

**Glass in buildings: Design and Application**  
**Prof. Soyuz Talib**  
**Department of Civil Engineering**  
**Indian Institute of Technology, Madras**

**Lecture - 83**  
**Case study: Commercial Buildings**

At the onset I would like to thank glass academy for inviting me for sharing my experiences with all you people. And, I have brought up a few slides and a little small presentation that I would be making during the course of this presentation to give you an idea of my experiences and my the times that I have had working with glass. And what are my experiences with working with glass in the past 15 to 20 year.

To start off with I would like to give an introduction of my firm which is called Soyuz Talib Architects private limited. We are a firm that was established in the year 2001 and since then we have been doing work in the field of architecture in specifically in the Navi Mumbai region. Most of my examples today that I am going to show you are built projects that have been constructed in the area around Navi Mumbai.

To give you a brief introduction further on my office I would like to say that our office deals in mostly architectural and interior design work in the Navi Mumbai region. And of course, we are working pan India in other small cities that are spread across the western half of India from right from Rajasthan down the south all the way to Goa.

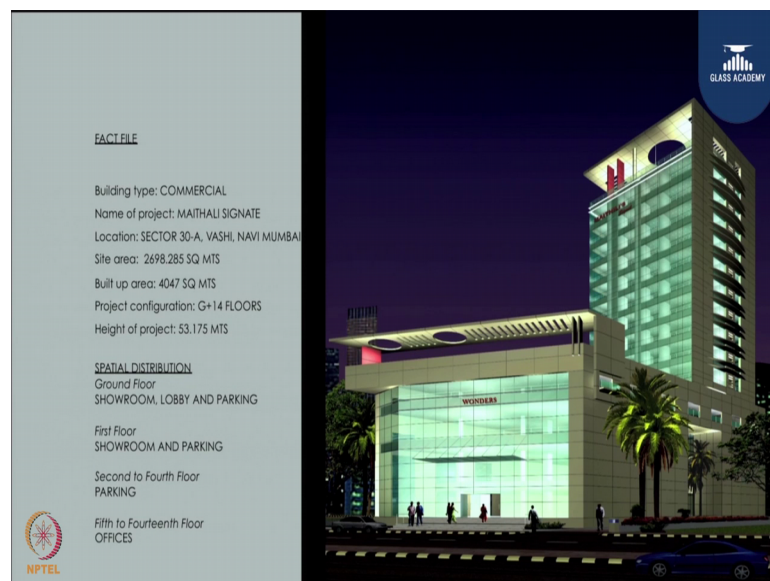
But we have been working mainly on a lot of residential projects to start off with when we started off our architectural career we worked a lot on residential projects and commercial projects at that time were still not something that I had started working on until the year 2003 and 2004. When I actually land up doing my first commercial project, to give you a brief idea of what the concept of commercial projects earlier was that you would just build a building similar to probably or residential buildings. It did not have any distinctive character that differentiated it from a residential complex, it only kind of gave you an appearance that was a concrete structure similar to a residential one.

However, in the late 90's and probably in the early 2000 people started actually experimenting with facades and working with putting up glazing on facades for buildings and things like that began take shape in the whole of our country. Of course, this did

exist in other parts of the world, but was not predominantly something that existed in India. Thanks to the advent of glass coming into the Indian scenario and companies like Glover Bell and Sengobben that made the initial progress into the Indian subcontinent with the promotion of reflective glass.

And glass that actually performed for facades of buildings that is when people actually kind of visualized architects began to visualize buildings with these kind of facades and having buildings that had a strongly different character from residential buildings. Now getting back to the start of where I started working on the commercial building sector was way back in 2004. And one of my first buildings that got built commercially was a building called Maithali Signate, which I am going to show you right here on this first slide that is coming up out here.

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So, this is Maithali Signate this was a building that I had visualized maybe way back in 2003, 2004 by the time it got built and completed it was 2006 or 2007. At that point of time there were not too many options available for architects in the industry as far as glass was concerned. Glass was a new material probably people did not know too much about glass either; how it performed, what it did, how it worked for the betterment of the building and things like that.

But through my years of architecture and what I had learnt back then I knew that glass was a material that would what that would create some issues regarding heat gain and

things like that. So, when we started work on this building we had very few options as far as the availability of glass was they were very few contenders for supplying glass. The quality of glass available at that point of time was far-far primitive compared to what is available today. At that point of time the kind of glass that was available was purely reflective through our practically most of the light did not allow too much of sunlight into the building, but we had to make our choices from what was available at that point of time

This building at that point of time was something that we visualized with a green glass, green glass was something that was what was green glass was something that performed better than the blue range. And it is purely because, of its performance criteria we kind of switched over to the green glass rather than the blue glass at that point of time. Because like I mentioned earlier there were not too many options available in the glass industry and we had very, very limited glasses to choose from. This facade when it was built back then the few of the problems that we kind of grappled with as an architectural firm was that we were dealing with glass for the first time we did not know how it had to be cut, what had to be done, how it had to be fitted etcetera on the facade of the building.

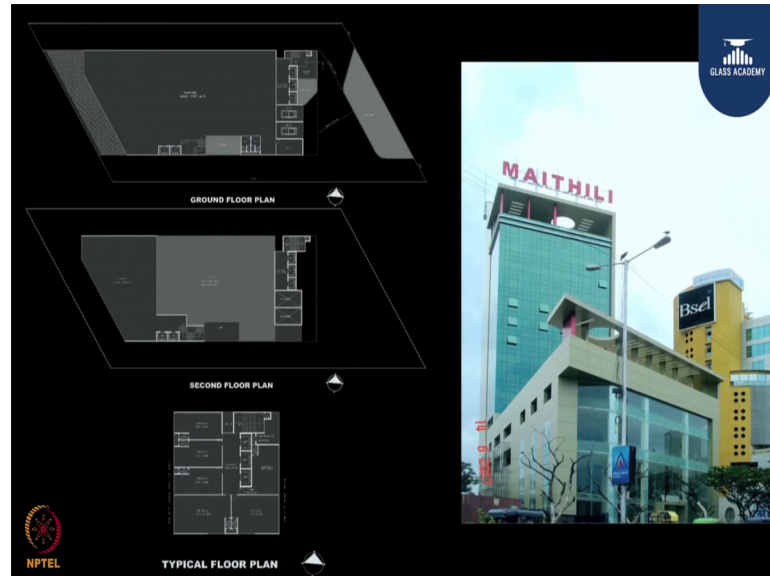
So, our learning process started on day 1 when we had to actually start working with the glass sizes available and we kind of began to understand the format in which glass is available. And how it is converted into a double glaze unit and other aspects of it of how the inner glass and the outer glass together perform with the vacuum created in between. How it is fitted on the facade of the building, how the aluminum the glass interact with each other and things like that.

Those are things that we were which we picked up at the initial stages as architects and we began to understand how glass actually is to be used, how it is to be cut, what are the sizes available, how it can be broken down into the sizes that we want, how do we design the concrete finish to kind of take on the glass surface on it. What are the kind of requirements that are needed in the structural grid of the building to coordinate with the glass sizes and things like that began to become important factors in the early stages of the design of the building.

So, this building basically was a learning curve; it taught us a lot in terms of what we need to do and how we need to deal with glass. Of course, one of the important things is

that we would we as an architectural firm were always keen on completing buildings in the format that we had visualized them.

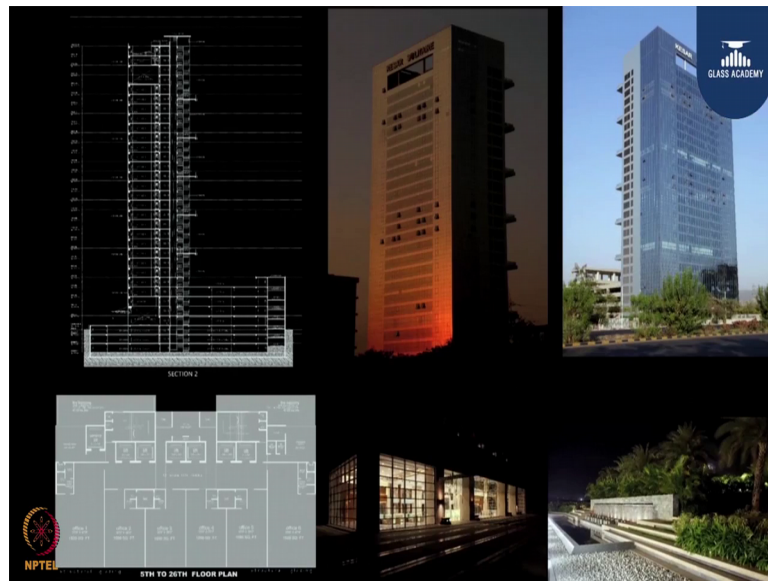
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So, when we look an end result of this building this was something that we kind of maintained as an architectural firm that we kind of want to complete the building in the format that it has been visualized. This building is located at Vashi station we had a facade on the outside that is facing mainly western side. So, we had a lot of direct sunlight hit the main facade of the building because, the plot very narrow as you can see in the slide.

And the offices faced both the west and the east's eastern side. Of course, there were larger number of offices facing the west than the east and hence the choice and the glass was to go for a green shade which kind of performed much better than the blue at that given point of time. We would, I would like to move on to the next project of mine which is basically the second project that we will end up doing. And this project was something that kind of again challenged our skills as architects on facade design.

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This is a project that was basically called Kesar Solitaire, this was the initial visualization of the project. One thing that had to be taken care of when we worked on this project also that we had to kind of ensure that we were choosing a very, very good and high performance class. Because, the entire facade on this project was facing the southwest side with direct sun hitting the main facade of the building throughout the day with, all the office facing the same direction.

The reason why I would say that you know you are so stuck in tricky situations sometimes is because we want to kind of have the best of both worlds in most of what we design. So, when we were working on this building project the challenge was that we were looking south west and south west is where the view was.

And we wanted all the offices in this building to basically look southwest which was the main viewing direction where we have the seafront, we have the wave being visible from there. And from the upper floors you would get a beautiful view of the entire Mumbai skyline from there from New Bombay. And because this was the challenge we did not have too much of option in terms of the office orientation because, the viewing direction was fixed.

So, the challenge came in trying to design the facade of the building. We tried a lot of options on this as far as the glass is concerned before we actually closed in on what we wanted to do in terms of the final choices on glass. Of course, we had graduated from where we were earlier and we kind of land up designing or visualizing the building with two colors of glass which was something that we said let us move one step ahead.

And let us go from the single glass building that we did earlier to a glass building which had two shades and we want to create an aesthetic appeal on the building by putting in the two glass shades on the building. So, that was something that we added on from our past experience when we had used a single glass, now we had gone to use of two different colors of glass within the same facade.

We had also organized the structural grid of the glass of the building to function with the glass sizes that were available. So, I mean most of the times people land up designing buildings without really thinking too much on the glass sizes and things like that which would land up incurring huge amount of wastage in the glass itself, which would be an uneconomical option in terms of whoever is going to put the bill for the glass actually.

So, uh of course, the first thing that we need to do is kind of the architects save as much money for the developer and put in enough effort to ensure that the glass and the building kind of sync with each other in terms of the sizing of the glass. So, that is something that we land up doing here we these are two of the things which we land up; one was change the colour of the glass itself to two colors and secondly, we worked on the structural grade of the building.

We also focused on one more thing in this building that was the lobby of the building because, the lobby of the building that is the ground floor lobby where we enter the building which generally is one of the most ignored things in most of the projects. That is where we kind of decided to ensure that we had a fully large lobby at the lower level which kind of acted as the area that people would enter upon and then move on to the upper floors. The difficult part about the lobby was that it was again facing the west and we did not want to put any reflective glass on the lobby facade and we wanted to be transparent something that people could look into from inside to outside and from outside to inside as well.

So, that was another challenge where we had to think of how to cut down the heat that was getting into the lobby, because it would simply increase air conditioning costs for the entire building if the lobby consumed way more electricity than it had to. So, what we have done at the base of the lobby, is we have gone in for a curtain wall glazing, broken up the facade into smaller areas of glass where the curtain wall itself act as a shading device. And the canopy that projects out at the top of the entrance, kind of adds the further shading to the entire area that does not allow too much of direct sunlight to get into the lobby.

On the upper floors of course, we have worked with glass which is at the corners of the building like you can see reflective silver glass and then at the center we put in blue glass that both high performance glasses. Of course, by then by the time this building came up there were a lot many more players in the market as far as glass companies were concerned which gave us a wide range of glass to choose from the tendency to kind of move from the more reflective glass to the more neutral looking glass, had kind of taken shape preferences towards more neutral than highly reflective glass had increased.

Even though we have chosen a silver it is a high performance silver with very low reflectivity. So, what you see is not a very, very reflective facade you see what you see is a more neutral kind of facade which kind of reflects the sky almost kind of making the building disappear at the evening time. So, the photograph that you see in the slide actually shows the sunset time and it kind of takes up the glass kind of beautifully takes up the colours of the sky.

Now as there is something that I would want to add on here is that we normally make our choices sitting back in our offices, we do not really get into trying to sample glass and look at glass from various different angles and various different times of the day. There is something that I would recommend to most people who are working with glasses not to sit back in there offices and approve samples and approve performances of glass just by looking at a piece of glass that is presented to you. It is better that you kind of put the building put the glass up on the building facade look at it at different times of the day, some of the glasses you know they kind of change their appearance throughout the day.

So, as an office we made it compulsory that we put up samples on most of our buildings we kind of inspect samples of buildings at different times of the day. We get back feedback from lot many people, associates within our firm on how the glass looks and feels aesthetically. Also we evaluate at the same time the properties of the glass in terms of the heat gain and the light gain and in most of our buildings.

So, what happens is that some of the glass that is aesthetically good looking may not be very, very good in terms of performance, but may score lot of brownie points in aesthetics. Now here is where architects always face a dilemma and we are kind of struggling to balance the equation between aesthetic appearance and performance. And when we are trying to do this we always have to have an equal weighing scale and try to put things together in that format rather than just look at one of the criteria's.

Now, in this building facade we had a lot of sampling done for this project they were n number of samples put up from various different companies. But, what we were looking specifically on this building facade to start off with the onset was that we wanted to have something that reflected the sky, that something that merged with the sky and did not really become a reflective facade which was very, very strong in its character.

So, that became one of our because we were facing the seafront and we had an open ground in front and we want the sky to reflect within the building. So, that became our clear guiding point. Of course, the performance was important that is why we chose glass that was again a performance oriented glass. The silver that has been used on the corners was a high performance silver which was a neutral shade of silver and this one at the center was a blue glass that was again a high performance class at the center.



Of course, in terms of controlling the costs we have not put in any further glass in this on the DGU which was a high performance glass which was something that was recommended at that point of time, but things did not fit into the budget for this particular building. And, the double glaze unit was made with the outer performance glass and the inner clear class. How much ever we would have preferred a much higher performance class on the inner side, the budgets was a constraint and kind of restricted the use of double glazed unit which had two high performing glasses.