# **3.4 DEMOUNTABLE PRECAST CONCRETE SYSTEMS**

Methods of disuniting of structures :

- Systems consisting of linear members disunited at joints.
- System for the prefabrication of entire rigid frames.
- Straight members disunited at points of minimum moments.
- Two hinged and three hinged arches.

System consisting of linear member disunited at joints :

Disunity at joints which gives linear member, this means a great advantages and facility from the point of view both manufacture and assembly ,using this system, auxiliary scaffolding are not necessary and the hoisting process is, as a rule, very simple. In the system is that the joints are corners, so the forming of the joints are very difficult. The quality of subsequent concreting executed in-site only exceptionally and at readily accessible places as be over dimensioned. This necessities additional material for the precast member too. This, on one hand, justifies the newer precast members and , on the other hand , the newer trend of replacing moment resistant joints by hinge like ones .Although this method requires more material for the beams . The complicated construction of rigid corners can be omitted.

# Advantages

- It is very simple.
- Scaffoldings are not necessary .
- Easy of hoisting process .
- Easy of assembling .

# **Disadvantages :**

- Formation of joints is very difficult .
- Joints are at corners , where the moments usually reach their maximum values



#### Systems for the prefabrication of disuniting of entire rigid frames:

The trend to lesson the number of joints and to precast larger members in one piece leads to the prefabrication of entire frames . Such frames are as shown in figure , but these solutions are appropriate only for site prefabrication . The production of frames does not cause particular trouble , but their hoisting is more difficult and requires careful preparation . The stress distribution of straight members during their hoisting is, in general, statically determined . Example that of a beam lifted at two points or at more than two points when using a balance, or a cable – rocker or that of column lifted at one point and supported at its lower end.

The stress distribution arising in frames during their hoisting. On the other hand, is frequently statically redundant. The tilting of a frame from the horizontal into the vertical position, lifted at two points by two separately acting hoisting machines, illustrates the above statement. If these two points are not hoisted exactly at the same time and with prefect uniformity, the frame itself will be affected by torsion. Connecting the two suspension points by a balance or a cable rocker enables the frame to be hoisted at one single point.

Now the stress distribution is statically determined but if the rocker is not suspended at the exact point, torsion can also arise in this case. This shows that the hoisting of a frame is far more complicated than hoisting a straight member. The hoisting of asymmetric frame is particularly difficult. In this case the force affecting the rocker does not act at the same place during the tilting up process as it does later, when the frame is already suspended. Therefore, the elimination of torsion during hoisting and placing requires either the transfer of the suspension point on the rocker after the tilting up is finished or the application of a counter weight. Entire frames are precast as a rule, in a horizontal position on the ground close to their final location. They can also be produced in a vertical position standing side by side.



#### Straight members disunited at point of minimum moment:

In this method is there is any deviation into member at points where the moment are smallest. This method called lambda method in some countries. The recognition of the difficulties met with when carrying out a moment-bearing junction at a place where the moment is greater led to this method. Therefore the junction must be re-sited in places where the moment is smallest.



Fig1.4System consisting of Structures disunited at points where the moments are smallest Moments