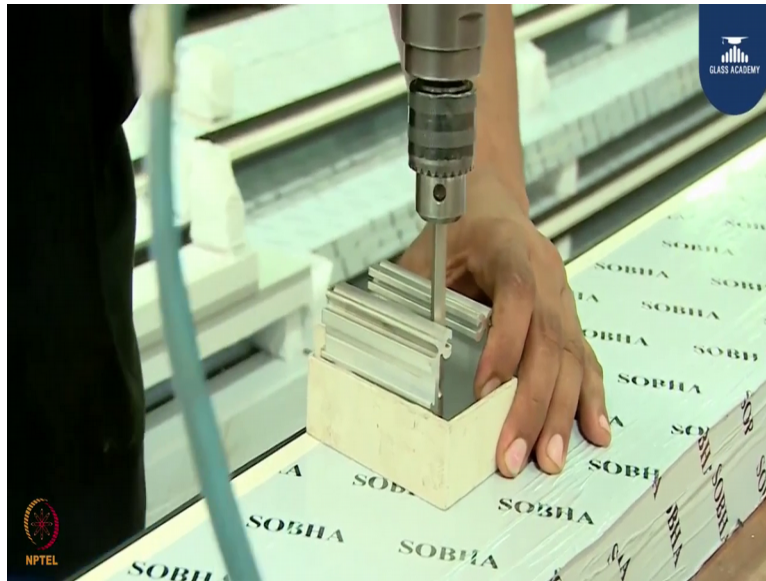


Glass in buildings : Design and Application
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Lecture - 65
Facade - Factory Operations

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Here we are doing one semi unitised panel, where I at the beginning I explained a major project will have unitised panel, semi unitised panels and windows, where unitised panel will go from factory has fully assembled. And, the erection at site is like tiling interlocking one after another. But, in the case of semi unitised suppose the area is not regular, suppose the area having curvature, suppose the area having less area to cover; we prefer to have semi unitised, where members of the assembly will go to site prepared for its correctness, fully cut giving provision for assembly. And, glass frame will be separately done and bond with the glass and this bonded glasses will be sent site separately.

So, the site activity will have assembly of mainframes mullions and transoms network attached to the building with the help of brackets. And, glass frames carrying the glass bonded from the factory will go and it will mount to the respective places with the help of hidden fasteners. Here also the major bonding of the attaching the glass with the frame by structural silicon, but there will be hidden mechanical fix fixings, which will not be

expressed at all outside. Now, what they are doing is they are doing mullions for this semi unitised assembly. Ideally, these mullions with carrying connectors this they are doing a connector, where exactly there horizontal mullion transom will come.

This go separately to the site, they will be attaching this one after another for different different floors followed by the horizontal transoms which cut and sent to the site. So, when you see the site activity there will be a framing work where horizontals and verticals assemble at site on the location of the building and attached to the building elevation with the help of brackets. And, proper alignment will be done for its correctness in line and level. And, even once everything is ready we start moulding the glasses in its respective spaces. What we are seeing the picture is a connector, where it will receive its horizontal in its own place.

So, the moment we keep the connector exactly in the location, when you cannot do a mistake at site, it will receive the transom there only. If you see then for the demo purpose they are doing the assembly of a one particular panel here namely, 2 mullions and 2-3 transoms. And, earlier bonded glass will go in its position. This is nothing, but a semi unitised assembly where we have mullions of around 6 inches depth and transoms like transoms like earlier I told you, if there is a spandrel panel there will be additional transom. If there is an openable panel there is an additional transom, otherwise there will be transom on top and bottom.

Here all the units are attached together after assembly at site. So, this transom assembly is continuous, one side of the mullion it will receive the other side also it will receive and the assembly will be continuous. But, in the case of unitised it will not be continuous; each panel will be sitting separately touching each other with the help of gaskets. So, each panel is allowed to move both way height wise and width wise. But, here that movement is restricted this connectors and all this assemblies are done giving a space of 1 millimeter, 2 millimeter. So, breathing is done especially in the case of height when it is continuous glazing is happening after every floor there will be a flexible connection is given.

So, that also in major direction thermal expansion is taken care and each panel is separately moulded giving space for expansion. So, glass expansion is also taking taken care, is a mullion here also we have to use lot of gaskets to avoid contact of the main

members with the glass. And, it will serve as the seals where it will seal the air and water. We call it as EPDM gaskets, where it has to perform, it is flexible at the same time when we press each other it will ensure water tightness and air tightness. And, it will hold the glass flexibly, it will not allow the glass to break, it will give sufficient space for expansion and contraction. So, this is a connector receiving the transom, you can see 1440 that is the transom length cut accordingly, now it is assembly; all assembly facilitated by the design itself, it can take screw there only.

So, in the design of the system itself all the screws locations are all taken care. See panel is getting ready, here also there is a connection with connector that connector is also specially designed. So, in the semi unitised assembly connectors are playing a major role to assemble the horizontal and verticals together, this is a part of the system. Now, you see the earlier you see the first unitised panel assembly where I told you there is an openable panel this is nothing, but that openable panel separately done. All members assembled together and it is attached at the corners with the process called crimping. There will be a corner cleat inside that is also a part of the system.

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The particular section will have its own corner profile. So, corner profile is inserted from both side a crimping is done so, that this corner is attached firmly. So, here there will not be any visible member screws or anything. So, aesthetically it will be placing. There is a hidden corner cleat, that cleat will have its location for the pressing the aluminium metal.

So, that when we press at that particular location it will attach together without expressing any fasteners; all 4 corners we have to crimp it now.

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Now, from here we are going to see the assembly of a window, where you can see the profile, their cutting; unlike in unitised and semi unitised here window demands a mitre cutting where almost all the corners will be 45 degree. When we have 45 degree 45 degree assembled together will get 90 degree, usually in window construction all the corners will be of 90 degree. So, a 45 degree cutting required here. It is nothing, but a slider profile where they are doing the work on a outer frame, where provision for tracks would be there. There will be 2 or 3 shatters running or sliding on this.

So, it is called a sliding system where it can carry 2 or 3 shatters. It is for a dual sliding having an additional track for fly mesh. These after cutting they will prepare the edges for assembly purpose either a cleat can be used like earlier or hidden screws can be used with the corner cleat. For that they are preparing the edges and in sliding system, you can see the tracks. When glass heat on the water heat on the glass, it will come to the track and we have to give escape route for the water. Here that space is created, if you see at the edge of the system there is a space there. So, there will be a hole to immediately attract the water towards the bottomest chamber and there will be a drainage hole a slot, you can see he is making a slot a long slot which will facilitate the water to go out.

So, when we fixed from the fixed the window in the building always the water drainage

you can see on the outside. The chamber bottom of chamber will take the water and it will drain out. To avoid the pressure due to wind blowing in the window direction building inside direction there will be a cap provider for that. So, when there is then when the wind blowing in the opposite direction this drainage hole will close automatically. We do not allow the wind with water coming inside. You can see the water holes, usually it will be a slotted hole 2 to 3 numbers. This again this machine is called a copy router, where the required slot will be kept on top. The system will give the same slot on the aluminium members. Now, again they are going back to the semi unitised assembly once again.

So, as a part of the program today we had a factory visit, where still factory visit. Out of that we have covered majorly two things, how a unitised panel assembled and kept ready to send to the site. And, there is a semi unitised panel assembly and how this construction have done will be done at site. Major difference I told you semi unitised panel will be assembled fully at factory, glass attached to it by a process called structural bonding and floor to floor panels will be sent to site. Site will be doing the erection of this panels floor to floor like tiling, a interlocking method is used here with the help of floor mounded hidden brackets.

So, after the unitised panel assembly after discrete completion you cannot see any fixing mechanism from outside or inside, these are all hidden. This is fast where major areas of the building big facades 1000, 10,000 or 50,000 square meter of the façade. Regular facade we always prefer this because, lifting using mechanical means we can have floor small cranes on top of the building, pulling this panel up to the position and we can insert by standing inside the building. So, this particular kind of construction is good for regular building, large areas and high rise building where scaffolding and other kind of application is difficult, where it does not demand a scaffolding we can do the work from inside.

Locations are marked for the bracket from inside, panel to panel width is marked and floor mounded brackets will be fixing then assembly will be happening. But, in the case of semi unitised where small areas or irregular areas, where building is having a curvature or having a tapered shape or we have limited areas of the building having the glazing, we have to go for semi unitised. This particular one is a semi unitised application where mullions and transoms cut and semi assembled form will go from the

factory. It will be assembled on the building façade, later glass frames attached to the glass will go and it will be mounded on the required space.

This kind of application will be little slow, it demands scaffolding from the outside because always we have to apply the glass panels from the outside. We have to push it and we have to fix it in position, but it will be easy for doing one small area we can do one day, other small area we can do another day. So, intermittent applications semi unitised should be better and all small buildings and residential buildings usually this unitised semi unitised will not be serving the purpose of our functional requirements. Small window this will be tackled by window system either a sliding window or openable window or fixed window as per the clients requirement. So, these three areas we touch together.

Thank you.