



THE ENGINEER'S HOUSE

Architectural Design for a Residential Bungalow

Client:	Mr Janak Mistry
Site Location:	E3 Block, Vesu, Surat - 394518
Construction Area:	7500 sq ft / 697 sq m (carpet area)
Plot Area:	1312 sq m
Cost of Project:	Confidential
Year of Completion:	2017
Services:	Architecture, Interior Design, MEP Integration, Landscape, Artworks

'An Engineer should design a structure that an architect would be ashamed to cover up'.

- Bill Baker, Partner - SOM

As a designer, this project was one such rare opportunity, where the client himself is able to contribute in the design process to reach levels of synergy which is unthinkable for both as individuals - the Architect and the Client. 'The Engineer's House' is a case where the Client, a brilliant mechanical engineer and a global leader in manufacturing of very high- end diamond process related machines, offered all his knowledge and infrastructure to the Architect's disposal. The conventional paradigms of door closer, ceiling fan, swing, elevator, geothermal cooling, louvers and lot of other elements were questioned and the outcome is truly noteworthy.

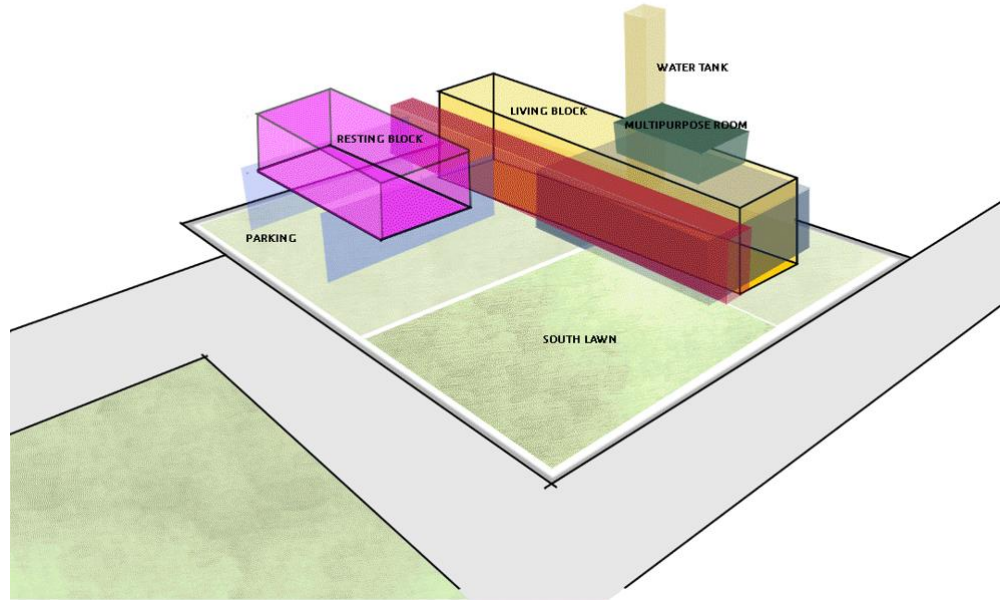
However, for us, the success of the project, lies in the fact, that none of these mammoth product design and development exercises, came in the way of creating such wonderful living spaces for an equally wonderful family consisting of 'Hum do, Hamare do!' In fact, each of these engineering marvels, enhanced the overall experience of having a great family and personal time for each family member.





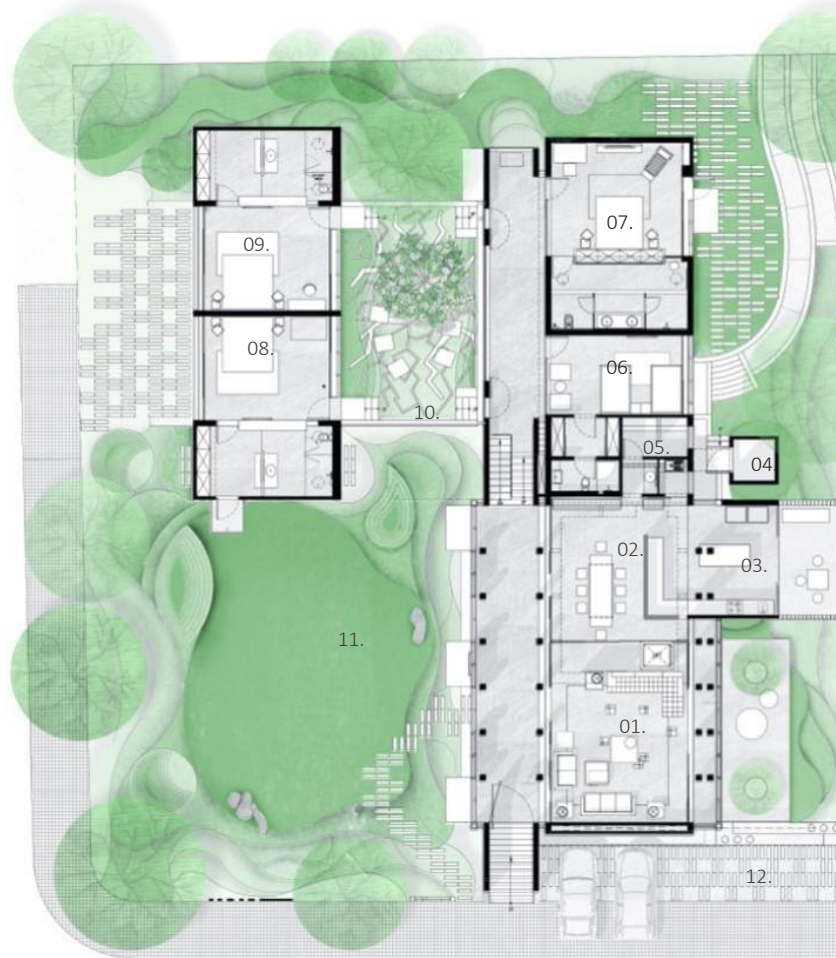
The 1400 square meter piece of land, is a part of a gated residential society at suburban Surat, developed by fourteen acquaintances and friends. Its a corner plot, located right across the common garden space of the society, with roads on the South and the East.





Spatially, the four bed room villa, is organised around two open spaces - the public lawns and the private courtyard. The public block consists a singular glass box housing the living room, dining area, the kitchen and the elevator transporting one to the first floor family room. It is flanked by a long veranda spaces on both the sides, for allowing circulation and climatic comfort. A slightly inclined copper box floats over the dining area, which houses the family room. Beyond the public block, one climbs few steps to get into the private realm, which has the four bedrooms built around a courtyard. The Puja space is the culmination of the circulation tunnel which runs along the public block and then through the private zone.

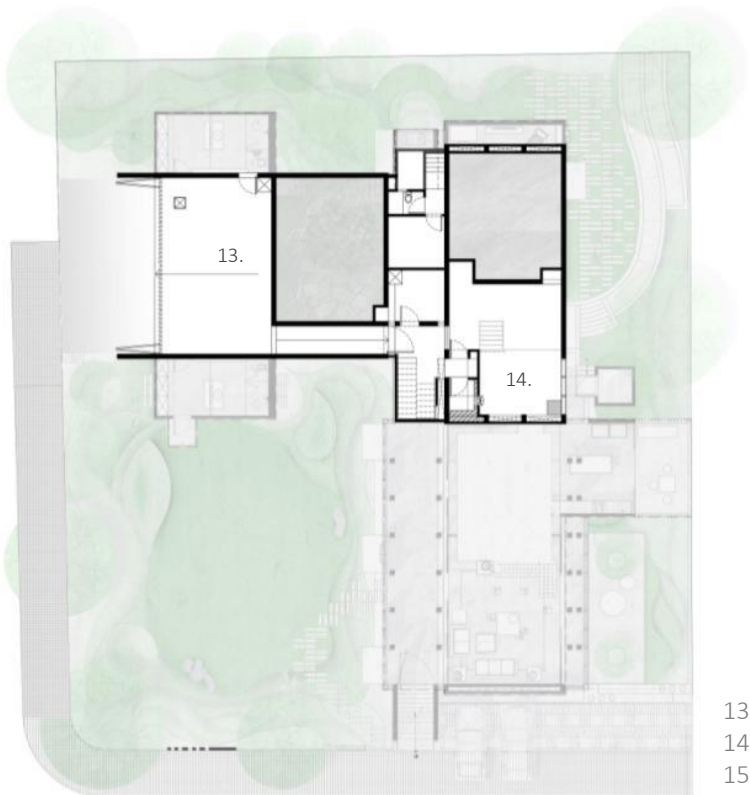
1. Living room
2. Dining
3. Kitchen
4. Store
5. Utility
6. Parents bedroom
7. Master bedroom
8. Son's bedroom
9. Daughter's bedroom
10. Family court
11. South lawn
12. Visitor's parking



- PRIVATE SPACES
- PUBLIC SPACES



GROUND FLOOR PLAN

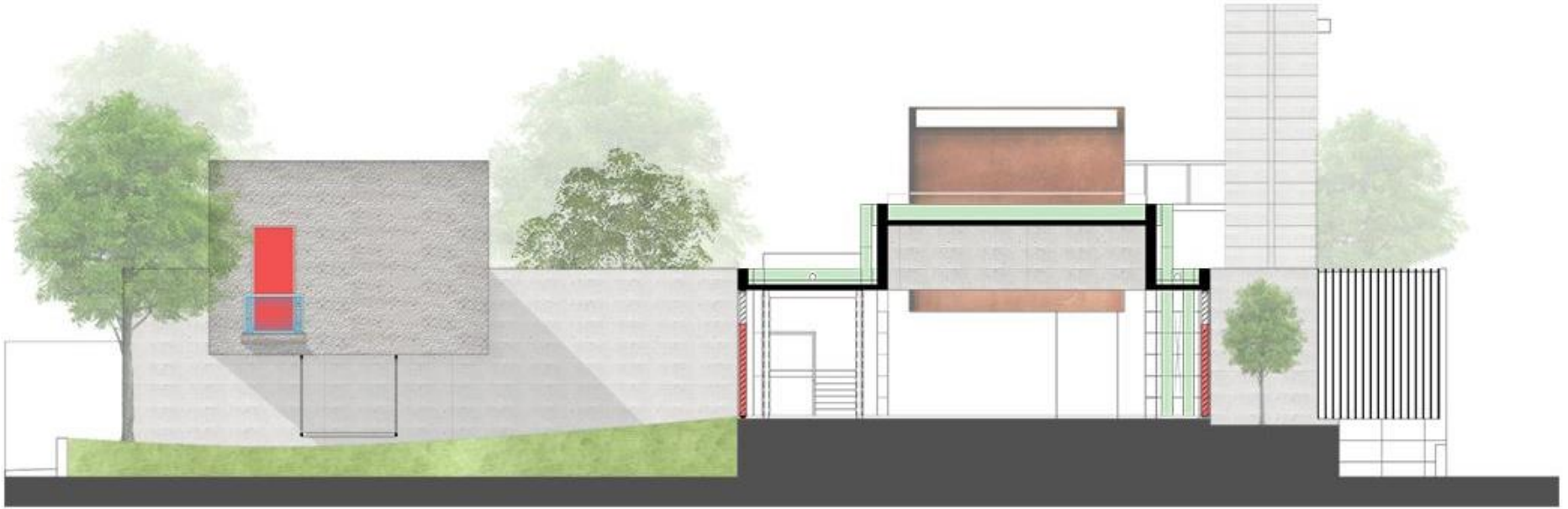


- 13. Parking
- 14. Utility
- 15. Multipurpose room

0 1 2 3 5m  LOWER GROUND FLOOR PLAN



0 1 2 3 5m  FIRST FLOOR PLAN



SECTION



AERIAL VIEW



AERIAL VIEW FROM THE EAST



THE FAÇADE WITH THE UNIQUE LOUVERS MECHANISM



VIEW FROM THE SOUTH



CONCRETE



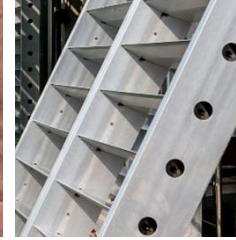
KOTAH STONE



POLISHED TEAK WOOD



COPPER

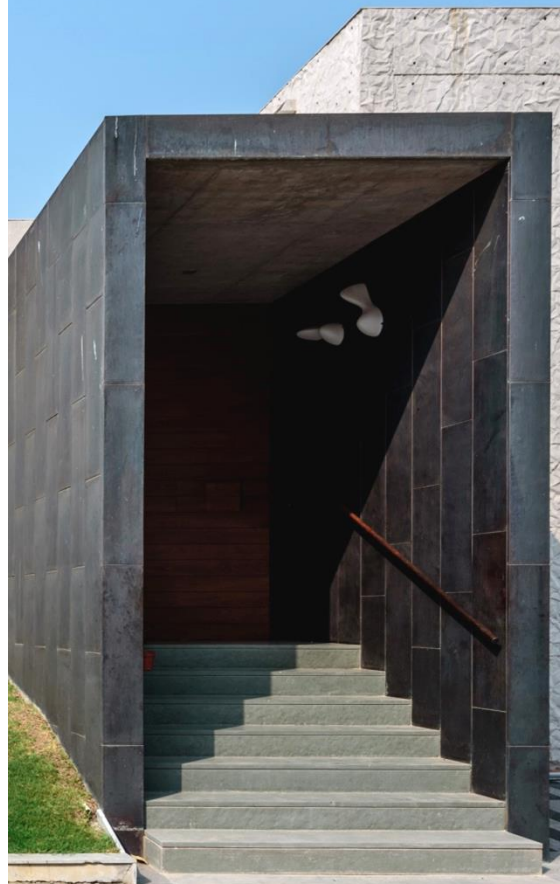


ALUMINIUM

In terms of materiality, the house is made in a palette which proudly showcase the structural materials in their natural state. The paint free shell of the house is constructed in form finished concrete. The interesting texture has been achieved through creating fibre moulds out of crumpled aluminium foils, and creates equally beautiful drama in the day and night, responding to the light falling on to it from different directions. The floor is a combination of large sized polished and leather finished Kotah Stone. Natural polished teak wood has been used freely in the house for fixed furniture, storages, and partitions and wall panelling. Copper sheets have been used to define the axial movement tunnel and the floating family room. Bright coloured compact laminate sheet used in some doors to add sharp accents in an otherwise a monotone grey-silver house.



THE LOUVERED FAÇADE



ENTRANCE



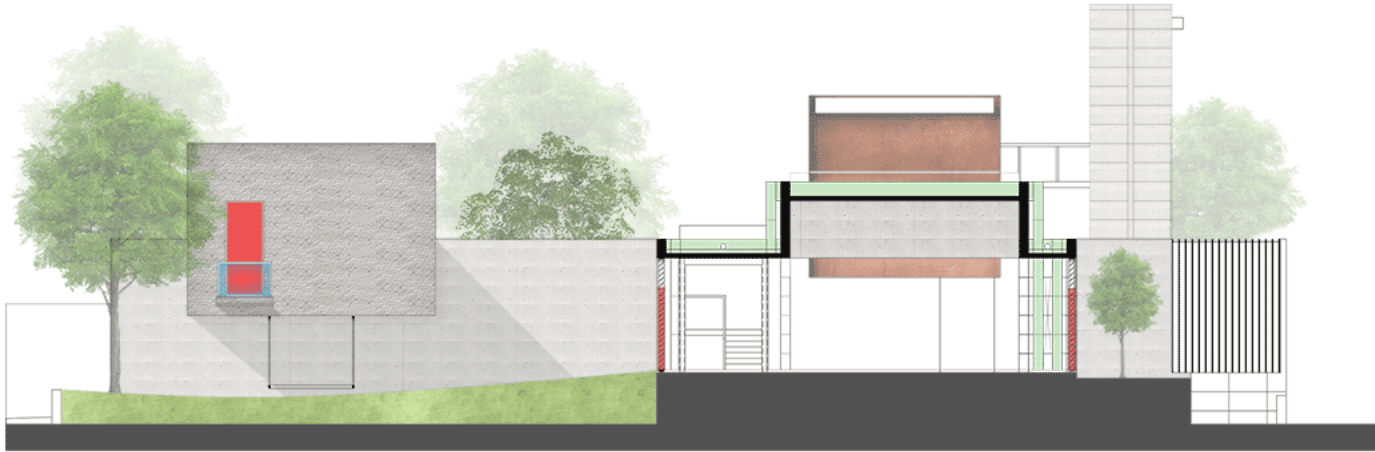
DAUGHTER'S ROOM BALCONY



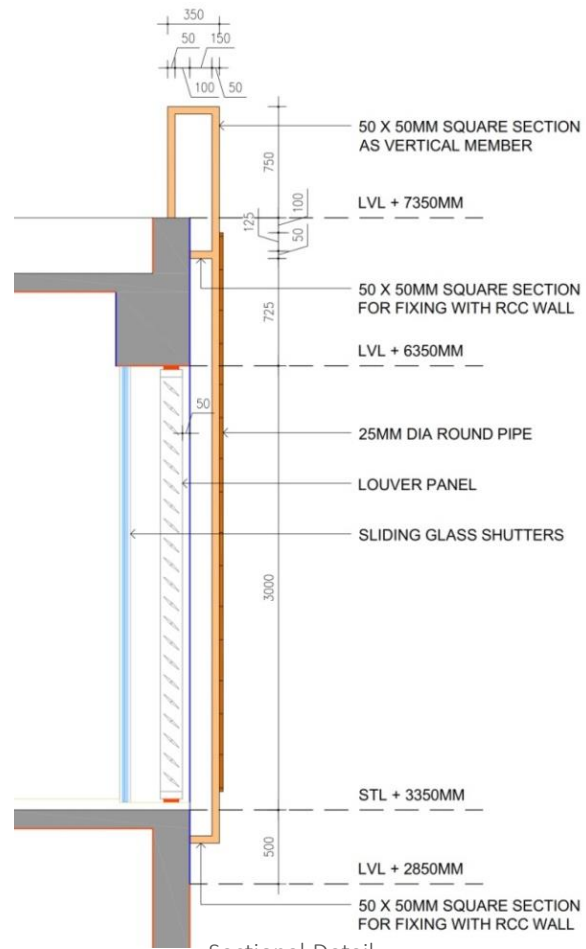
PARENT'S BEDROOM TOILET



DINING AREA



To respond to the Hot and Humid climate, the North and South of each space including the four bedrooms are ingeniously designed with operable louver's system with an open-able layer of glass, from wall to wall. This allows a wonderful connection with the landscape, and an incessant draft of breeze flowing across the rooms. **These louvers control amount of light, wind, rain, and dust entering the space; and also keeping the burglars out all the time.** The entire louver frames get manually lifted to become pergola. Very interesting user-friendly mechanisms for lifting and locking the louvers have been engineered using number of gears and levers.



Sectional Detail

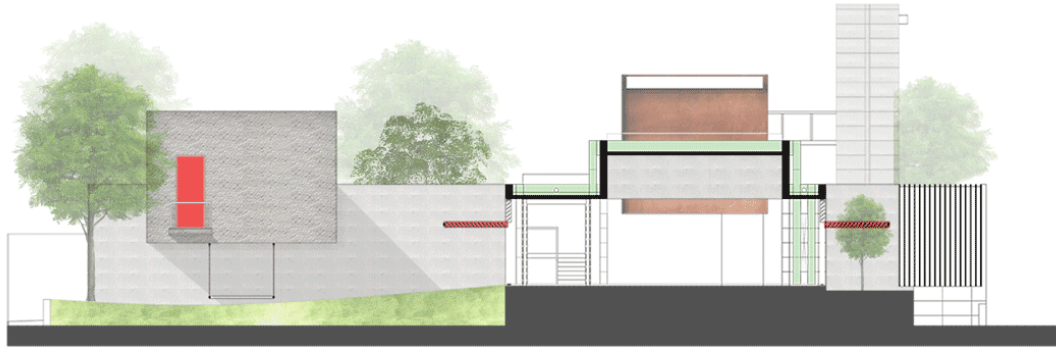


THE LOUVRES







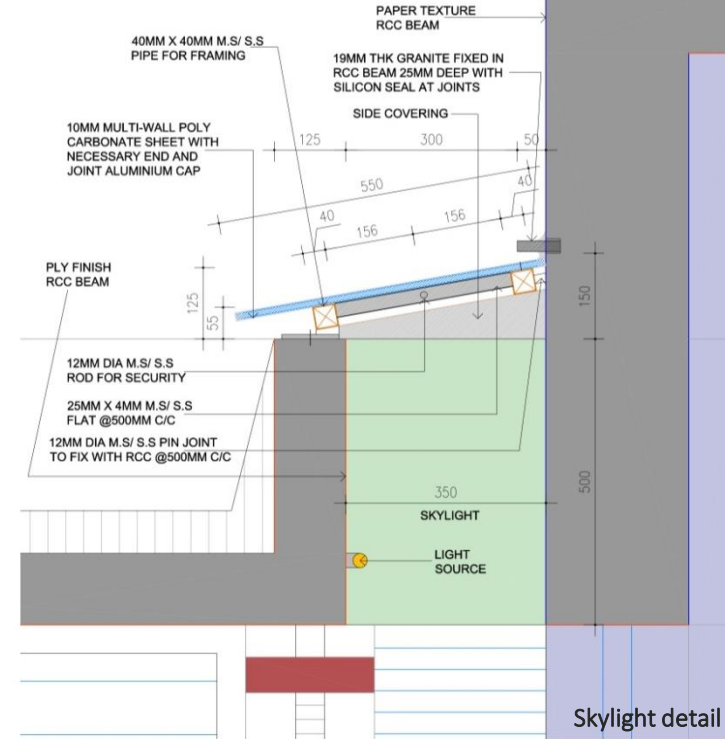
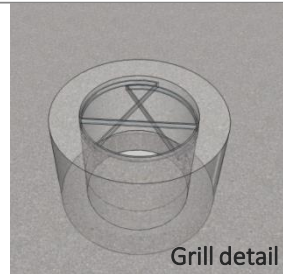
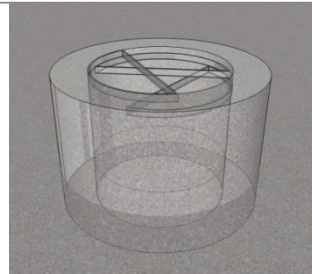
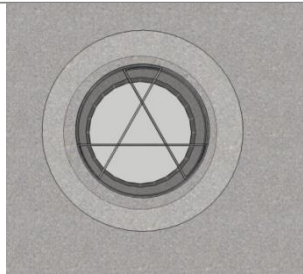
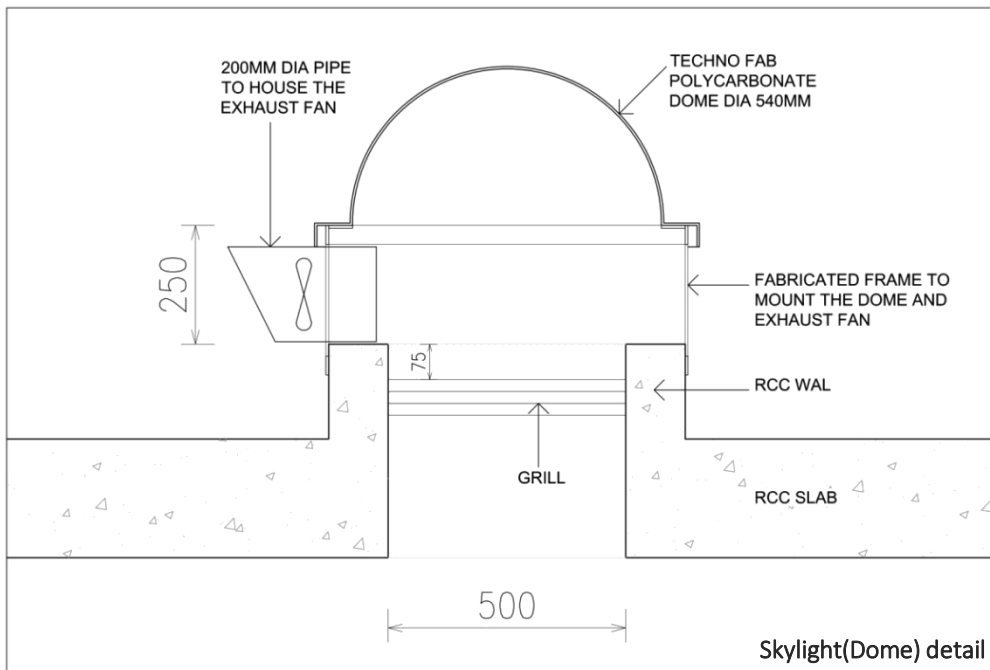


The louvered walls on the north and south of all the spaces enable natural daylight in all these habitable spaces throughout the day. Further to this, there are number of skylights in the living space and the movement tunnel to bring in more daylight. The bathrooms have interesting endeavours in various types of skylights, which combine with the textured concrete walls creating mesmerising user experience. The grid connected rooftop solar photovoltaic cell panels generate almost 8 KW of electricity, which nearly takes care of almost the total power needs of the house.

DAYLIGHT- A CRUCIAL MATERIAL



DAUGHTER'S ROOM BALCONY

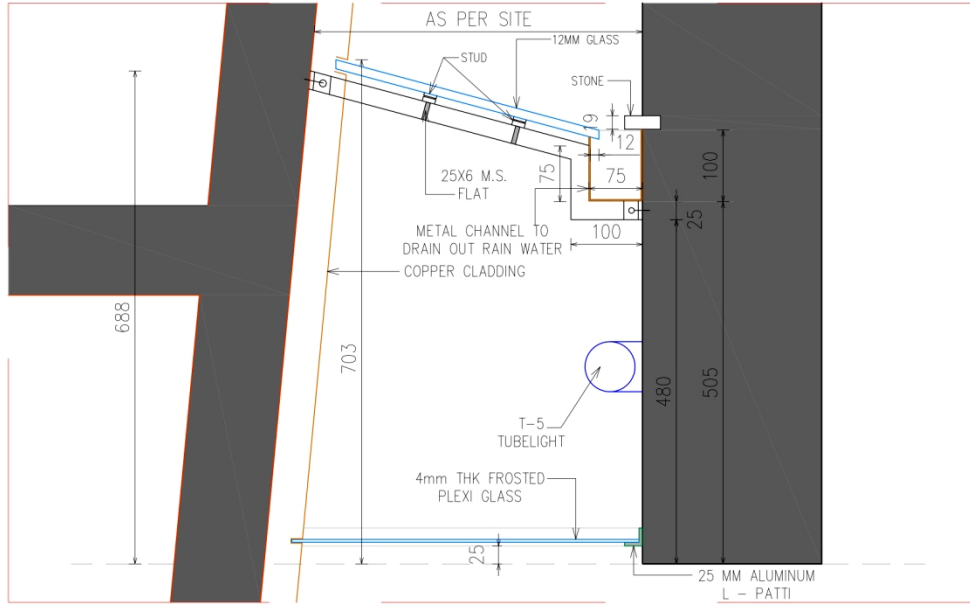




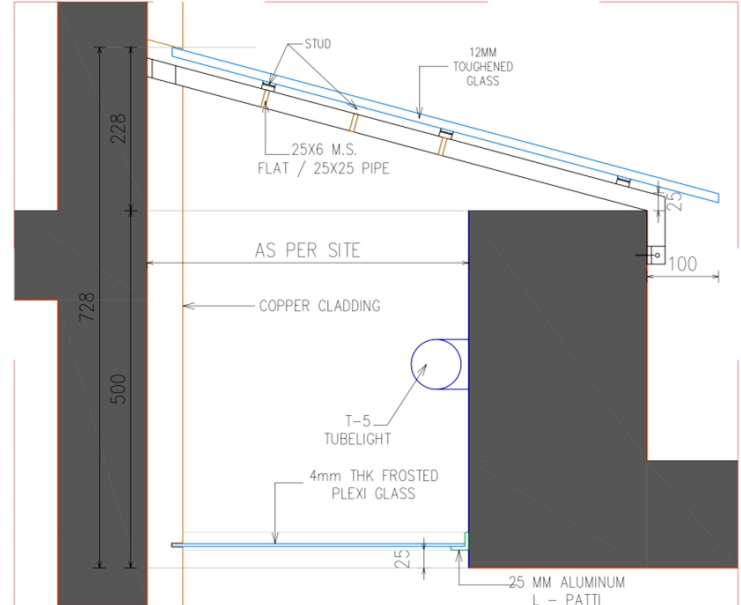
DAYLIGHT- A CRUCIAL MATERIAL



DAYLIGHT- A CRUCIAL MATERIAL



Skylight detail 1



Skylight detail 1



PASSAGE LEADING TO PUJA ROOM

DAYLIGHT- A CRUCIAL MATERIAL



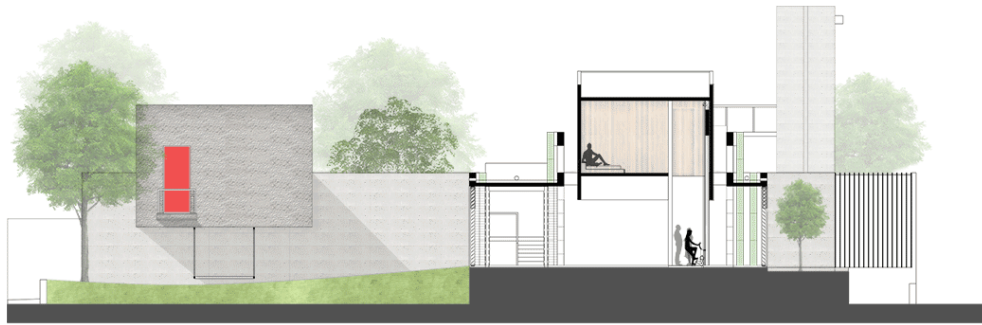
LIVING AREA

DAYLIGHT- A CRUCIAL MATERIAL



LIVING AREA

DAYLIGHT- A CRUCIAL MATERIAL



The living room has a very interesting looking square wooden platform on the floor with a bicycle seat and paddles mounted on a stand. Its an elevator which can take about three people at a time to the upper level family room, with one person paddling to make this happen. This is a very complex piece of engineering considering the various aspects of human safety and with a electrical override to the bicycle, to call the elevator. This is possibly, the greenest elevator for human transport in the world.





ELEVATOR ON GROUND FLOOR (LIVING AREA)



ELEVATOR ON FIRST FLOOR (MULTIPURPOSE ROOM)

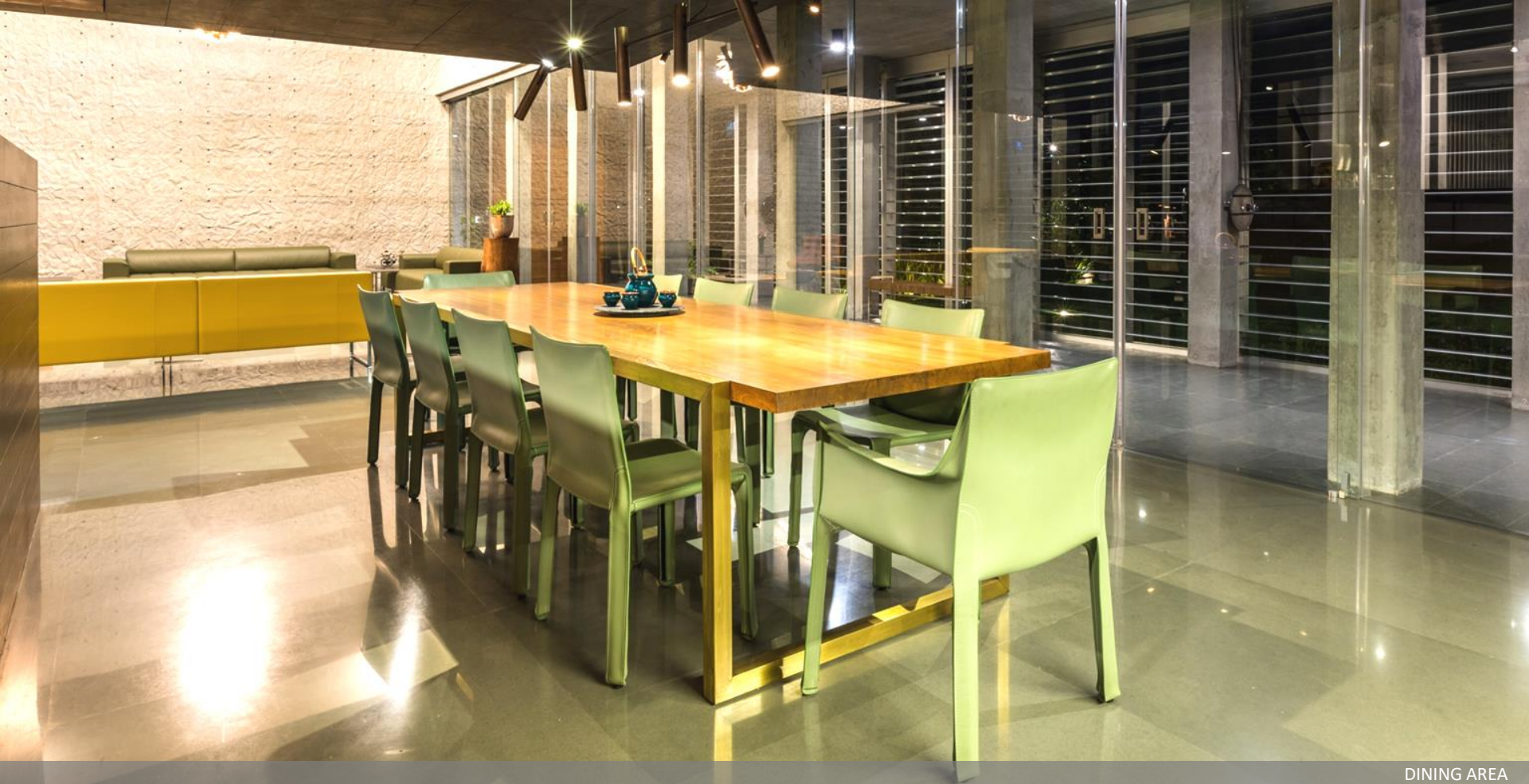


ELEVATOR ON GROUND FLOOR (LIVING/ DINING AREA)

For the general lighting of the bedrooms and the living room, a very simple yet interesting luminaries has been designed, calculating the various angles to minimise glare, and maximise the light in the spaces. The dining area has another interesting luminaire designed using randomly suspended tubes with narrow beam LED light source.



LET THERE BE LIGHT



DINING AREA

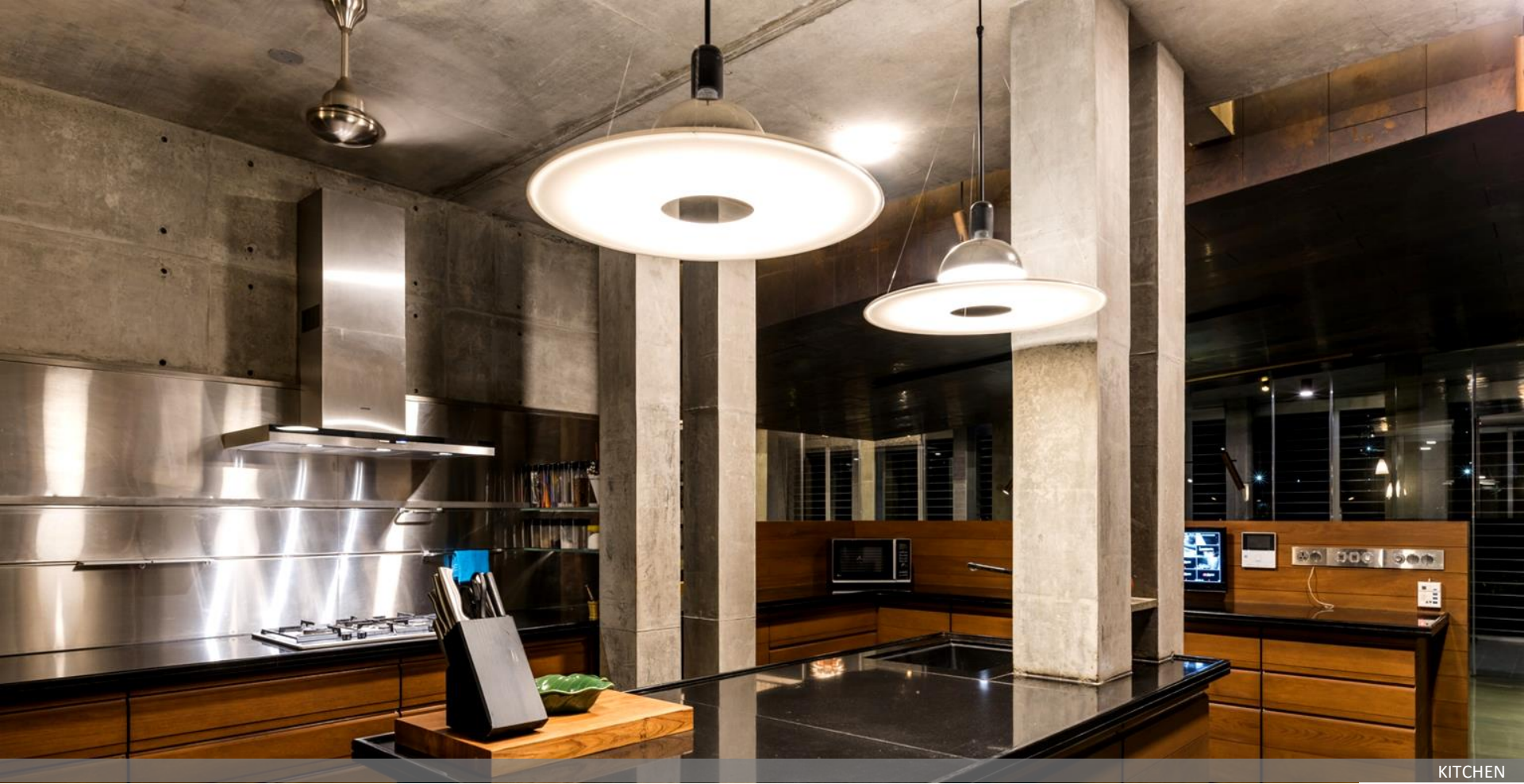
LET THERE BE LIGHT

 essteam



LIVING AREA

LET THERE BE LIGHT



KITCHEN

LET THERE BE LIGHT

 essteam



DAUGHTER'S BEDROOM



PASSAGE LEADING TO PUJA ROOM

LET THERE BE LIGHT



As you enter any bedroom, you will be surprised to see large piece of leather hanging vertically right over the bed with a complex looking metal assembly fixed to it. This is a modern version of the Maharaja fan traditionally found in the good old days when there was no electricity and the ceiling fans that we see today. The spinoff is that the assembly helps you control the speed of the oscillations of the leather plane, thereby controlling the amount of breeze the user needs in the room.

THE MAHARAJA FAN





MASTER BEDROOM

THE MAHARAJA FAN

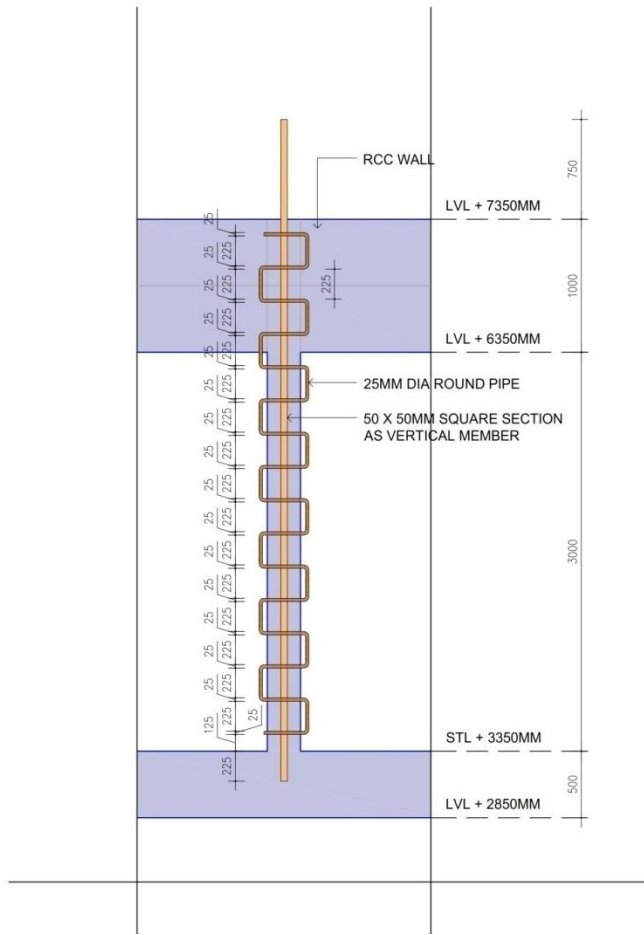
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PARENT'S BEDROOM

THE MAHARAJA FAN

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FAMILY COURT

THE LADDER

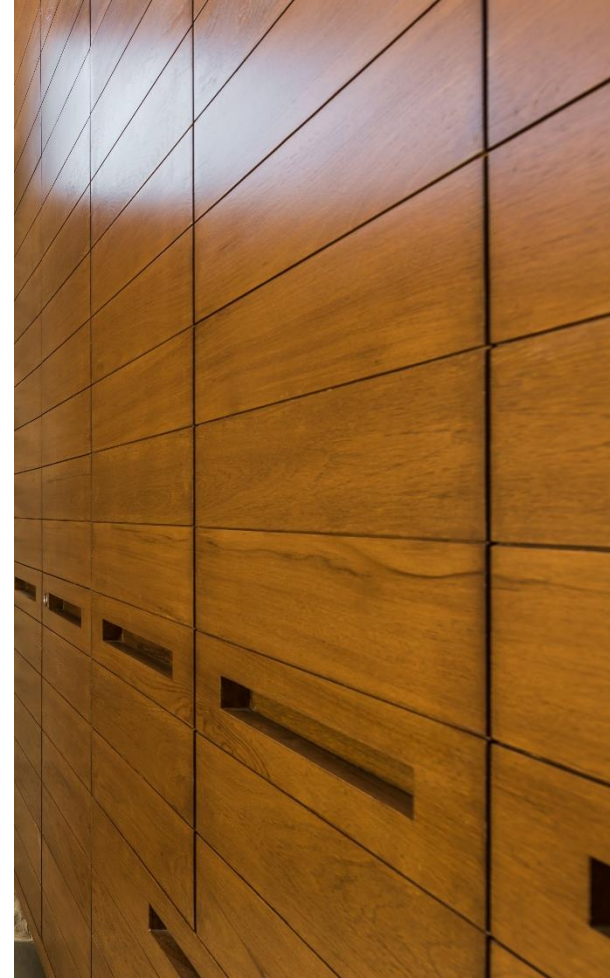
In most of the pieces of furniture that were designed in the project, the effort was always to challenge the limits of engineering to come up with solutions which add significantly to the human comforts.

One such example is the huge **concrete coffee table** in the living room. The coffee table looks massive, but is constructed out of very thin Ferro-cement and with hidden castors; a small child can move the furniture piece with no significant effort.

Another interesting piece of furniture is a small **bench** lying in the veranda along the public block of the house. The bench is constructed using independent pieces of wood tied together using tensioned metal rope. As a result, when one sits on the bench, the wooden pieces get displaced to accommodate the contours of the person sitting on it.

Similarly the **Puja Space** has an interesting copper box, which takes care of all the complex functional and storage needs of the user, leaving the space absolutely neat after the Puja.

The beds and the wardrobes exhibit some very interesting joinery and junction details in solid wood. The huge garage gate (12m x 2.4 m) is constructed in aluminium sheets, but extremely easy to operate.





CONCRETE COFFEE TABLE IN LIVING ROOM



CONCRETE COFFEE TABLE ON DECK



PUJA ROOM



BENCH



FURNITURE DESIGN



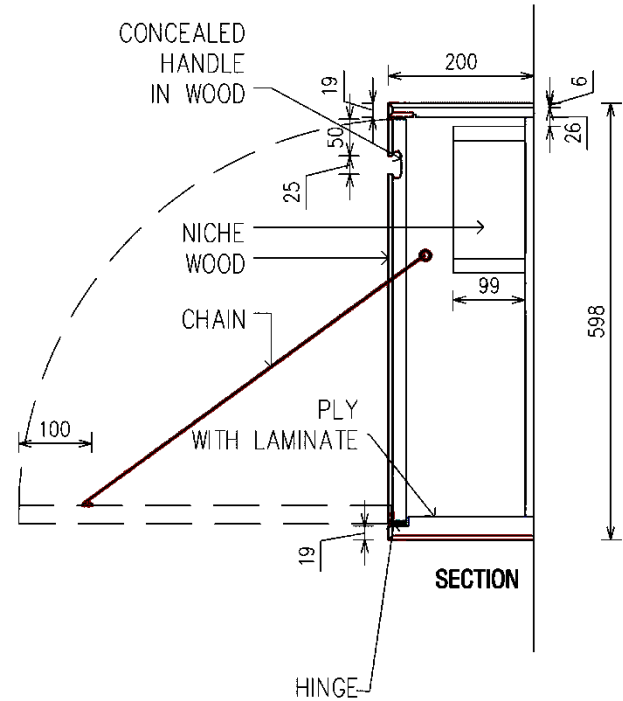
DAUGHTER'S BEDROOM DRESSING



The idea of creating pieces of furniture as evolved, and well engineered products continues in most of the products and furniture pieces designed for the house. A study table for son's room which can be just closed when not in use to make the space neat and minimal is a result of a number of attempts to get it right. The elevated copper box houses a very important part of the house; the Family Room. This place reached by the 'bicyclelevator' is created using just one basic material - Teak Wood; be it storage, wall and ceiling lining, the informal seating or the storages. This cosy and warm room happens to be the most utilized and cherished space for the family!



SON'S BEDROOM- STUDY TABLE





SON'S BEDROOM

LESS IS A LOT MORE

 essteam



SON'S BEDROOM



SIDE TABLE

LESS IS A LOT MORE



MULTIPURPOSE ROOM

LESS IS A LOT MORE





MULTIPURPOSE ROOM

LESS IS A LOT MORE



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