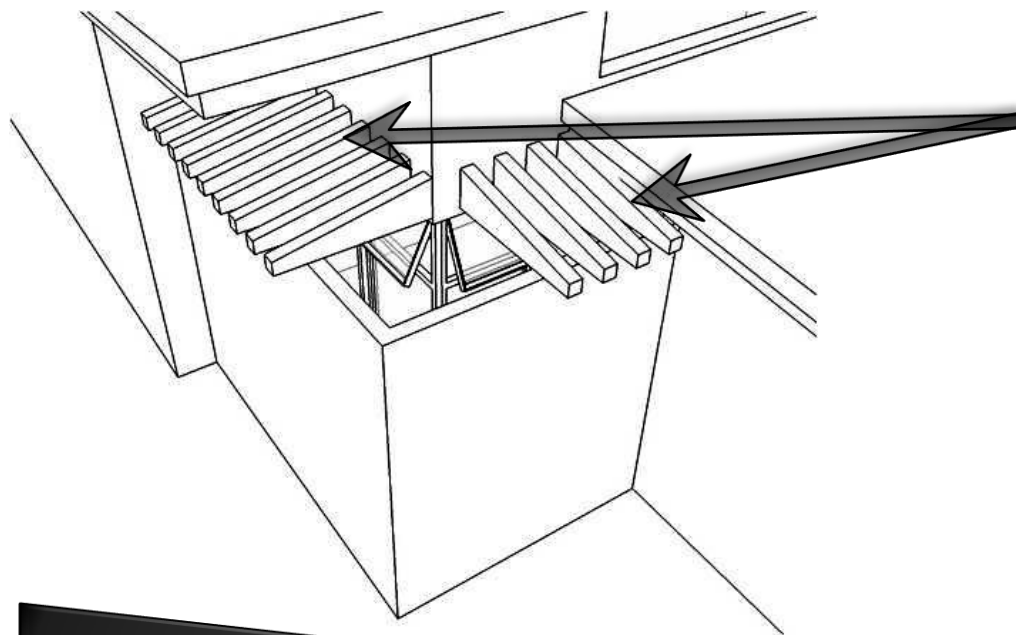


Hi Dave.

I went through your questions and did some research. My main focus for this project is to create a space which shows excellence in both aesthetics and functions. In concept development I took care of aesthetics more than the functions. But this time I am giving you solutions to control both functions and aesthetics at the same time.

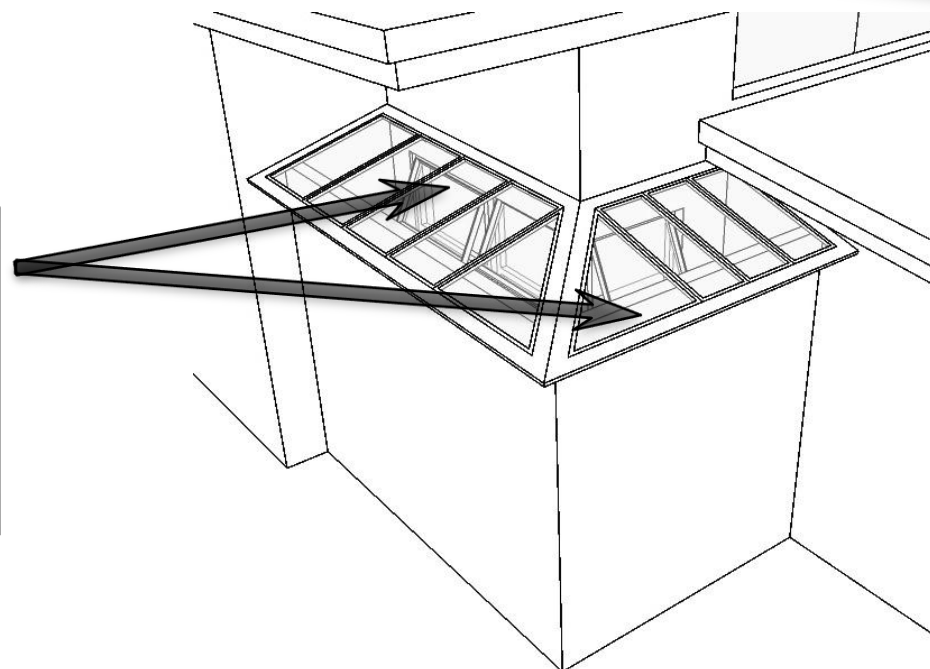
### Q :1 CLERESTORY WINDOWS ABOVE THE MASTER BATH:



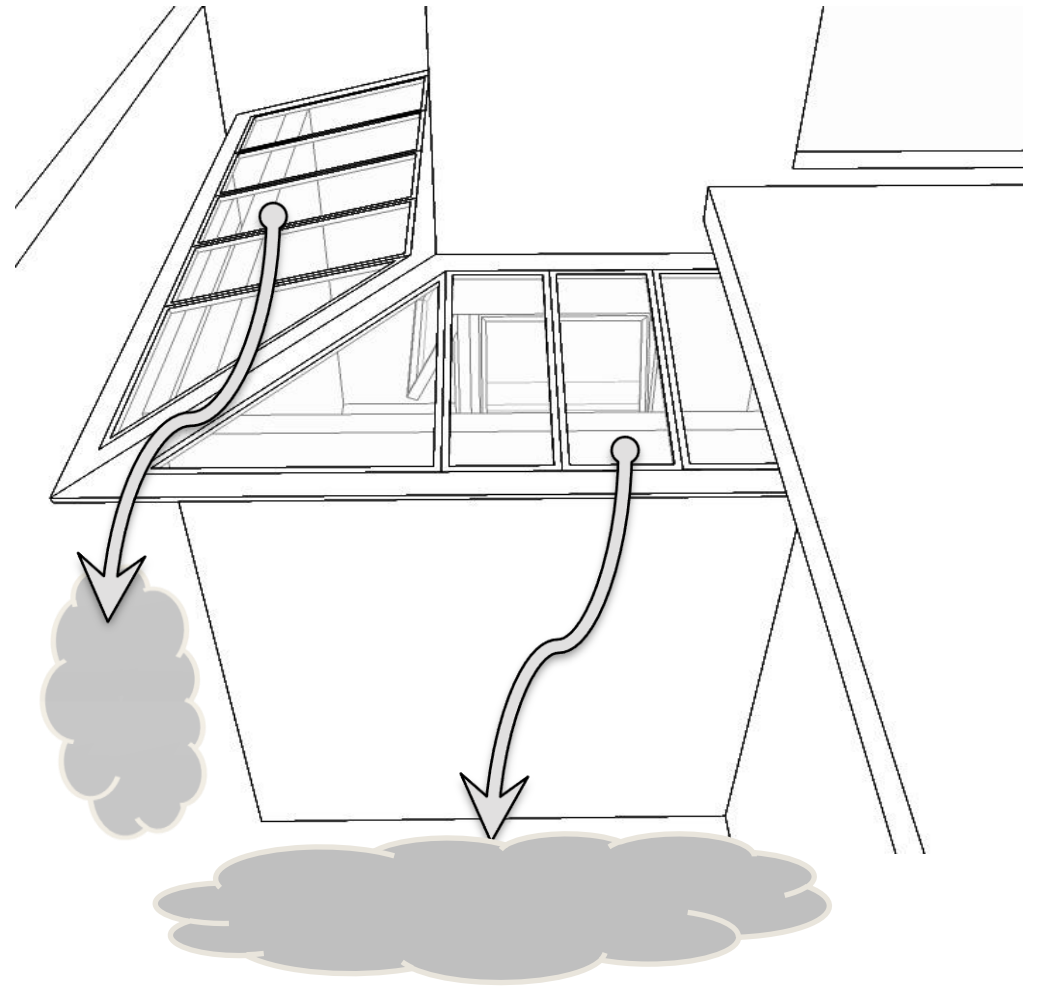
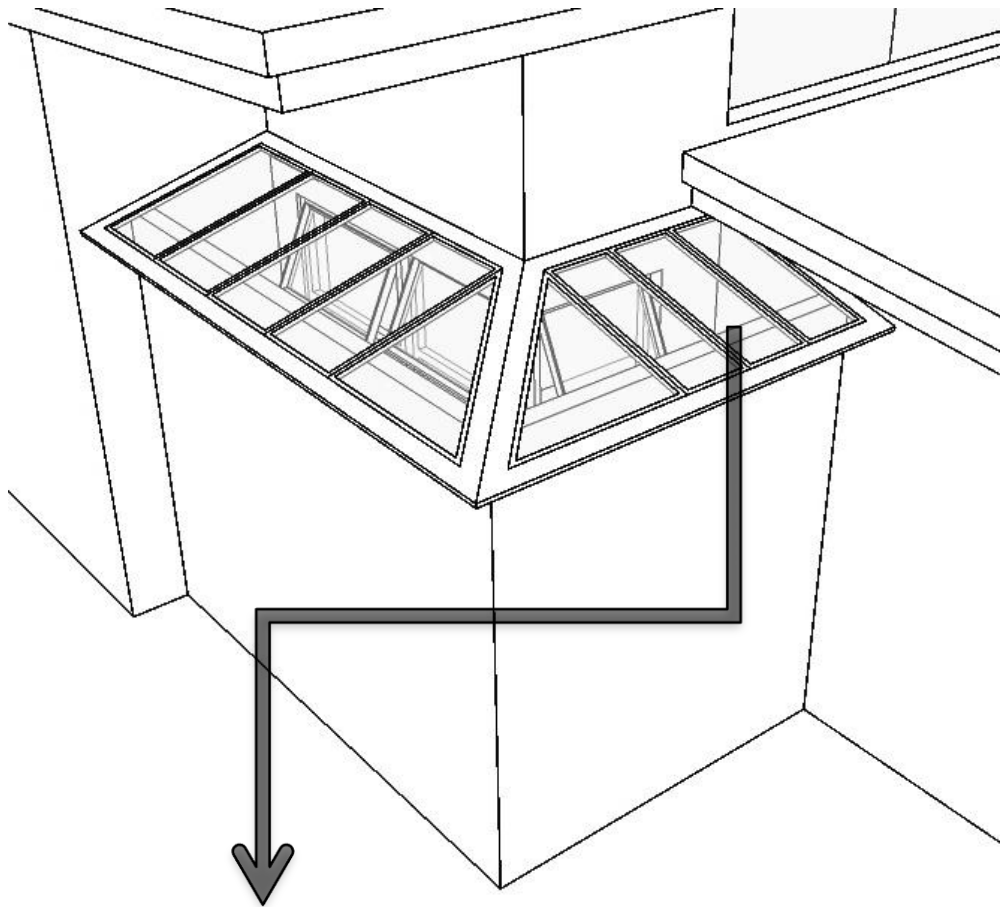
These pergolas might create some opening for snow accumulation. So I decided to remove this pergolas. I decided to use poly-carbonate sheet. See the image below.

We can use Poly carbonate skylights to provide :

- Natural light
- Prevent from snow accumulation.



## Q :2 COURTYARD OUTSIDE THE MASTER BATH:



Using these polycarbonate shade we are getting out of this snow problem. **Another idea** clicked in my mind while thinking about it. We'll discuss it later. 😊

Polycarbonate is a tough and very good alternative of plasticized glass. It is slippery and doesn't let the snow accumulate on top.

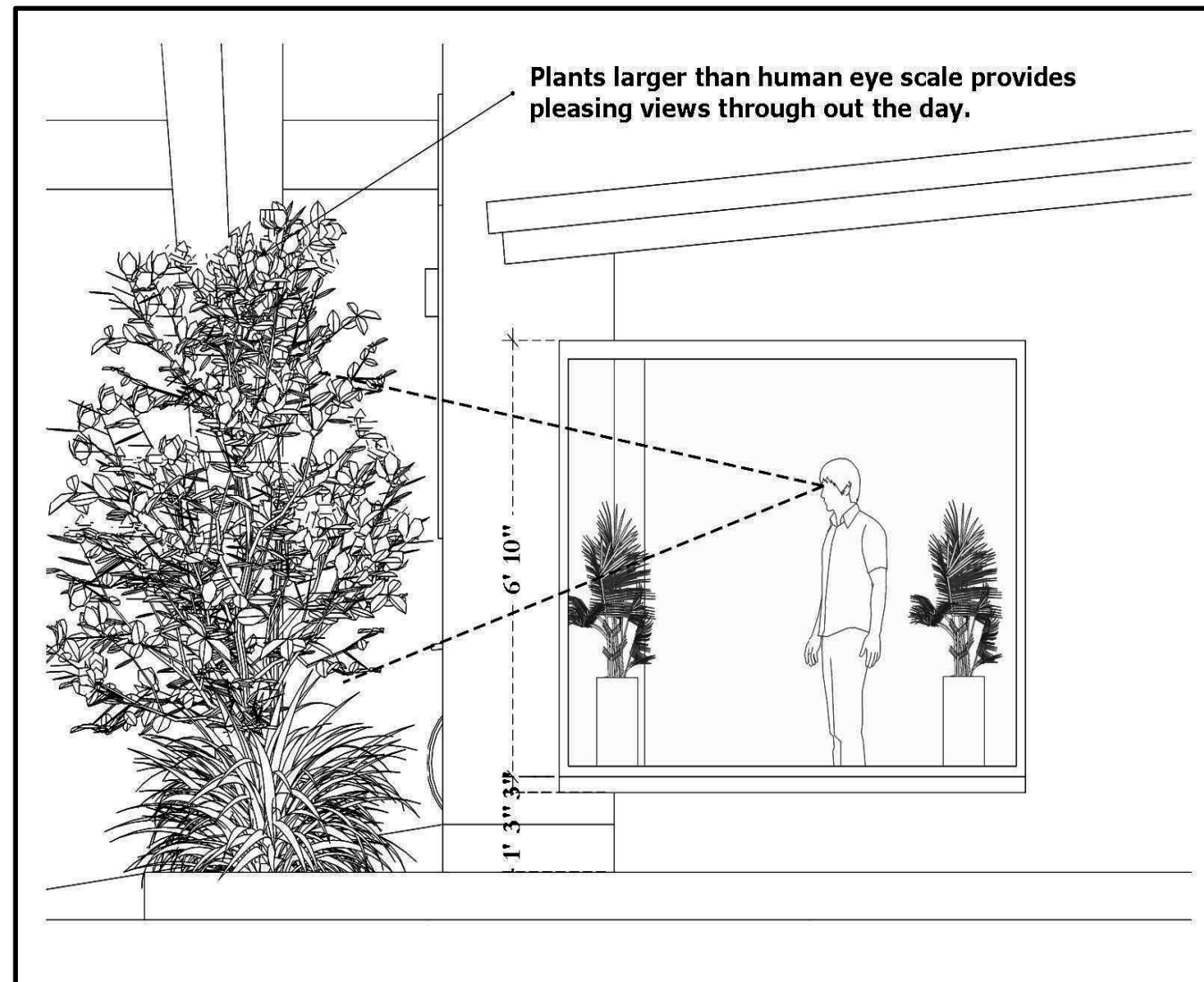
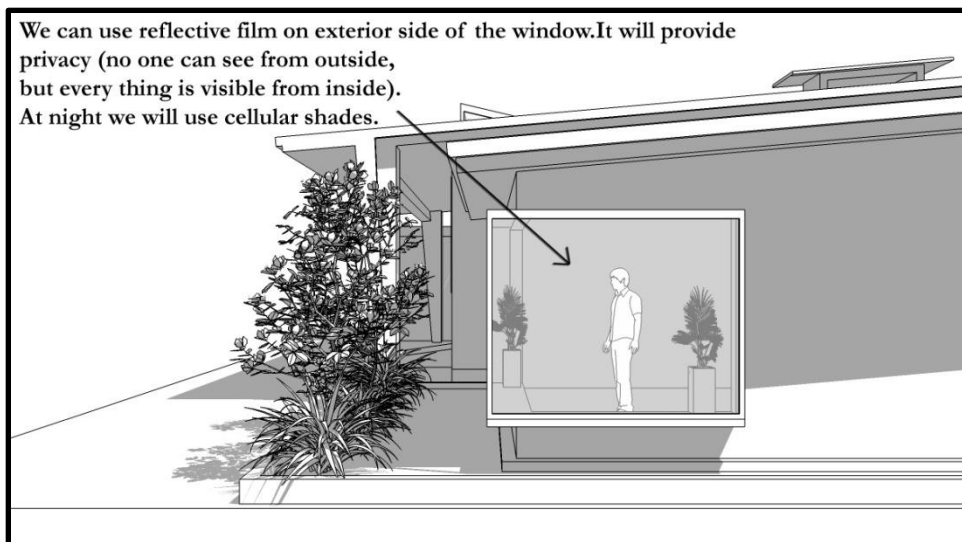


## Q :3 WINDOWS ON THE NORTH (FRONT) FAÇADE :

*Major reason of adding large windows there was to avail the beautiful and restful diffuse light throughout the day. What I want to achieve is to keep the windows large to avail north light without obstructing view. As I said before I want to create a relationship b/w man and nature. I thought to add a small landscape outside the north facing window too.*



We can use reflective film on exterior side of the window. It will provide privacy (no one can see from outside, but every thing is visible from inside). At night we will use cellular shades.



## WHY USING REFLECTION FILM.?

### CURTAINS :

#### Pros:

- Provides privacy and insulation

#### Cons:

- Light cannot get in
- View obstruction

### RAISING WINDOW'S SILL LEVEL:

#### Pros:

- Provides privacy
- Natural light is available

#### Cons:

- View obstruction

### LOUVERS:

#### Pros:

- Provides privacy
- Natural light is available

#### Cons:

- View obstruction

### WINDOW REFLECTION FILM:

One-way mirror film offers a perfect imitation of a mirror. One side reflects an image whereas the glass remains transparent on the other side.

#### Pros:

- Privacy
- Diffuse light
- No view obstruction from inside

#### Cons:

- No insulation
- At night film is effect less. And privacy would disturb.

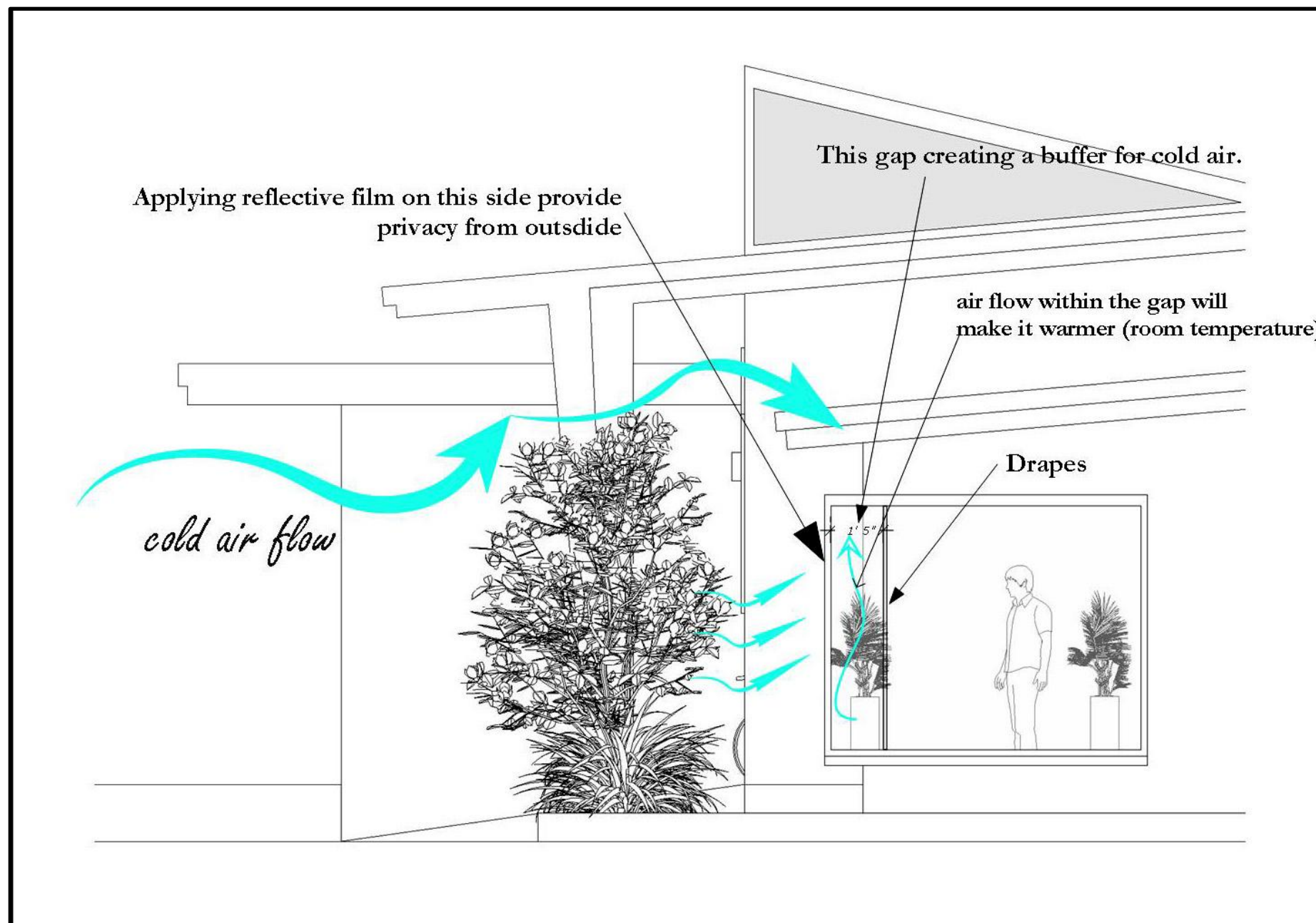


It is clear that applying window reflective film we can achieve maximum light, view and privacy during day time.

What to do at night. ?? Privacy is disturbed as film is refracting rather than reflecting. So we can use white drapes for night.

*(The film reflects where the intensity of light is more.)*

**To prevent from north cold winds we can create a gap between windows and drapes.**



## Q :4 ROOF CONSTRUCTION:

There are different solutions regarding this.

Typically in northern areas of Pakistan climate is nearly similar to north Dacota.

We face average temperature less the -10 c

Prestressed slab usually cause leakage due to heavy precipitation and causes cracks.

I recommend RCC.

- **Steel reinforcing is simple to place.**
- **Steel reinforcing reduces random cracking.**

Total quality can only be achieved when well qualified suppliers and contractors are on the construction site.

We'll use metal plates instead of composition or asphalt shingles.

Steel roofs are a good choice for areas that experience high winds. They withstand far higher mile per hour winds than composition shingles.

Life of steel roofs expected to be more then 50 years.

## MAJOR PROBLEM IS SNOW ACCUMULATION AND THAWING.

### □ SOLAR THAW:

Non-reflected sunlight strikes the roof surface through the blanket of snow, which converts the energy to heat and may contribute to a sudden release of snow from the rooftop.

### □ HEAT LOSS THAW:

Heat escaping through the roof construction warms the surface of the roof to temperatures above outside air. Differing temperatures can cause thawing and re-freezing of melted snow in a down slope area, resulting in ice dams causes icicles.





# SOLUTION

❑ We'll use a roof color with a high solar absorption value, such as red, brown, or dark gray instead of cool colors like blue, green, or white. This tends to initiate solar thaw.

❑ We'll use de-icing cables.



Heat cables are economical and a good solution to remove icicles. Figure shows clearly about its mechanism.

## Q :5 EXTERIOR DOORS:

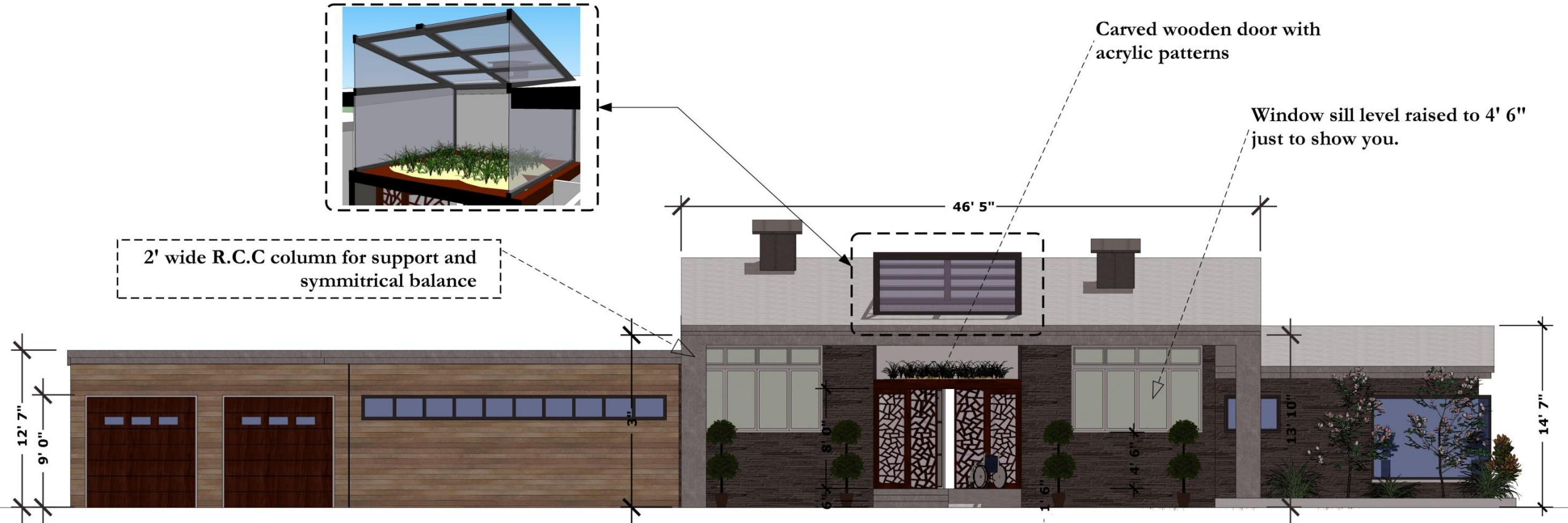
We used hinged doors in the design except the patio area.

Yes for patio we can also use hinged doors. No issues with that.

Ice cannot built up on this side because the patio is covered.

I designed a chimney system above patio which is acting as a shade too.





Concrete chimney serving as a duct for smoke and also a shade for patio

Sliding doors changed to Hinged doors

Clerestorey windows for the great room ventilation

Sheer curtain along pation Pergolas are removed as for clearer view to the yard.

Polycarbonate skylight

RCC flat roof with slope on south end. Easily access remove snow with roof rake.

