

ELECTRICAL DRAWINGS INDEX

Partner: **MINISTRY OF HEALTH
ETHIOPIA**

Implemented By: **UNOPS - ETMCO**

WORLD BANK

Project Name: **PROCUREMENT AND INSTALLATION OF
OXYGEN PLANT**

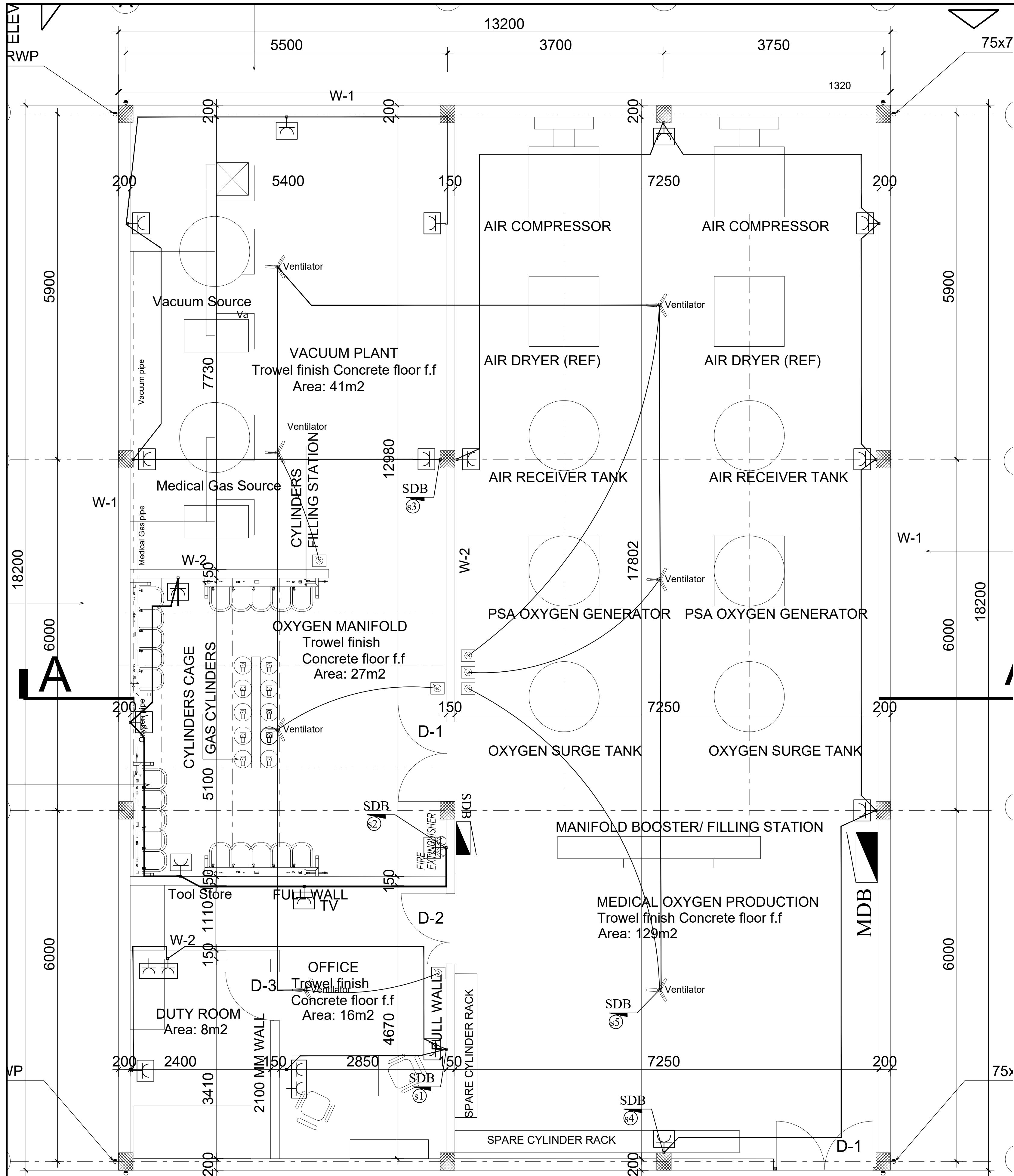
Date: 19/12/2024

DRAWING INDEX

DRAWING NO		DESCRIPTION	REVISION
EL 01/04	OXYGEN PRODUCTION PLANT	Lighting	
EL 02/04		Small Power and Ventilation	
EL 03/04		Equipment Power Distribution and Earthing Detail	
EL 04/04		-Fire Alarm System -Data system	

DRAWINGS INDEX

Designed by		Discipline:	Dr. No:	Tot. No:	Rev No:
GT		EL	00	04	R0
Drawn:	Checked:	Approved:	Size:	Scale:	Date:
GT	DA/AE	SH	A1	1:50	26 / 11 /2024



SDB-Building (Compliance to NFPA 70E for Arc flash resistance is required.)

Distribution Board Schedule									
Panel Name: SDB-BUILDING		Bus Type: TPN + PE		Mounting: Flush					
Service Voltage: 380v/3 Phase,		Bus Rating: 32A/6KA		IP Rating: IP = 44					
Circuit #	Load Description	Load (KW)	Circuit Breaker Rating (A)	# of Poles	Wire Crosssection (mm²)	Conduit Ø (mm)	Phase		
							R	S	T
01	Emergency Lighting	0.2	10	1	3x1.5	16	°		
02	Lighting	0.3	10	1	3x1.5	16	°	°	
03	Lighting	0.2	10	1	3x1.5	16			°
04	Lighting	0.3	10	1	3x1.5	16	°		
05	Lighting	0.3	10	1	3x1.5	16	°	°	
06	Lighting	0.3	10	1	3x1.5	16			°
07	External Lighting	0.4	10	1	3x1.5	16	°		
08	Reserve	0.2	10	1	3x1.5	16			
s1	Socket Outlet	1.2	16	1	3x2.5	20		°	
s2	Socket Outlet	1.0	16	1	3x2.5	20			°
s3	Socket Outlet	1.0	16	1	3x2.5	20	°		
s4	Socket Outlet	1.2	16	1	3x2.5	20			°
s5	Power to Ventilation Fan	0.7	16	1	3x4	25			°
s6	FEEDER TO FACP	1.0	10	1	3x4	25	•		
Reserve Space (20%)									
Main Switch		20A/3P, MCB with 30mA		KW Connected (P _{10p})		8.3			
Feeder Cable		5x6mm²		Demand factor		0.8			
U.V.C. Conduit		Ø50mm		KW Demand (P _{10m})		6.6			
Power Source		MDB-PLANT		Current (A)		12.5			

LEGEND INDOOR LIGHTING		
SYMBOL	REFERENCE	DESCRIPTION / MOUNTING METHODS
L1	LED 30W Down Light	Surface mounting
L2	LED 18W Down Light	Surface mounting
L3	30W LED Panel Light	Surface mounting
L4	40W LED Panel Light	Surface mounting
L5	30W Mini LED wall pack	Surface mounting
L6	LED Chandelier	Surface mounting
L7	LED Outdoor Flood Light	Surface mounting

ELECTRICAL FITTINGS	
F1	One way switch, surface mounting
F2	Two way switch, surface mounting
F3	Socket Outlet 2P+E, 230V, 16A, with shutter, surface assembly
F4	Socket Outlet 2P+E, 230V, 16A, with shutter, surface assembly
F5	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for television power supply
F6	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F7	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F8	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F9	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F10	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
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F95	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F96	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F97	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F98	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F99	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator
F100	Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for oxygen Concentrator

CABLES LEGEND	
SYMBOL	DESCRIPTION / MOUNTING METHOD
C1	Cable installed in conduit in the ground
C2	Cable installed on perforated tray run horizontally
C3	Cable installed in conduit on surface mounting with cable clips
C4	Power Distribution Board - Mains Power Supply
C5	Manhole / Downward conductor with connection terminal (Cable Ø 40x40x40mm, 11x11x11)
C6	Manhole 40x40x40x40mm
C7	Lightning Protection System, Aerial
C8	Manhole for Earthing of Lightning Protection System

GENERAL NOTES:

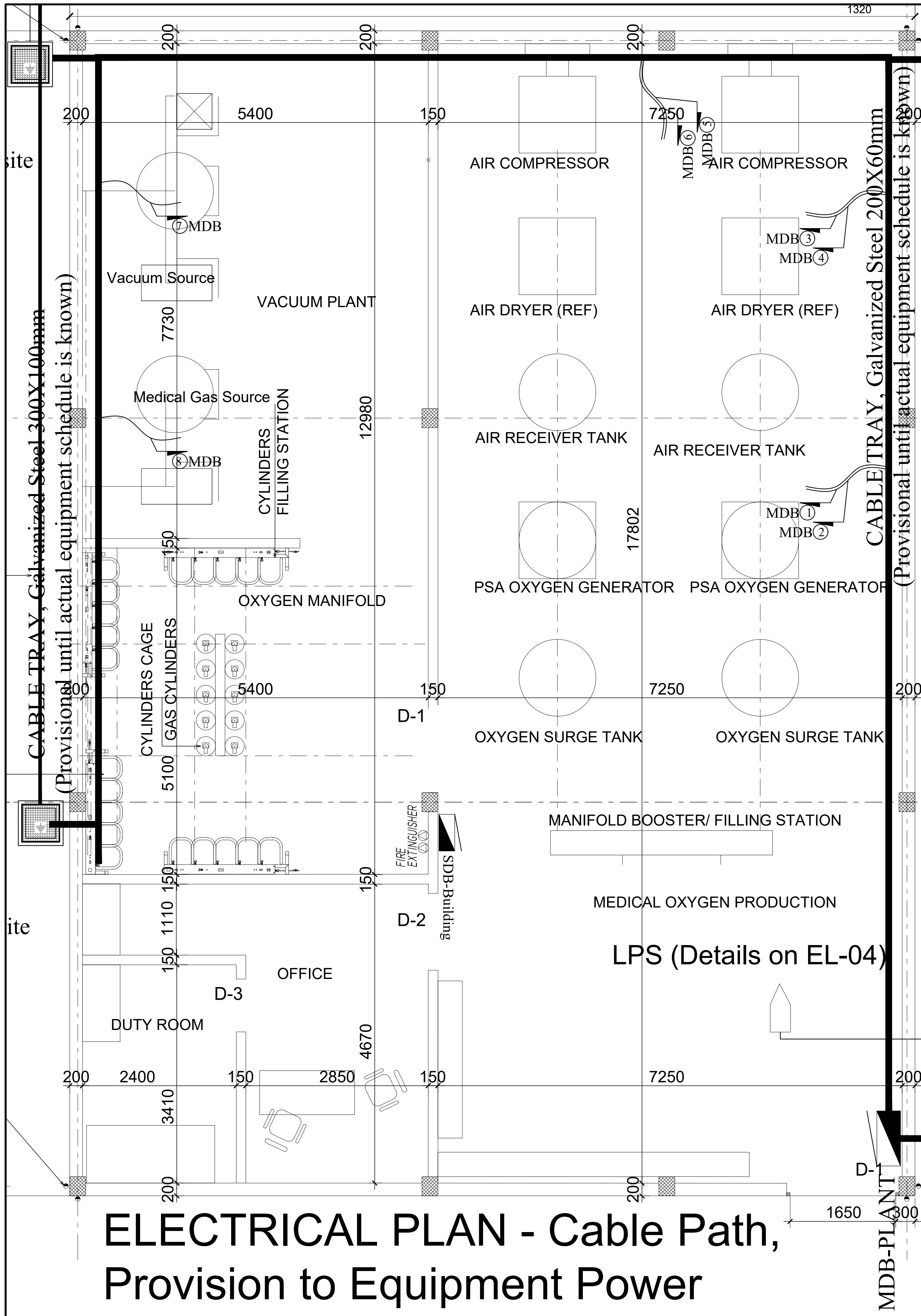
1 - All dimensions are in meters
2 - All branch breakers are 10kA rated interrupting capacity and type shall be "c curve"
3 - All elevations are referred to above finished floor level (a.f.f.)
4 - All junction boxes are not shown but they are installed every two bends
5 - All conduits used for lighting & socket outlets are pvc Ø 16mm, and for telephone, tv lines are pvc Ø 25mm diameter from rear point to junction box, and pvc Ø 21mm,pvc Ø19mm, &pvc Ø16mm depending on the number of lines inside conduits from junction box to every individual data point.
6 - Installation elevations above f.f. are @1.40m for switch, @2.00m for kWhm, @0.60m for socket outlets.
7 - Cable type for the wiring to be used is pvc sheathed, pvc insulated, type nyy 0.6/1kv or
8 - Switches will be legrand mosaic, decorisuno type or equivalent
9 - Illumination level for each room is maintained as per Ethiopian building standard code etes-10.
10 - Cable color code will be red for r ph, yellow for y ph, blue for b ph - and black for neutral upto cable size upto 25 sq.mm, above 25 sq.mm cable color will be black with r/y identification.
All light are surface mounted, mounting height is normal ceiling height.
Socket locations are indicative and can be modified based on site conditions.
Made-to-order arrangements are shown as indicative.

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KEY PLAN	
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Funded By:	Partner:
WORLD BANK	MINISTRY OF HEALTH ETHIOPIA
Program:	Implemented By:
PROCUREMENT AND INSTALLATION OF OXYGEN PLANT	UNOPS - ETMCO
Project Name:	Design:
PROCUREMENT AND INSTALLATION OF OXYGEN PLANT	UNOPS-ETMCO
Drawing Title:	
ELECTRICAL PLAN	
- Small Power and Ventilation	

Designed by	Developed by	Discipline:	Dr. No:	Tot. No:	Rev No:
GT	EL	02	04	R0	
Drawn:	Checked:	Approved:	Size:	Scale:	Date:
DA/AE	SH	A1	1:50	19/12/ 2024	0

ELECTRICAL PLAN - Small Power and Ventilation



MDB-PLANT (Compliance to NFPA 70E for Arc flash resistance is required.)

Distribution Board Schedule											
Panel Name: MDB-PLANT											
Service Voltage: 380v/ 3 Phase,				Bus Type: TPN + PE			Mounting: Floor Standing				
				Bus Rating: 4x300A (*P)			IP Rating: IP = 44				
			Enclosure: Steel Sheet								
Site #	Load Description	Load (KW)	Circuit Breaker Rating (A)	# of Poles	Wire Crosssection (mm ²)	Conduit Ø (mm)	Phase			Remark	
							R	S	T		
01	PSA OXYGEN GENERATOR	120.0	20	3	5X6	50	•	•	•	*P These parameters are to be determined when the actual plant equipment are determined.	
02	PSA OXYGEN GENERATOR										
03	AIR DRYER (REF)										
04	AIR DRYER (REF)										
05	AIR COMPRESSOR										
06	AIR COMPRESSOR										
07	VACUUM SOURCE										
08	MEDICAL GAS SOURCE										
	Reserve Space (20%)										
	Reserve Space (20%)										
	Reserve Space (20%)										
	FEEDER TO SDB-BUILDING	8.3									
	Reserve Space (20%)										
	Main Switch	250A MCCB (*P)		KW Connected (P _{Tot})			128.3	(*P)			
	Feeder Cable	3x120/70 sqmm (*P)		Demand factor			0.8	(*P)			
	CABLE TRAY	Concrete Pipe Dia 200mm		KW Demand (P _{Max})			102.6	(*P)			
	Power Source	CMDB-Premise		Current (A)			194.4 A	(*P)			

*P These parameters are to be determined when the actual plant equipment are determined.

EARTHING PIT 500X500X600mm, (Dependent on actual site conditions)

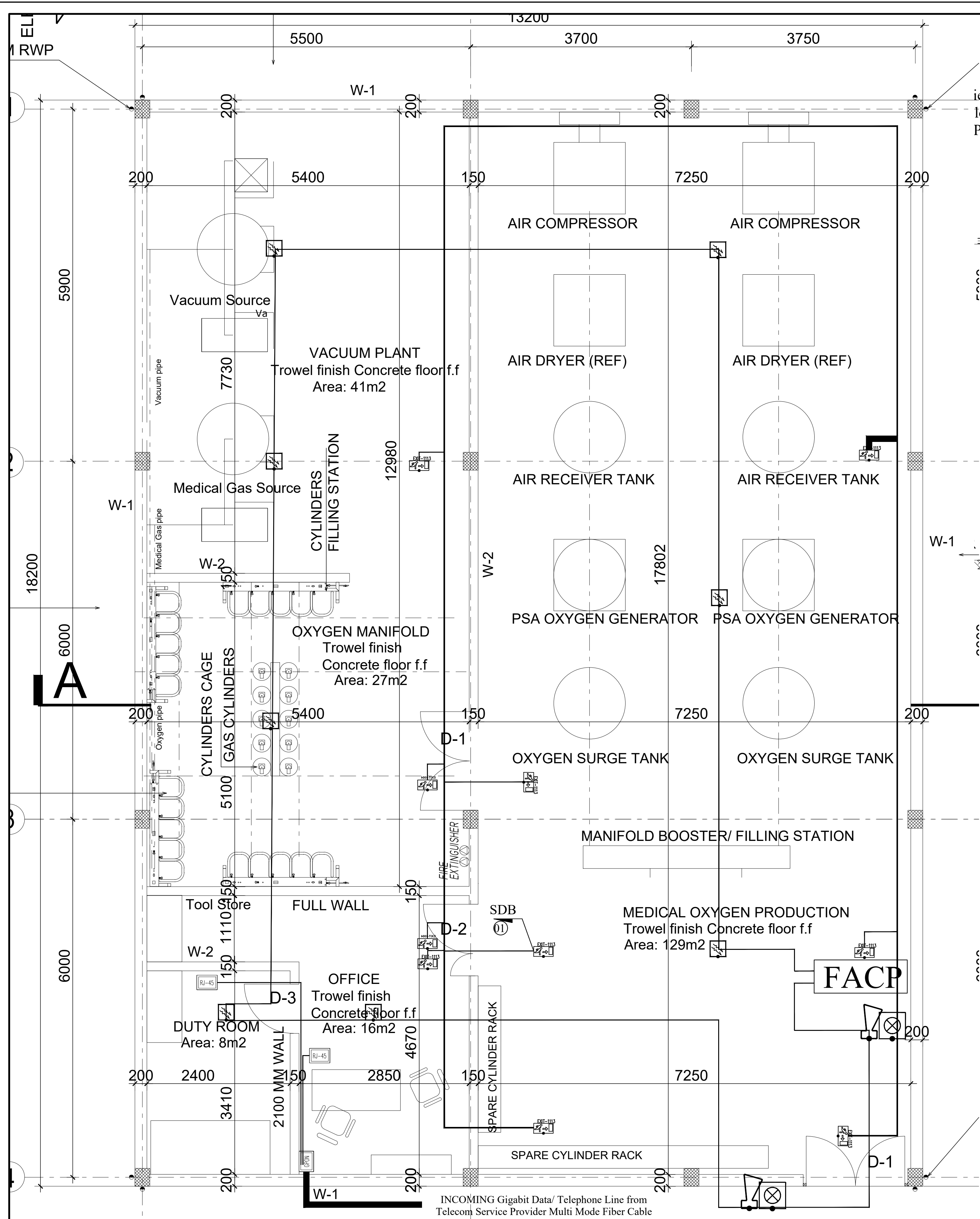
Equi-potential Earthing Ring, 1x70sqmm round copper Cable

INCOMING POWER FEEDER (To be determine when actual equipment schedule is known)

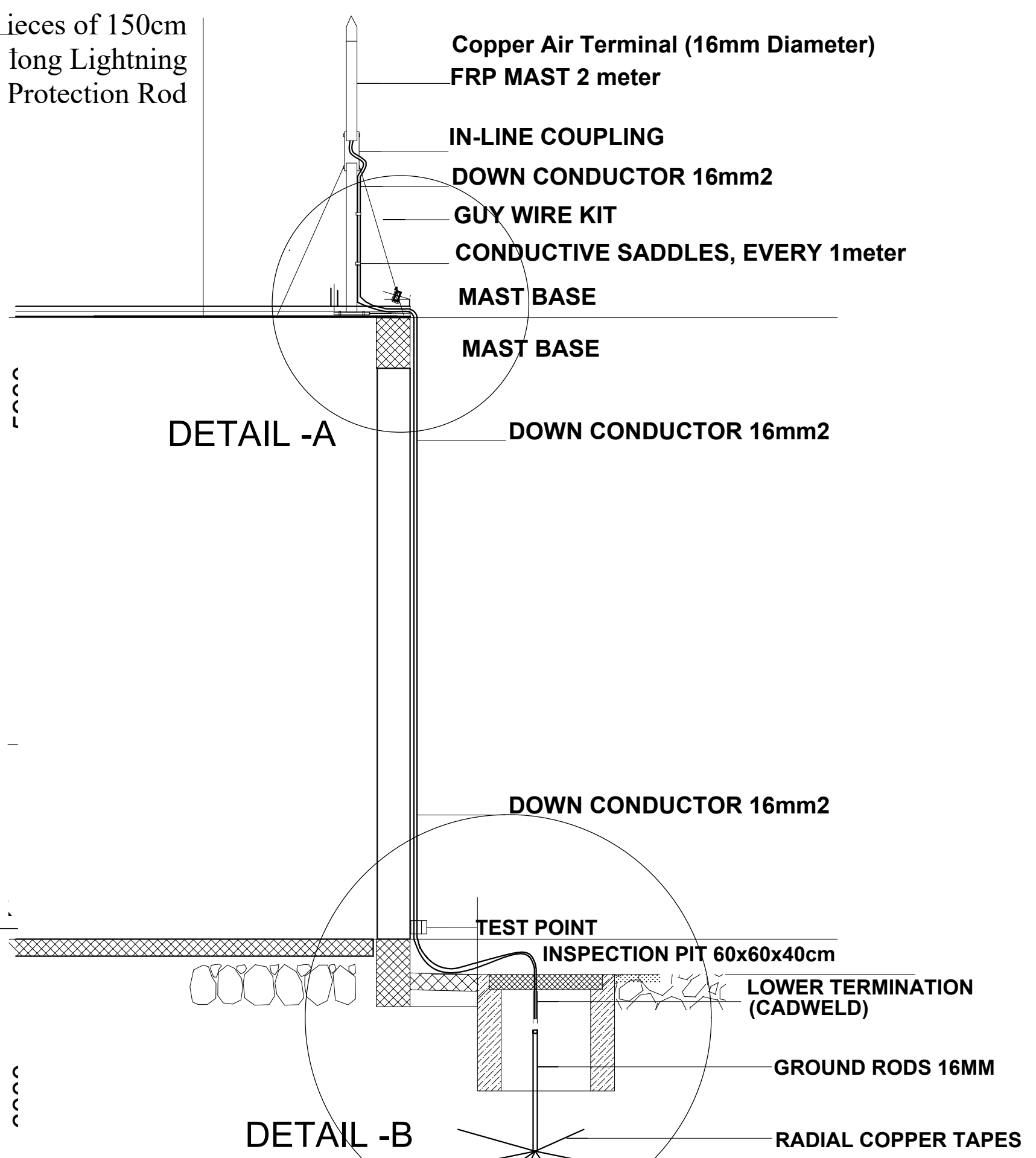
ELECTRICAL MANHOLE, and EARTHING PIT 700X700X800mm, (Dependent on actual site conditions)

ELECTRICAL PLAN - Cable Path, Provision to Equipment Power

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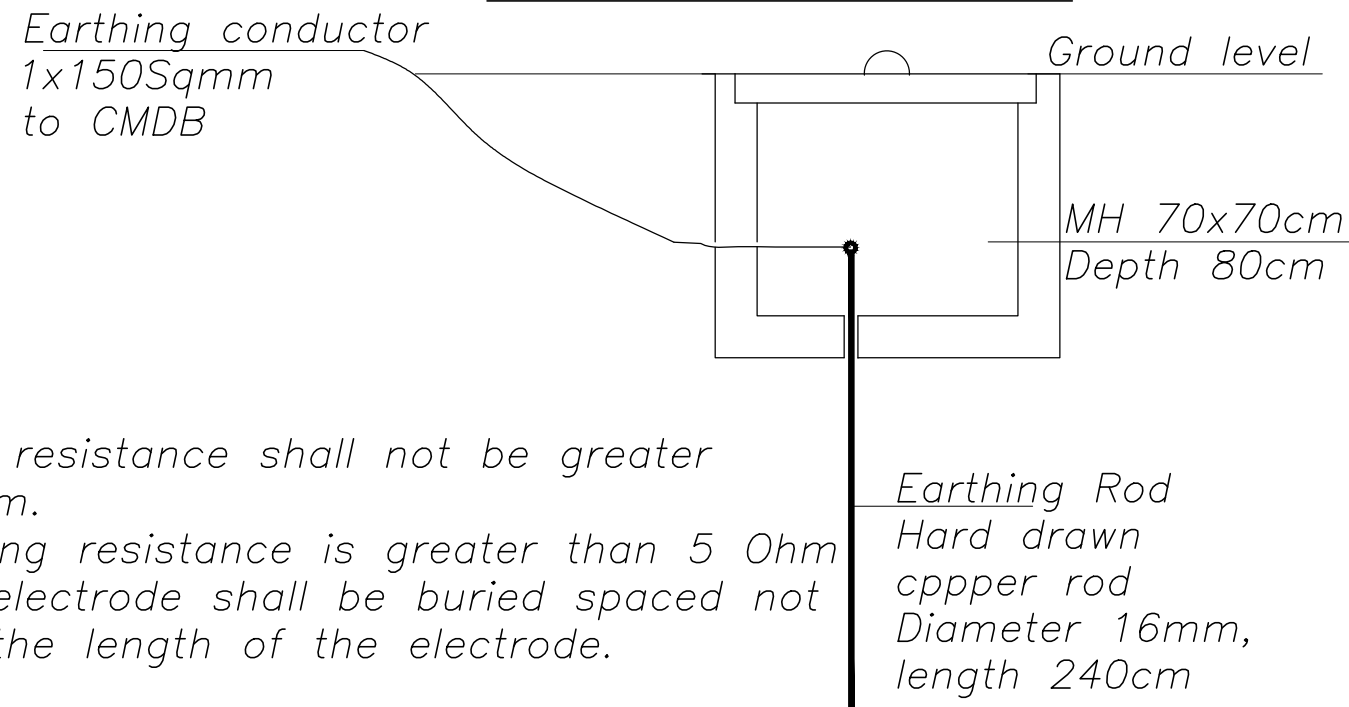
DETAIL FOR LIGHTNING PROTECTION SYSTEM



NOTE

- 1 - Copper Lightning Protection shall not be installed on aluminum roofing, siding or other aluminum surfaces.
- 2 - Down conductor entering corrosive soil shall be protected against corrosion for not less than 915mm above ground level and for entire length below grade level.
- 3- Service conduit entering a building underground shall be suitably drained. keeping the slope suitable to drain.

EARTHING DETAIL



EL NOTE:
1-Earthing resistance shall not be greater than 5 Ohm.
2-If earthing resistance is greater than 5 Ohm additional electrode shall be buried spaced not less than the length of the electrode.

GENERAL NOTES:

SYMBOL	REFERENCE	DESCRIPTION / MOUNTING METHODS	FLUX
L1	L1	LED 5000K Down Light Surface type 24W, 3000 K, 1500lm, IP 44, Surface assembly	1500lm, down
L2	L2	LED 7 W Trim Canister with 18W 9W driver included 4000K IP 44, Mounting 2500mm 16mm, operating voltage 220VAC ON equivalent	750lm
L3	L3	90W LED Panel Light 3000LM IP 44	3600lm
L4	L4	40W LED Saddle Light 3000LM IP 44	3600lm
L5	L5	30W Mini LED wall pack with integrated photocell, IP 65	700lm
L6	L6	R2B SENSER 60W 7000m with LED 16W lamp	
EXIT	EXIT	EXIT SIGN	
L6	L6	LED Circular Light for Living Room, 24W, driver included 2700K	2400lm
L7	L7	LED Outdoor Tube Light for Surrounding, 40W, driver included 5000K IP 44, Mounting 2500mm 16mm, operating voltage 220VAC ON equivalent	6000 lm

ELECTRICAL FITTINGS

One way switch, surface mounting	
Double pole switch, surface mounting	
Two way switch, single pole, surface mounting	
Socket Outlet 2P+E, 230V, 25A, surface assembly for floor	
Socket Outlet 2P+E, 230V, 16A, with shutter, surface assembly	
Socket Outlet 2P+E, 230V, 16A, surface assembly for water heater	
Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for television power supply	
Socket Outlet 2P+E, 230V, 16A, with shutter, flush mounted for for oxygen Concentrator	
Junction box, surface mounting	
Switchboard - Mains Power Supply	
CEILING FAN 110W/150W/200W FAN 13W	
Multis-Sensor Combined optical smoke and heat detector	
Data outlet 14RJ45 1 2RJ45 Cat5 - Surface assembly	
Data I/O Rack	

CABLES LEGEND

SYMBOL	DESCRIPTION / MOUNTING METHOD
	Cable installed in conduit in the ground
	Cable installed on perforated tray run horizontally
	Cable installed in conduit on surface mounting with cable clips
	Power Distribution Board - Mains Power Supply
	Manhole / Downward conductor with connection terminal (Cable 40x40x400mm, 11x IP X G)
	Manhole 40x40x400-HAND
	Lightning Protection System, Aerial
	Manhole for Earthing of Lightning Protection System

GENERAL NOTES

NOTE

- All dimensions are in meters
- All branch breakers are 10kA rated interrupting capacity and type shall be "c curve"
- All elevations are referred to above finished floor level (a.f.f.)
- All junction boxes are not shown but they are installed every two bends
- All conduits used for lighting & socket outlets are pvc Ø 16mm, and for telephone, tv lines are pvc Ø 25mm diameter from floor point to junction box, and pvc Ø 21mm, pvc Ø 19mm, & pvc Ø 16mm depending on the number of lines inside conduits from junction box to every individual data point.
- Installation elevations above f.f. are @1.40m for switch, @2.00m for tv/hm, @0.60m for socket outlets.
- Cable type for the wiring to be used is pvc sheathed, pvc insulated, type nyy 0.6/1kv or
- Switches will be legrand mosaic, decorauno type or equivalent
- Illumination level for each room is maintained as per Ethiopian building standard code-10
- Cable color code will be red for p, yellow for y, blue for b, and black for neutral upto cable size upto 25 sq. mm. above 25 sq. mm cable color will be black with r/y identification.
- All light are surface mounted, mounting height is normal ceiling height. Sockets locations are indicative and can be modified based on site conditions. Make & cable board arrangements are shown as indicative.

Rev.:	Date:	Description:	Approved:
0			

KEY PLAN

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Funded By:	Partner:
WORLD BANK	MINISTRY OF HEALTH ETHIOPIA
Program:	Implemented By:
PROCUREMENT AND INSTALLATION OF OXYGEN PLANT	UNOPS - ETMCO
Project Name:	Design:
PROCUREMENT AND INSTALLATION OF OXYGEN PLANT	UNOPS-ETMCO

Drawing Title:

ELECTRICAL PLAN

- Fire Alarm System
- Data System

Designed by	Developed by	Discipline:	Dr. No:	Tot. No:	Rev No:
GT		EL	04	04	R0

Drawn:	Checked:	Approved:	Size:	Scale:	Date:	Rev.:
DA/AE	SH		A1	1:50	19/12/ 2024	0

ELECTRICAL PLAN - Fire Alarm, Exit Indicators, and I