



Ensuring a Greener Earth

*Powerline* Group of Industries

# **INSTALLATION GUIDELINES & USER MANUAL**

## CONTENT

SR.NO.	TOPIC	PAGE NO.
1.	INSTALLATION- location, foundation, canopy design, & exhaust system	3-6
2.	FOUNDATION DRAWING FOR DG SETS	7
3.	SINGLE LINE DIAGRAM FOR CHANGE OVER SWITCH FOR MANUAL PANEL	8
4.	SINGLE LINE DIAGRAM FOR AMF BY-PASS WITH TWO CHANGE OVER SWITCH (IDEAL)	9
5.	SINGLE LINE DIAGRAM FOR AMF BY-PASS WITH TWO CHANGE OVER SWITCH – (NOT RECOMMENDED)	10
6.	EARTHING FOR DG SET	11-12
7.	OVERALL INSTALLATION SUMMARY: Cable, Earthing, Foundation, etc.	13
8.	STACK HEIGHT	14-15
9.	CONCLUSION	16

## **LOCATION**

Dust and Fumes are the greatest danger to generating set as they could lead to clogging of cooling of air system which may affect Genset performance.

1. If genset to be installed in free field condition, please ensure dust free location and clear space of 2 times of height of genset.
2. If genset to be installed in the room, please ensure proper cross ventilation, clear space of minimum 3 meters from all sides.
3. If genset to be installed on Roof Top, please ensure Structural clearance, proper cross ventilation with respect to wind direction, clear space of minimum 3 meters from all sides.
4. If genset to be installed in basement, ensure ventilation with respect to Air requirement and clear space for easy maintenance.

## **FOUNDATION**

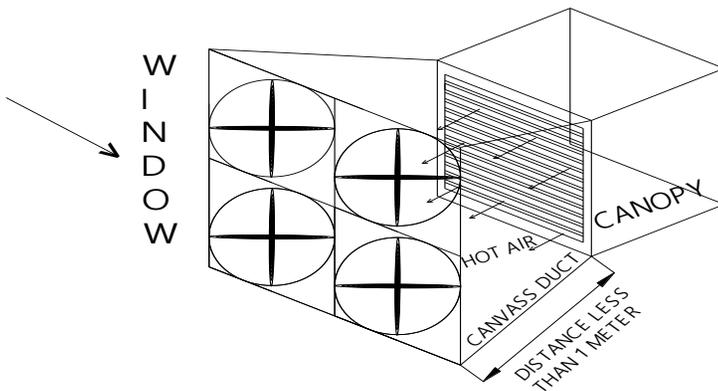
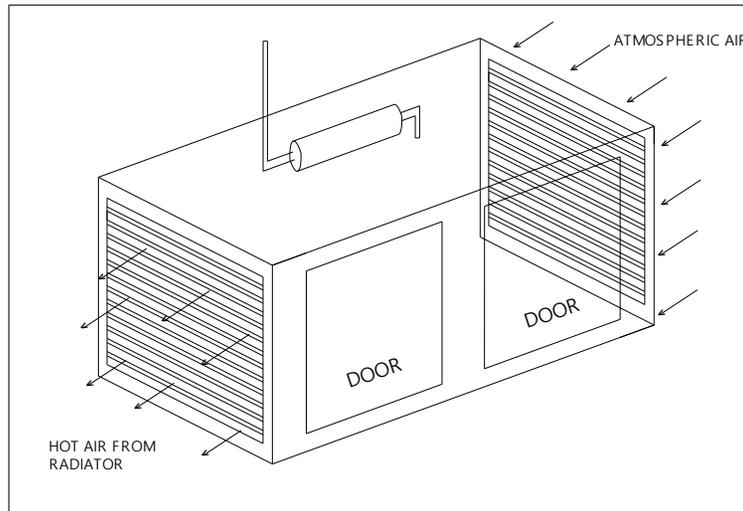
The basic functions of foundation are as below:

- To provide leveled platform to seat and seal the genset.
- To support the weight of the entire generating set.
- Support the dynamic load of genset while running.
- Absorb the vibration produced by the rotating and reciprocating masses.

## **CANOPY DESIGN / INSTALLATION OF CANOPY**

The canopised genset may be lowered down from top with the help of a crane on the foundation block after curing time of PCC is over which usually is 21 days.

For installation inside a room window must be provided in line on either side walls- one for hot air to go out of room and other for letting in the atmosphere air without any restriction between window and canopy. Window size= 1.5 x Frontal area of air passage of canopy



In case natural wind flow resists hot air.  
In case natural wind causing overheating  
of engine then install exhaust fans in the  
window for positive scavenging of hot air  
outside room.

Exhaust fans discharge capacity (total) M3/hr=75 x bhp of Engine .  
Distance between window and canopy should be less than one meter.  
Provide canvas ducting between canopy & window.

**EXHAUST SYSTEM INSTALLATION**

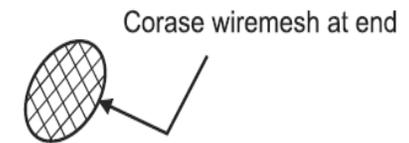
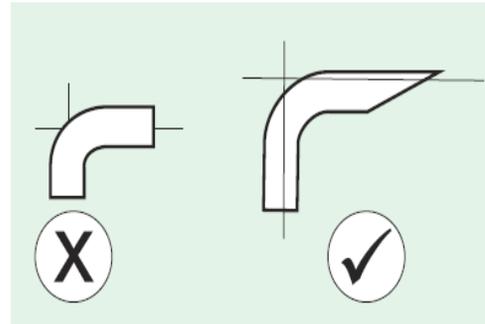
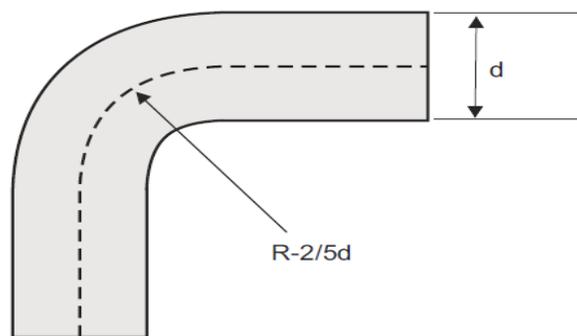
Genset Exhaust system directs the hot flue gases into the atmosphere harmlessly.  
Exhaust silencer and expansion bellow are the integral part of DG exhaust system. At the time of genset installation, please ensure, proper alignment of exhaust silencer with respect to expansion bellow. If the canopy is required to dismantle, then utmost care is necessary at the time of re-assembling.  
While taking exhaust gases away from genset above the standard stack height, please consult with Kirloskar ITC Team for selecting the size of exhaust pipe.  
As per Statutory regulations, the exhaust pipe has to be extended vertically as per below calculation.  
 $H = h + 0.2 \times \sqrt{\text{KVA}}$  Where H= Minimum height of exhaust stack, h= height of building.

Below table is for reference only. (Consult ITC team for further calculation)

<b>ENGINE MODEL (WATER COOLED)</b>	<b>MINIMUM PIPE INSIDE DIAMETER IN INCH</b>
<b>2R SERIES</b>	<b>2.5"</b>
<b>3R 550</b>	<b>2.5"</b>
<b>3R 1190</b>	<b>2.5"</b>
<b>4R SERIES</b>	<b>3"</b>
<b>4K/6K</b>	<b>4"</b>
<b>6SL</b>	<b>5"</b>
<b>DV</b>	<b>6"</b>

Note: If the extension of exhaust pipe is more than 5 meters above Genset, increase pipe dia by 0.5" for every 3 meters.

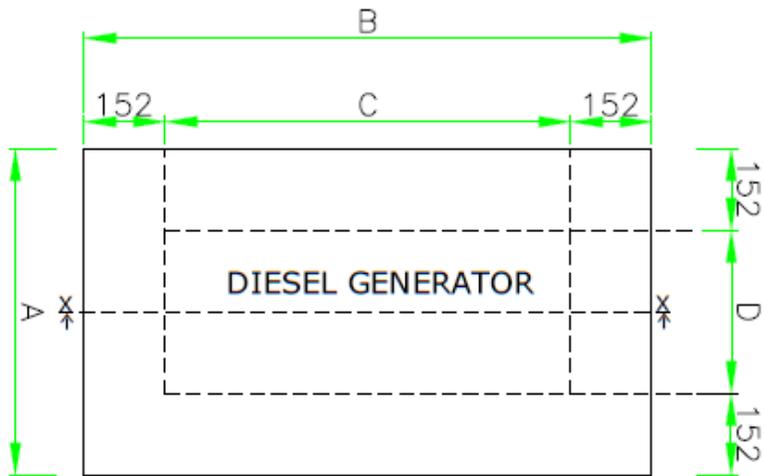
**EXHAUST BEND:** MS Bends used in exhaust piping should have a long smooth bend as shown in figure to ensure smooth flow of exhaust gases. Exhaust Outlet should have 30 degree cut at the tail end with Coarse wire mesh.



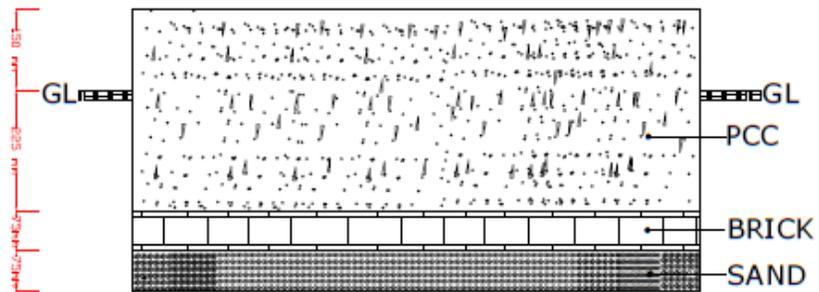
**Note:**

- If no. of bends are more than 4, increase the diameter of Exhaust Pipe and Bend by 0.5'' for addition of each band.
- The exhaust outlet should be in the direction of prevailing wind.
- It is recommended to fill fuel after stopping the genset to avoid condensation.

DRAWING NAME ; INSTALLATION GUIDELINES.(FOUNDATION DIAGRAM)  
POWERLINE GROUP OF INDUSTRIES.



TOP VIEW

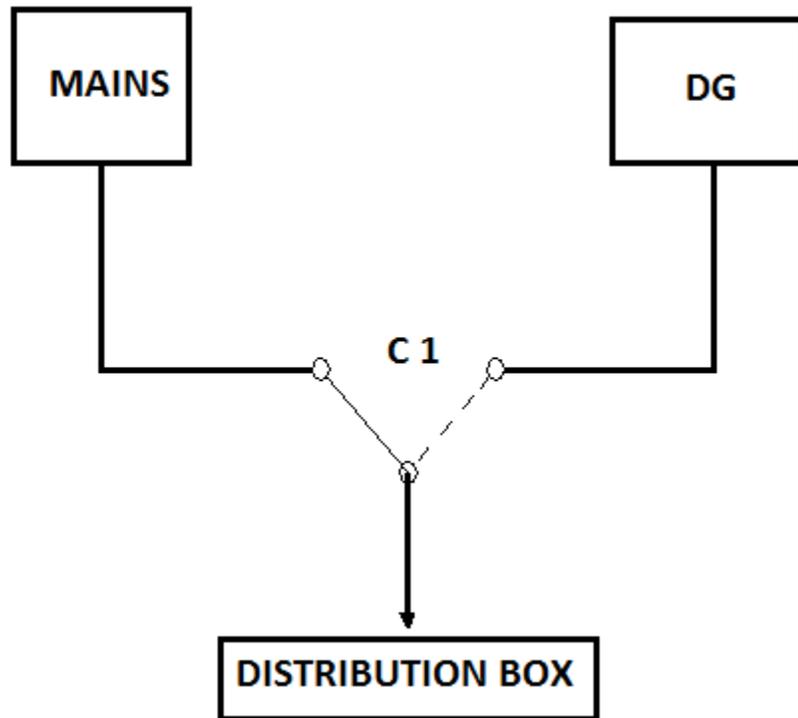


SECTIONAL ELEVATION AT X-X

### FOUNDATION DRAWING FOR DG SETS

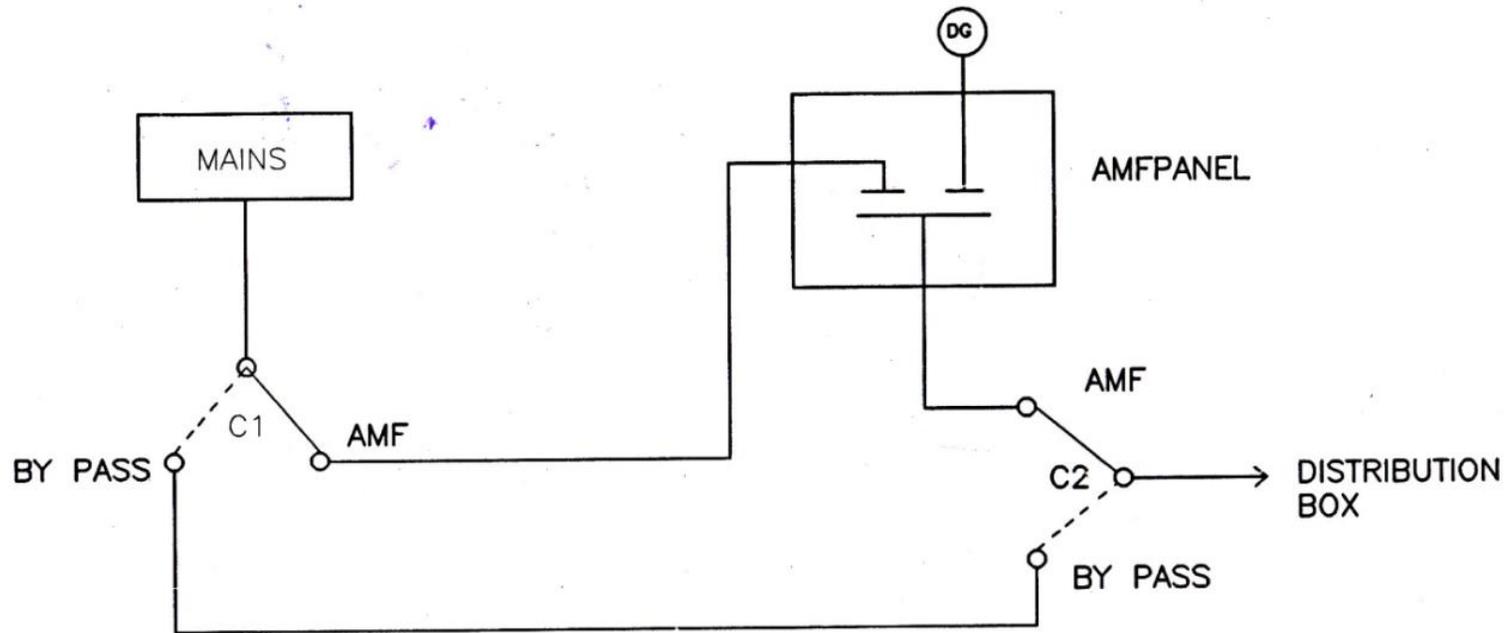
*The dimensions mentioned in the foundation diagram are in mm (millimeter).*

SINGLE LINE DIAGRAM FOR CHANGE OVER SWITCH FOR MANUAL PANELS



C1- CHANGE OVER SWITCH

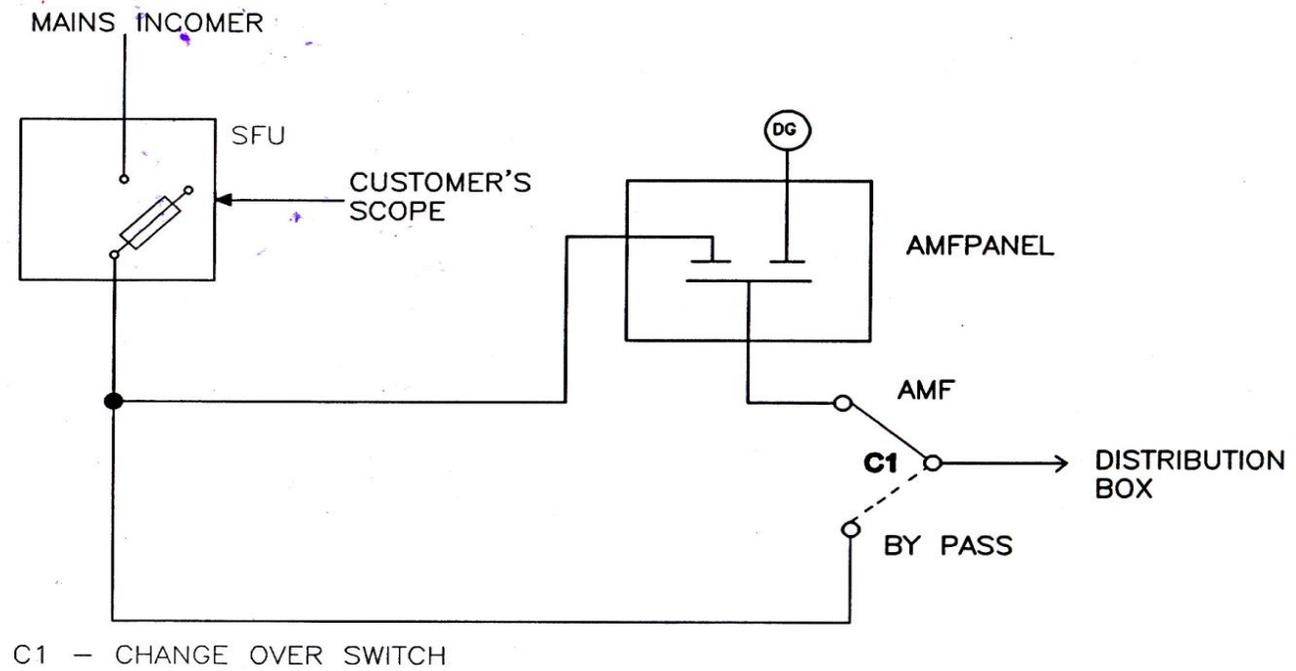
**SINGLE LINE DIAGRAM FOR AMF BY-PASS WITH TWO CHANGE OVER SWITCH - (IDEAL)**



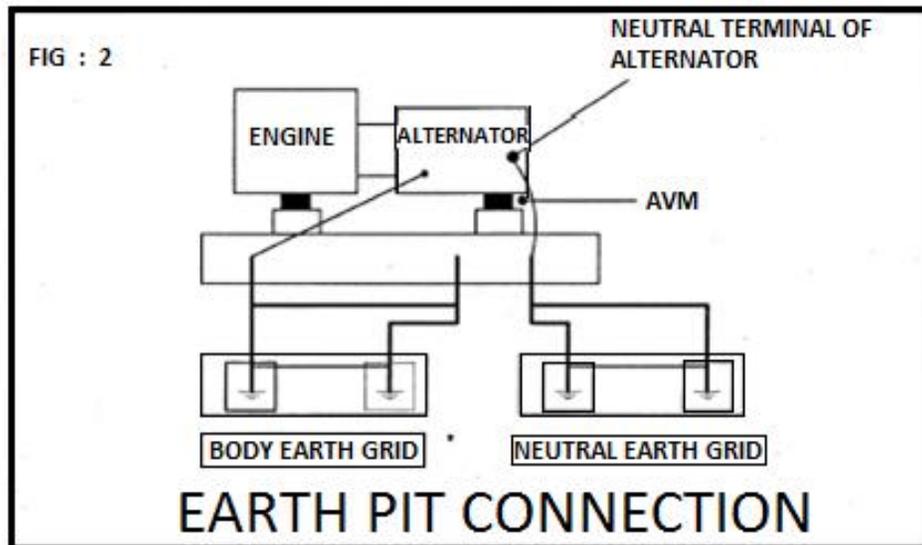
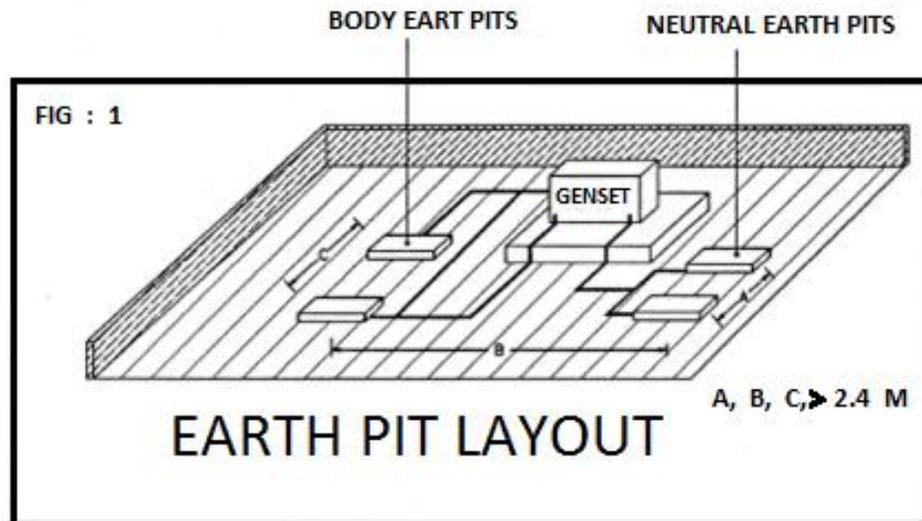
C1 - CHANGE OVER SWITCH

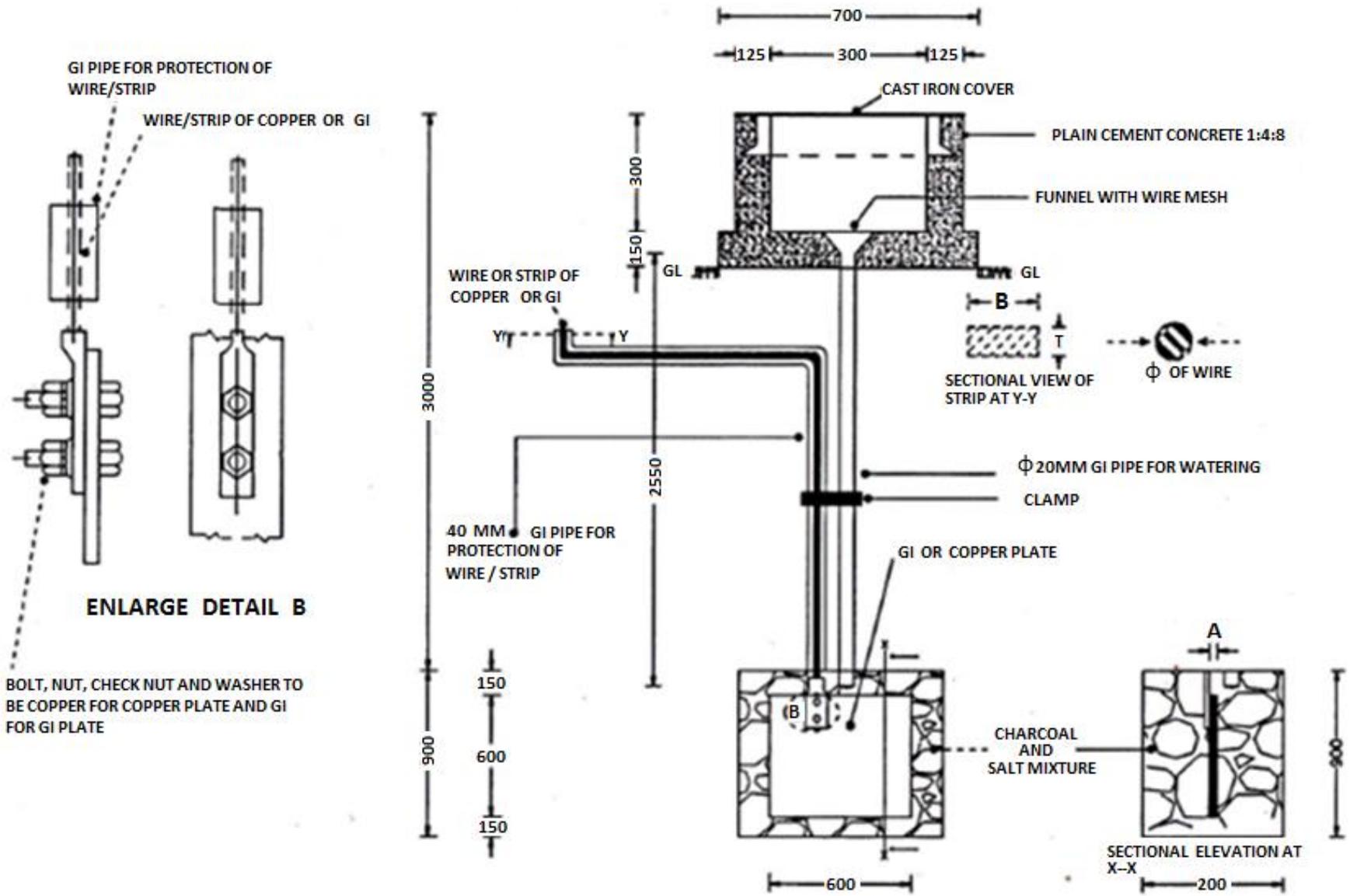
C2 - CHANGE OVER SWITCH

SINGLE LINE DIAGRAM FOR AMF BY-PASS WITH SINGLE CHANGE OVER SWITCH

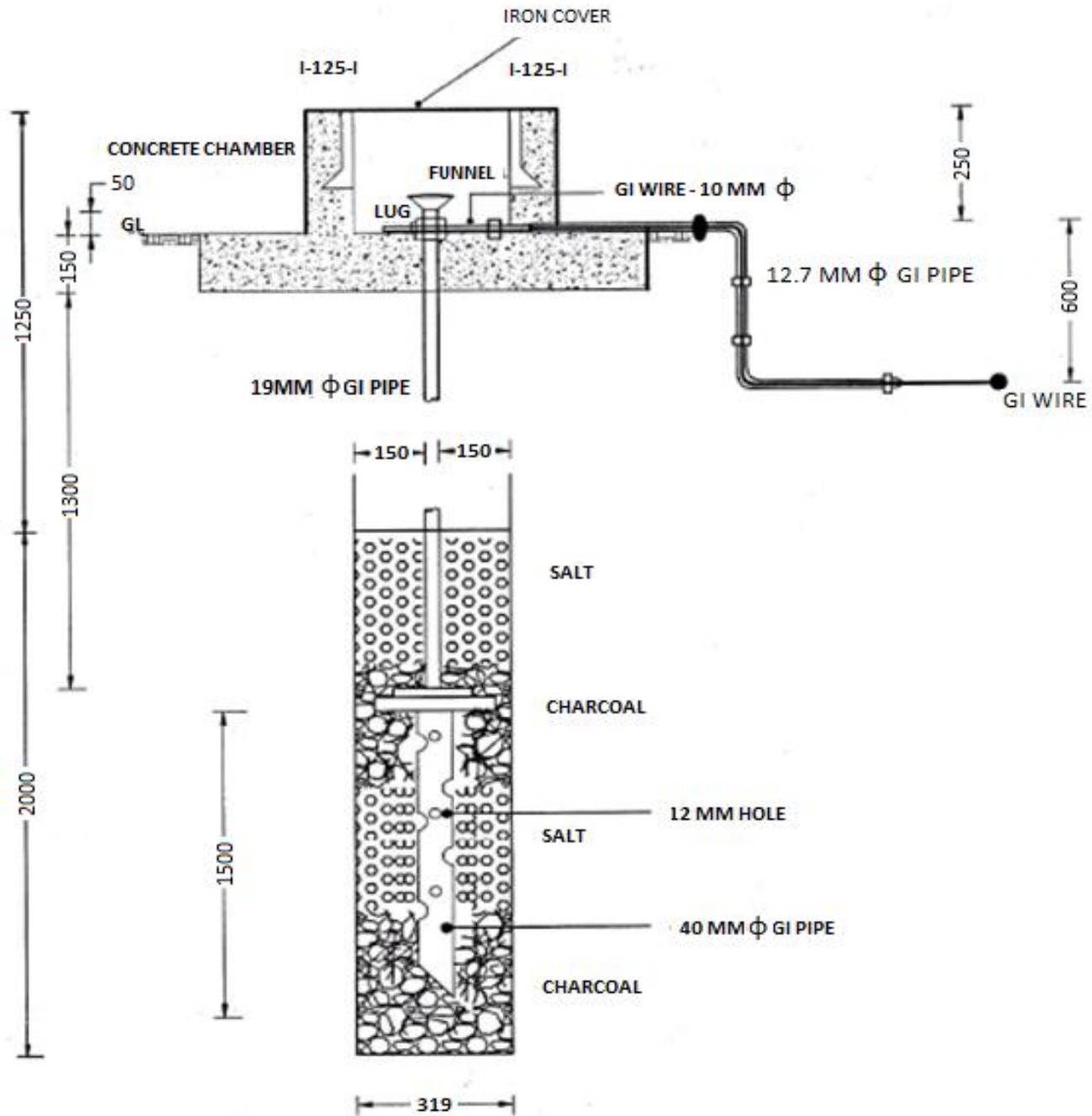


## EARTHING FOR DG SET





**PLATE EARTHING**



PIPE EARTHING

## ***STACK HEIGHT***

It is recommended to follow the Govt. Environmental Standard for Ambient Air, Automobiles, Fuels, Industries and Noise as per CPCB norms.

You may directly search for details on the below link from the official website of the Central Pollution Control Board.

<https://cpcb.nic.in/openpdffile.php?id=UHVibGljYXRpb25GaWxlLzY4NI8xNTcxMzgzNDAxX0Vudmlyb25tZW50YWwgU3RhbmRhcmRzLnBkZg==>

We are requesting here to consider Content No. 22 from the notification in connection to your Diesel Generator Sets Stack Height arrangements.

## 22.0 DIESEL GENERATOR SETS : STACK HEIGHT

The minimum height of stack to be provided with each generator set can be worked out using the following formula :

$$H = h + 0.2 \times \sqrt{\text{KVA}}$$

H = Total height of stack in metre

h = Height of the building in metres where the generator set is installed

KVA = Total generator capacity of the set in KVA

Based on the above formula the minimum stack height to be provided with different range of generator sets may be categorised as follows:

### **For Generator Sets**

50 KVA

50-100 KVA

100-150 KVA

150-200 KVA

200-250 KVA

250-300 KVA

### **Total Height of stack in metre**

Ht. of the building + 1.5 metre

Ht. of the building + 2.0 metre

Ht. of the building + 2.5 metre

Ht. of the building + 3.0 metre

Ht. of the building + 3.5 metre

Ht. of the building + 3.5 metre

Similarly for higher KVA ratings a stack height can be worked out using the above formula.

Source : Evolved By CPCB  
[Emission Regulations Part IV:COINDS/26/1986-87]

## **CONCLUSION**

- ***Improper Installation may adversely impact the performance of the Genset and will have a bearing on warranty support from the manufacturers. As such, we request you to ensure that given guidelines are strictly followed while installing the Genset. Before commissioning of the Genset please go through the warranty booklet/user manual for more details.***
- ***If DG commissioning is not done immediately (i.e. 7 - 30 days) after delivery then it is advisable to protect it from atmospheric moisture, condensates, internal corrossions and rodents. Certain components like lube oil, oil filter, diesel filter etc. are likely to deteriorate as a result of lying idle for a long time.***

***Therefore, Pre-commissioning health check-up/servicing of Dg set through authorized service dealer may be required after crossing the ideal time frame of commissioning. The same is considered chargeable and service dealer may raise necessary bills in order to execute the same.***

***Please contact- KOEL Helpdesk No. 8806334433, E-mail: [KOEL.Helpdesk@kirloskar.com](mailto:KOEL.Helpdesk@kirloskar.com) regarding more information on servicing/health check-up.***