

Fig 3.2.1-2 (1/7)
CONNECTION DIAGRAM OF TRANSMISSION LINK (DESSIE ROUTE)

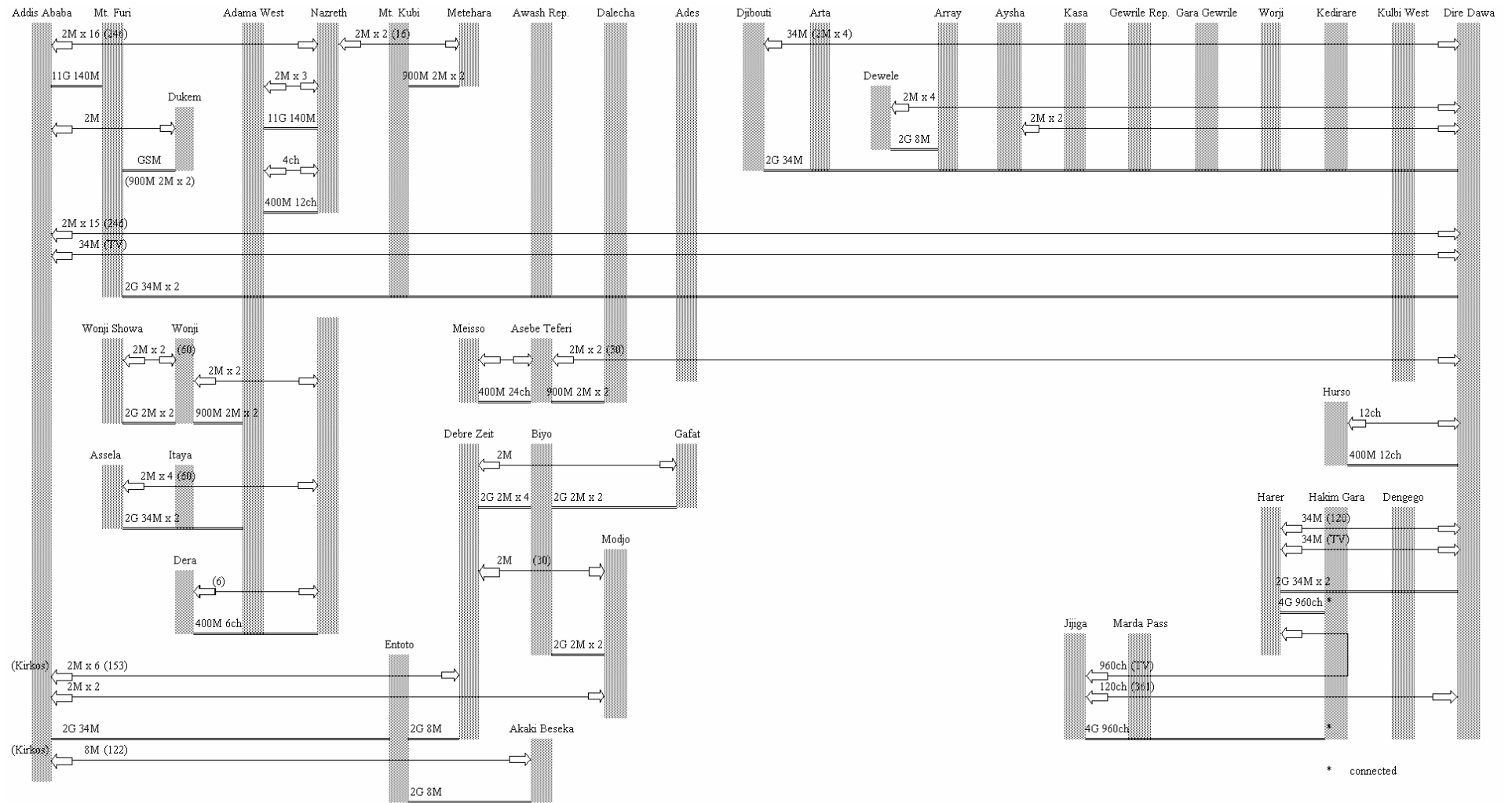


Fig. 3.2.1-2 (3/7)
 CONNECTION DIAGRAM OF TRANSMISSION LINK (DIRE DAWA ROUTE)

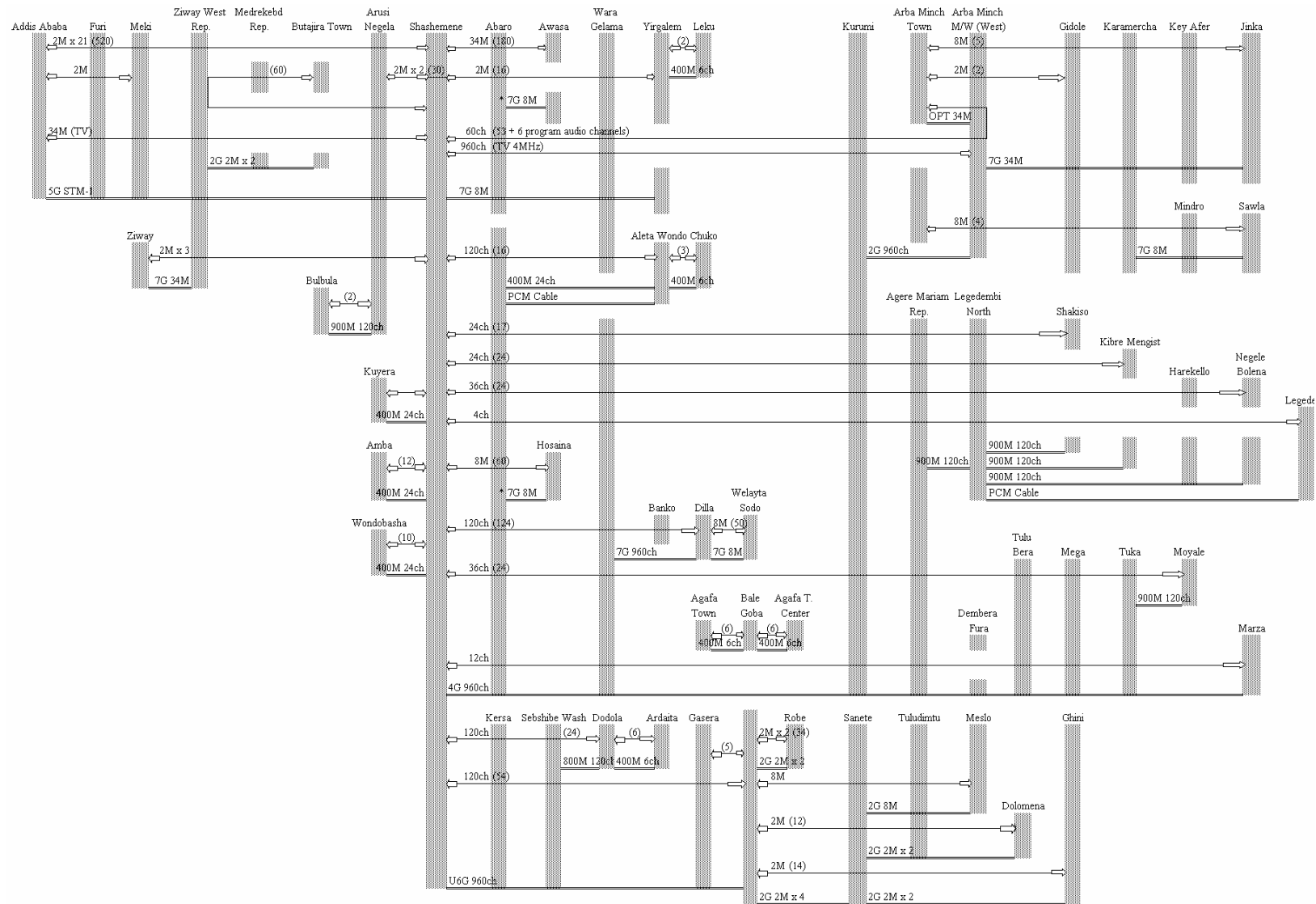


Fig. 3.2.1-2 (4/7)
CONNECTION DIAGRAM OF TRANSMISSION LINK (SHASHEMENE ROUTE)

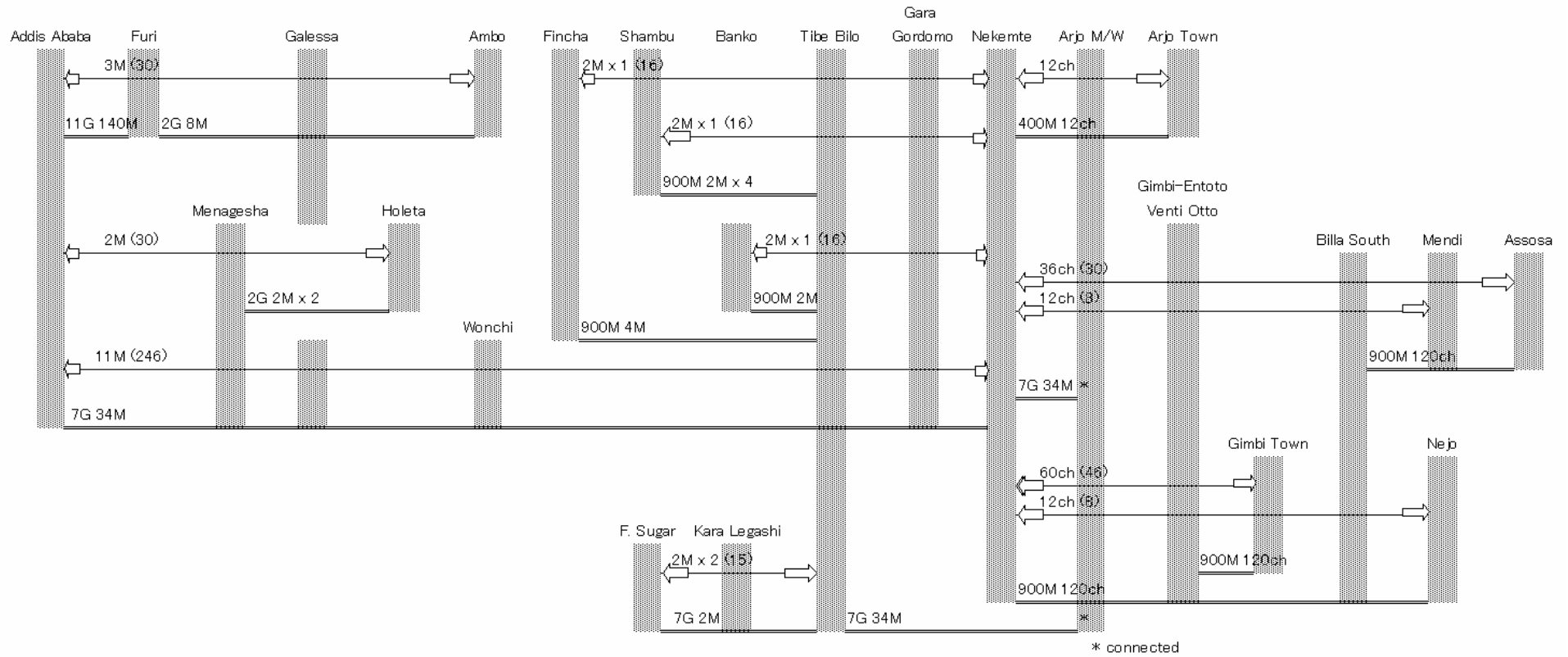


Fig. 3.2.1-1 (6/7)
 CONNECTION DIAGRAM OF TRANSMISSION LINK (NEKEMTE ROUTE)

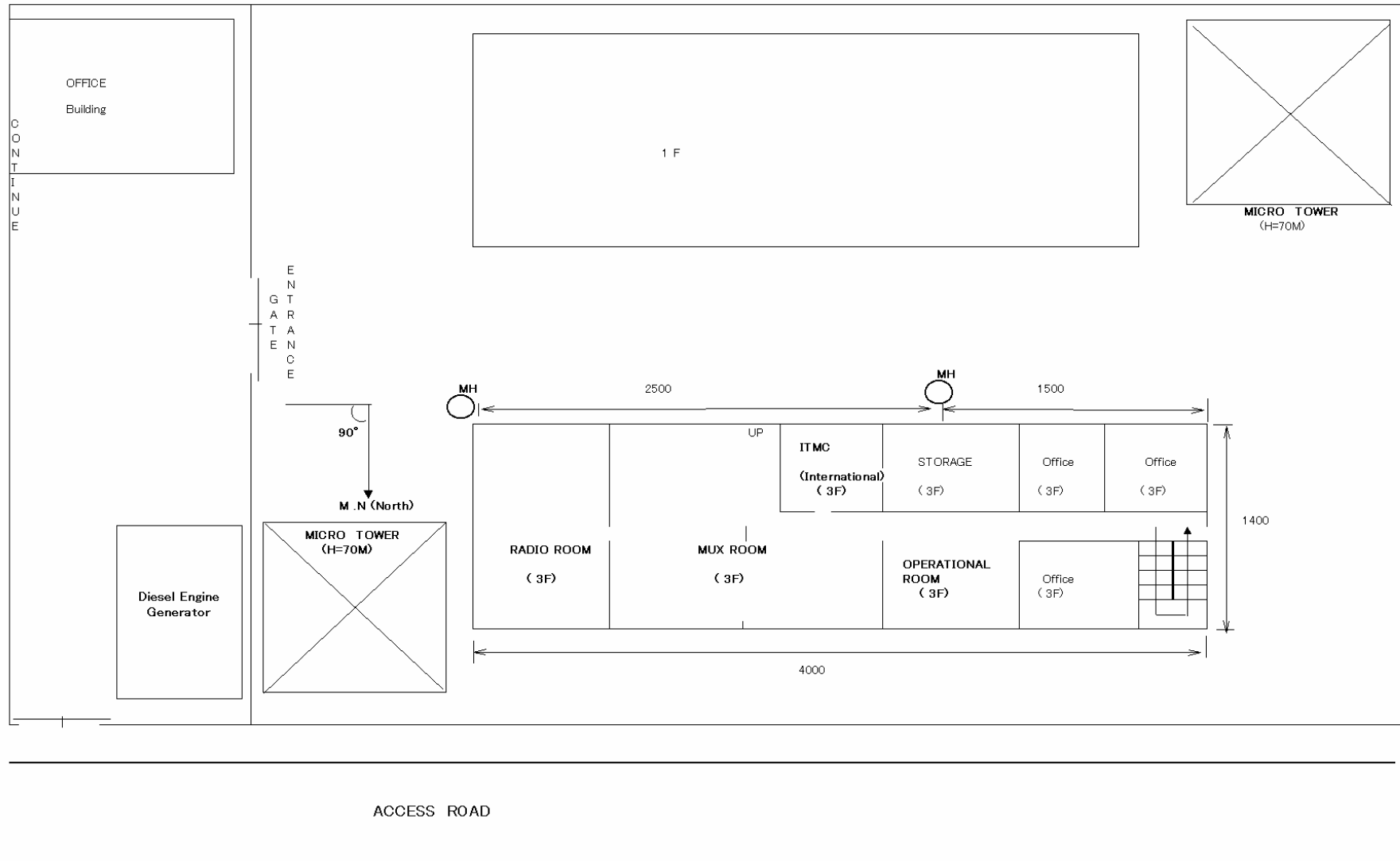


Fig. 3.3.1-1(1/3) Addis Ababa IR/ITE Center Building Layout (3F)

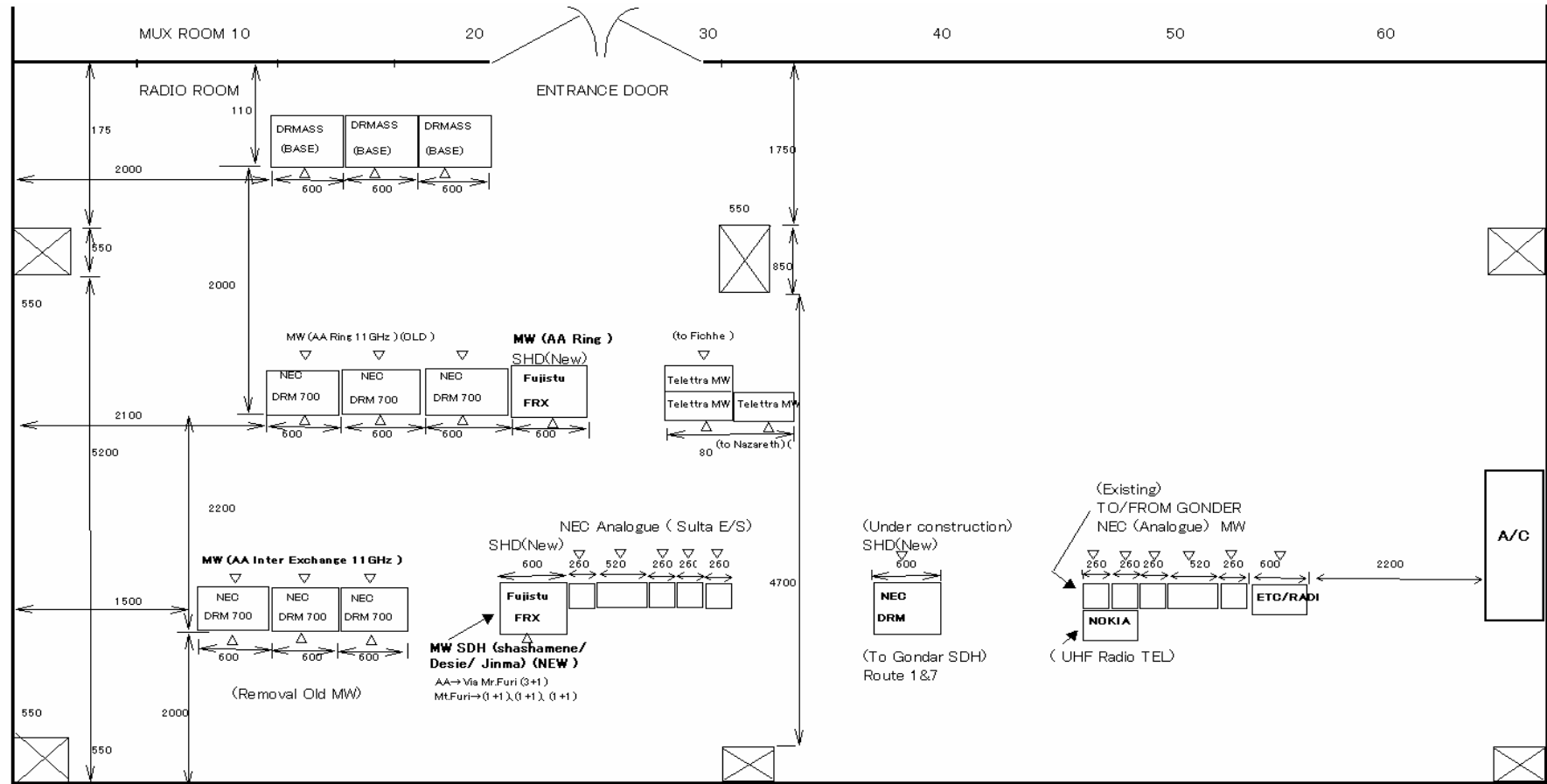


Fig . 3.3.1-1(2/3) AA IR/ITE RADIO ROOM

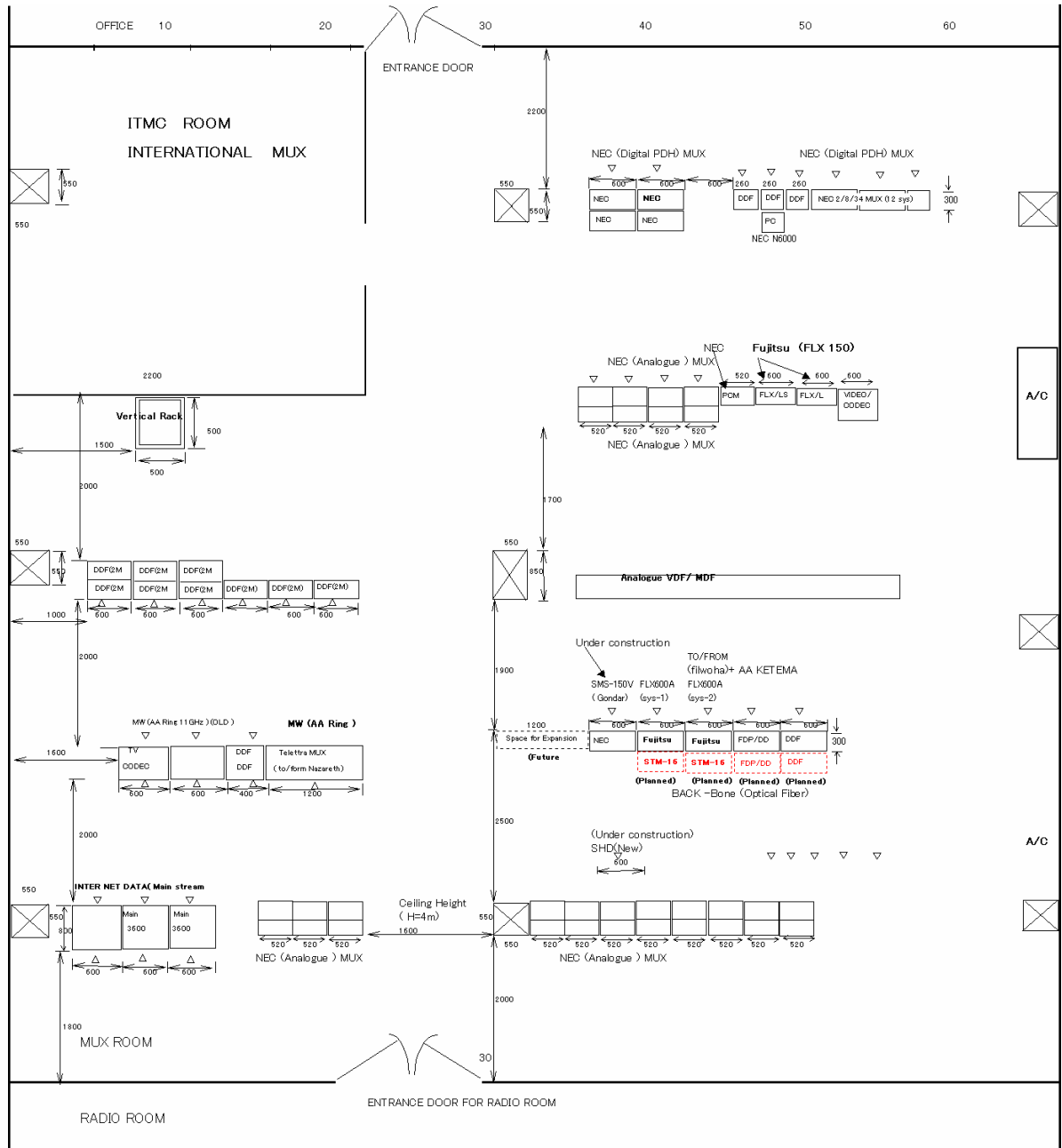


Fig. 3.3.1-1 (3/3) AA IR/ITE MUX ROOM

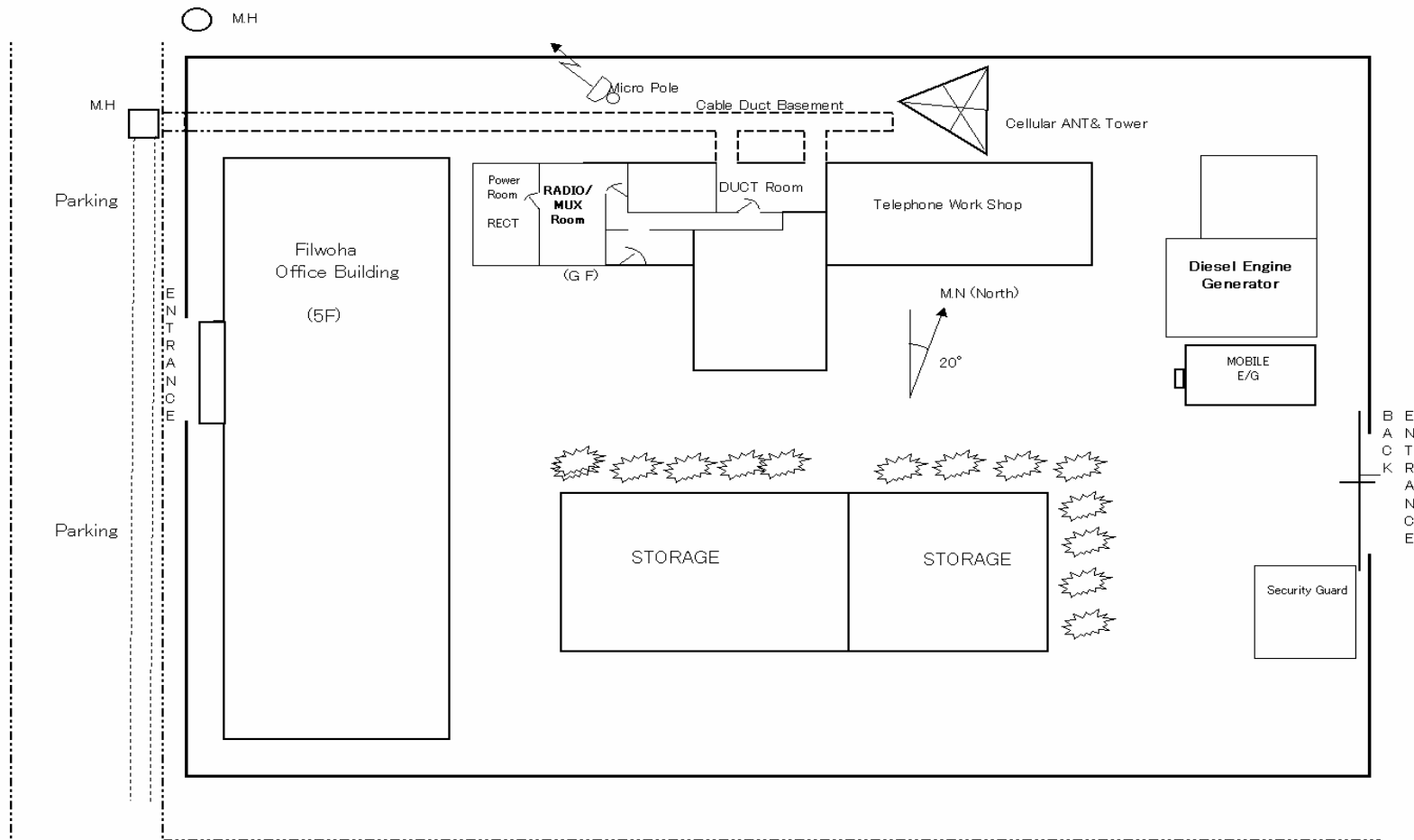


Fig . 3.3.1-2(1/2) AA FILWOHA Center Building Layout (1F)

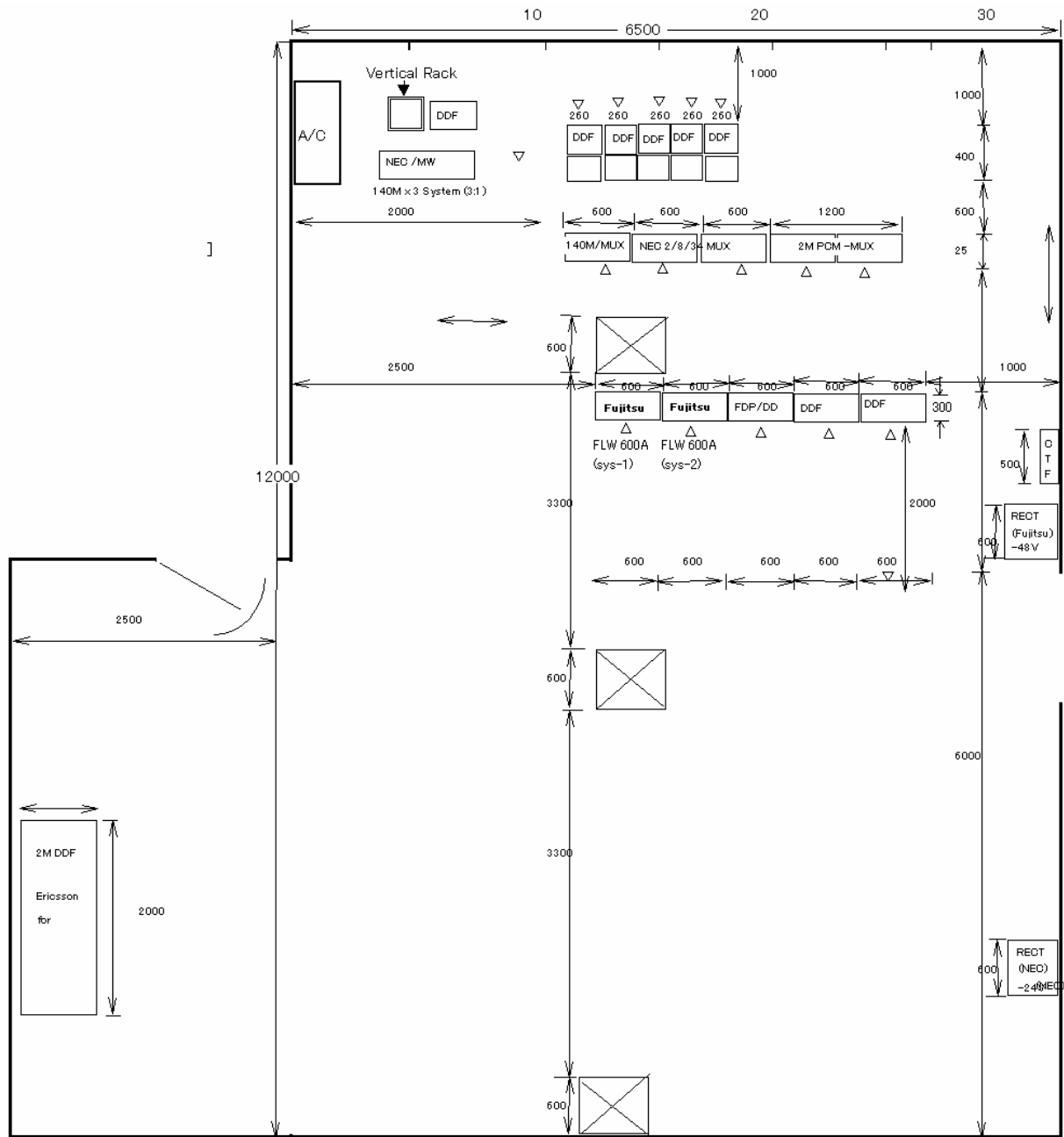


Fig . 3.3.1-2 (2/2) AA FILWOHA RADIO/MUX ROOM

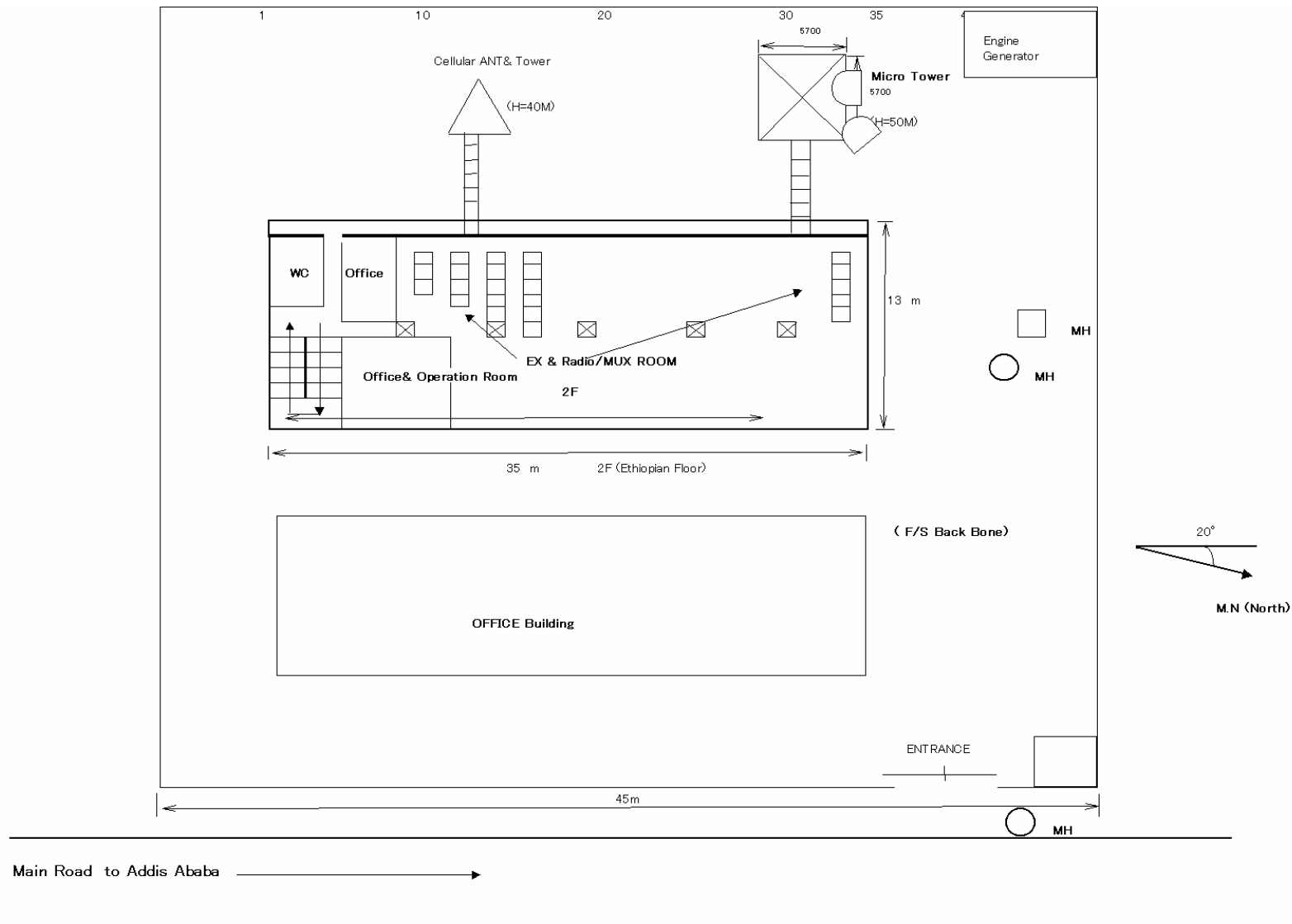


Fig .3.3.1-3 (1/2) AA NEFAS Silk Center Building Layout (2F)

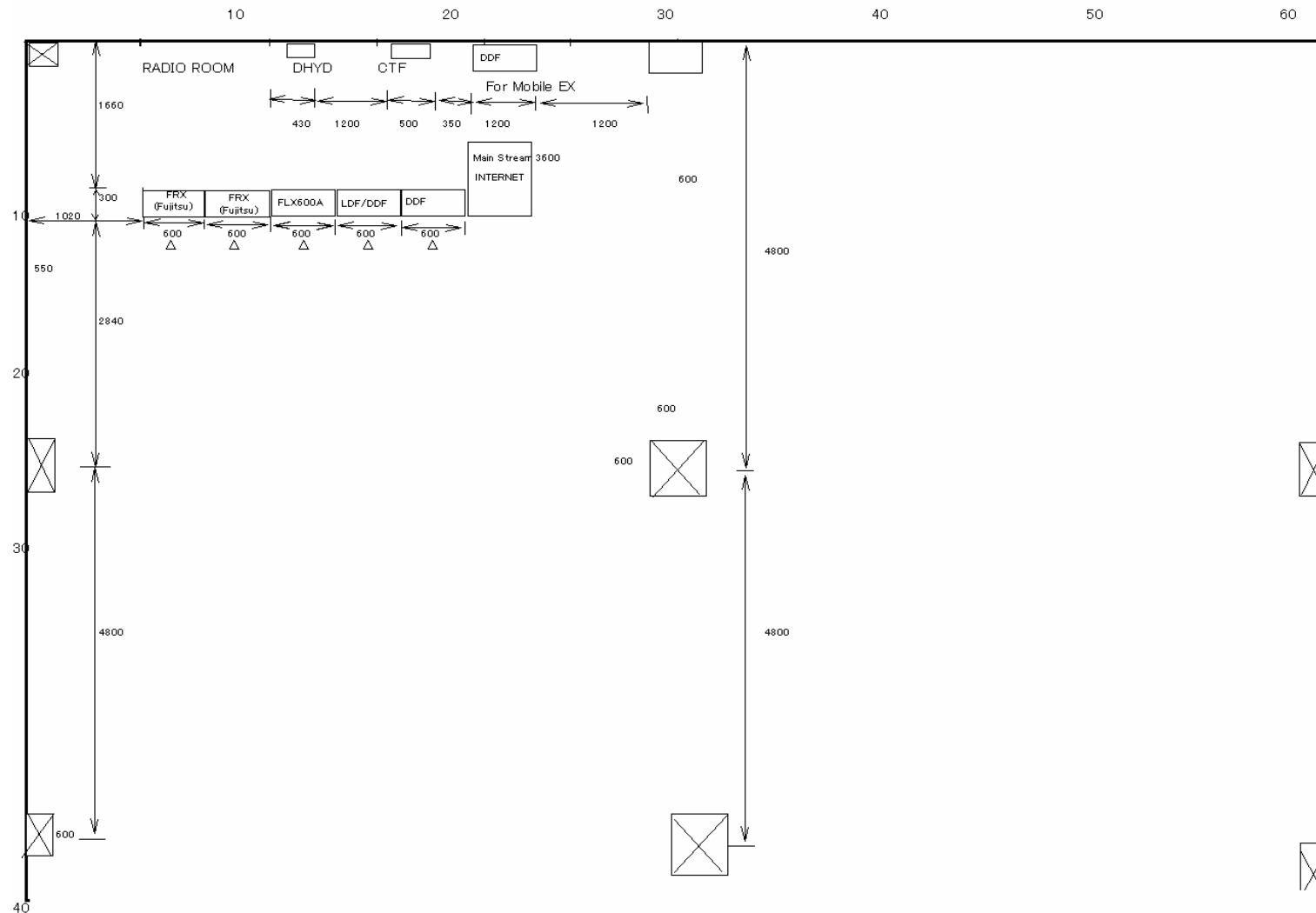


Fig . 3.3.1.-3 (2/2) NEFAS SILK RADIO ROOM

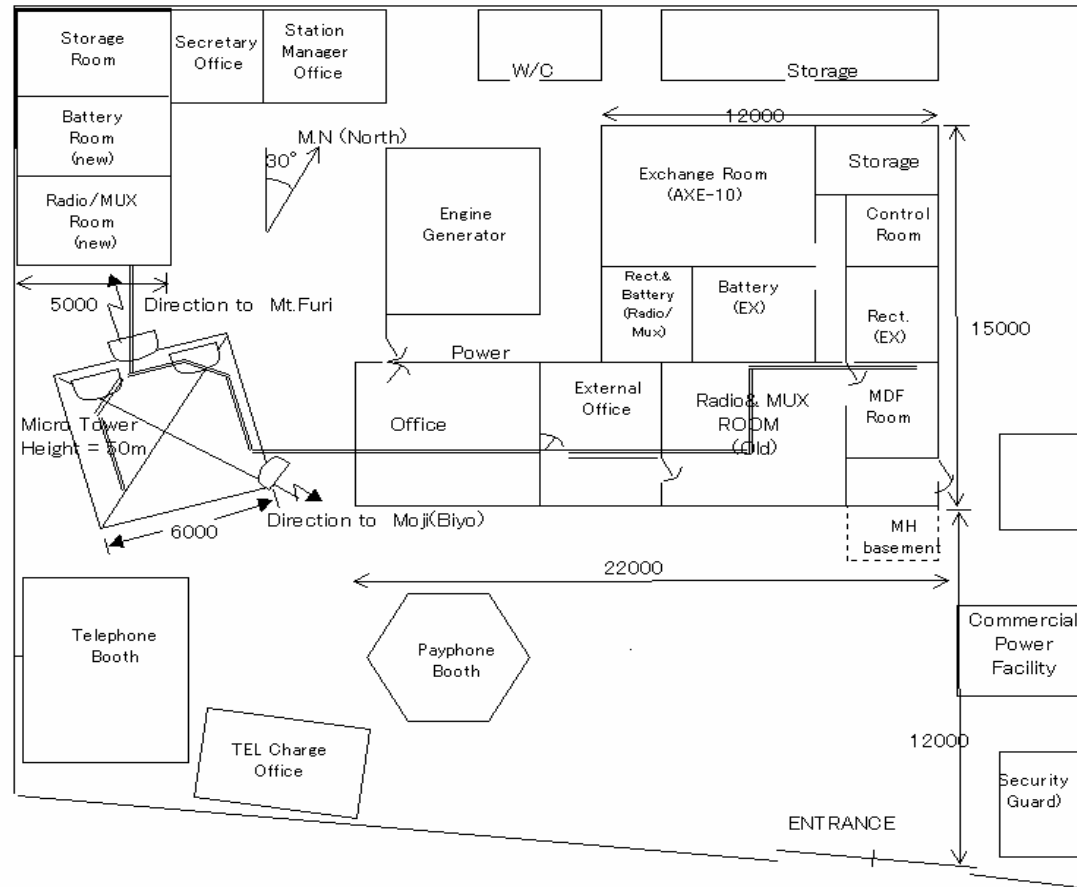


Fig . 3.3.1-4(1/2) Debre Zeit Building Layout

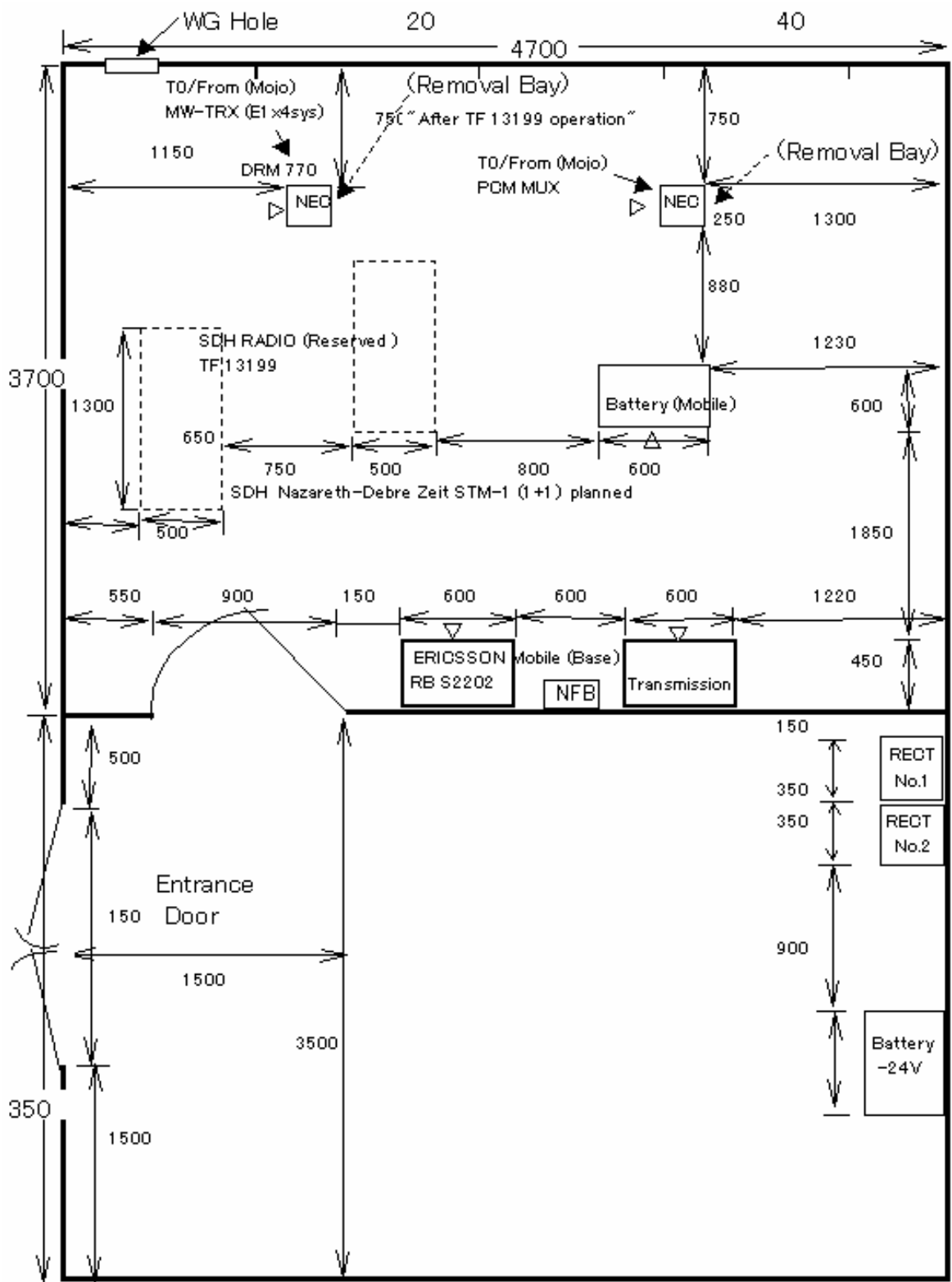


Fig. 3.3.1.-4(2/2) Debre Zeit RADIO/MUX ROOM

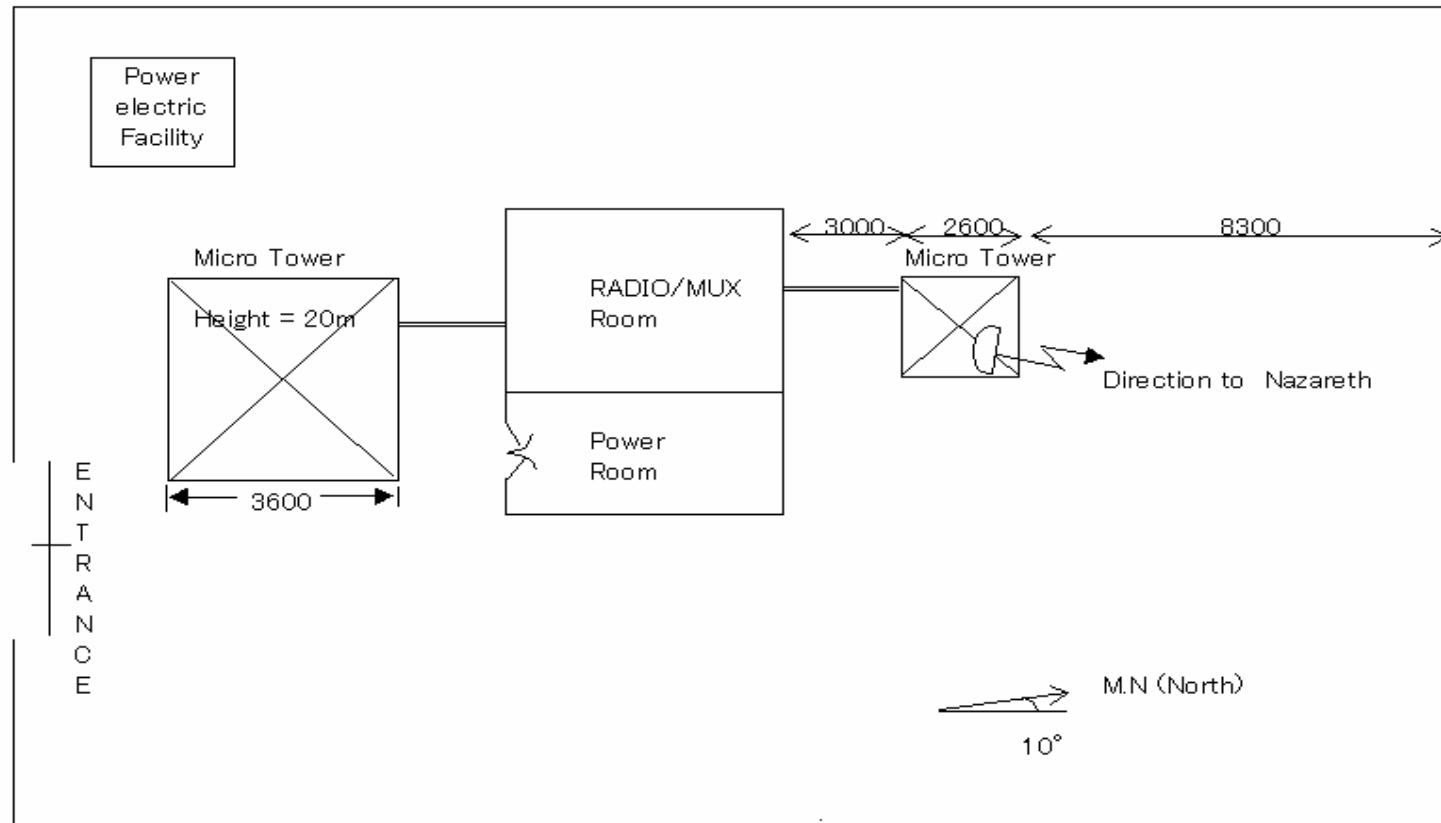


Fig . 3.3.1-5 (1/2) ADAMA WEST MW Rep. Building Layout

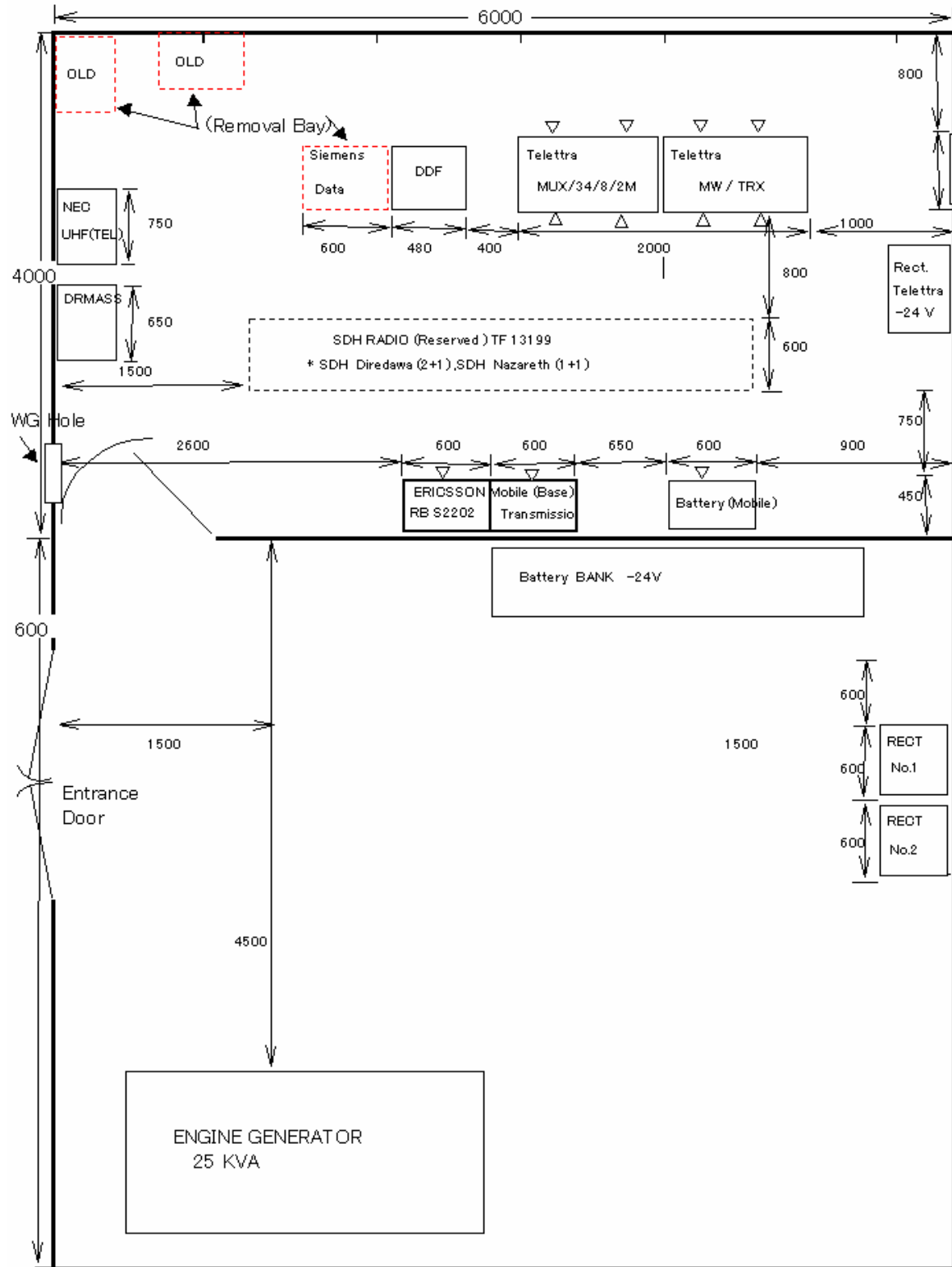
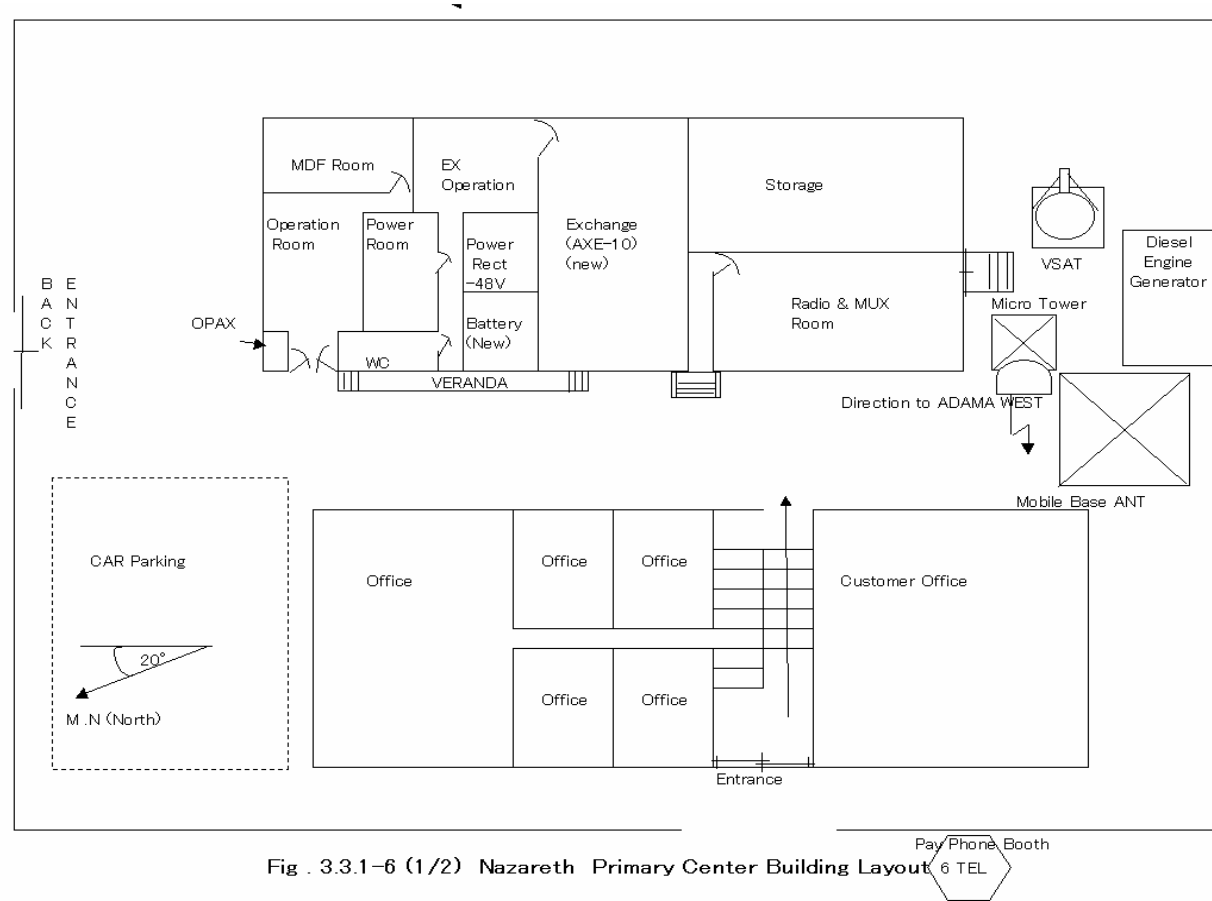


Fig .3.3.1.-5 (2/2) ADAMA WEST RADIO/MUX ROOM



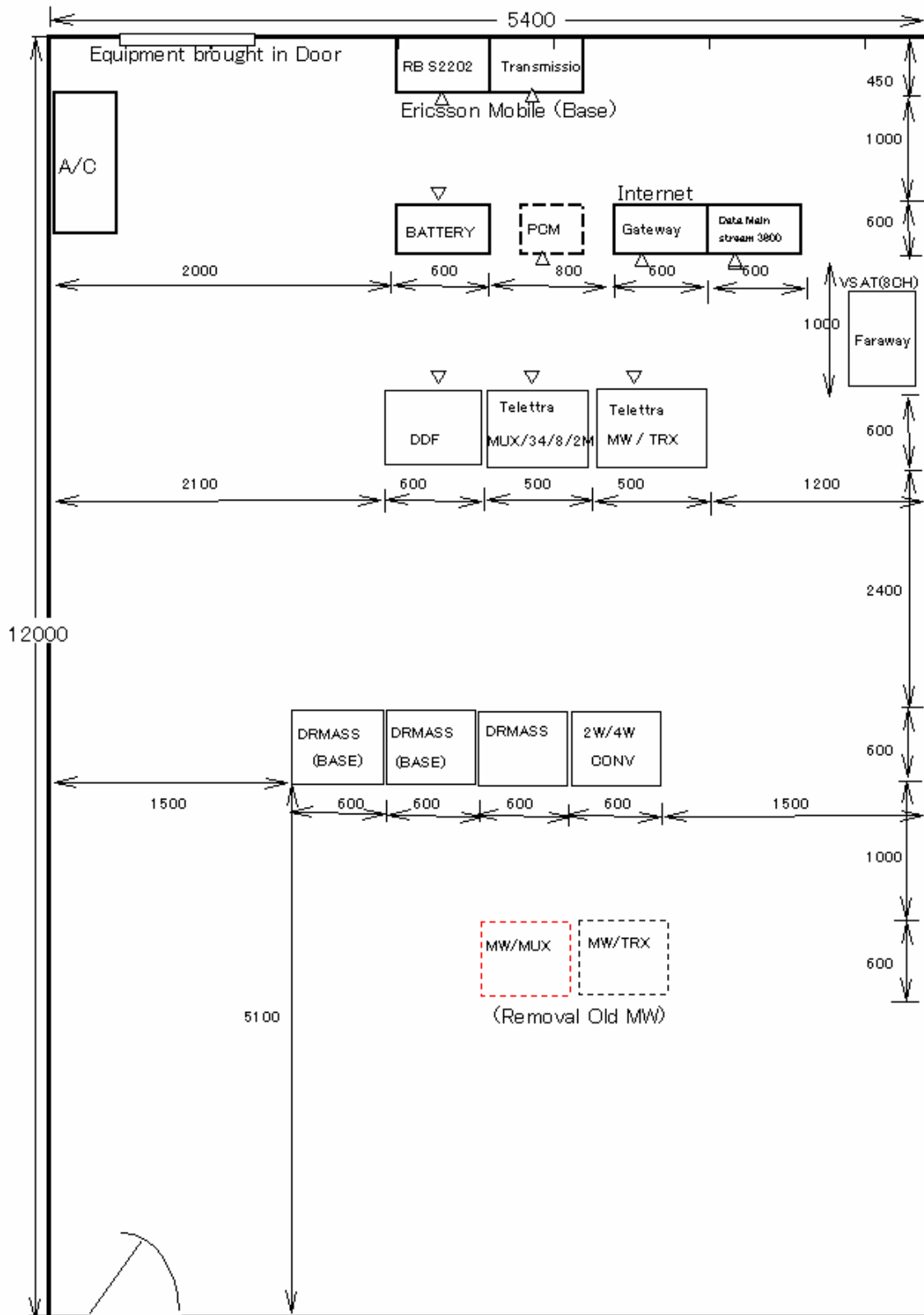


Fig .3.3.1-6 (2/2) Nazareth Primary Center RADIO/MUX ROOM

4. BACKBONE TRAFFIC FORECAST

Table 4.1 shows the traffic forecast for the whole backbone of Ethiopia based on the demand forecast in the master plan. Areas benefiting from the construction of the backbone are the Nazareth region (area code 02), Dire Dawa region (area code 05) and Shashemene (area code 06).

The traffic forecast for these regions is shown again in Table 4.2 Traffic Forecast for a Planned AA-Nazareth Backbone Link.

The units for the line switchover of this backbone will be STM-1 (155 Mbps), under consideration of the units of the connection lines of the SDH microwave links that provide route diversity. For this reason, both TV lines and telephone lines are potentially affected in case one of the higher-layer STM-1 (155 Mbps) lines fail, when merging the line capacity of the TV lines (34 Mbps) and telephone channels for the corresponding destinations. Further, to multiplex these TV and telephone lines, each network node additionally requires a digital multiplex subsystem, so that the dynamic operation of switching over lines in STM-1 units becomes limited.

Information and communication technology is advancing worldwide, and the trend is that the demand for links grows, and that the capacity of transmission equipment increases correspondingly. Compared to few years ago, it is now possible to procure large-capacity transmission facilities at relatively low prices. Because of this, multiplexing and capacity changes at repeater stations have been eliminated as far as possible for telephone and TV lines and we assume that allocate dedicated lines in STM-1 units until the destination.

Table 4.2 Traffic Forecast for a Planned AA-Nazareth Backbone Link

Link Destination	2005 GC**		2010 GC		2015 GC		2020 GC	
	Total E1	TV (Mbps)	Total E1	TV (Mbps)	Total E1	TV (Mbps)	Total E1	TV (Mbps)
1.AA-Nazareth	31	34	44	34	47	34	56	34
2.AA- Dire Dawa	34	34	43	34	45	34	50	34
3.AA- Shashemene	50	34	59	34	61	34	66	34
Required STM-1*	3	1	3	1	3	1	4	1

(*Note 1 : STM-1 is equivalent with E1(2Mbps) x63)

(**Note 2: GC means Gregorian calendar year)

Based on the stance described above, the forecast for the total traffic of the three areas that benefit from the construction of this backbone transmission link is as shown below:

- Year 2005 GC: STM-1 (4 lines)
- Year 2010 GC: STM-1 (4 lines)
- Year 2015 GC: STM-1 (4 lines)
- Year 2020 GC: STM-1 (5 lines)

As a consequence, STM-16 optical fiber backbone (equivalent to 16 x STM-1) that can sufficiently respond to the traffic demand until the year 2020 GC is required.

Link	2005 GC					2010 GC					2015 GC					2020 GC				
	Fix & IP Tel	Mobile	Internet	Total E1	TV (Mbit/s)	Fix & IP Tel	Mobile	Internet	Total E1	TV (Mbit/s)	Fix & IP Tel	Mobile	Internet	Total E1	TV (Mbit/s)	Fix & IP Tel	Mobile	Internet	Total E1	TV (Mbit/s)
	Equiv.E1	Equiv. E1	Equiv. E1			Equiv.E1	Equiv. E1	Equiv. E1			Equiv.E1	Equiv. E1	Equiv. E1			Equiv.E1	Equiv. E1	Equiv. E1		
AA (NSC) - 2 Nazareth	25	4	2	31	34	36	5	3	44	34	42	2	3	47	34	49	3	4	56	34
3 Dessie	23	2	1	26	34	26	5	2	33	34	29	1	2	32	34	32	2	3	37	34
4 Mekele	33	4	2	39	34*	42	6	3	51	34*	49	2	4	55	34*	55	3	5	63	34*
5 Dire Dawa	29	3	2	34	34	36	5	2	43	34	40	2	3	45	34	44	2	4	50	34
6 Shashemene	45	3	2	50	34	50	6	3	59	34	55	2	4	61	34	59	3	4	66	34
7 Nekemte	11	1	1	13	34	13	2	1	16	34	14	1	1	16	34	15	1	1	17	34
7 Jimma	23	2	1	26	34	26	3	2	31	34	28	1	2	31	34	30	2	2	34	34
8 Bahir Dar	27	5	3	35	34	45	7	4	56	34	54	2	5	61	34	54	3	6	63	34
Dessie - Mekele	4			4		4			4		3			3		4			4	
Nekemte - Jimma	1			1		1			1		1			1		1			1	
Nazareth - Asela		4		4			5		5			2		2			3		3	
Shashemene - Ziway		1		1			1		1			1		1			1		1	
Bahir Dar - Gonder		5		5			7		7			2		2			3		3	
Dessie - Tendaho TV					34					34					34					34
Dire Dawa - Harer					34					34					34					34
Harer - Jijiga					34					34					34					34
Shashemene - Arba Minch					34					34					34					34
Bahir Dar - Gonder					34					34					34					34

* Link is extended from Dessie.

Table 4.1 Backbone Traffic Forecast for Transmission Designing