Room (ER) and the Main Distribution Area (MDA).

ER is the point where external telecommunications cables from internet service providers (ISPs) and other carriers enter the facility and connect to the data center's internal cabling system. It acts as a crucial junction point, demarcating the boundary between the public network and the secure, private network of the data center.

The Main Distribution Area (MDA) serves as the central nervous system of a data center's cabling infrastructure. It houses the main cross-connect (MC), acting as the primary distribution point for all the data center's cabling. Consider it as the grand central station for data traffic overseeing the flow of information between various areas within the data center. It typically houses essential components like core LAN/SAN switches, routers, and power distribution units (PDUs).

The Figure 8 illustrates the two ER/MDA spaces within the data center.



Figure 8: ER/MDA Rooms.

1.1 Light intensity

The amount of light intensity for each of the project areas is the first priority in accordance with the Tia-942 and National Construction Regulations of Iran Chapter 13 as described in the Table 6:

Table 6: Light intensity of the project areas

Row	Type of interior, task or activity	E_{avg}	E_{min}
1	Kitchen	200	100
2	Stairs	150	100
3	Corridor	200	100
4	Offices work	500	200
5	Archive	300	100
6	NOC	500	200
7	SOC	500	200
8	Server room ⁵	500	200
9	Power room	500	200

Lighting fixtures should not be powered from the same electrical distribution panel as the telecommunications equipment in the computer room. Dimmer switches should not be used. Emergency lighting and signs shall be properly placed per authority having jurisdiction (AHJ) such that an absence of primary lighting will not hamper emergency exit.

7.1.2 Safety Lighting

To ensure a secure pathway, especially during times of danger such as a fire, safety lighting will be employed. This will be achieved by utilizing lights equipped with battery backups capable of keeping the lamp illuminated for a minimum of 1 hour. Emergency-type safety lighting will illuminate escape routes from the building and the areas above exit doors, maintaining an average brightness level of 10 lux.

Safety lights are categorized based on their installation positions into two distinct types:

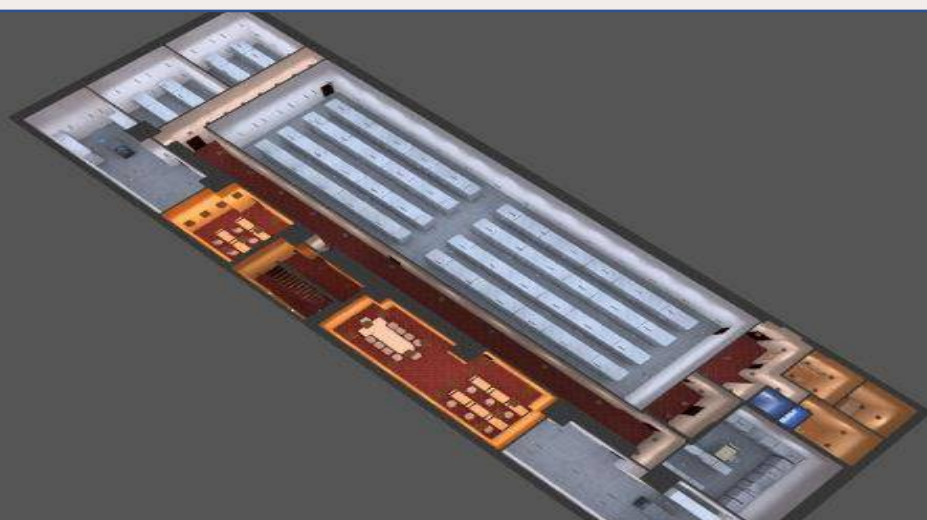
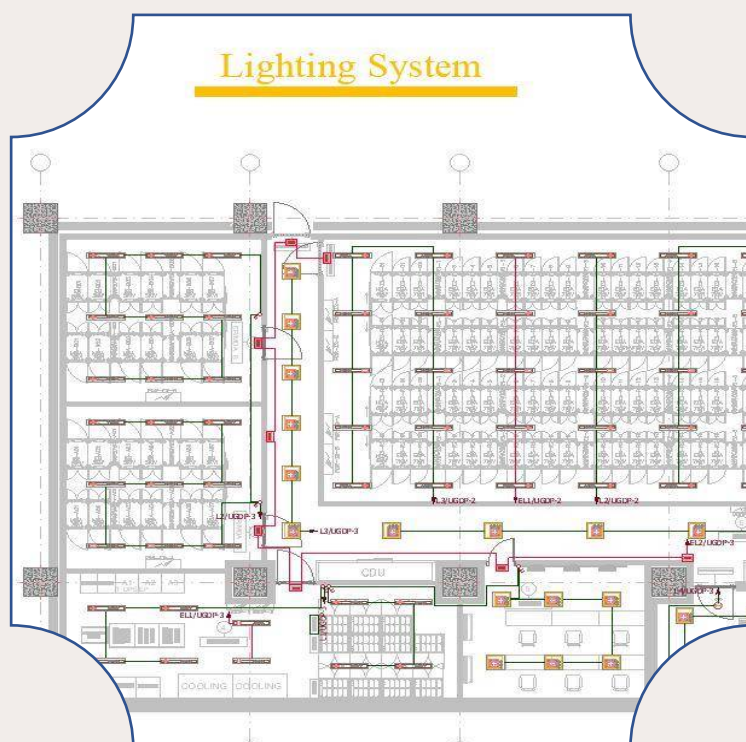
7.1.2.1 Sign Escape Lighting

This category serves a specific purpose by featuring signs imprinted on them, particularly due to their installation locations. Specifically, lights with escape signs are positioned above fire doors or exits, indicating exit locations for individuals. The handling of these lights differs from regular lights in terms of power supply circuits and control, and they are accorded special importance.

⁵ Based on Tia-942, Server room lighting shall be a minimum of 500 lux in the horizontal plane and 200 lux in the vertical plane, measured 1 m above the finished floor in the middle of all aisles between cabinets.

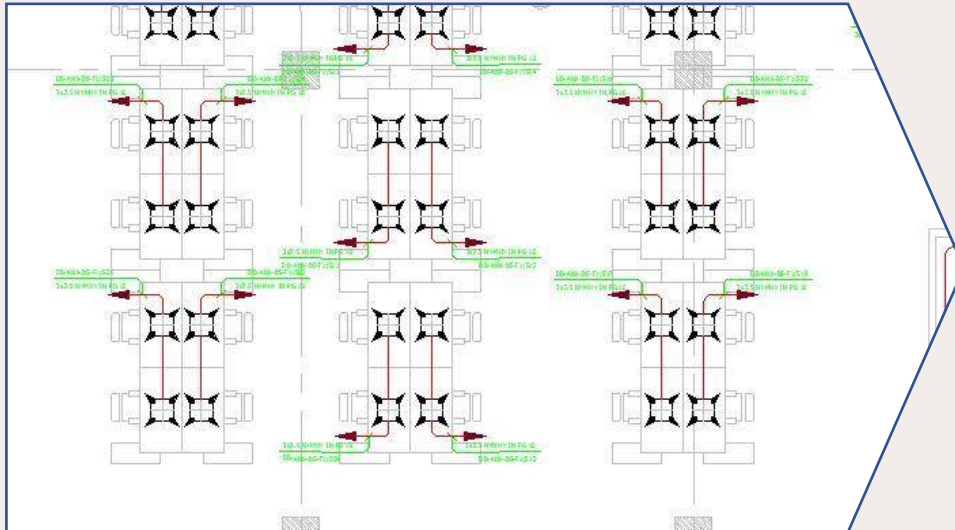
Data Center Design

Lighting System



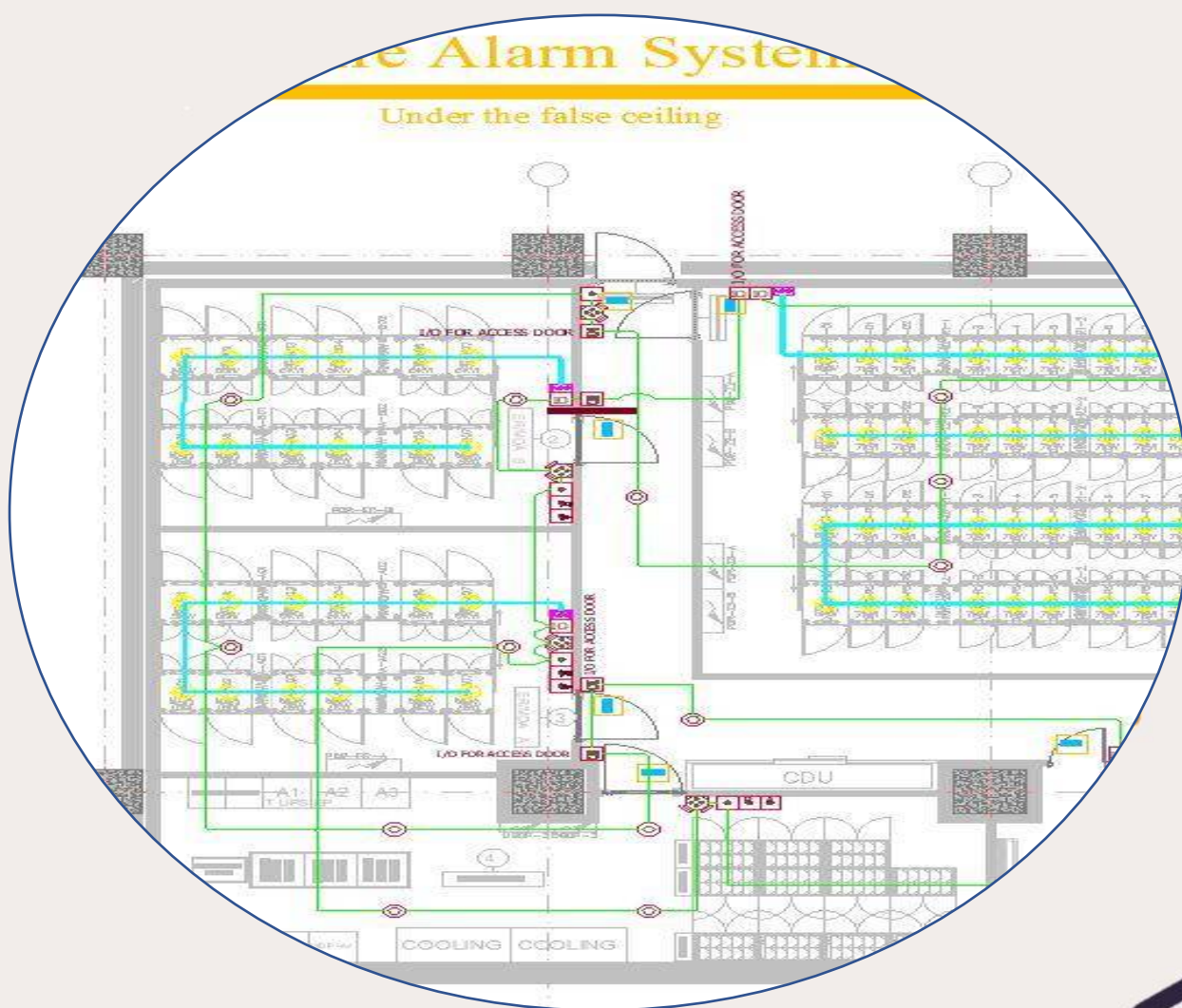
Data Center Design

Socket Outlet & Network System



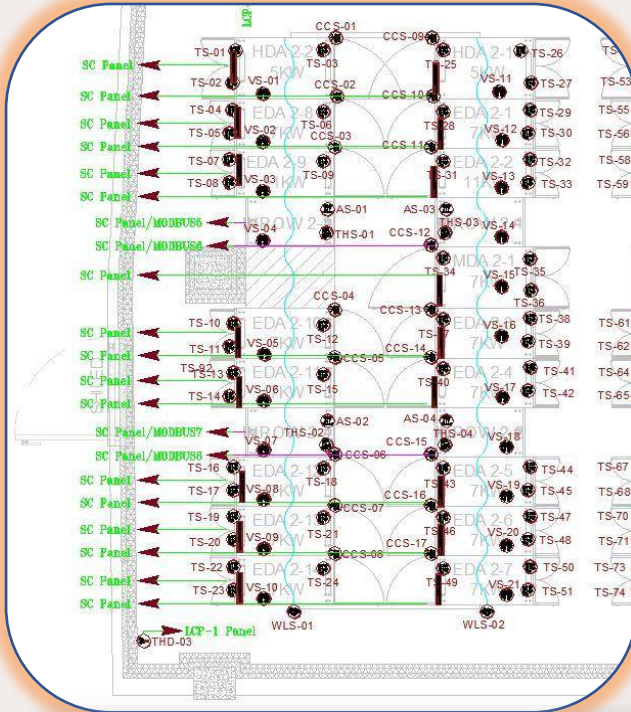
Data Center Design

Fire Alarm System

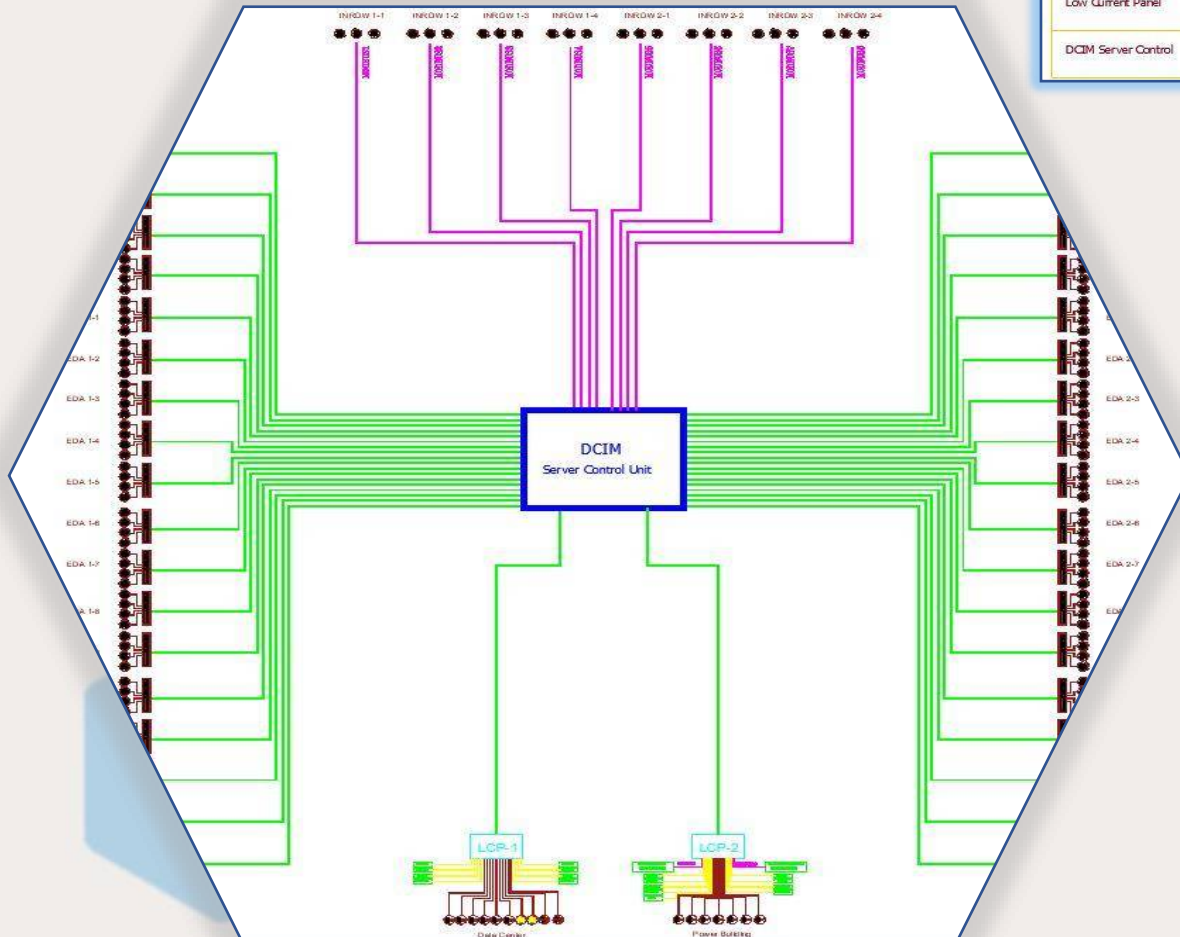


Data Center Design

Data Center Infrastructure Management

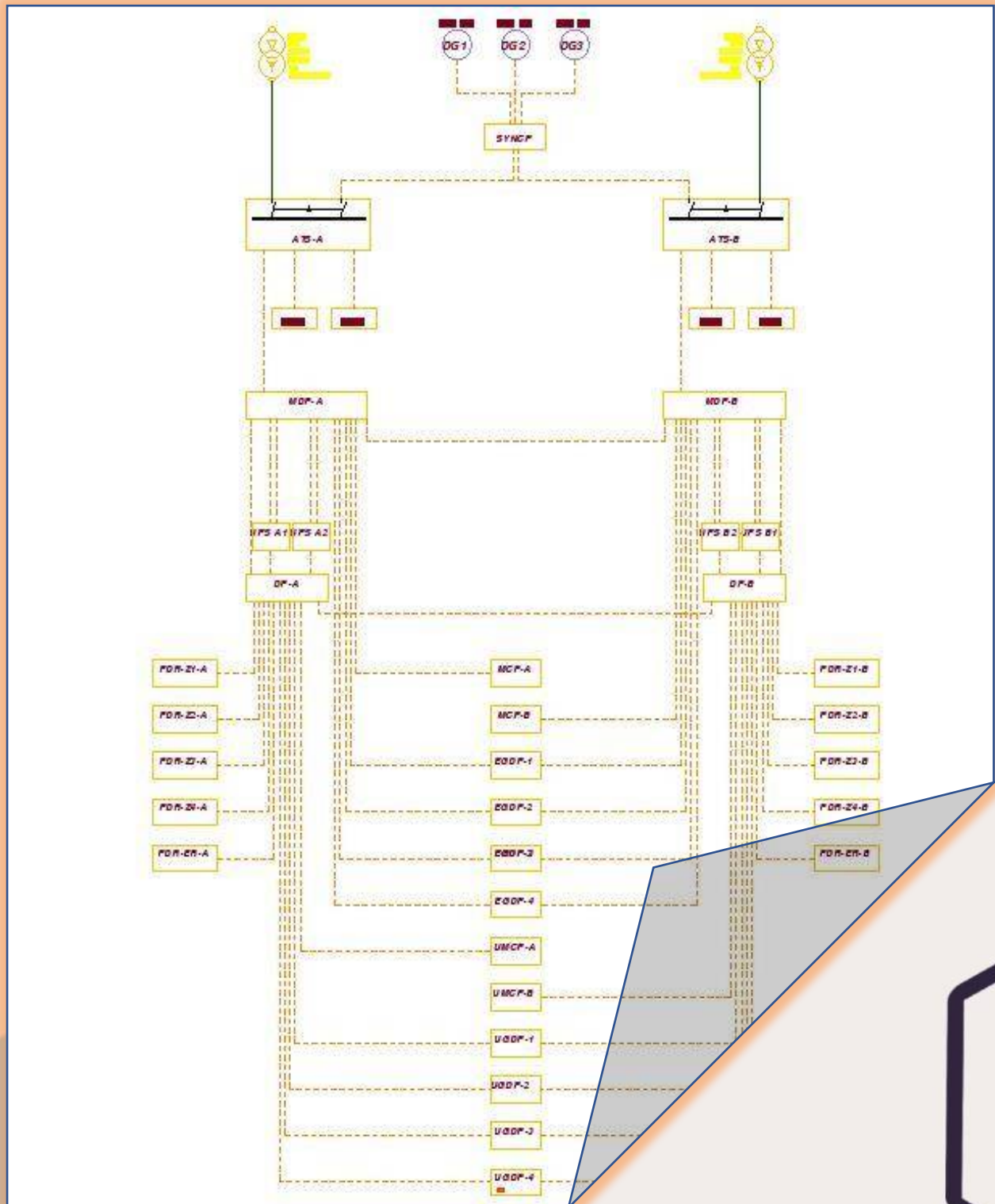


Legend	SIGN
Temperature Sensor	
Vibration Sensor	
Particle Matter/Dust Air Quality Sensor	
Water Leak Detection Sensors	
Water Leakage Rope	
Temperature and Humidity Sensor	
Temperature And Humidity Sensor With Display	
Contact closure sensors	
Airflow sensor	
Pressure sensor	
Temperature and Pressure sensor	
MODBUS	
Rack Monitor Unit	
Low Current Panel	
DCIM Server Control	



Data Center Design

Power Distribution Riser Diagram



Data Center Design

Panel Schedule and Short Circuit current

Panel Schedule Calculation

										Date: 14/01/21												
PANEL NAME: RTG-A										UPSTREAM PANEL: TLA 2000 C												
FEEDER NAME		Current (A)			Phase	Lighting Load (W)	Socket Load (W)	Recreation Load (W)	Educational Load (W)	Lighting Control Factor	Socket Control Factor	Recreation Control Factor	Educational Control Factor	Innovation Load (W)	Cat D	Protection						
Name	FEEDER NAME	K	L	T												Phase	Lighting Load (W)	Socket Load (W)	Recreation Load (W)	Educational Load (W)	Lighting Control Factor	Socket Control Factor
1	RTG-A	1100.00	1100.00	1100.00	1	6.67	28	901.4	1100	1	0.6	1	0.6	1849	0.89	2(10-100)+(10-100)	0(10-100) (0A)	AP	PANEL	RCB	2500	1000
2	DMPT	296.00	296.00	296.00	1	0	0	188.6	0	1	0.6	1	0.6	155.6	0.89	0(10-100)+(10-100)	10(10-100) (0A)	AP	PANEL	VECB	100	100
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2 Installation general design

2.1 List of devices

2.1.1 MV/LV transformer

Name	Nbr	Range	Insulation	Sr (kVA)	ukRt (%)	Connection	U2 (V)	SEA	Rb (mΩ)
TR-A	1	Trihal	Resin	2500	0	D	420	TN-S	10000
TR-B	1	Trihal	Resin	2500	0	D	420	TN-S	10000

2.1.2 LV switchboards and busbar

Switchboard name	Range	Rating (A)	IP
ATS-A	No preference	0.00	Undefined
MDP-A	No preference	0.00	Undefined
IT-UPS-AT-A	No preference	0.00	Undefined
FAC-UPS-DP-A	No preference	0.00	Undefined
ATS-B	No preference	0.00	Undefined
IT-UPS-AT-B	No preference	0.00	Undefined
FAC-UPS-DP-B	No preference	0.00	Undefined
MDP-B	No preference	0.00	Undefined

Busbar name	Switchboard name	Ks	Polarity	SEA	Equipotential bonding
ats-a	ATS-A	1	3Ph+N	TN-S	With
mdp-a	MDP-A	1	3Ph+N	TN-S	Without
it-ups-dp-a	IT-UPS-AT-A	0.5	3Ph+N	TN-S	Without
mech-ups-dp-a	FAC-UPS-DP-A	1	3Ph+N	TN-S	Without
ats-b	ATS-B	1	3Ph+N	TN-S	With
it-ups-dp-b	IT-UPS-AT-B	0.5	3Ph+N	TN-S	Without
facs-ups-dp-b	FAC-UPS-DP-B	1	3Ph+N	TN-S	Without
mdp-b	MDP-B	1	3Ph+N	TN-S	Without

2.1.3 Circuit breaker

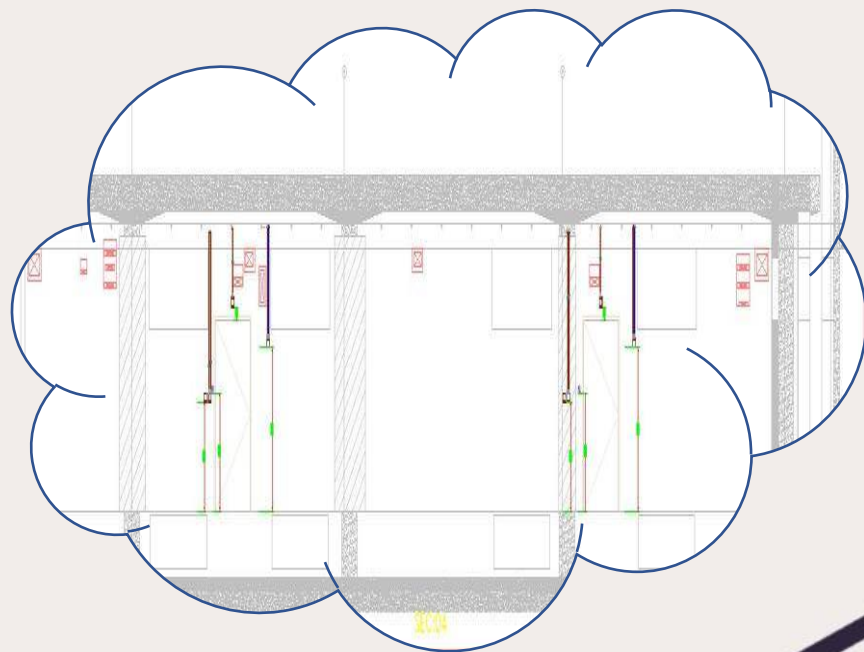
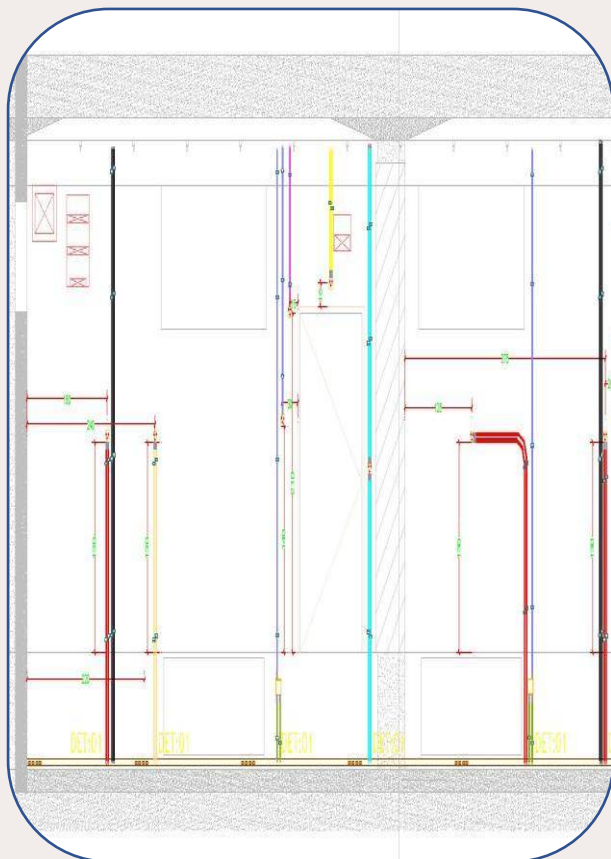
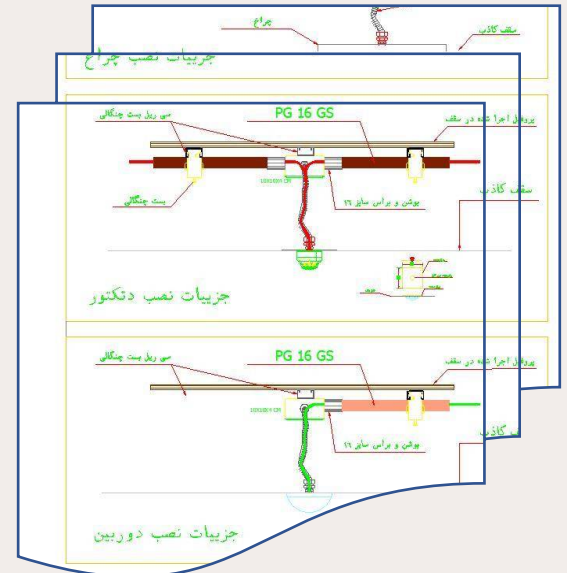
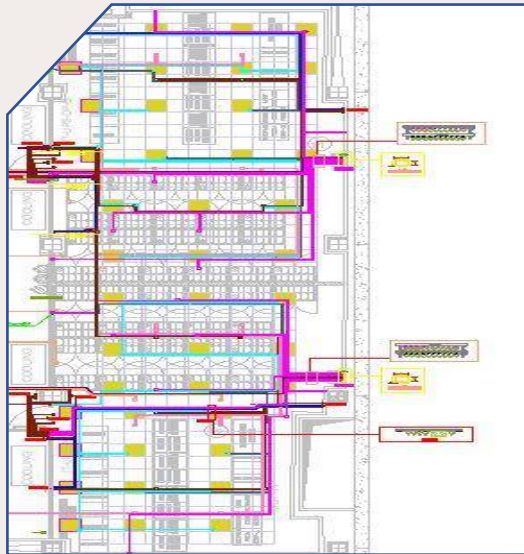
Name	Nbr	Range Designation	Rating (A)	Poles	Trip unit/Curve	RCD	RCD class	PowerTag Energy Designation	PowerTag Energy Connection Type
ATS-A-CB	1	Masterpact MT22 - MTZ2 40H1	4000	3P3d	Micrologic 5.0 X				
MDP-A-CB	1	Masterpact MT22 - MTZ2 25H1	2500	4P3d	Micrologic 5.0 X				
CHP1-CB	1	ComPacT NSX - NSX400H	400	3P3d	Micrologic 5.3 E				
CHP2-CB	1	ComPacT NSX - NSX400H	400	3P3d	Micrologic 5.3 E				
IT-UPS-DP-A-CB	1	Masterpact MTZ1 - MTZ1 16H2	1600	4P3d +Nr	Micrologic 5.0 X				
FAC-UPS-DP-A-CB	1	Masterpact MTZ1 - MTZ1 08H2	800	3P3d	Micrologic 5.0 X				
QA 40	1	Act9 NG125 NG125	25	3P3d	C				

Project: TR-A&B

180402034

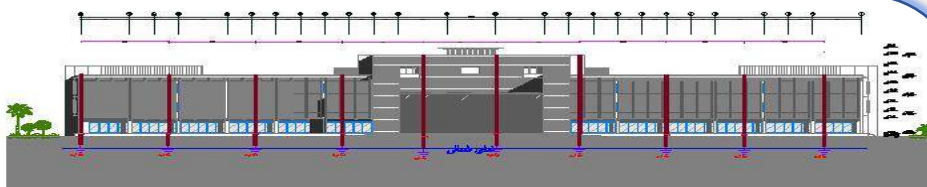
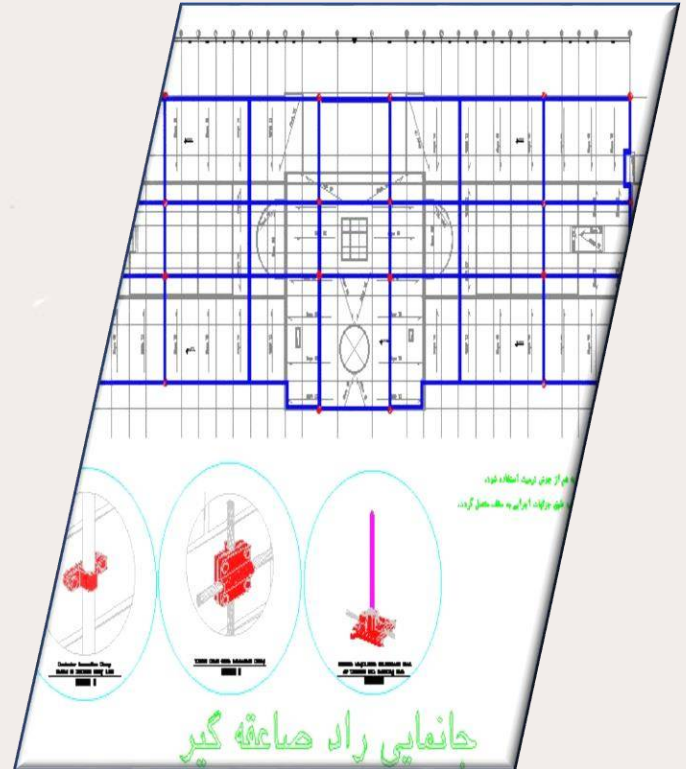
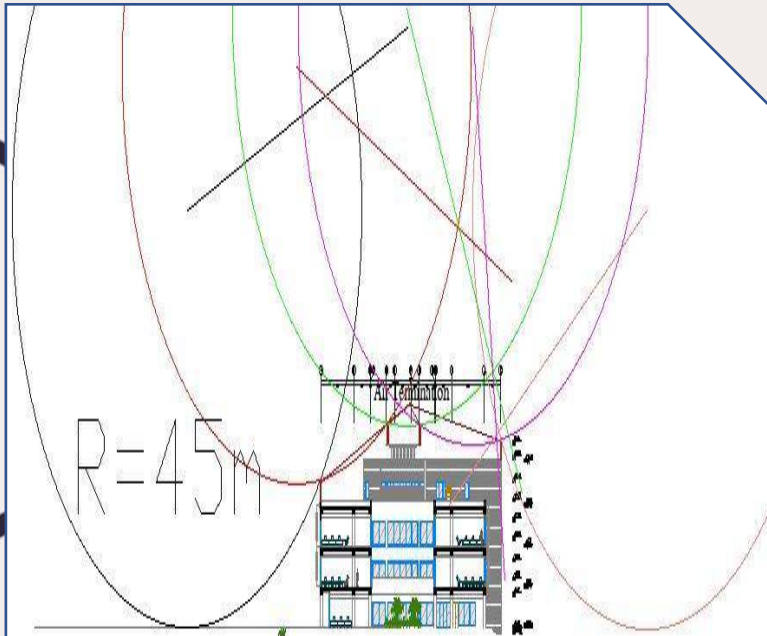
Data Center Design

Shop Drawing Plans

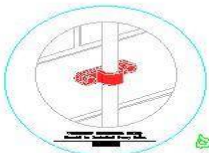


Khouzestan Steel Office Building

Earthing & Lightning System



- در صورتی که از جدارهای بتنی استفاده شده باشد، باید از جدارهای بتنی برای اتصال به سیستم زمین استفاده شود.
- جدارهای بتنی باید به سیستم زمین متصل شوند و باید از جدارهای بتنی برای اتصال به سیستم زمین استفاده شود.
- جدارهای بتنی باید به سیستم زمین متصل شوند و باید از جدارهای بتنی برای اتصال به سیستم زمین استفاده شود.
- جدارهای بتنی باید به سیستم زمین متصل شوند و باید از جدارهای بتنی برای اتصال به سیستم زمین استفاده شود.
- جدارهای بتنی باید به سیستم زمین متصل شوند و باید از جدارهای بتنی برای اتصال به سیستم زمین استفاده شود.
- جدارهای بتنی باید به سیستم زمین متصل شوند و باید از جدارهای بتنی برای اتصال به سیستم زمین استفاده شود.



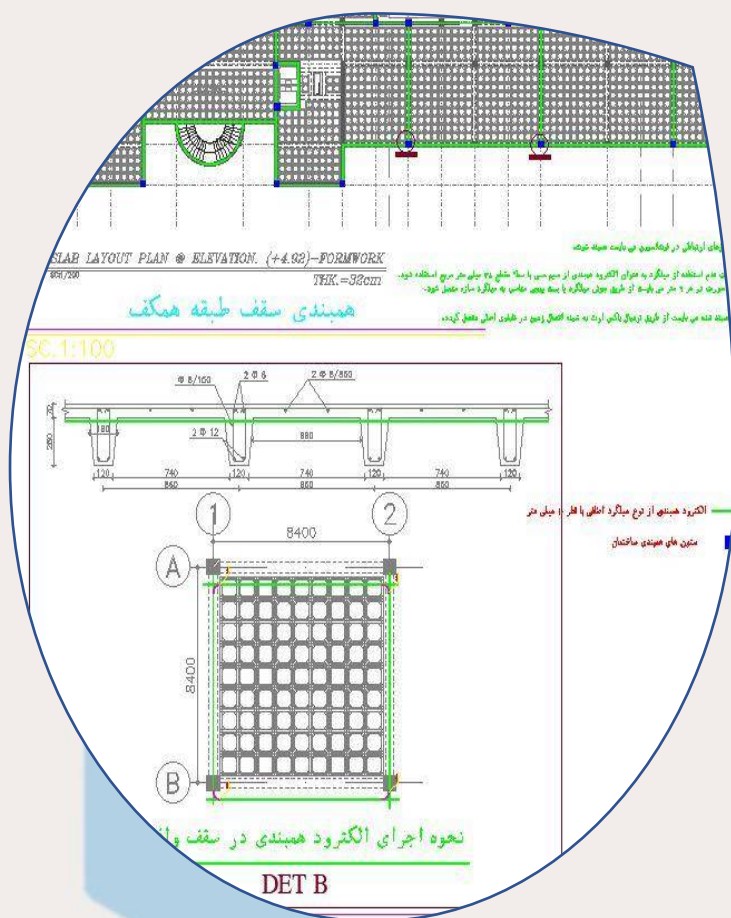
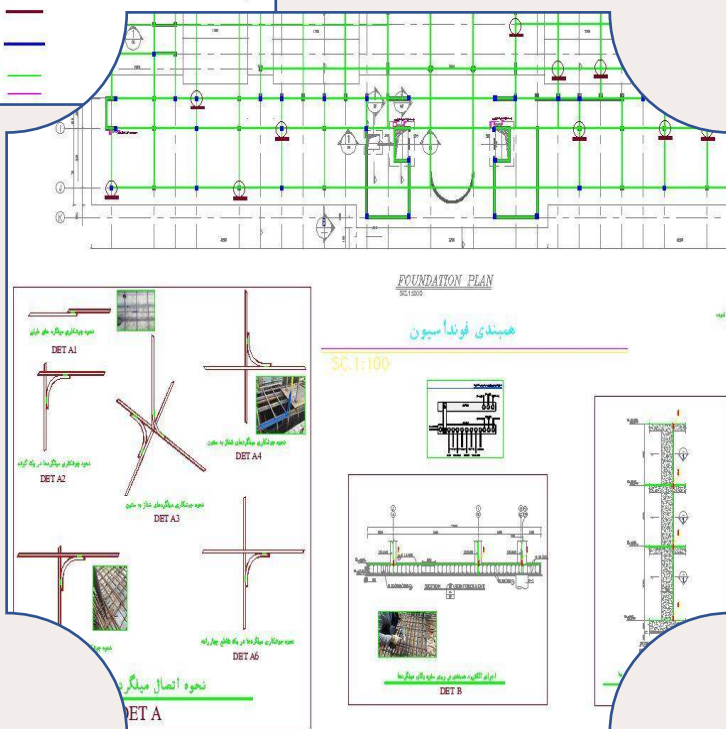
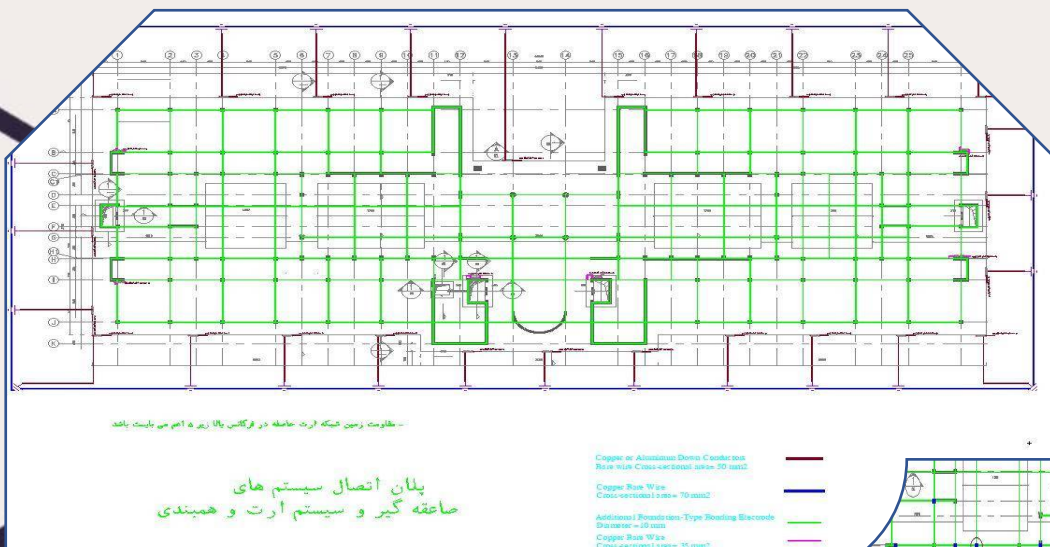
ردیف	شرح	مقدار
1	طول هادی	100 متر
2	قطر هادی	10 میلی متر
3	معمول هادی	10 میلی متر

Copper or Aluminum Wire or Cable
 To be used for the system
 To be used for the system
 To be used for the system

جانمایی هادی پایین رونده
نمای شمالی

Khouzestan Steel Office Building

Earthing & Lightning System



Atlas Mall

Shop Drawing Plans

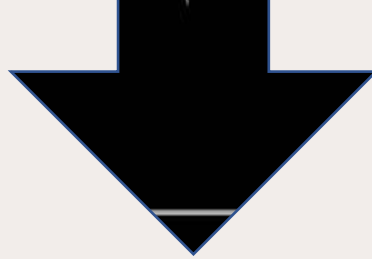
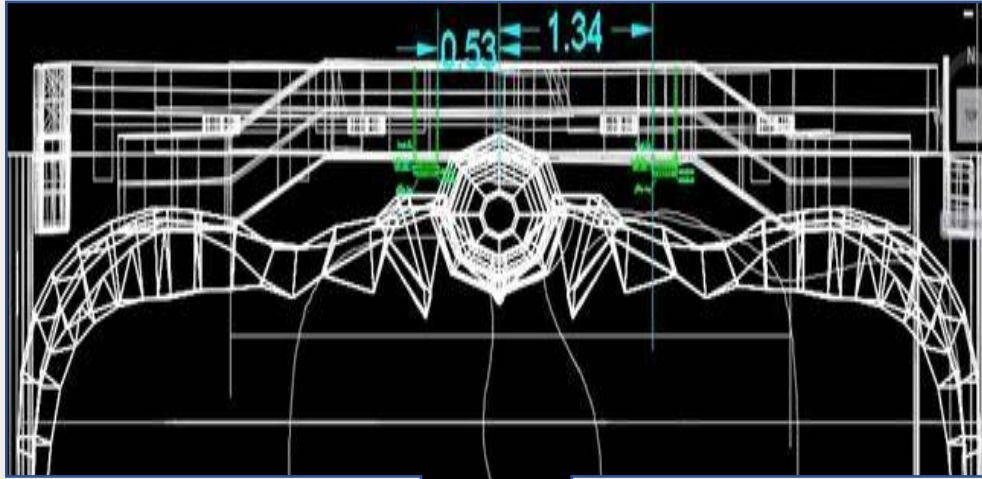
Execution in Accordance with Specifications



Atlas Mall

Shop Drawing Plans

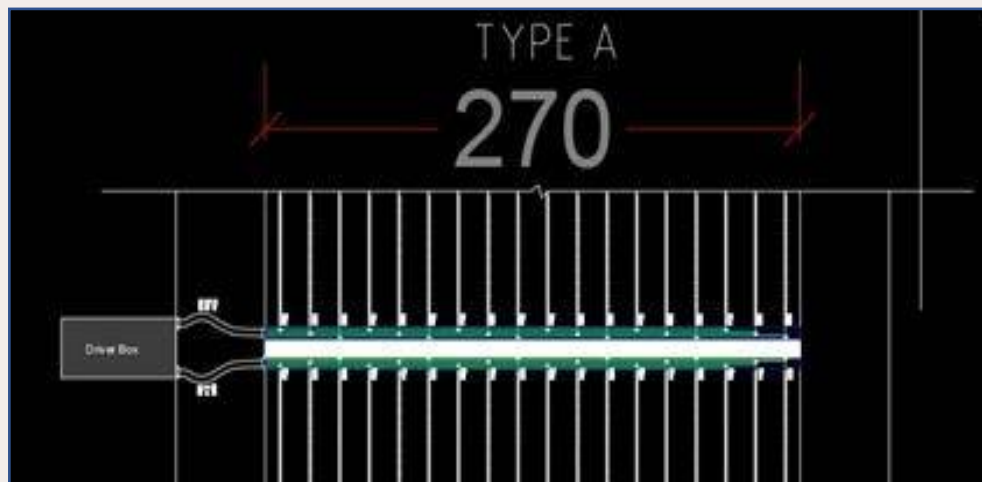
Execution in Accordance with Specifications



Atlas Mall

Shop Drawing Plans

Execution in Accordance with Specifications



Atlas Mall

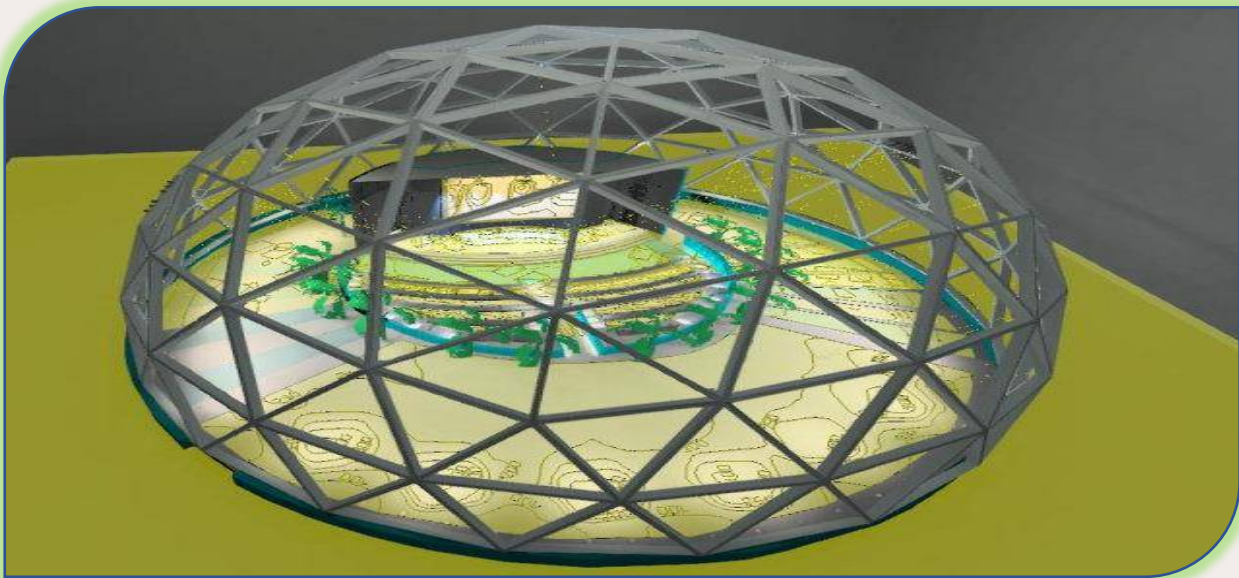
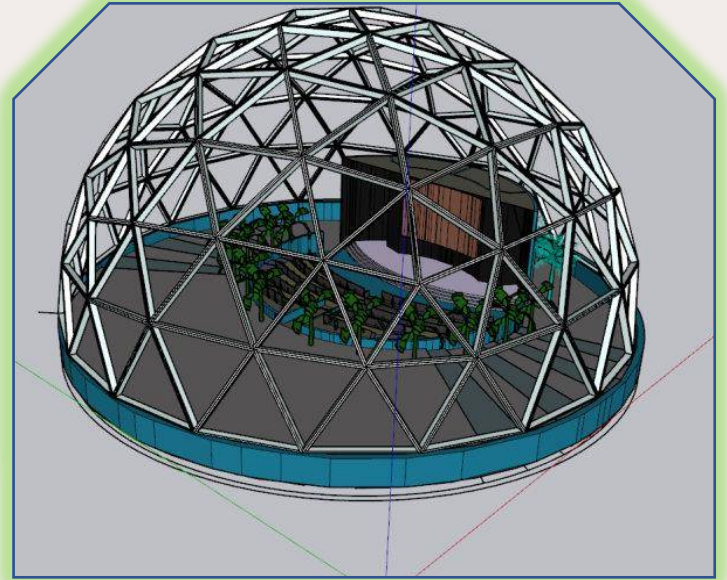
Shop Drawing Plans

Execution in Accordance with Specifications

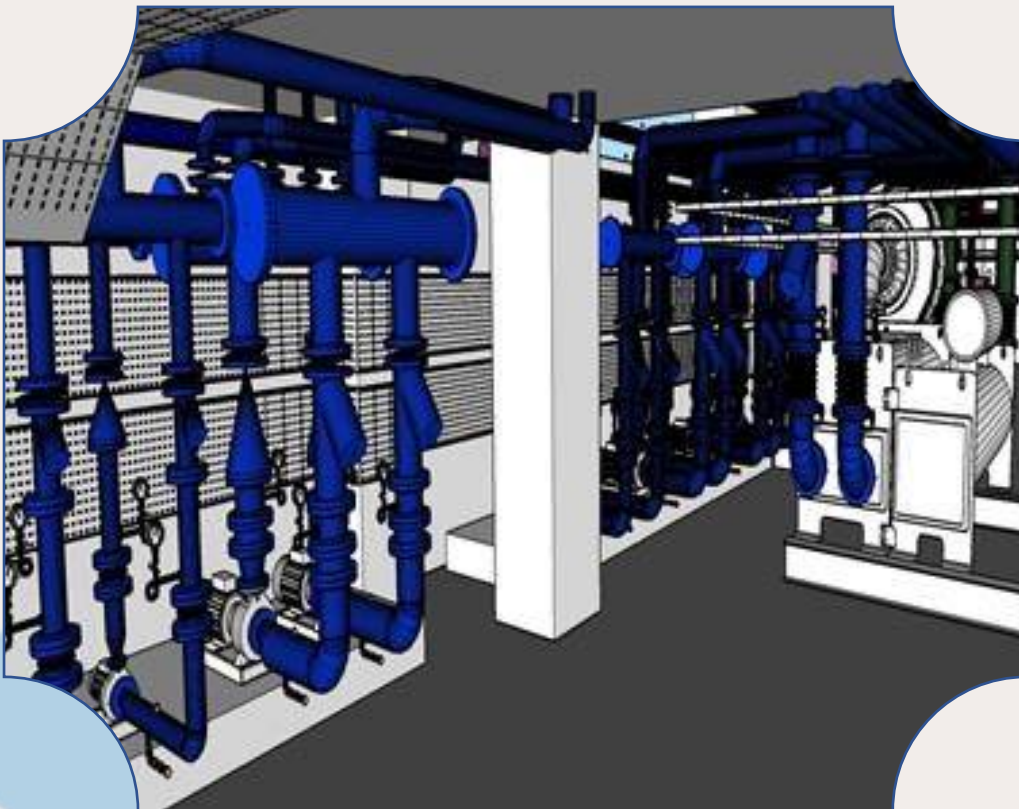


Cinema Hall and Greenhouse, Golgohar

Special Lighting System



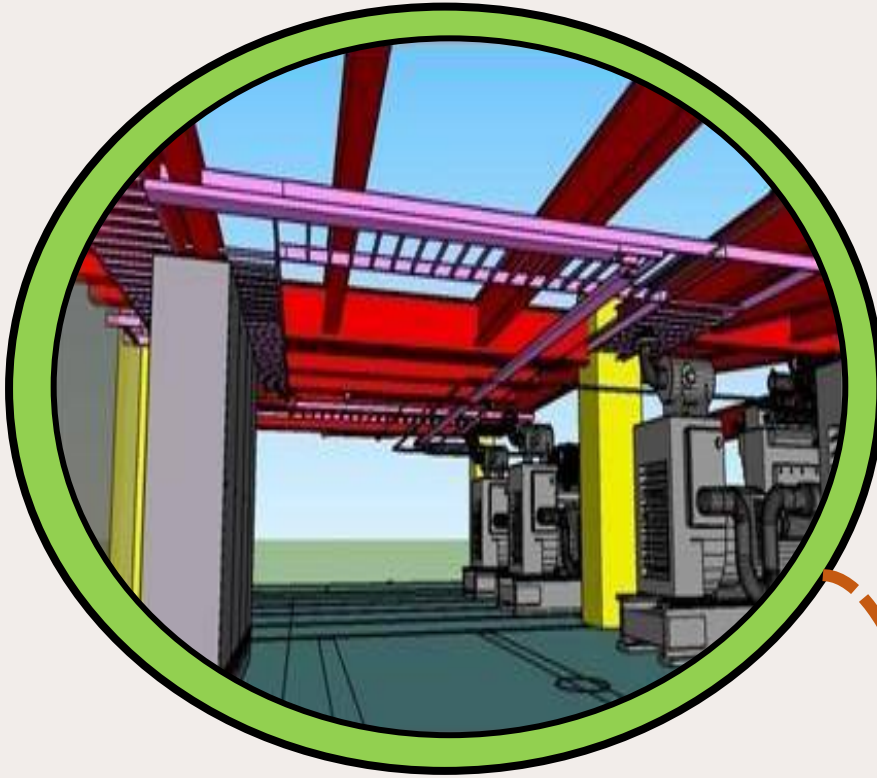
Utilizing 3D Plans for Design and Execution



Utilizing 3D Plans for Design and Execution



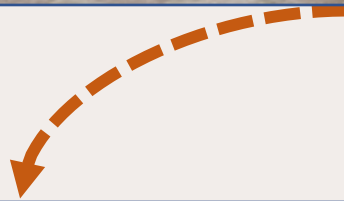
Utilizing 3D Plans for Design and Execution



Utilizing 3D Plans for Design and Execution

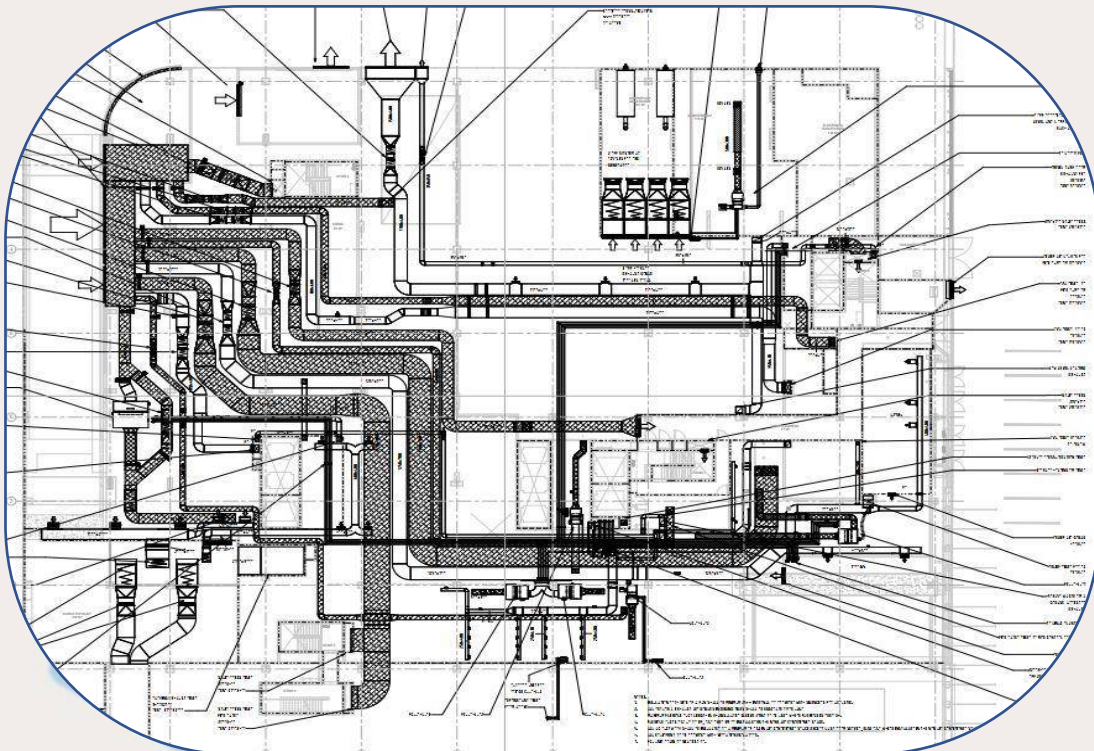
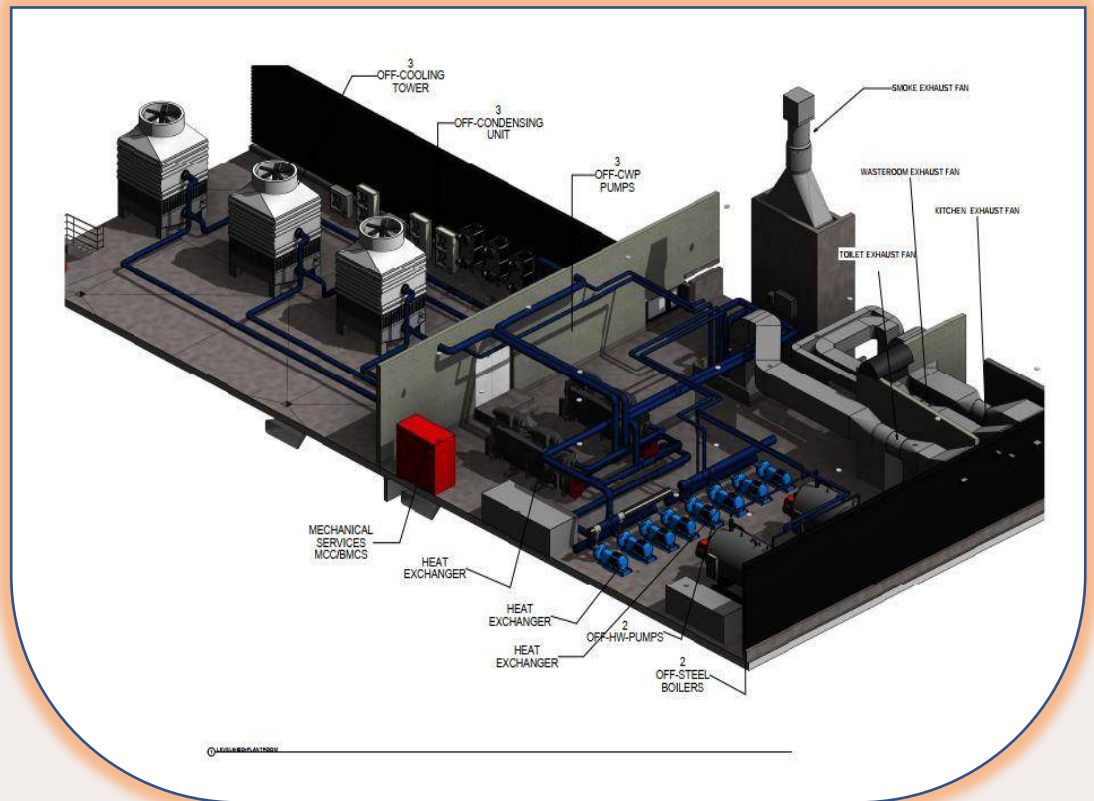


Utilizing 3D Plans for Design and Execution



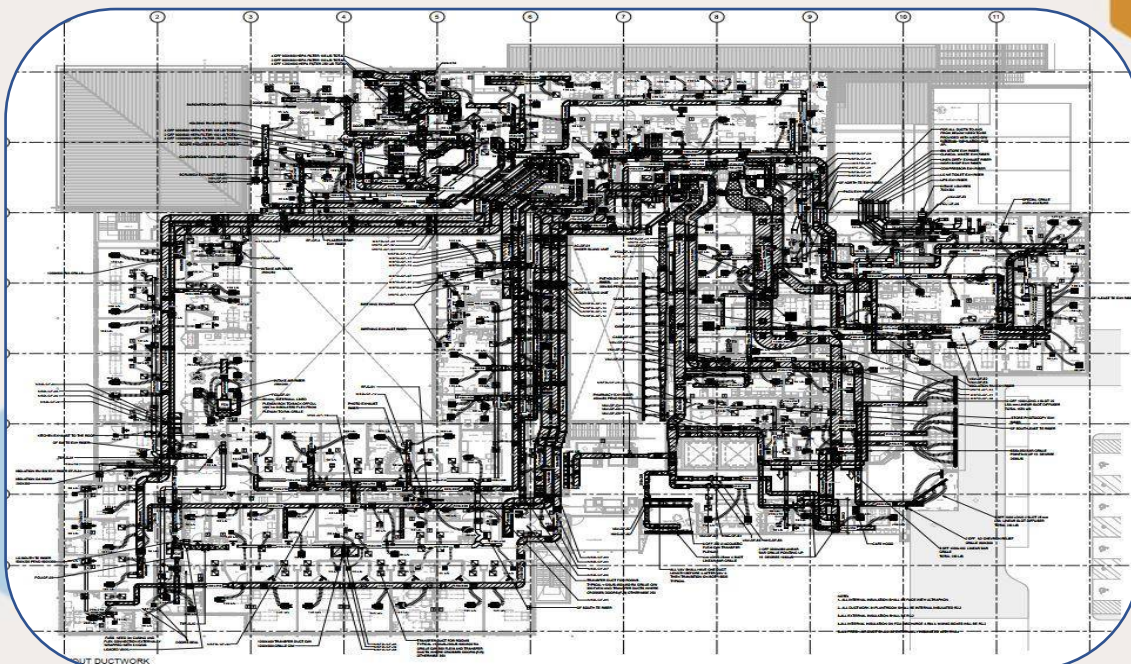
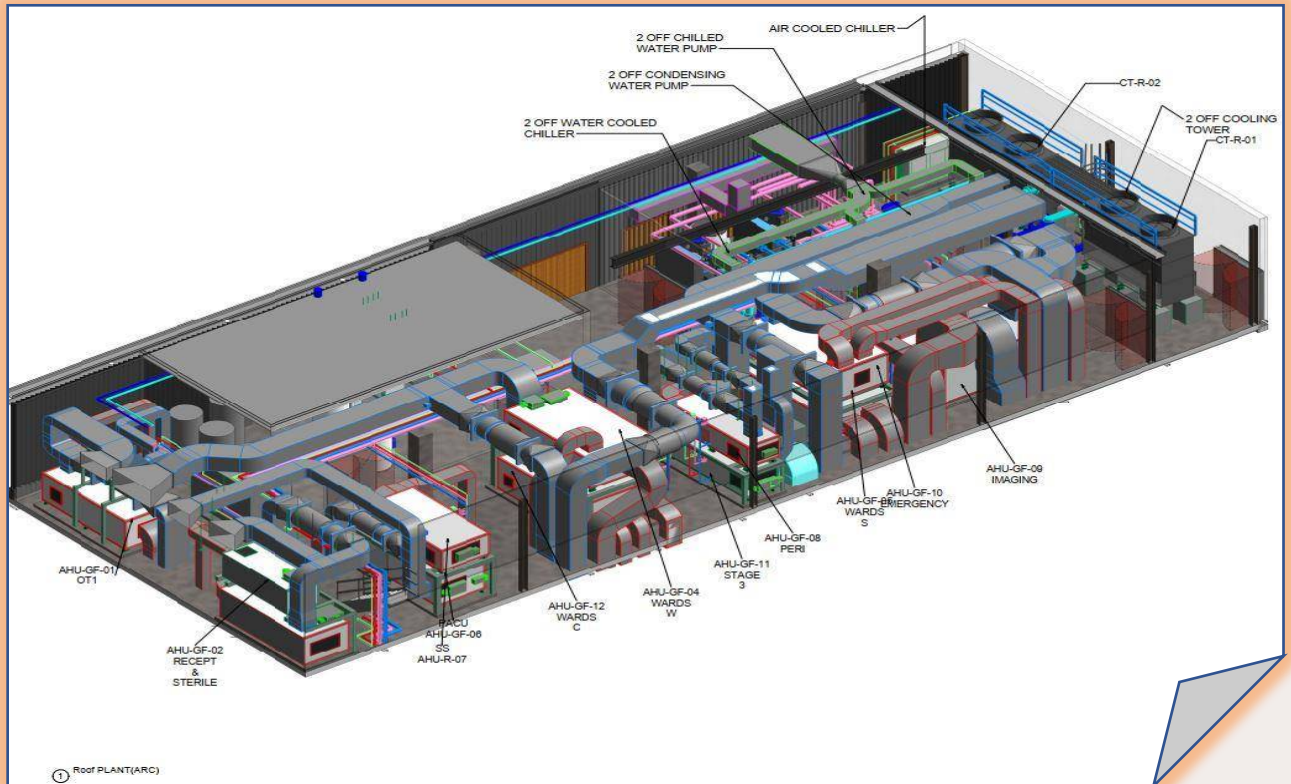
Mechanical Installation Design

NORTH SHORE HOSPITAL



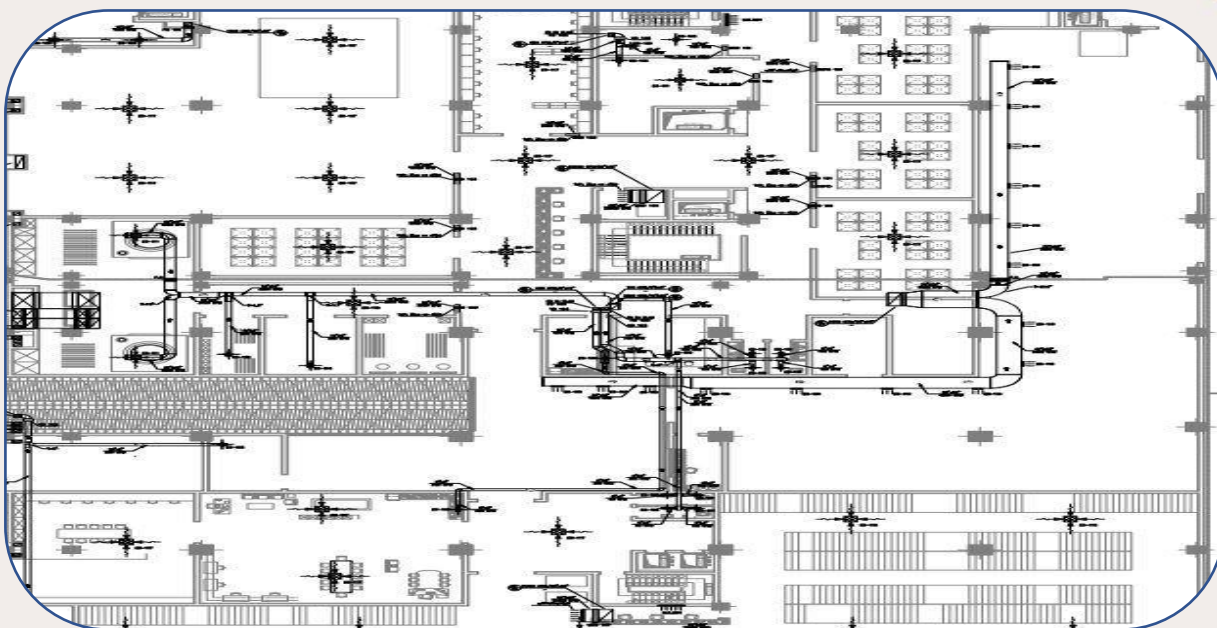
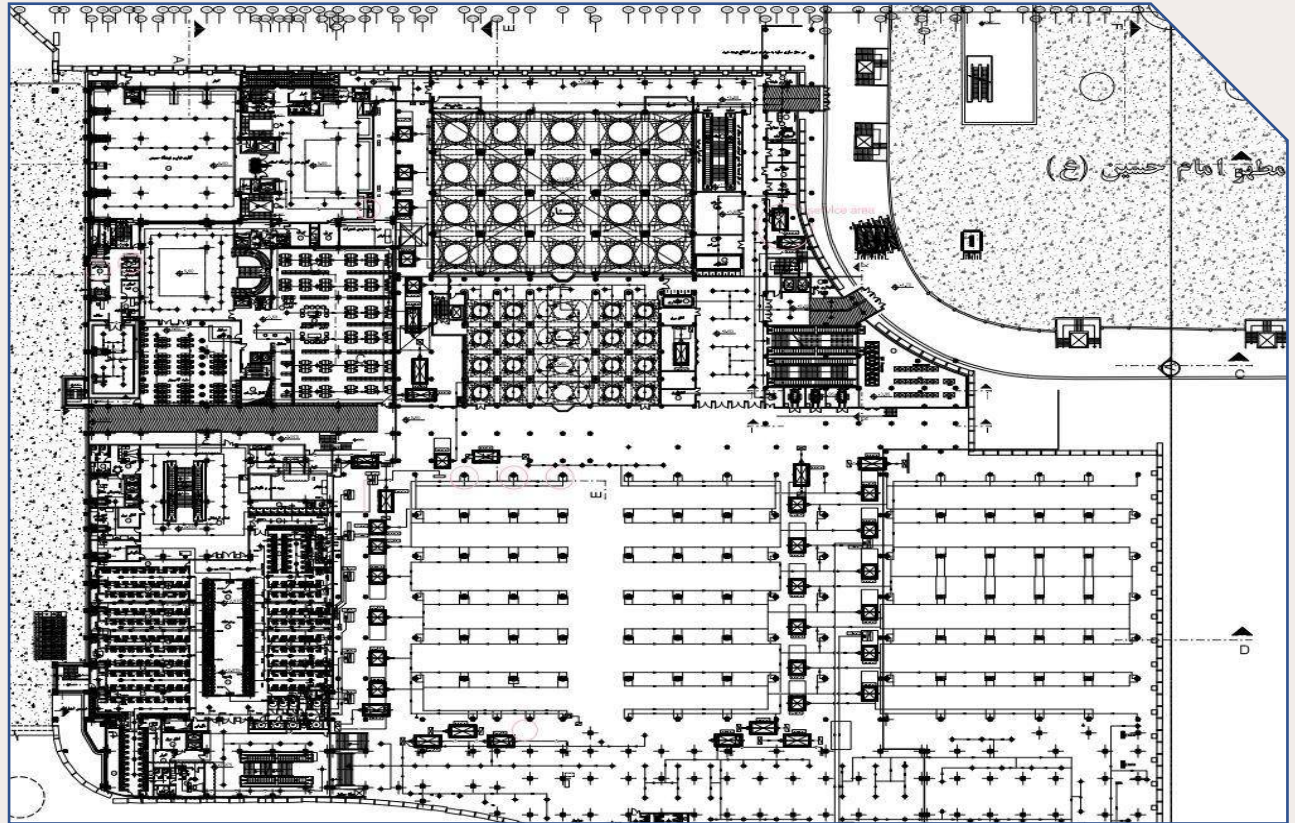
Mechanical Installation Design

MUDGEE HOSPITAL



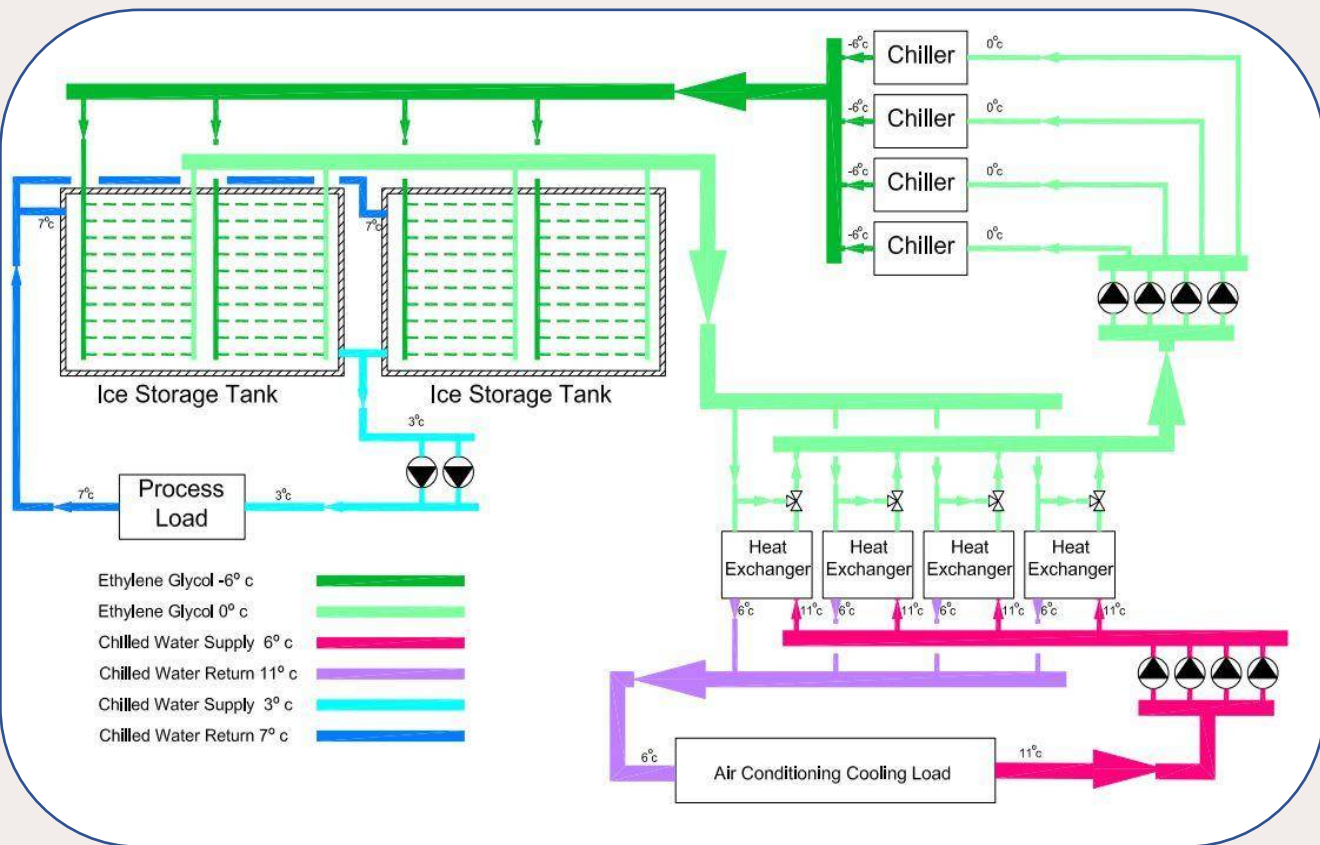
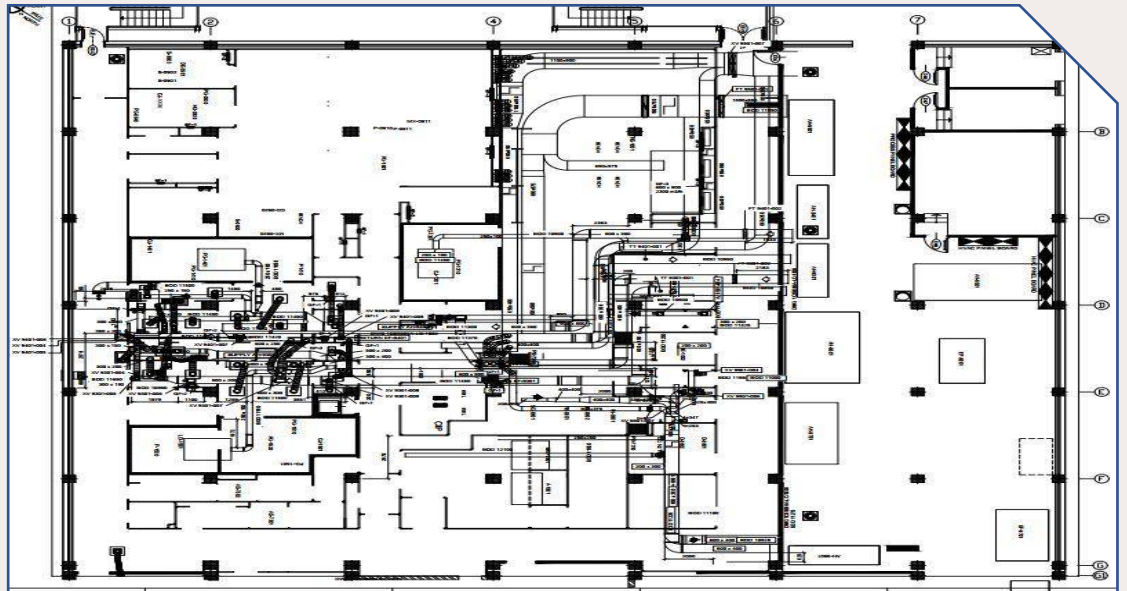
Mechanical Installation Design

Development of Imam Hossein Shrine



Mechanical Installation Design

Saman Daro Eighth





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