3.3 ALLOWANCE FOR JOINT DEFORMATION

Various structural elements are made in the plant or prefabricated when these element in their site there may be joint deformation to take it workout deformation.

An allowance is tolerance or dimensions of the pre fab units are given in the design.

This is the limiting value of the permissible or admissible deviation in the size or shape of the finished prefabricates from the design requirements.

In practice it is not possible to make products which will have the exact design dimension. Extreme precision is not possible as in accuracies or unavoidable during erection.

The designer should be able to forecast or even to tell title maximum tolerance value or the allowance which will make the correct assembly and efficient functioning of the individual prefabricates. The decreasing tolerance leads to the increased cost of protection and optimum value of permissible deviations must be established large admissible deviations which are normally made positive as a safety factors lead to waste of material in mass production.

In making large block prefabricates the average volume of concrete in their products was increased by 1.5% (the thickness of the blocks was on the average 0.5cm) with the production of 3000 m^3 of concrete per month the excessive month use of cement is nearly 15 metric tonnes.

Deviations in the dimensions of products are important to the production equipment main the frame work. The materials used in formwork and the manner in which the parts of the forms are joint together are the important face because of the deformability and their tendency to warp with moisture the timber forms can no ensure the accuracy like steel or concrete forms. Bolted connections are not recommended for formwork because of difficult of thread cleaning. The best accuracies obtained with self locking or wedged forms.

As in the machine tool industry, degree of precision is important in prelabrieate building industry. There is a conventional scale defining the maximum permissible

allowance or tolerance. The small is in relation to the theoretical dimension of prefabricates.

The following table gives the values degree of precision and basic tolerances or allowances (dimensions and tolerances in mm). Table 3.2.

Table 3.2 Degree of precision

Degree of precision required	Dimension of 10 m			Dimension of 60m	
	Upto 100	Upto 100 to 300	Upto 300 to 3000	3000 to 9000	Above 9000
3	0.5	1	2	3	4
4	1	2	3	4	6
5	2	3	4	6	10
6	3	4	6	10	16
7	4	6	10	10	25
8	6	10	16	25	40

In design it is advisable to design of frame work with an assumed 3rd or 4th degree of precision not less than the 5th degree.

For non-structural components 6th degree precision is sufficient if the dimensional co-ordmation is not affected.

The following rules are followed to decide the overall nominal degree of precision of a prefabricate.

From only one dimension is critical, the degree of precision corresponding to the dimension of the component.

When more than one dimension of the component are allowed tolerance or allowance of precision corresponding to the most critical or vital dimensions are calculated.

The degree of precision must be shown in the working drawings which make to know about the type of formwork for the given type of formwork the following specific ranges of precision are assigned.

- Steel or cast iron moulds = 4 to 5
- Concrete moulds = 4 to 6
- Vertical battery moulds steel = 5 to 8
- Vertical battery moulds, concrete = 6 to 8
- Collapsible steel forms = 5 to 8
- Timber forms bolted or welded = 7 to 8

In order to follow the design tolerances, the febricates of formwork must be accurate

by at least one degree. The admissible dimensional deviation of prefabricates are

(a) **Blocks:**

Thickness = –0 + 5mm

Width = –5 + 8mm

Length = – 15 + 10mm

(b) **Panels:**

Thickness = –0 + 5mm

Width = –5 + 10mm

Length =

(c) **Beam and Column:**

Thickness = –3 + 5 mm

Width = –5 + 5mm

Length = –15+15mm

For the forms, the maximum allowance or tolerances are the following range.

(i) **With timber forms:**

Thickness = 7.5 to 14mm

Width = 6.5 to 24mm

Length = 10 to 30mm

(ii) **Steel forms:**

Thickness= 3 to 20m

Width = 11 to 22mm

Length = 8 to 28mm

The limiting values of allowance are calculated for the following formula.