

**Area Calculation**

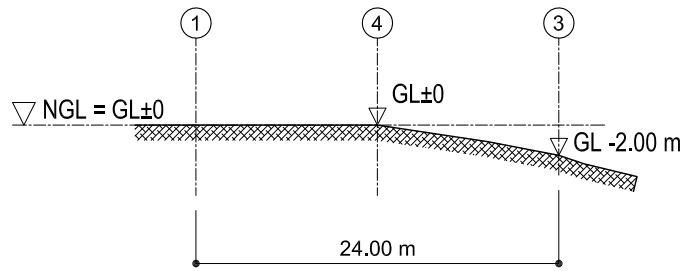
Floor	Area
1F	205.39 m <sup>2</sup>
2F	7.37 m <sup>2</sup>
M2F, 3F, M3F and 4F	0 m <sup>2</sup>
M4F	106.75 m <sup>2</sup>
5F	16.04 m <sup>2</sup>
6F	30.19 m <sup>2</sup>
<b>Total Floor Area</b>	<b>365.74 m<sup>2</sup></b>
<b>Building Coverage Area</b>	<b>205.39 m<sup>2</sup></b>

**Legend**

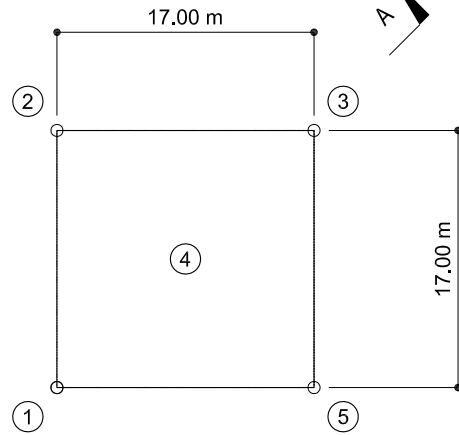
- BH : Bore Hole
- BM : Bench Mark
- ⊗ : Tree
- ⊙ : Electric Lamp Post

Project Site	1696.0 m <sup>2</sup>
--------------	-----------------------



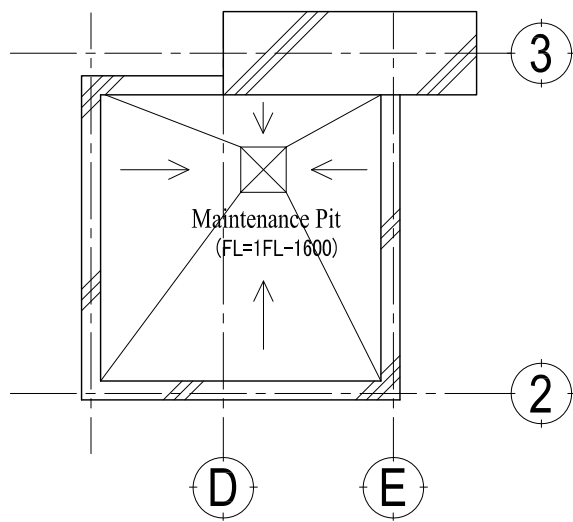


SECTION A-A  
NTS



SITE PLAN  
NTS

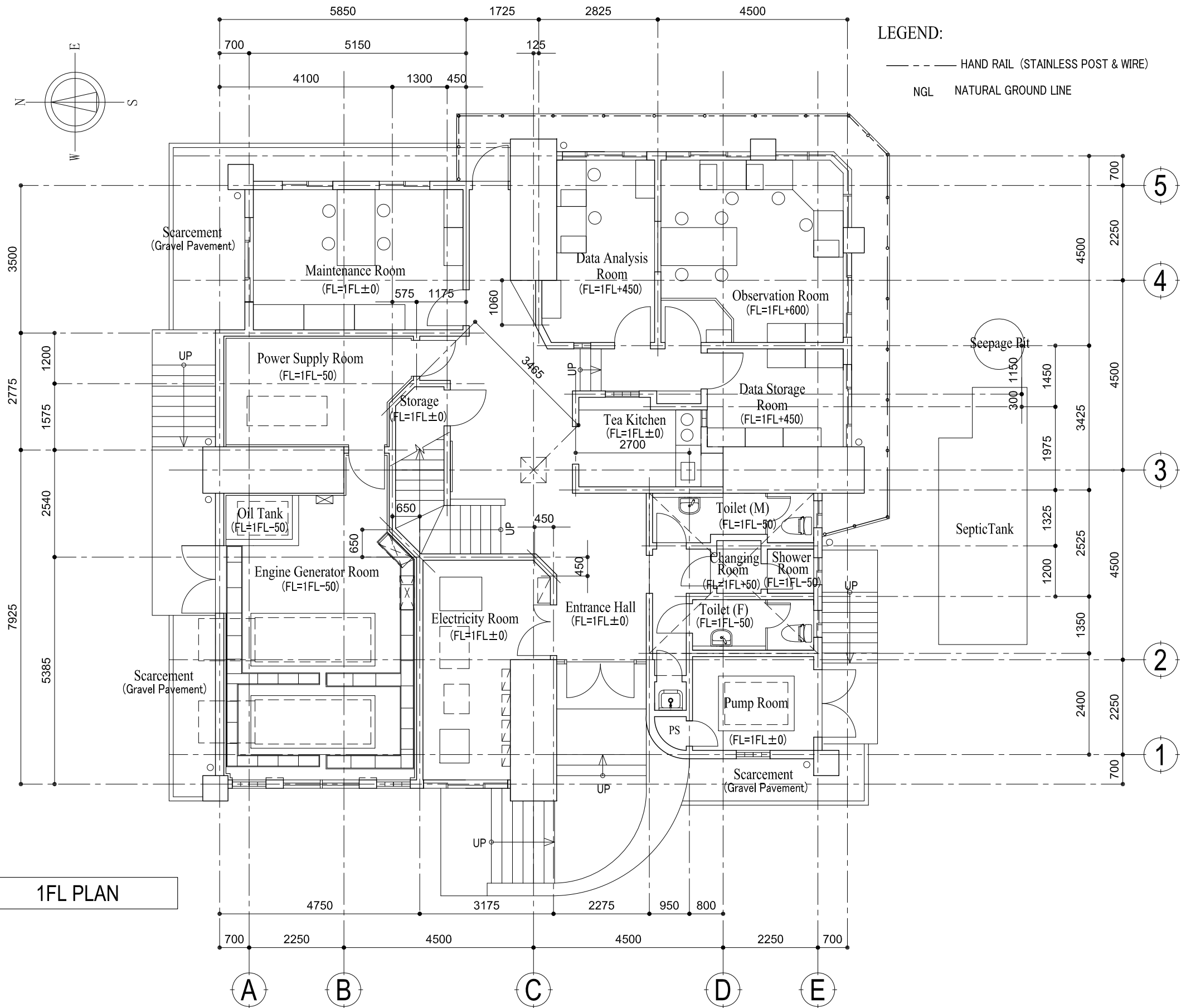
- ① NGL±0 = GL±0
- ② NGL = GL -2.00 m
- ③ NGL = GL -2.00 m
- ④ NGL ±0 = GL±0 (BUILDING CENTER)
- ⑤ NGL±0 = GL-2.00 m



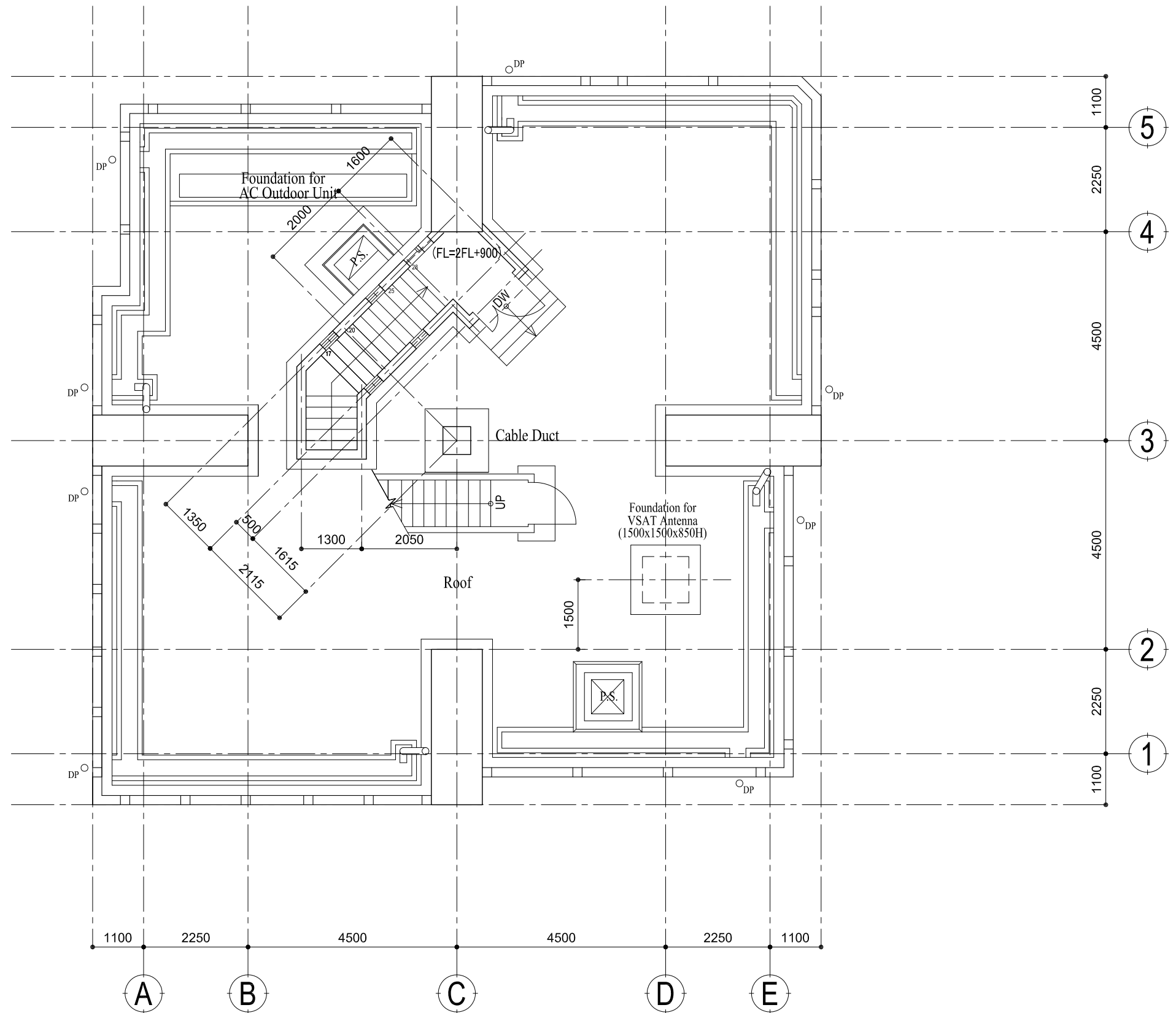
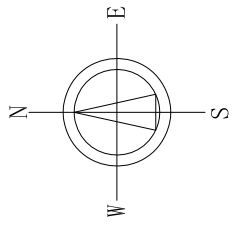
FL-1600



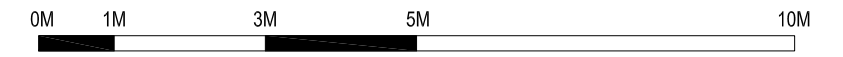
1FL PLAN

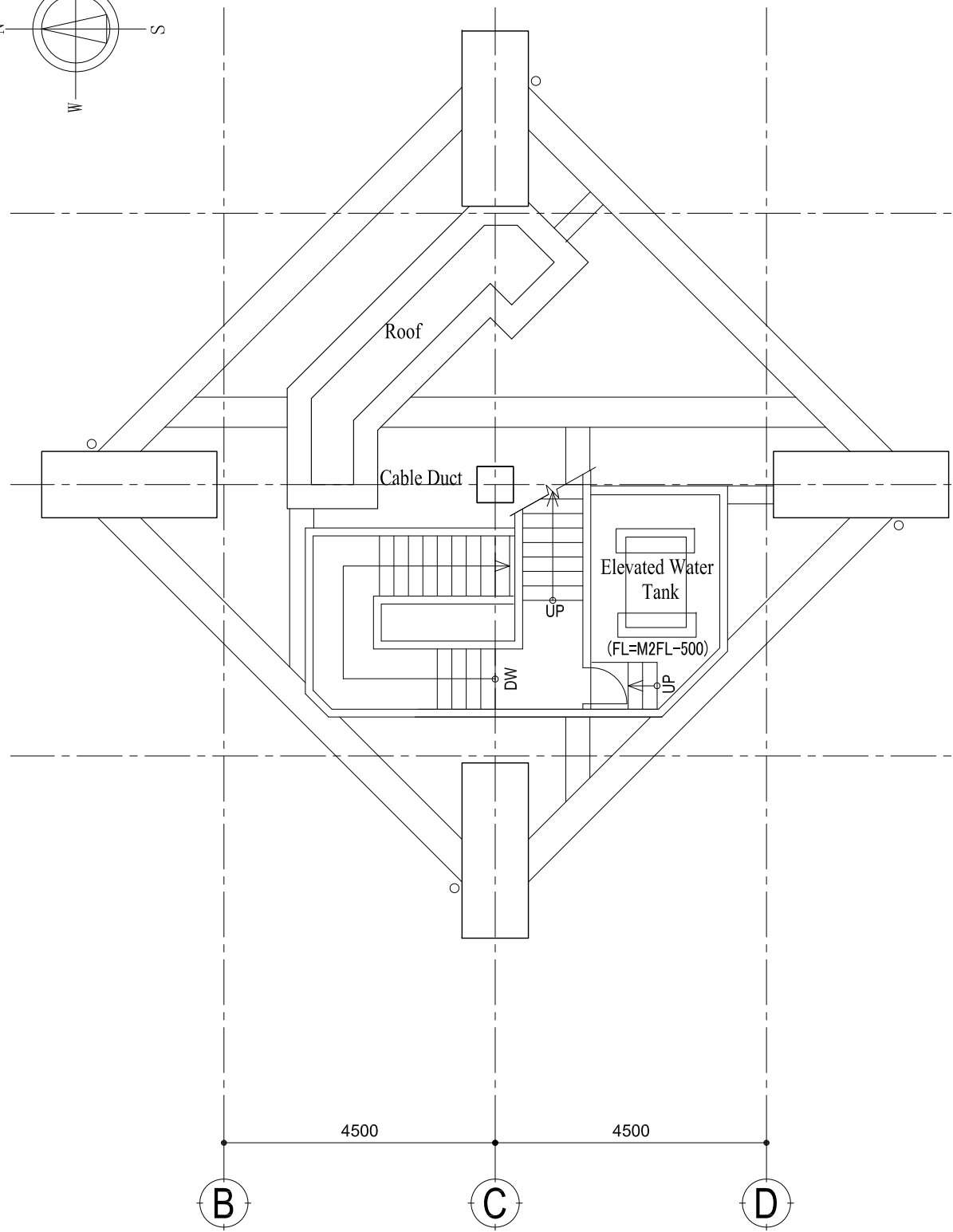
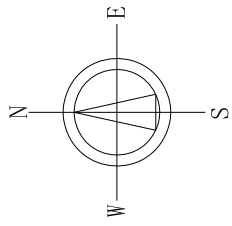


LEGEND:  
 --- HAND RAIL (STAINLESS POST & WIRE)  
 NGL NATURAL GROUND LINE

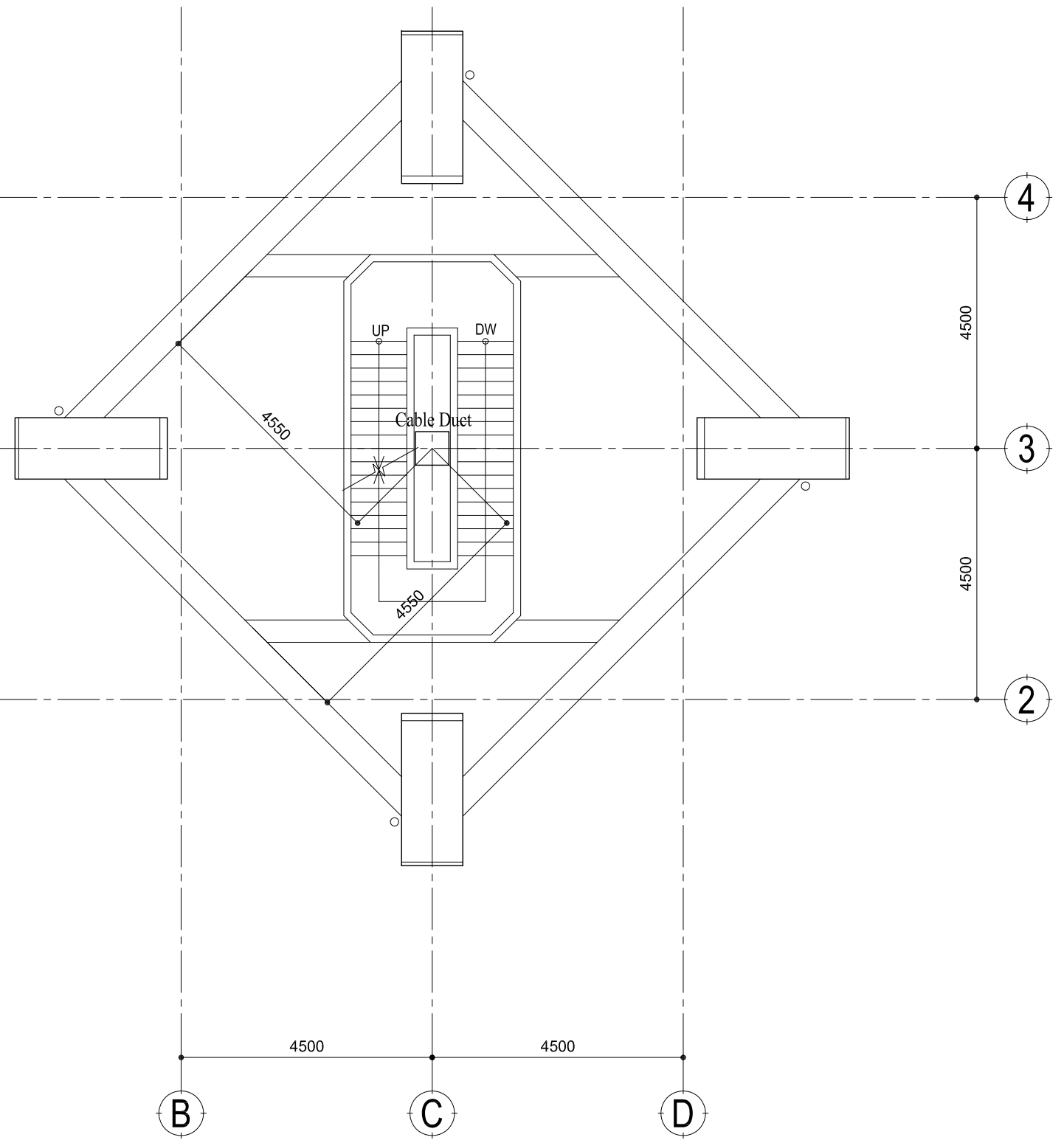


2FL PLAN

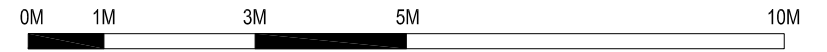


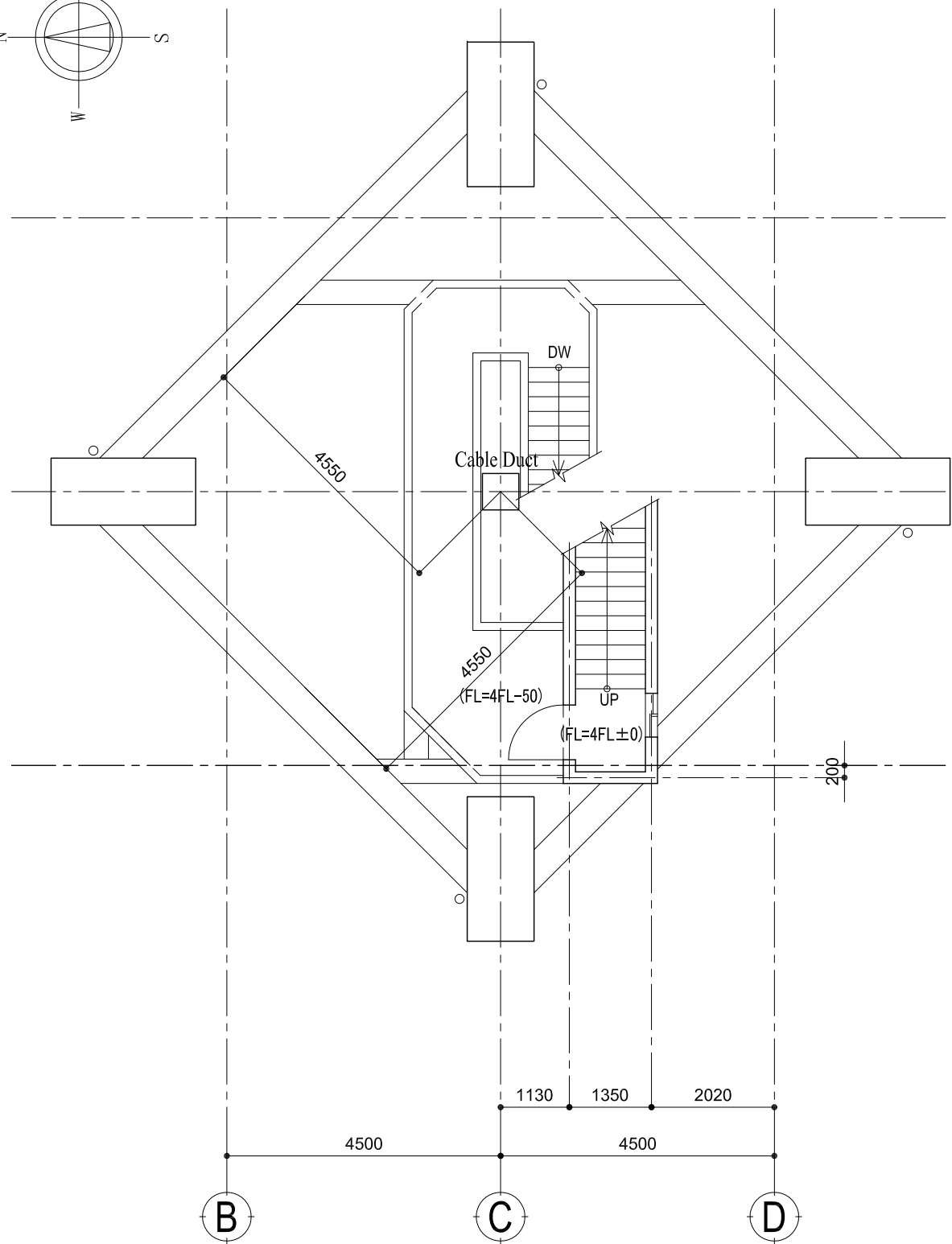
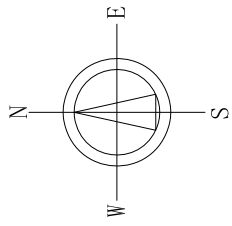


M2FL PLAN

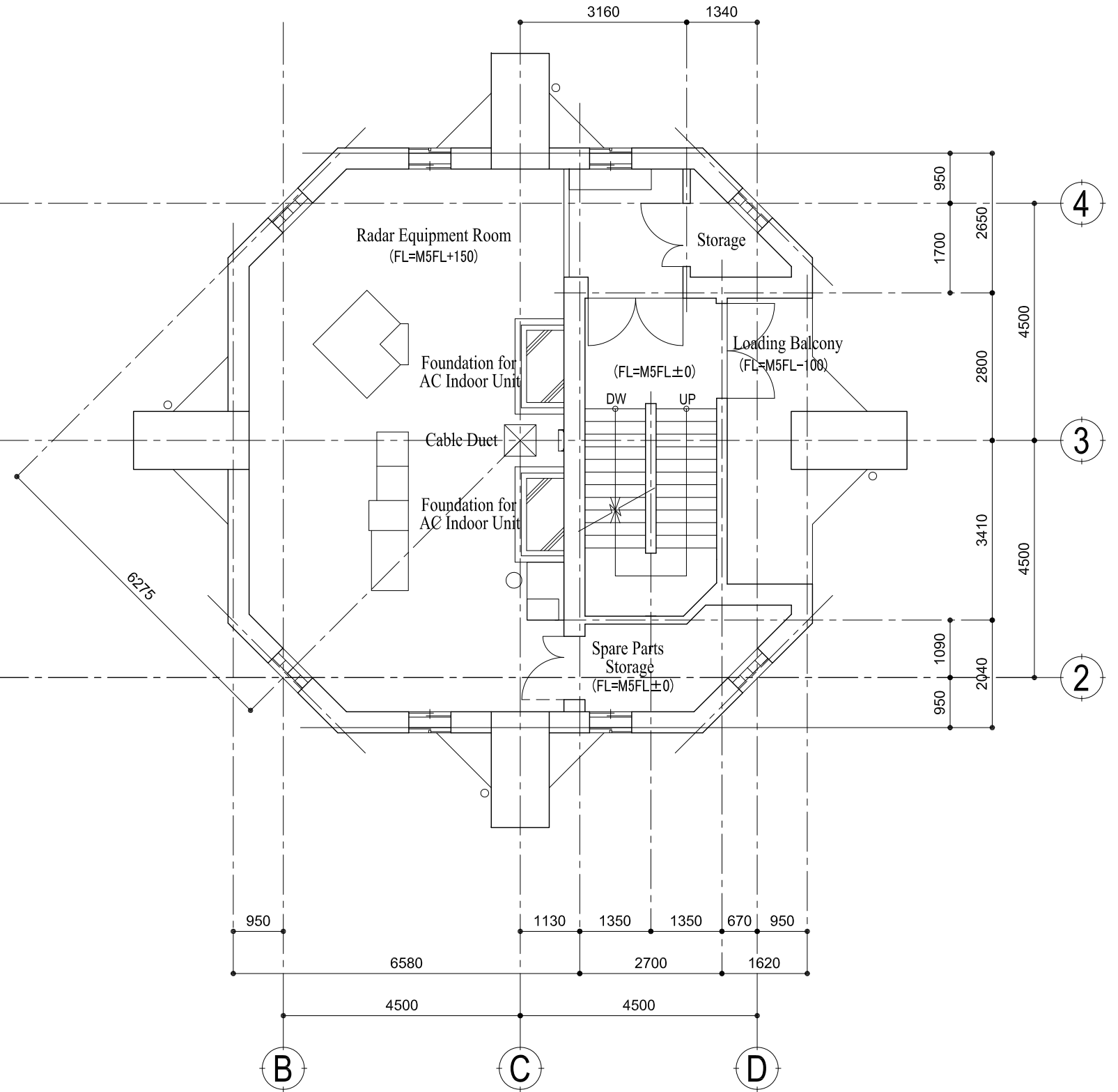


3FL, M3FL PLAN

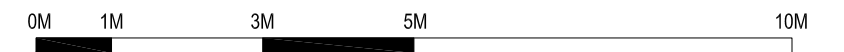


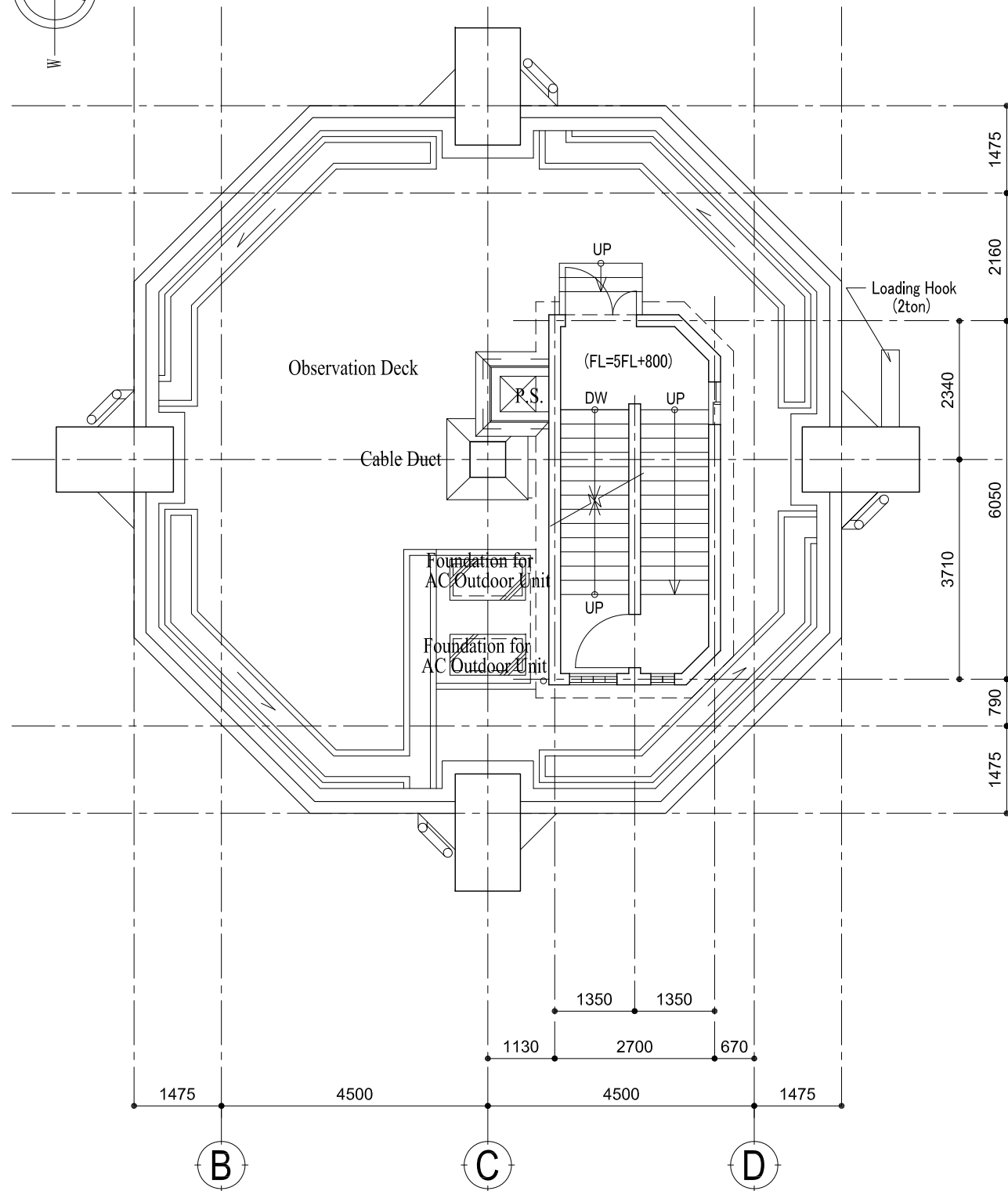
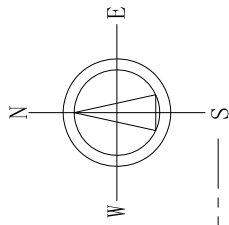


4FL PLAN

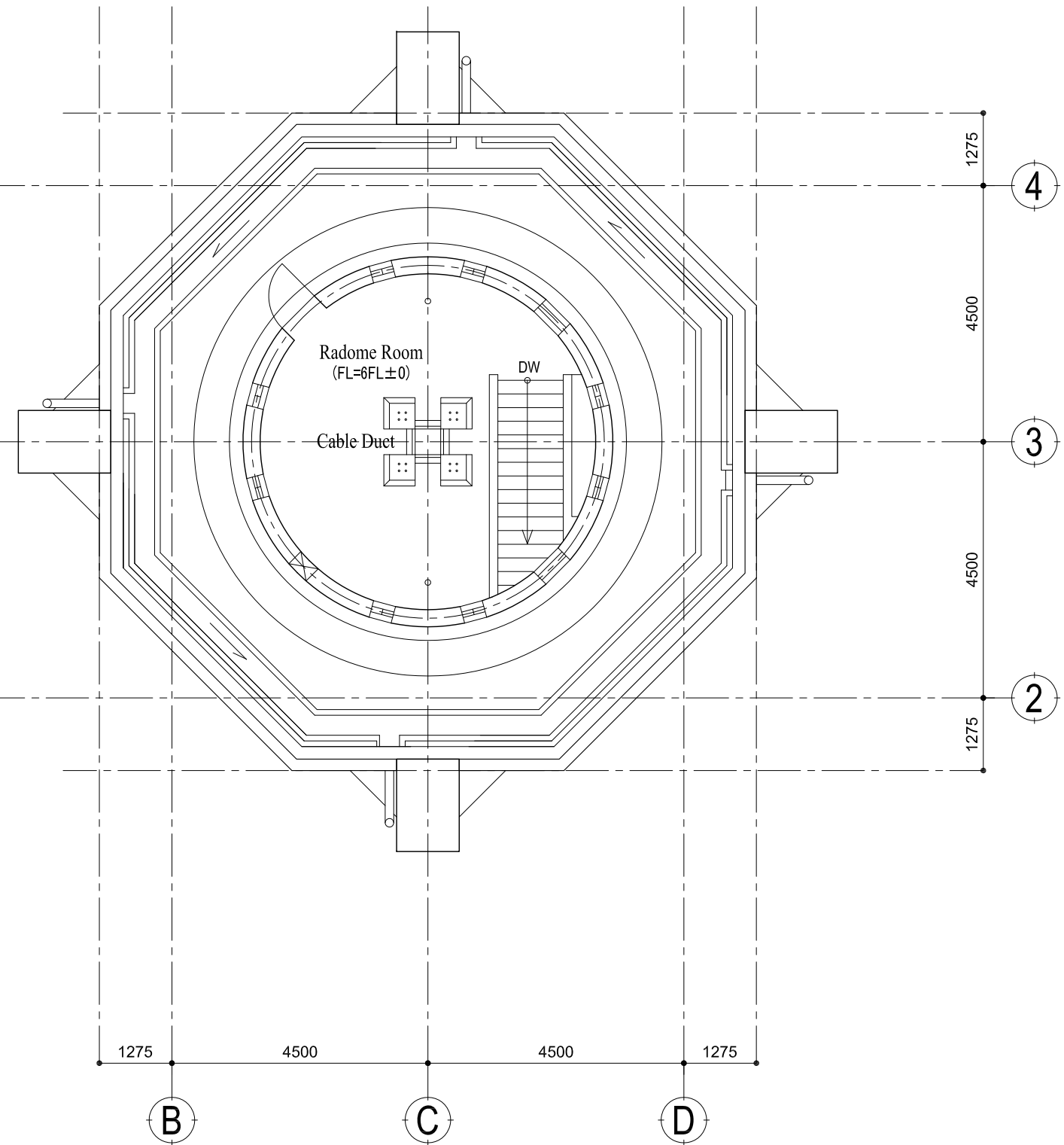


M4FL PLAN

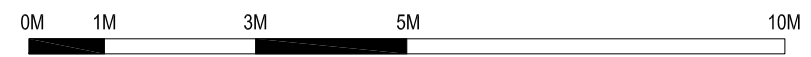


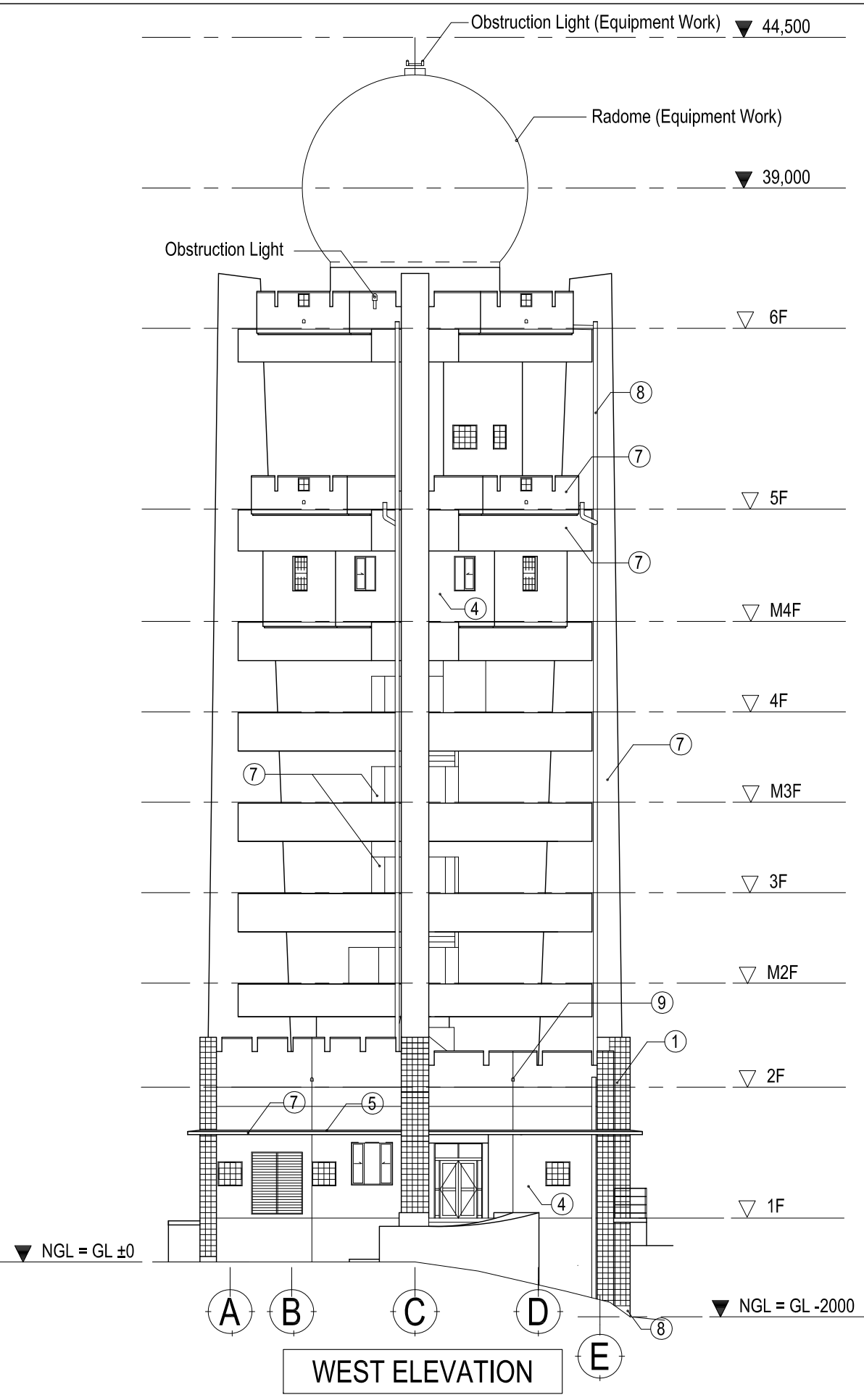


5FL PLAN (OBSERVATION DECK)

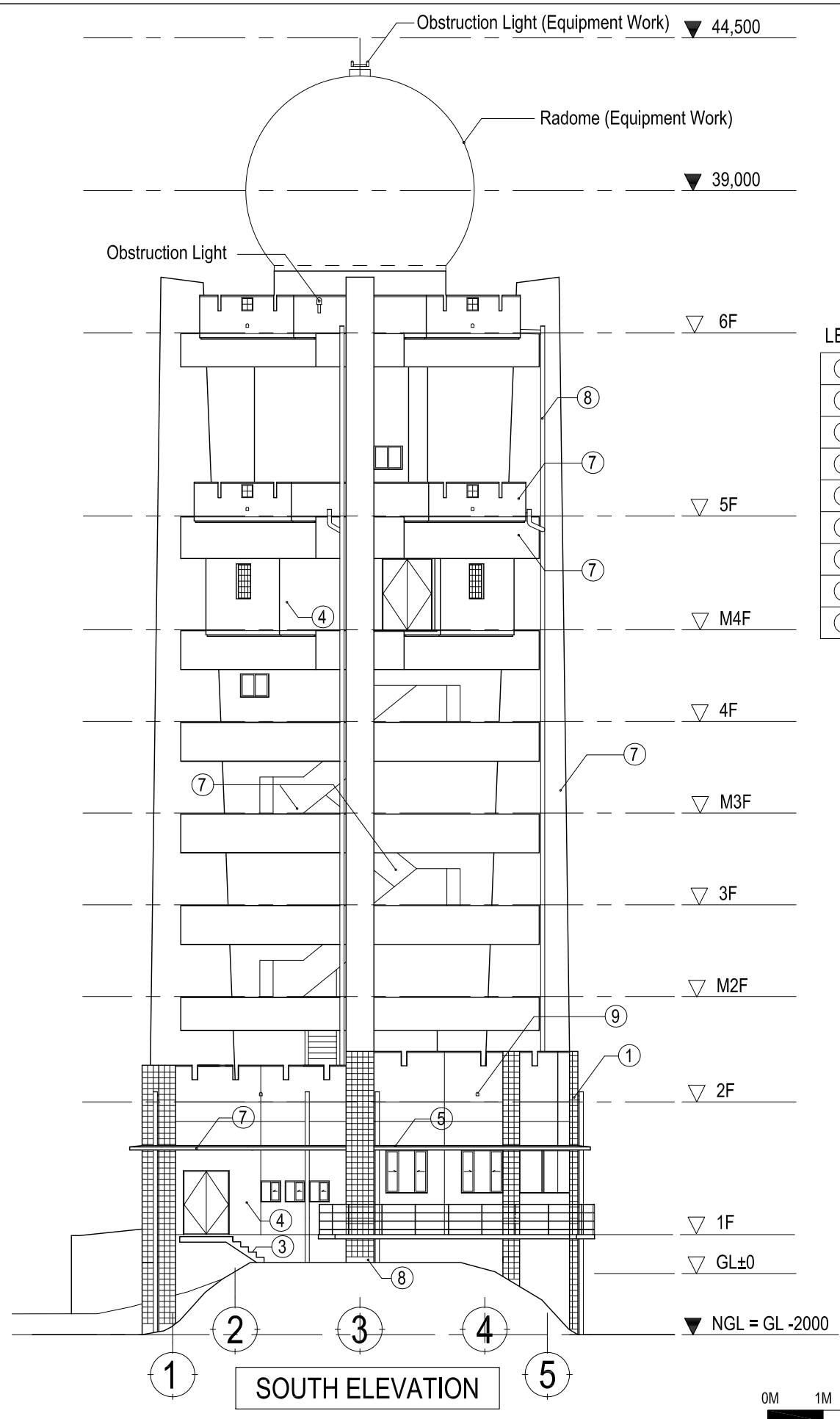


6FL PLAN (RADOME FLOOR)





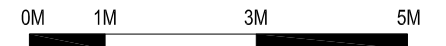
WEST ELEVATION

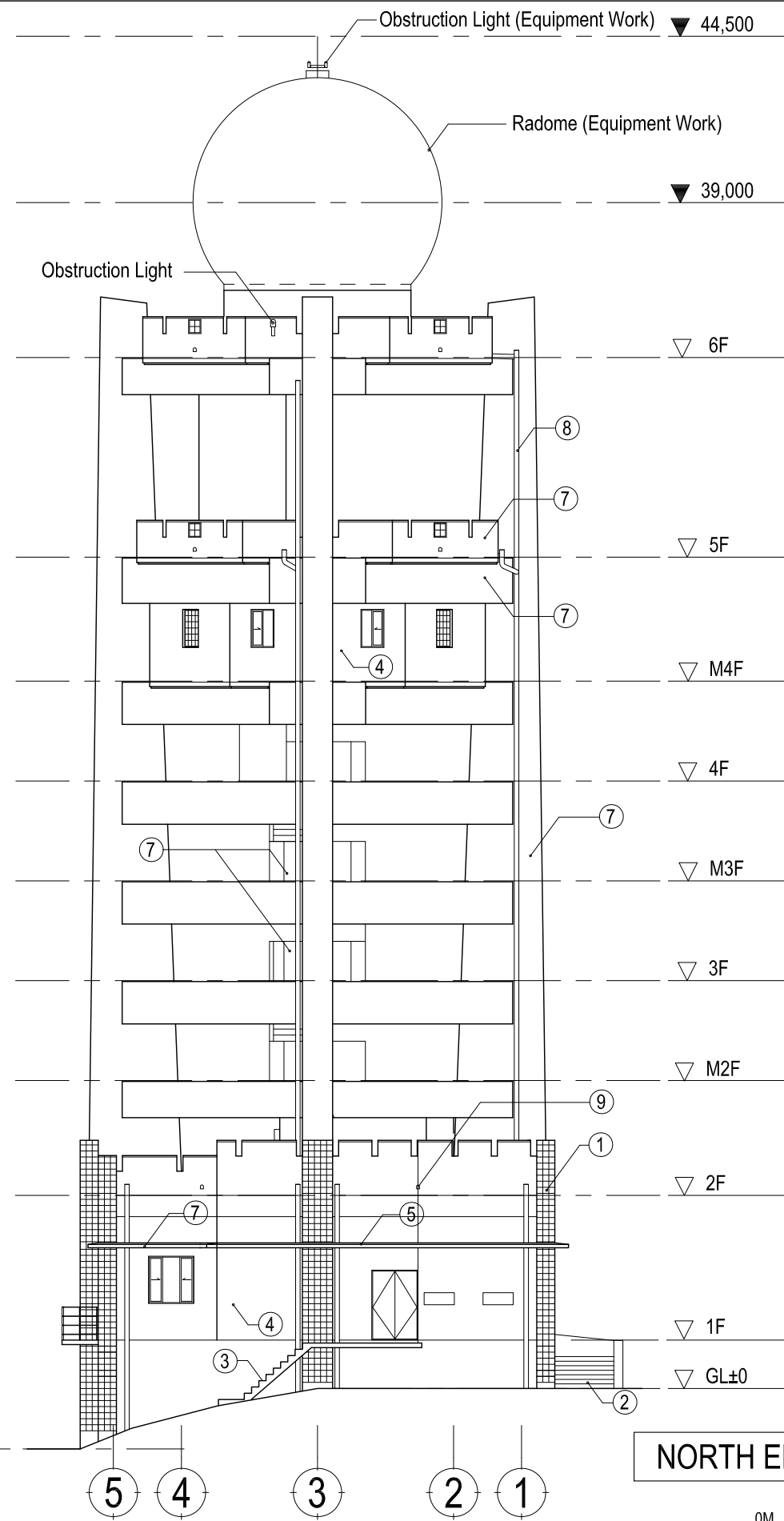
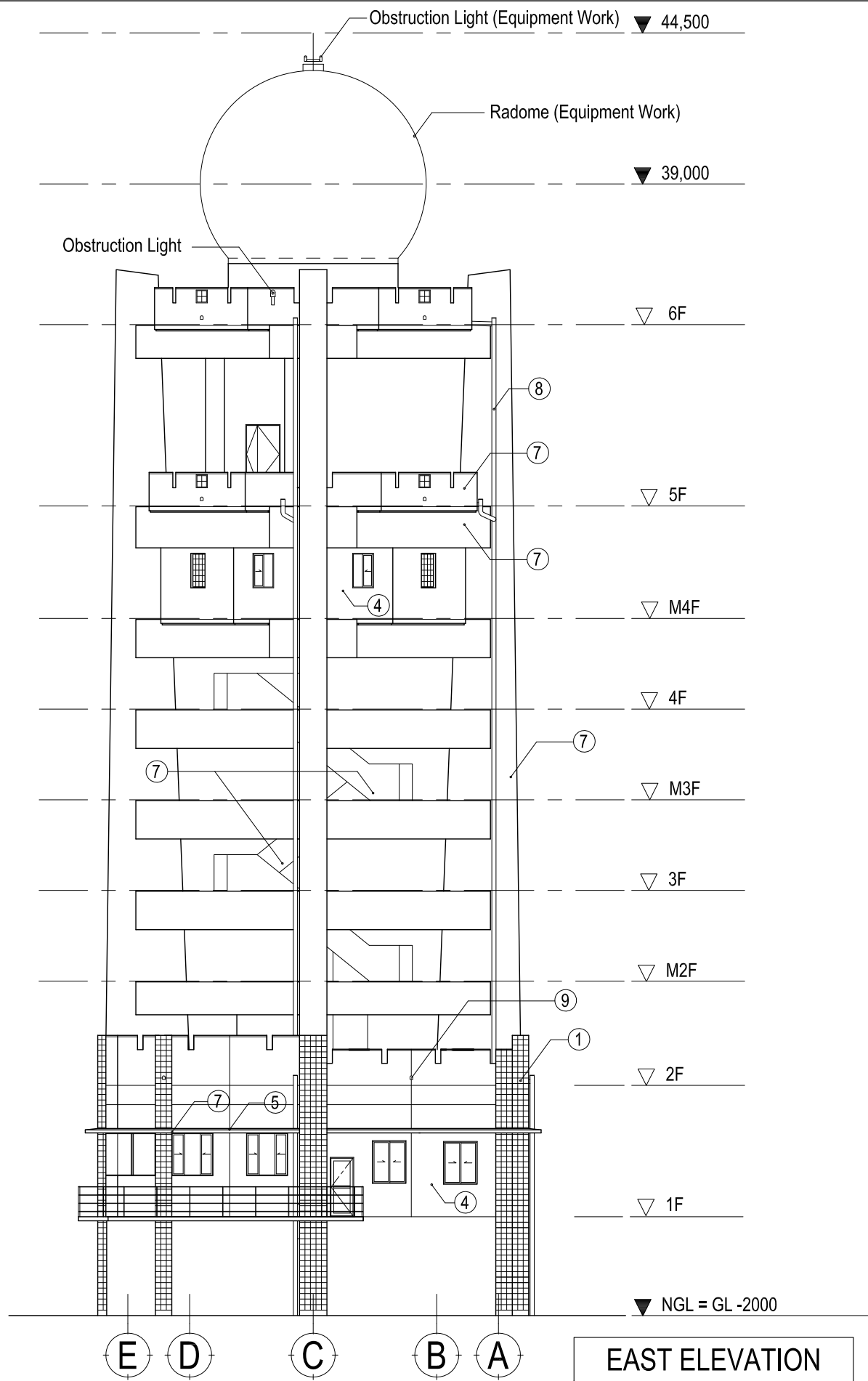


SOUTH ELEVATION

LEGEND

①	Porcelain Tile 100×50
②	Porcelain Tile 200×200
③	C.S.mortar t=30
④	C.S.mortar t=25, Spray Tile
⑤	Waterproof Mortal t=30
⑥	Fair-faced Concrete Mortal Mending, EP
⑦	Fair-faced Concrete Mortal Mending, Spray Tile
⑧	Rain Leader Pipe: Galvanized Steel Pipe 150A Spray Tile
⑨	Overflow Pipe: Galvanized Steel Pipe 100A, Spray Tile



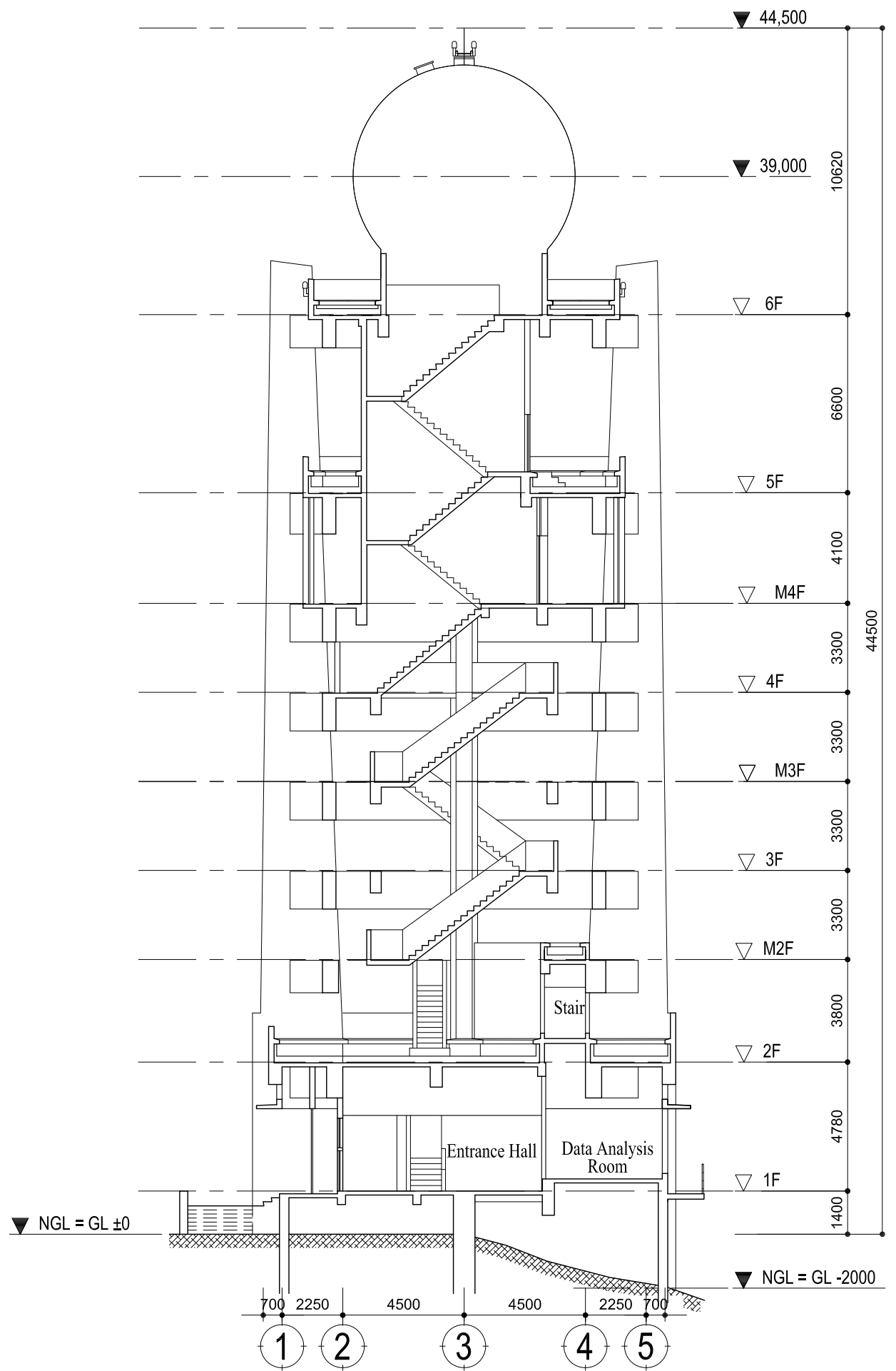
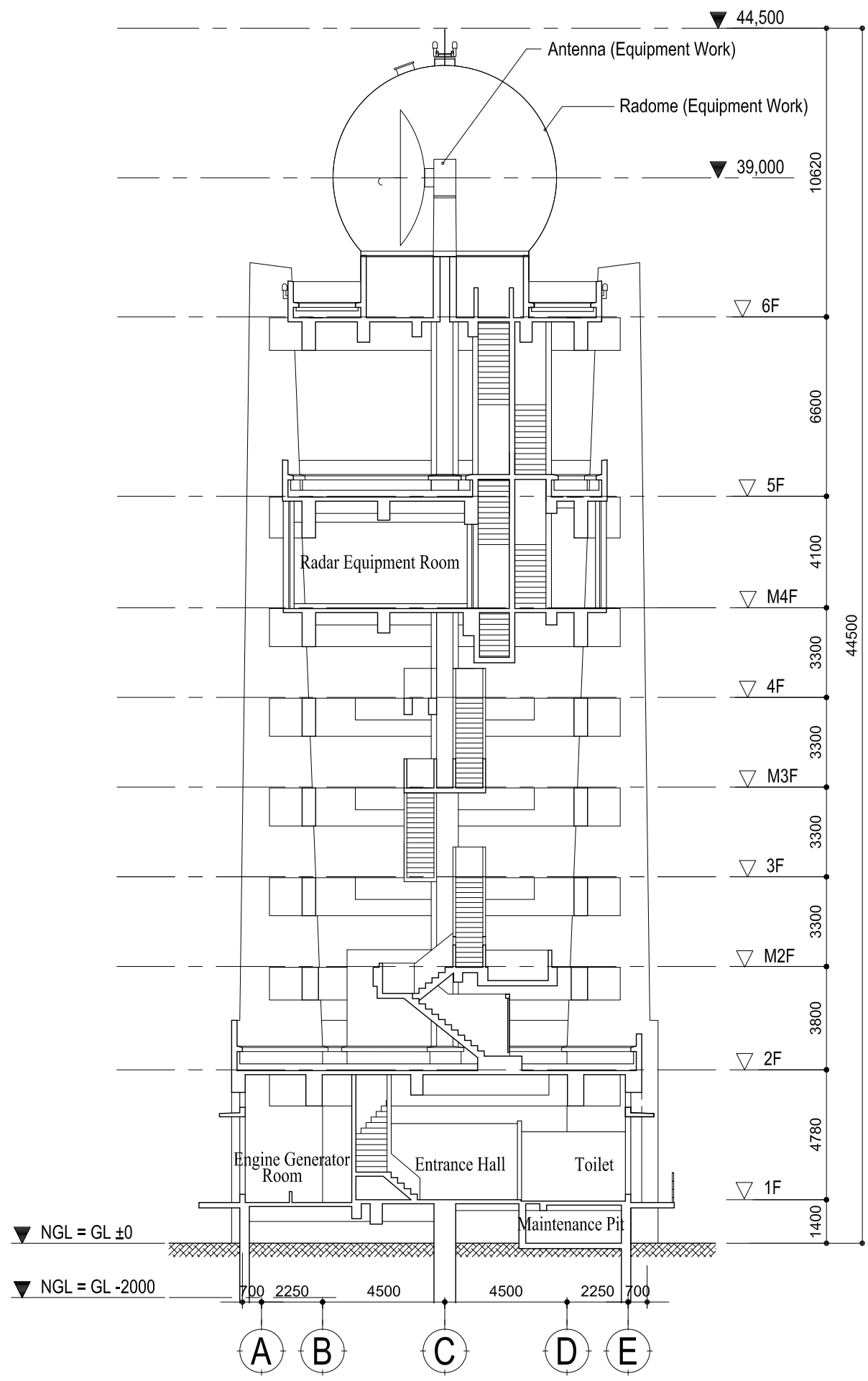


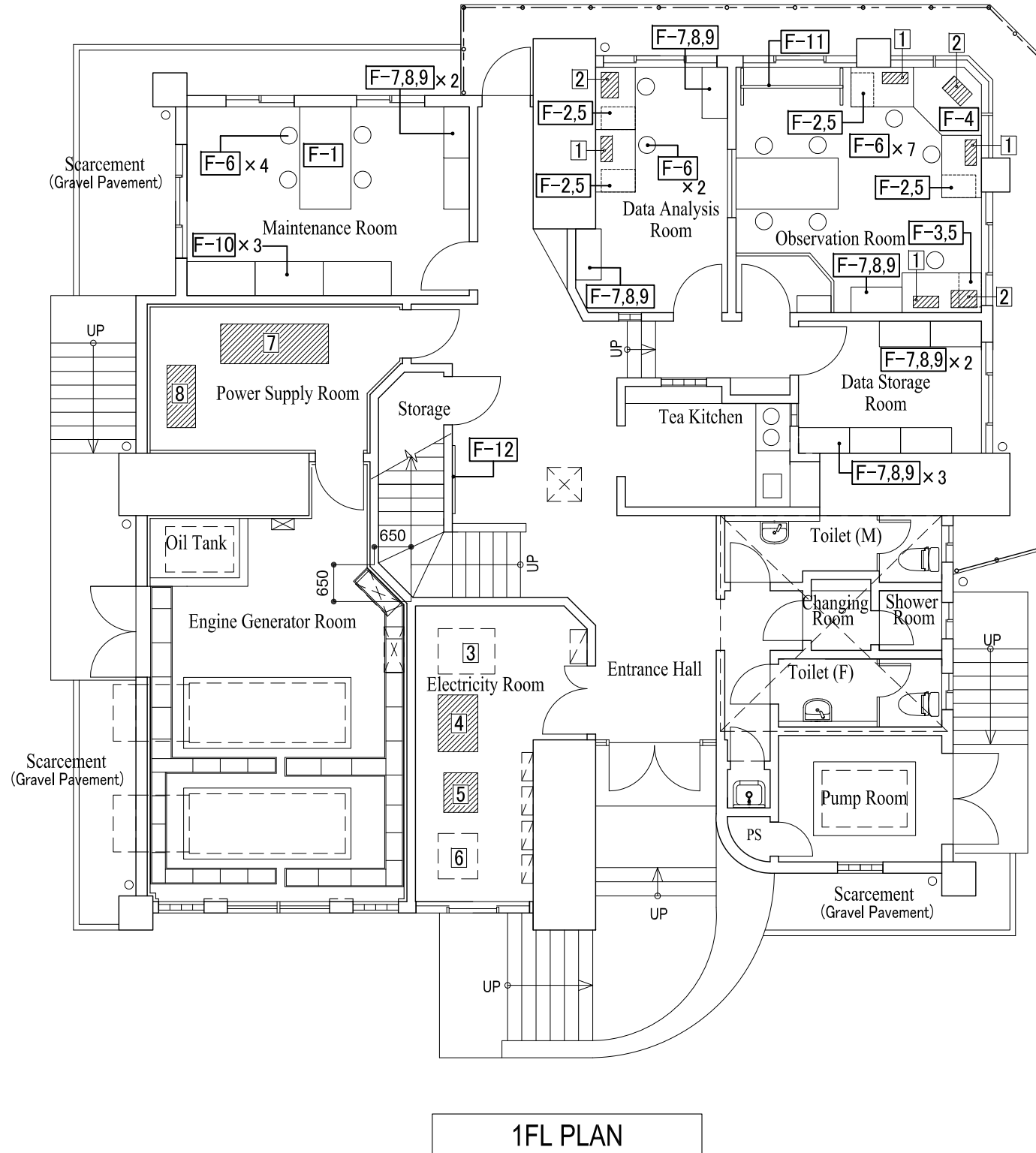
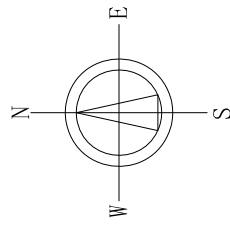
**LEGEND**

①	Porcelain Tile 100×50
②	Porcelain Tile 200×200
③	C.S.mortar t=30
④	C.S.mortar t=25, Spray Tile
⑤	Waterproof Mortar t=30
⑥	Fair-faced Concrete Mortar Mending, EP
⑦	Fair-faced Concrete Mortar Mending, Spray Tile
⑧	Rain Leader Pipe: Galvanized Steel Pipe 150A Spray Tile
⑨	Overflow Pipe: Galvanized Steel Pipe 100A, Spray Tile

0M 1M 3M 5M







**EQUIPMENT (EQUIPMENT WORK)**

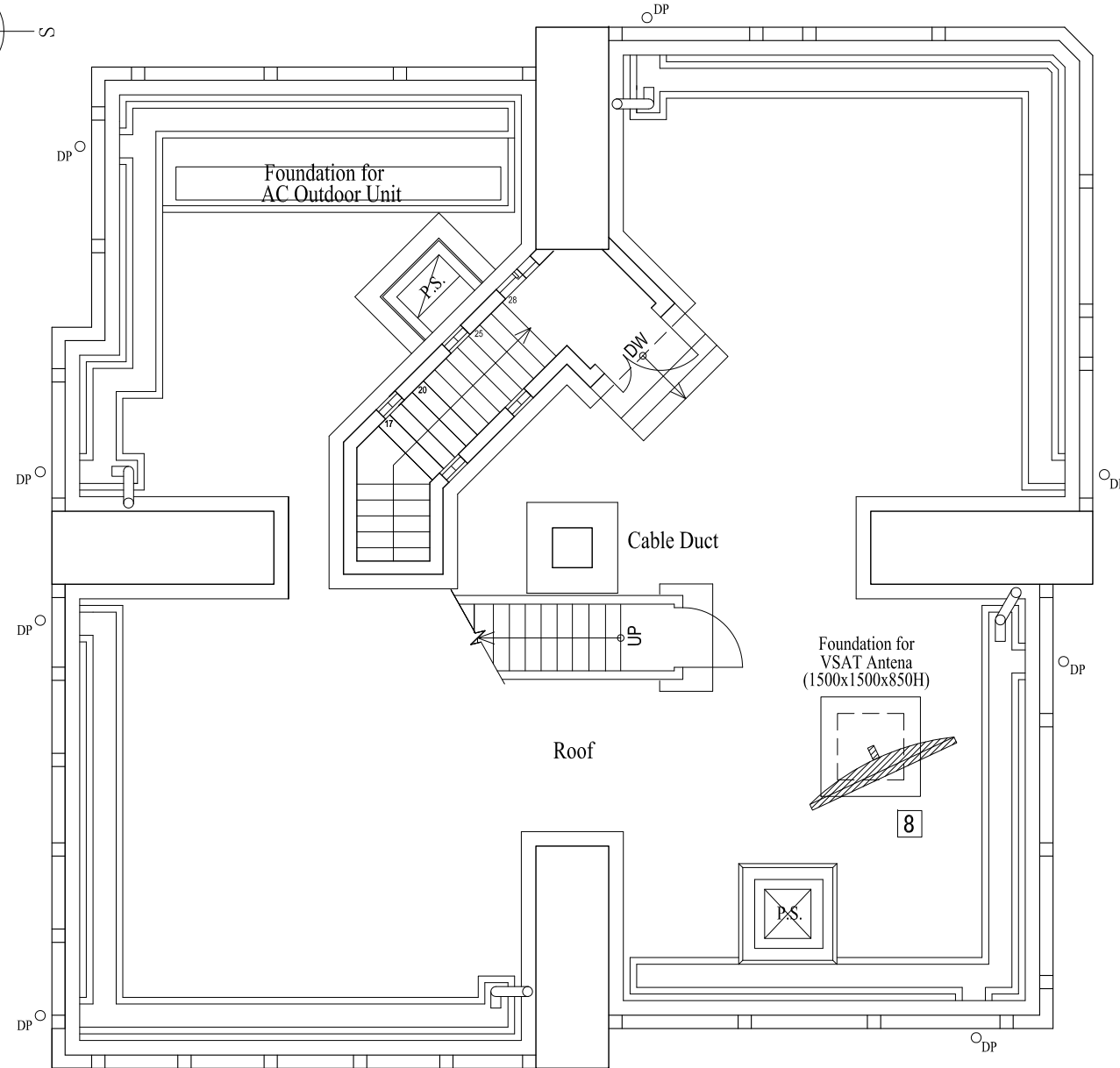
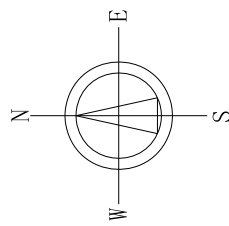
- 1 Indicator
- 2 Color Printer
- 4 Radar AVR
- 5 Isolation Transformer
- 7 Power Supply Capacitor
- 8 Emergency Power Backup Unit

**EQUIPMENT (CONSTRUCTION WORK)**

- 3 AVR
- 6 Isolation Transformer

**FURNITURE (CONSTRUCTION WORK)**

- F-1 Meeting Table
- F-2 Pedestal Desk (D700×W1100)
- F-3 Pedestal Desk (D700×W1400)
- F-4 Five-sided Corner Desk
- F-5 Drawer Unit with Casters
- F-6 Chair
- F-7 Lateral Filling Cabinet
- F-8 Cabinet with Double Hinged Door
- F-9 Top Panel
- F-10 Shelf with Double Hinged Door
- F-11 White Board (Movable Type)
- F-12 Pin Board (Wall Mounted Type)



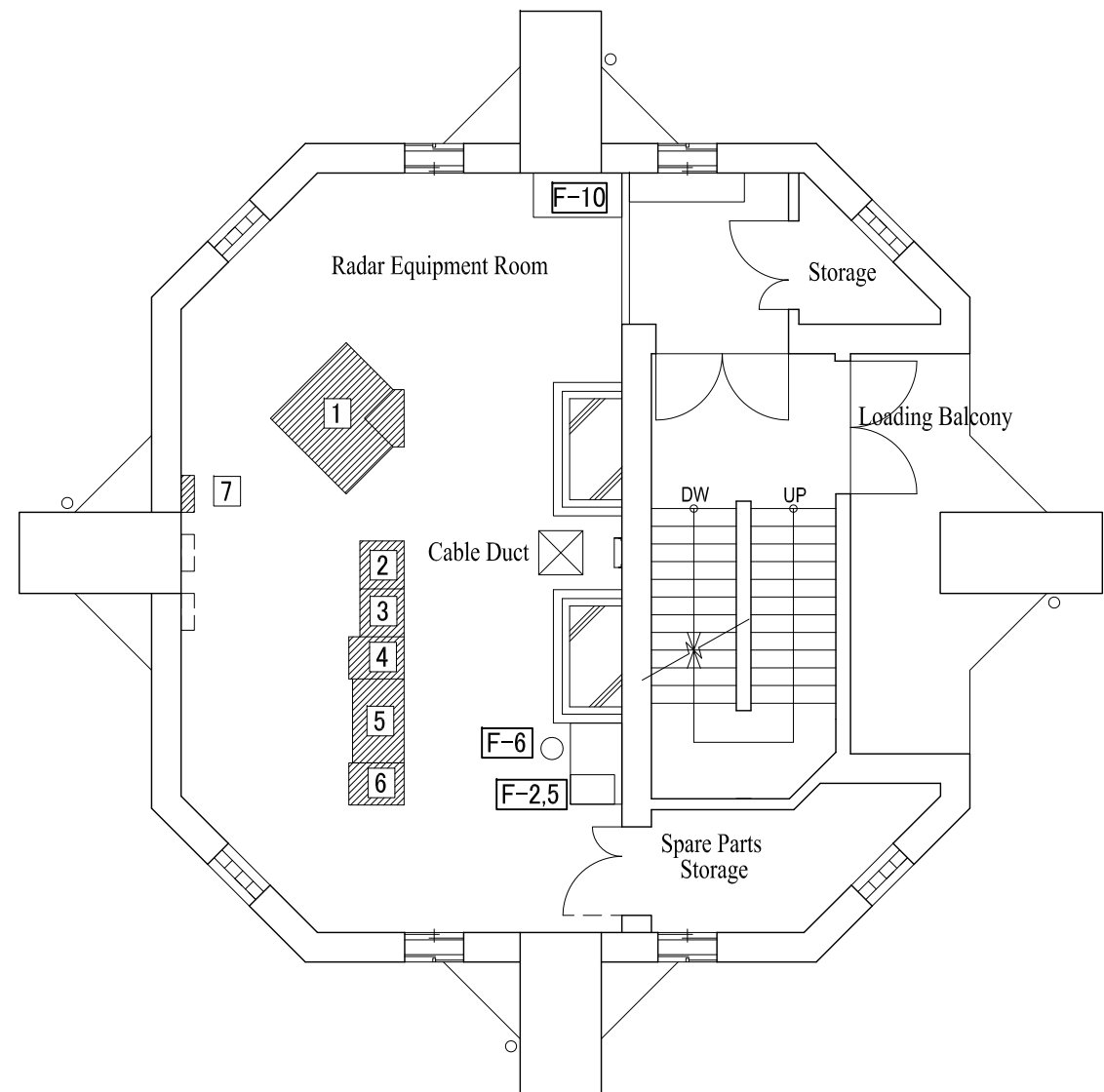
2FL PLAN

FURNITURE (CONSTRUCTION WORK)

- F-2** Pedestal Desk (D700×W1100)
- F-5** Drawer Unit with Casters
- F-6** Chair
- F-10** Shelf with Double Hinged Door

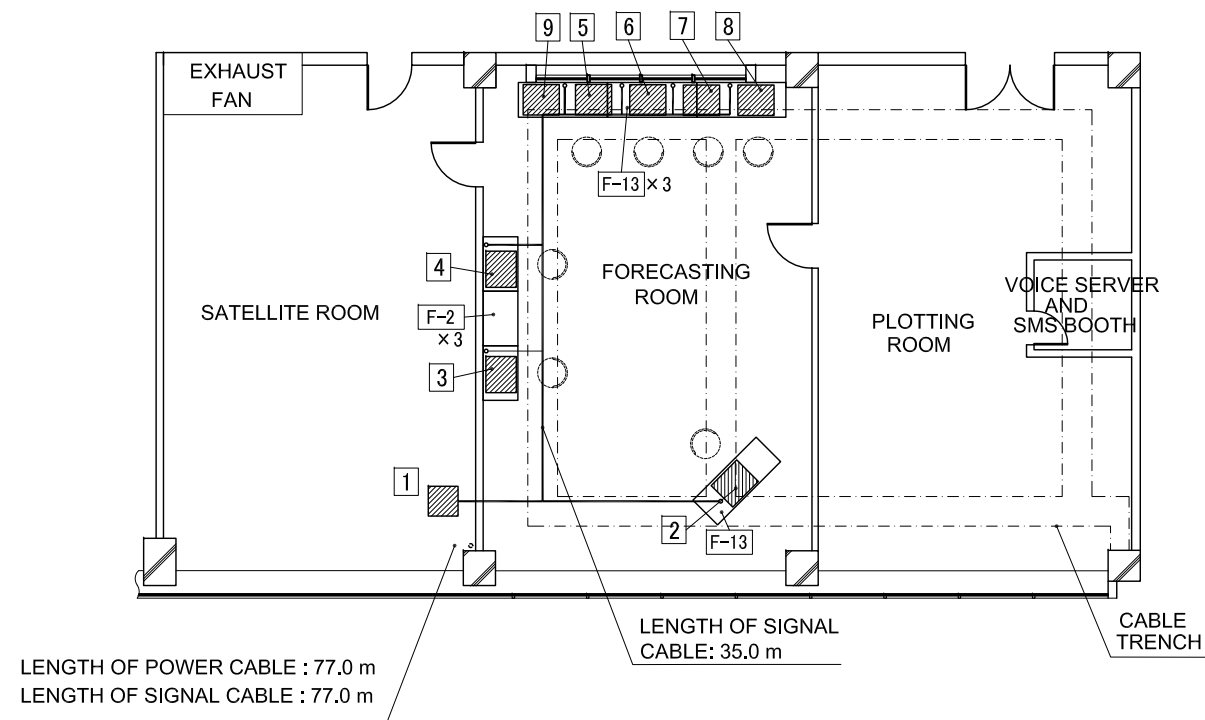
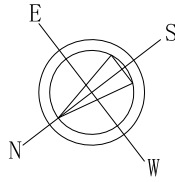
EQUIPMANT (EQUIPMENT WORK)

- 1** Transmitter
- 2** DRSP
- 3** Antenna Controller & Dehydrator
- 4** Data & Protocol Converter
- 5** Radar TASK Controller
- 6** VSAT In-Door Unit (IDU)
- 7** Radar Power Maintenance Panel
- 8** VSAT Antenna



M4FL PLAN



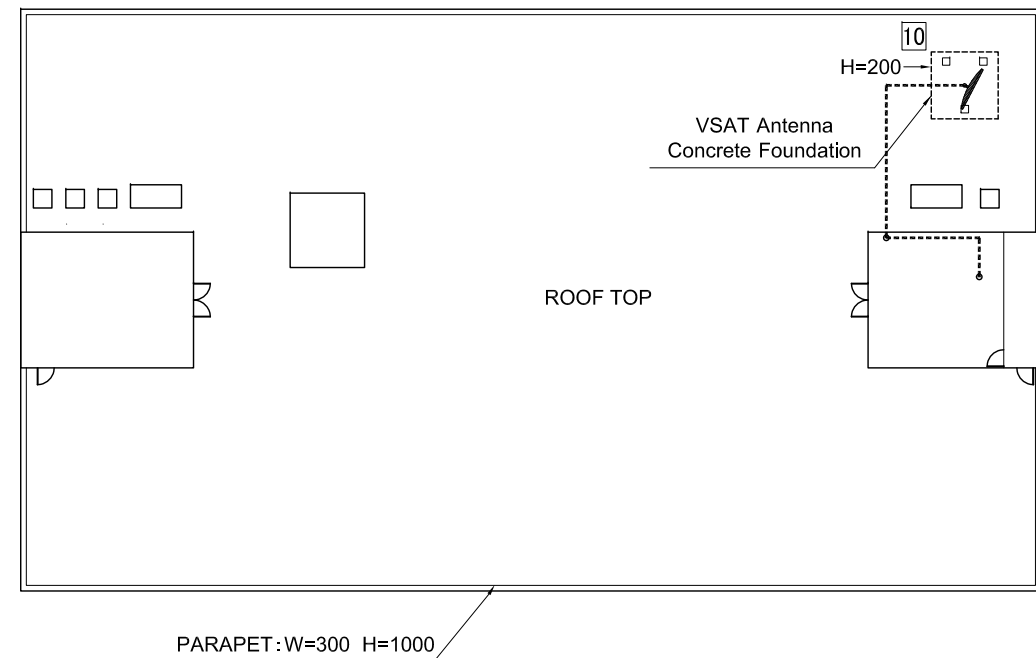


**WFFC 1ST FLOOR PLAN**

SCALE = 1:150

**FURNITURE (CONSTRUCTION WORK)**

- F-2** Pedestal Desk (D700 × W1100)
- F-13** Pedestal Desk (D700 × W1800)



**WFFC ROOF PLAN**

SCALE = 1:400

**EQUIPMENT (EQUIPMENT WORK)**

- 1** VSAT In-Door Unit
- 2** Composite Processor
- 3** Accumulated Rainfall Processor
- 4** Cyclone Tracking Monitor
- 5** Doppler Velocity Indicator
- 6** Meteorological Data Archiving Unit
- 7** Product Retrieval Unit
- 8** Radar WEB Server
- 9** Off-line Maintenance Computer
- 10** HUB VSAT Antenna/Out-Door Unit



*Japan Weather Association*

Sunshine 60 Bldg., 55F, 3-1-1 Higashi Ikebukuro, Toshima-ku, Tokyo,  
170-6055 Japan Tel. +81-3-5958-8161 Fax. +81-3-5958-8162

PROJECT FOR IMPROVEMENT OF THE METEOROLOGICAL  
RADAR SYSTEM IN THE PHILIPPINES

DRAWING TITLE DRAWING TITLE

WEATHER AND FLOOD FORECASTING CENTER  
EQUIPMENT LAYOUT PLAN

SCALE

1:150  
1:400

DRAWING No.

WFFC-EQ-01

## **2-2-4 Implementation Plan**

### **2-2-4-1 Implementation Policy**

The Project covers many fields, including procurement and installation of meteorological and communication equipment, construction work, etc. For the successful completion of the Project, close coordination will be required among all parties. In order to ensure continuous and reasonably substantial tropical cyclone monitoring capability by PAGASA during the project implementation, operation of at least 2 existing/new radar systems must be kept.

#### 1) Implementing agency for the Project

The responsible government agency of the Philippines for the implementation of the Project is PAGASA under the supervision of the Department of Science and Technology. PAGASA, as the Client, will be a signatory to the Consultancy Agreement and to the Contract.

#### 2) Consultant

After the signing of the Exchange of Notes (E/N) between the Government of the Philippines and the Government of Japan and the Grant Agreement (G/A) between the Government of the Philippines and JICA for the Project, it is important to finalize the Agreement of Consulting Services as early as possible. The Agreement of Consulting Services will be signed by PAGASA and a Japanese consulting firm, having its principal office in Japan and recommended by JICA.

The consulting firm will become the Consultant for the Project by signing the Agreement. The Consultant then will conduct a detailed design study in the Philippines with PAGASA and in Japan, and prepare tender documents including technical specifications, drawings, diagrams, etc. In addition, the Consultant instead of PAGASA will conduct a tender and supervise the Project implementation for successful completion of the Project as a project of Japan's Grant Aid Assistance.

#### 3) Contractor

A contractor with the required qualifications (an equipment supplier and a construction company) incorporated and registered in Japan, having its principal office in Japan, will be selected by an open public tender, in accordance with the tender documents prepared by the Consultant, in accordance with JICA guidelines, and approved by PAGASA.

### **2-2-4-2 Implementation Conditions**

#### 1) Natural Disaster in the Philippines

According to the following graph showing the annual frequency of tropical cyclone in the Philippines, annually 9 tropical cyclones crossed the country for the last 60 years. The project implementation schedule should give particular attention on the probable occurrence/season of tropical cyclones and heavy rains.

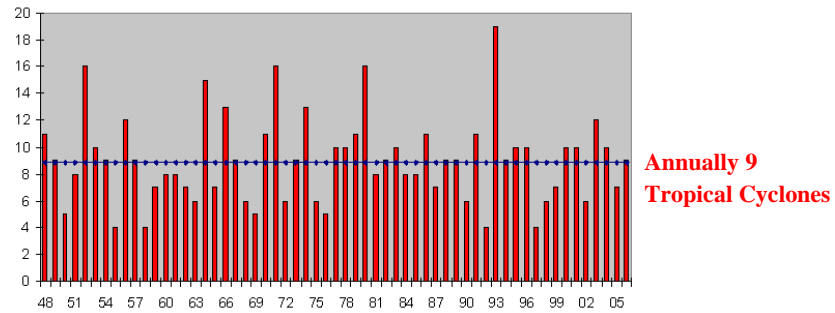


Figure 17: Annual Frequency of Tropical Cyclone made Landfall/Crossing the Philippines (1948-2004)

## 2) Conditions for the Installation of Equipment

The meteorological radar system, computing equipment and other sophisticated equipment with electric and electronic circuits will be installed in the radar tower building. In accordance with the construction schedule, the dispatch of an electrical engineer is required at the time of the installation, adjustment and wiring of the electric power supply and power back-up equipment. A building equipment engineer is required during the installation of air-conditioning systems for the adjustment and acceptance testing of the systems. During the construction period, it is important that there should be a smooth procurement of required materials and hiring of skilled labors to meet the construction schedule. In addition, specialized skilled engineers are needed for installation, adjustment and commissioning of the radar system, computing equipment and the sophisticated meteorological equipment. They are essential to ensure the quality of the installation work necessary for accurate meteorological observations. Furthermore, as part of the technology transfer to PAGASA staff, specialized highly skilled engineers are required as on-the-job trainees to ensure PAGASA can operate and maintain the equipment efficiently.

### 2-2-4-3 Scope of Works

In order to effectively utilize the existing facilities in the project sites and minimize the capital cost to be borne by PAGASA, PAGASA agreed to the following proposals made by the Basic Design Study Team.

- Complete separation of the radar operation & maintenance facility and the staff living facility in view of good hygiene and pest control
- Partial demolition/renovation of the existing building to improve the staff quarter instead of complete demolition of the existing radar tower building by PAGASA

The scope of works to be undertaken by Japan's Grant Aid Assistance and the Philippine side for the implementation of the Project are as follows.

1) Construction of the Radar Tower Buildings

<Scope of works to be undertaken by the Japan's Grant Aid Assistance>

- a) Architectural and civil works
- b) Electrical works
- c) Air-conditioning and Ventilation works
- d) Plumbing works

<Scope of works to be undertaken by the Philippine side>

- a) Securing the Project sites
- b) Demolition/relocation of the existing facilities that may obstruct during Project implementation
- c) Renovation of the existing buildings for establishing a new Staff Quarter
- d) Expansion and concrete pavement of the remaining unpaved portion of the existing access road
- e) External and planting works, as necessary
- f) Purchase of furniture for the new Staff Quarter
- g) Power supply intake work

2) Installation Work for the Equipment

<Scope of works to be undertaken by the Japan's Grant Aid Assistance>

- a) Procurement of the required equipment
- b) Transport of the equipment to the Project sites
- c) Installation work for the equipment
- d) Adjustment work of the equipment
- e) Commissioning for the total system

<Scope of works to be undertaken by the Philippine side>

- a) Provision of stable commercial power supply at the Project sites
- b) Removal/relocation of the existing radar systems
- c) Protection against any damage and theft of the equipment & systems

#### **2-2-4-4 Consultant Supervision**

##### 1) Principal Guidelines

- a) To take the responsibility for expediting the project implementation as well as smooth supervision, in accordance with the guidelines of Japan's Grant Aid Assistance and the Basic Design.
- b) To communicate closely with responsible organizations and personnel of both countries, and complete the Project in time in accordance with the implementation schedule.
- c) To provide appropriate advice to personnel of PAGASA and the contractor.
- d) To ensure safety of the project implementation as its top priority by earlier/advance detection of severe weather phenomena.

##### 2) Consultant Supervision

- a) The Consultant will dispatch at least one responsible and highly capable personnel to the Philippines at each implementation stage in the Project.
- b) Consultant technical specialists will be dispatched to the Philippines for installation guidance, inspection work, etc. for the installation and configuration work of the major hardware, data communication equipment, computing equipment and system software.
- c) The Consultant will attend factory performance tests, configuration verifications and inspections of the equipment on behalf of and instead of PAGASA.
- d) Qualified engineer(s) will be dispatched for data transmission tests in the Philippines.

##### 3) Scope of Work for Supervision

- a) The Consultant, in coordination with PAGASA, will prepare the contract in accordance with JICA standards; select a Japanese prime contractor through tendering; and recommend the nominated contractor to the Government of the Philippines.
- b) The Consultant will inspect and approve shop-drawings, system drawings & diagrams and material samples submitted by the contractor, and verify the performance and function of all equipment.
- c) Based on a review of the implementation schedule, the Consultant will provide instructions to the contractor and submit progress reports on the implementation of the Project to PAGASA, the Embassy of Japan, the JICA local office, etc.
- d) The Consultant will cooperate in certification of payment, such as through examination of notice of approval and invoices in connection with implementation cost to be disbursed during the implementation period and upon completion of the Project.



### 2-2-4-5 Quality Control Plan

Virac, Aparri and Guiuan are areas of high temperatures and high humidity reaching more than 80% almost all year round. According to past local meteorological data for the last 30 years, the monthly mean temperature can reach approximately 30°C. In view of this, the ambient temperature and the concrete temperature will be measured during concrete pouring, to ensure the correct concrete quality. The quality control plan for the main work is described in the table below.

Table 35: Quality Control Plan

Work	Work Type	Control Item	Method	Remarks
Structural Work	Concrete work	Fresh concrete Concrete strength	Slump, air volume, temperature Comprehensive strength test	Strength test at a public test institution
	Reinforcing work	Reinforcing bar Arrangement	Tensile test, mill sheet check Bar arrangement check	
	Pile work	Material, bearing capacity	Bearing capacity check	
Finishing Work	Roof work	Workmanship, leakage	Visual inspection, water spray test	
	Tile work	Workmanship	Visual inspection	
	Plastering work	Workmanship	Visual inspection	
	Door & window work	Products, Installation accuracy	Factory inspection sheet check Visual inspection, dimension check	
	Painting work	Workmanship	Visual inspection	
	Interior work	Products, workmanship	Visual inspection	
Electrical Work	Power Receiving & Transforming	Performance, operation installation check	Factory inspection sheet check; withstand voltage, megar, operation, visual inspection	
	Conduit work	Bending, support check	Visual inspection, dimension	
	Wiring and cable work	Sheath damage, loose connection check	Performance sheet check, cleaning before laying, marking after bolt fixing	
	Lightning work	Resistance, conductor support pitch check	Resistance measuring, visual inspection, dimension	
	Lighting work	Performance, operation, installation check	Performance sheet check, illumination measurement, visual inspection	
Mechanical Work	Water Piping Work	Support pitch, leakage	Visual inspection, leakage, water pressure test	
	Pump Installation	Performance, operation installation check	Performance sheet check, flow rate test	
	Air-Con. work	Performance, operation installation check	Performance sheet check, temperature measurement	
	Sanitary Fixture	Operation, installation, leakage check	Visual inspection, flow test	

Table 36: Governmental Construction Material Test Laboratory

	Virac	Aparri	Guiuan
Concrete Compressive Strength Test Slump Test	Material Quality Control & Hydrology Division, DPWH Virac Office, Virac, Catanduanes or Material Quality Control & Hydrology Division, DPWH Region 5 Office, Rawis, Legaspi City	Material Quality Control & Hydrology Division, DPWH Region 2 Office, Limgu Solana Tuguegarao City	Material Quality Control & Hydrology Division, DPWH Region 8 Office, Candahug Palo, Leyte
Re-bar Tensile Strength Test Chemical Composition Test	Material Quality Control & Hydrology Division, DPWH Region 5 Office, Rawis, Legaspi City	Material Quality Control & Hydrology Division, DPWH Region 2 Office, Limgu Solana, Tuguegarao City	Material Quality Control & Hydrology Division, DPWH Region 8 Office, Candahug Palo, Leyte

#### **2-2-4-6 Procurement Plan**

##### **(1) Equipment Procurement**

Maintenance requirements and the availability of the necessary parts and consumables in the Philippines are two of the most important factors in selecting the equipment. The equipment procurement process must provide for continuing maintenance after the completion of the Project. None of the meteorological equipment such as the pulse compression solid state Doppler radar system, the meteorological radar data display system, etc. to be supplied under the Project is produced in the Philippines. The pulse compression solid state Doppler radar system which has already been put into practical use for meteorological observation and has confirmed its reliability, durability, accuracy and performance is only available and made in Japan. The designed mean time between failure (MTBF) of transmitter for this system is more than 100,000 hours and the designed mean time to repair (MTTR) of transmitter is 0.5 hours.

The activities of the private sector in the Philippines will be useful in the support of the computer systems and other sophisticated systems. There are a lot of major computing equipment manufactures and local agents/suppliers. The procurement plan for the equipment is designed with a view to achieve the maximum possible degree of standardization as well as facilitating the acquisition of spare parts and maintenance services for the chosen computing equipment.

##### **(2) Procurement of Construction Material**

###### **1) Procurement Policy of Construction Material**

As the main construction materials can be procured locally, they will, in principle, be procured in the Philippines. Some construction materials imported from the neighboring countries (Association of Southeast Asian Nations: ASEAN) are marketed throughout the Philippines. As these imported materials can be easily procured locally, they are considered as part of the procurement of local products. In order to ensure the easy maintenance of the radar tower buildings, locally available materials will be utilized for construction.

###### **2) Procurement Plan of Construction Materials**

###### **[1] Structural Work**

The main materials for the structural works, such as fresh concrete, plywood for form works, etc., can be procured locally. Locally made concrete blocks are available and are a common material for building construction.

[2] Building Exterior and Interior Work

Timber, tiles, paint, glass, aluminum window frames, etc. used for the exterior and interior of a building are imported from ASEAN countries and, in principle, are readily available in the local market. For the proposed buildings, airtight aluminum and steel doors & windows, treated for salt-corrosion, are required.

[3] Air-Conditioning and Plumbing Work

Imported air-conditioning equipment, exhaust fans, sanitary-fixtures, etc. are popular in the Philippines. In principle, those products can be procured in the local market with a view to ease of repair and maintenance and large air-conditioning units and exhaust fans are also available in the local market.

[4] Electrical Work

Imported and local Lighting fixtures, switches, lamps, electrical wires and cables, conduits and other items are available in the local market. They will, in principle, be procured in the Philippines for the convenience of repair and maintenance. Custom-made building equipment such as control panels, power distribution boards and switch boards imported from ASEAN countries can be procured in the local market.

Table 37: Major Materials Procurement Plan (Architectural Work)

Materials	Local Market		Procurement Plan		
	Condition	Import	Philippines	Third Country	Japan
Portland cement	○		○		
Sand, aggregate	○		○		
Reinforcing bar	○		○		
Form (plywood)	○		○		
Concrete block	○		○		
Asphalt waterproofing	△		○		
Wood	○		○		
Aluminum door & window	△		○		
Steel door & window	△		○		
Wooden door & window	○		○		
Door handle, lock	○		○		
Floor hinge	○		○		
Plane glass	○		○		
Laminated safety glass	○		○		
Access floor panel	○		○		
Access floor panel (heavy duty type)	△		○		
Paint	○		○		
Gypsum board (T-bar)	○		○		
Cement board	○		○		
Rockwool acoustic board (T-bar)	○		○		
Glass wool, glass cloth	○		○		
Carpet tile	△		○		
PVC tile	○		○		
Porcelain tile	○		○		
Ceramic tile	○		○		
Floor maintenance hatch	○		○		
Kitchen	○		○		
Roof drain	○		○		
Steel drainage pipe (galvanized)	○		○		
Concrete pavement block	○		○		
Spray tile	○		○		
Caulking	○		○		

Table 38: Major Materials Procurement Plan (Mechanical and Electrical Work)

Work type	Materials	Local Market		Procurement Plan		
		Condition	Import	Philippines	Third Country	Japan
Air-conditioning work	Air conditioner	△		○		
	Heat exchanger	△		○		
	Exhaust fan (salt-proof)	△		○		
Plumbing work	Sanitary fixture	○		○		
	Pipe	○		○		
	Fire extinguisher	○		○		
	Water lifting pump	○		○		
Electrical work	Lighting fixture	○		○		
	Obstruction light	△	Japan			○
	Panel	△		○		
	Wire, cable	○		○		
	Conduit (PVC)	○		○		
	Conduit (Steel)	○		○		
	Cable-rack	○		○		
	Telephone system	△		○		
	Isolation Transformer	△	Japan			○
	AVR	△	Japan			○
	Fire alarm system	○		○		
	Diesel engine generator	○		○		
	Lightening protection	○		○		

- : Easy to procure in the Philippines
- △ : Available in the local market in the Philippines but model and quantity are limited
- × : Difficult to procure in the Philippines

### 3) Transportation Plan

There are 2-3 scheduled trips per day between Japan (Yokohama seaport) to the Manila seaport. The Marine transport from Japan to the Philippines takes approximately 15 days. The Manila seaport consists of the South port and the North port and only the South port can accept the duty exemption procedures for cargo from overseas. Therefore, containers of all the equipment must be loaded onto a cargo vessel which is bound for the Manila South port for smooth implementation of the duty exemption procedures.

Virac: Cargo will be transported by way of Calamba, Lucena and Naga by truck from the South port to Tabaco city (approx. 530km) for 2 days. From Tabaco city to Virac city, the cargo will be transported by ferry for about 4 hours.

Aparri: Cargo containers will be transported by way of San Fernando, Tarlac, and Laoag (high way and western route) by



Figure 18: Route Map of Transport

truck from the South port to Aparri city (approx. 720km) for 2 days. Since eastern route via Tuguegarao is a mountain corridor and some of security issues are available, this route is not suitable for the equipment transport.

Guiuan: Cargo will be transported by way of Calamba, Lucena, Naga and Legazpi by truck from the South port to Matnog city (approx. 640km) for 3 days. From Matnog city to Allen city, the cargo will be transported by ferry for about 1.5 hours and by way of Tacloban from Allen city to Guiuan by truck for 1.5 days (390km).

■ Transportation by Ferry for Cargo for Virac and Guiuan

Ferries between Tabaco city and Virac, Matnog city and Allen city cannot accommodate cargo containers for Virac and Guiuan due to their capacities. It is required that all the cargo must be transshipped from the containers to trucks in Manila for transportation by Ferry.

Tabaco city and Virac city: 1 Ferry/day

Matnog city and Allen city: 5 ferries/day

■ Duty Exemption Procedures

After completion of the procedures for deferred payment and custom clearance at the South port, all the cargo will be released.

**Table 39: Required Procedures for Duty Exemption**

Require Procedures	Agency	Required Time	Require Documents	Applicant
Deferred Payment Statement of Account	Bureau of Customs (BOC), South Port	After departure of ship: 3 weeks	Import Entry: 1 original SDV(Supplemental Declaration on Valuation):1 original Certificate of Undertaking:1 original Certificate of Official Importation:1 original Request Letter to Customs:1 original	Forwarder and PAGASA
Import Permit		After arrival of ship: 1 week	Contract: 1 copy Shipping Documents:1 original Statement of Account: 1 copy Shipping Documents:1 original	

**2-2-4-7 Operational Guidance Plan**

The required operation guidance will be implemented through practical operation simulation of each system in the course of the completion of the equipment installation. During the equipment installation period, the operational guidance for cabling, piping (wave guide), unit replacement/adjustment, transmitter discharge, etc. of the meteorological radar system will be imparted to PAGASA, as such operational guidance for said items will no longer be able to be implemented after completion of the equipment installation. The operational guidance for each system will be implemented at the following places indicated in the table attached hereunder.

Table 40: Operation and Maintenance Training (OJT)

Equipment	PAGASA Head Office, WFFC	Virac Meteorological Radar Observation Station	Aparri Meteorological Radar Observation Station	Guiuan Meteorological Radar Observation Station
Meteorological Radar System <ul style="list-style-type: none"> <li>• Power Unit</li> <li>• Antenna</li> <li>• Radar Unit</li> <li>• Meteorological Radar Transmission Unit</li> <li>• Computer Network Unit</li> <li>• Application Software</li> </ul>	-	○	○	○
Meteorological Radar Data Display System <ul style="list-style-type: none"> <li>• Power Unit</li> <li>• Computer Network Unit</li> <li>• Application Software</li> </ul>	○	○	○	○
Meteorological Data Satellite Communication System (VSAT) <ul style="list-style-type: none"> <li>• Power Unit</li> <li>• VSAT Communication Unit</li> <li>• Computer Network Unit</li> <li>• Application Software</li> </ul>	○	○	○	○

2-2-4-8 Implementation Schedule

Table 41: Implementation Schedule

	1	2	3	4	5	6	7	8	9	10																															
Detailed Design	[Gantt bar]																																								
Tendering Procedures	[Gantt bar]																																								
Total: 9.0 months																																									
<b>Construction Work at Virac Radar Tower Building</b>	<b>Total: 20.0 months</b>																																								
Preparation Work	[Gantt bar]																																								
Temporary/Piling/Earth Works	[Gantt bar]																																								
Structure Work	[Gantt bar]																																								
Finishing Works	[Gantt bar]																																								
Building Equipment	[Gantt bar]																																								
External Work	[Gantt bar]																																								
Equipment Manufacturing for Virac and PAGASA WFFC	[Gantt bar]																																								
Equipment Transportation for Virac and PAGASA WFFC	[Gantt bar]																																								
Equipment Installation/Adjustment for Virac	[Gantt bar]																																								
Equipment Installation/Adjustment for PAGASA WFFC	[Gantt bar]																																								
<b>Construction Work at Aparri Radar Tower Building</b>	<b>Total: 18.0 months</b>																																								
Preparation Work	[Gantt bar]																																								
Temporary/Piling/Earth Works	[Gantt bar]																																								
Structure Work	[Gantt bar]																																								
Finishing Works	[Gantt bar]																																								
Building Equipment	[Gantt bar]																																								
External Work	[Gantt bar]																																								
Equipment Manufacturing for Aparri	[Gantt bar]																																								
Equipment Transportation for Aparri	[Gantt bar]																																								
Equipment Installation/Adjustment for Aparri	[Gantt bar]																																								
<b>Construction Work at Guiuan Radar Tower Building</b>	<b>Total: 17.3 months</b>																																								
Preparation Work	[Gantt bar]																																								
Temporary/Earth Works	[Gantt bar]																																								
Structure Work	[Gantt bar]																																								
Finishing Works	[Gantt bar]																																								
Building Equipment	[Gantt bar]																																								
External Work	[Gantt bar]																																								
Equipment Manufacturing for Guiuan	[Gantt bar]																																								
Equipment Transportation for Guiuan	[Gantt bar]																																								
Equipment Installation/Adjustment for Guiuan	[Gantt bar]																																								