

**GUIDELINES FOR**  
**USE OF POLE MONTED OR PAD/PLINTH MOUNTED DISTRIBUTION**  
**TRANSFORMER SUSBTATONS**

**1. Introduction**

Nowadays, finding a suitable and convenient location for installation of Distribution Transformer (DT) substation or Grid substation is one of the challenge being faced by Discoms. The problem is severe in Urban areas and therefore, Discoms/power departments need to plan for a suitable location for installation of appropriate capacity of DT Substation considering the load in the area, load center, feasibility and further expansion etc. The Distribution Transformer may be mounted on a single pole, H pole structure or on a plinth depending upon site requirements, size and weight of the transformer. Accordingly, the decision for installation of a Pole mounted DT substation or Pad/Plinth mounted DT substation is to be taken by Discoms based on the capacity of the DT and availability of space.

As per CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, the mounting of distribution transformers shall be as per relevant Indian Standards IS 1180 and as per provisions of IS 1180, transformers upto 500 KVA capacity may be mounted on the poles. Based on this, DTs above 500 KVA have necessarily to be mounted on a plinth and DTs of capacity less than 500 KVA may be mounted on single pole, double pole, 4 pole or on a pad/plinth based on the size of DT, space available and practices being followed in the Discoms etc.

These two type of mounting of DT substation are discussed as below:

**2. Pole mounted Distribution Transformer substation (DT S/S)**

It is the most common type of outdoor type substation, designed by Discoms/power department conveniently at load centers. Normally, single phase DT upto 25 KVA capacities are installed on single pole/2 pole structure and 3 Phase DTs up to 500 KVA capacities are mounted on 2 pole or 4 pole structure or on plinth. The two poles structure is made of poles with channels and

associated accessories creating a H type pole configuration to locate the DT at certain minimum height from the ground level to meet the ground clearance. This arrangement of pole type S/S needs about 3 meters by 2 meters space (on ground) around the H Pole structure to locate Distribution box and other accessibility. This area also to be provided with suitable fencing and lockable doors to prevent unauthorized access to Distribution box. The structures should also be provided with anti-climbing devices and danger board. .

In case of single phase transformers upto 25KVA capacity, the transformers can normally be installed on single pole or on H pole structure at appropriate height from the ground on the roadside which is easily accessible. These single phase transformers do not require distribution boxes as it directly feed to a group of consumers and no additional ground space is required.



Figure-1(a) Single phase Pole Mounted DT substation

Figure-1(b) Three phase Pole Mounted DT substation (H pole)

### **3. Pad /Plinth mounted DT Substations**

As per IS 1180, DTs above 500 KVA have necessarily to be mounted on a plinth, however, lower capacity DTs may also mounted on plinth as per the practices being followed in Discoms.

The Pad, which is a low height platform/plinth, normally made of concrete structure. It can also be prefabricated by fiber blocks on which the transformers can be mounted, however, the strength of the fiber block have to be ensured by the Discoms before installation. The Pad should be capable to carry the weight of the DT and should also have the facility for cable entry and exit at two sides as per the terminals available at the Transformers.

The plinth shall be higher than the surroundings and plinth foundation is normally made of concrete. Plinth mounted distribution sub-stations should be adequately protected by fencing so as to prevent access to the equipment by unauthorized persons, animals and should be provided with standard danger boards. The enclosure should also permit free circulation of air on all sides

This type of DT substations is best suitable for higher load centers areas where adequate land is available such as in urban areas , housing complex, office complex and other developed areas. This substation can be indoor type or outdoor type and the rating of Transformer may normally be more than 250KVA to 1000KVA depending on load requirement in the localities and also for economic reasons as this needs control gears/ switchgears and proper enclosed wall boundary.

The height of Pad/plinth should be designed by considering the factors such flood level & topography of the locality etc and should be adequately protected by fencing so as to prevent access by any unauthorized persons.

Depending upon the distribution system available in the area, the provisions for entry of cables or for connection with overhead systems at DT primary and the exit from secondary side with underground arrangement for laying the LT lines upto consumer premises is made accordingly.



Plinth Mounted Distribution Transformer Sub-stations