

### Case study for Home Construction

Every person dream of having a home perfectly matching to their lifestyle and requirements. In the same way, Mr. Ivan decides to construct his dream home and puts forward the idea of building a house to his family. His family consists of his wife, a college going daughter and a son, who is an IT professional. His parents stay with him, and they have a maid cum cook who works in the daytime and are currently residing in a 3BHK flat which is 15 years old. As his family will expand in 2-3 years' time, he decides to construct a house that would cater his family's requirements.

Ivan earlier thought of selling his ancestral property as partial fund for constructing the house as the savings he and his wife had wouldn't be enough. However, after discussing with the family, his son and parents also wishes to share their savings for the house construction. Now, that he has enough budget to start the project, he discusses about various options of getting the house constructed. To buy a villa, or land near his son's office which is in the city. However, getting good plots of desired size in the city is not an easy task. Ivans bucket list included the following:

- Natural lighting to hall, dining space and kitchen
- 2 bedrooms in ground floor and 3 bedrooms in 1<sup>st</sup> floor
- Space for pets and aquarium
- Work from home facility
- Prayer room
- Overhead Cupboards and wardrobes
- Things easily accessible to his mother who uses a wheelchair
- A courtyard with daylight
- Space for relaxation and entertainment
- A room for guests
- Parking space for 2 cars and 1 two-wheeler
- Air conditioning in bedrooms
- Space for gardening

He comes to know of a township development within the city. The developers provide a choice of either constructing an architect approved typical villa or the owner can construct a villa of his/her choice. The township has facilities of gym, club house, swimming pool, children's park etc.

Ivan decides to buy land inside the township from the developers and construct house of his own. He checks with his fellow colleagues, friends and find out an Architect who is specialised in contemporary home design. He briefs the Architect about his requirements and shows a sketch made by his wife and daughter. There is a requirement of 8-seater dining table and a corner sofa set. A living space in the 1<sup>st</sup> floor with recliners and a screen for gaming and entertainment. The Architect comes up with a basic layout. It undergoes iterations before freezing it. The detailed plan is prepared and submitted for building permits and approval from governing authorities.

A BIM model of the proposed villa was made by the 3D team of Architect to check for viewing and clash detection. It was found that the mid landing of staircase had a clash with the cupboard bellow. The size of the cupboard was reduced accordingly.

Mr. Ivan prepares a schedule for the project with help of his Architect:

Applied Project Management Program (APMP) – Case Study #1

SL.NO	TASK DESCRIPTION	ASSIGNED TO	START DATE	END DATE	DURATION
1	Planning	GC	21-Sep-21	11-Oct-21	20
2	Raw Material Accumulation Complete	GC	01-Oct-21	13-Oct-21	12
3	Basement Creation	GC	06-Oct-21	25-Oct-21	19
4	Floors Creation	GC	25-Oct-21	24-Dec-21	60
5	Wiring work	Electrical	01-Jan-22	27-Jan-22	26
6	Sewage Pipelines	Plumbing	13-Jan-22	21-Jan-22	8
7	Painting	GC	25-Feb-22	27-Mar-22	30
8	Accessories Installation	Plumbing	19-Jan-22	10-Feb-22	22
9	AC Installation	Electrical	29-Jan-22	05-Feb-22	7
10	Parking Space	GC	29-Jan-22	20-Feb-22	22
11	Appliances	Electrical	10-Mar-22	16-Mar-22	6
12	Plumbing	Plumbing	10-Jan-22	16-Jan-22	6
13	External development - Hardscape	Hardscape	22-Feb-22	14-Mar-22	20
14	External development - Landscape	Landscape	28-Feb-22	07-Mar-22	7
15	Final Inspections	Architect	27-Feb-22	03-Mar-22	4
16	Wrap up	GC	03-Apr-22	13-Apr-22	10
17	House Cleaning	GC	10-Apr-22	20-Apr-22	10
18	Complete		21-Apr-22	01-May-22	10

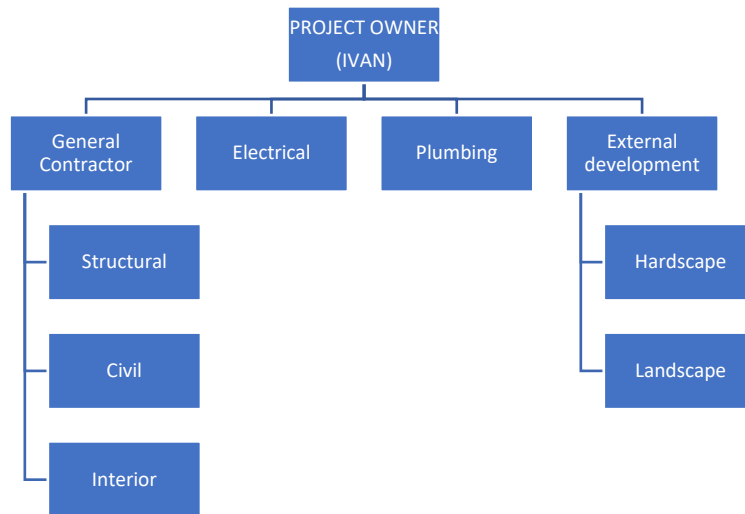
After receipt of approval, he evaluates the contracting model if he must award the works to a general contractor or hire individual contractors for each package. During evaluation, he understands that it will become difficult for him and family to do all coordination in case of individual contractors and Ivan choses to execute the work with the help of a general contractor who does structural, civil, and interior works.

He shortlists few contractors suggested by the Architect, friends, colleagues, relatives. He decided to share the BOQ with 5 bidders say A, B, C, D, E. He takes their quotation. The techno-commercial comparison is done by his consultant friend. It is found that 2 of the contractors (D and E) do not have in house labours and Ivan decides to eliminate them for the next round of bid submission in which the specification for interior works is changed. Ivan receives the 2<sup>nd</sup> round of submission and does the evaluation in which he finds that one of the contractors (A) had quoted very high while the other two (B and C) are at comparable rates. Ivan calls them for a meeting with the Architect. During the negotiation it is found that Contractor B has executed more similar projects in the same locality where Ivan had decided to construct the house. He gets a good discount from Contractor B as he has in-house labours for interior works. The work is awarded to Contractor B. The payment terms agreed are:

- Advance- 5%
- Upon completion of foundation 15%
- 1<sup>st</sup> floor slab casting – 20%
- Terrace slab casting –35%
- Plastering, doors and window frame fixing – 20%
- After 6 months of occupancy – 5%

## Applied Project Management Program (APMP) – Case Study #1

Ivan decided to go with individual contracting for electrical, plumbing works and external development. The procurement of approved materials and execution of works is scoped under these contractors. Under external development, the hardscape part and landscape part is sub-contracted separately. The following resource breakdown structure is prepared:



The setting out of land is done and the foundation works are completed. Further, the wall construction starts, the lintels are casted. The 1<sup>st</sup> floor slab casting is done. Similarly, the 1<sup>st</sup> floor works are completed. The structure works gets completed in 3 months' time.

The chasing works for electrical and plumbing works were in progress and works got stopped due to heavy rains. The labors could not reach the site due to flood. The plumbers and electricians returned after 2 week, meanwhile the civil works were resumed. While the plumbing works were resumed, it was found that the chasing made by plumbing contractor was closed by civil vendor without prior information to plumber. This leads to an issue at the site. The GC informed that his labor was not aware and that labor charges and material will be billed as it is causing a rework.

The GC requests Owner to accept his additional works claims request. However, Ivan investigates the issue and holds a meeting with the GC and the Plumbing contractor. It is found that the GC has closed it without checking with the Plumber. However, due to the rework, Ivan decided to pay half the amount of material and labor that costs the GC.

During middle of project Ivan tracks the progress of Project on 15-Jan-22:

SL.NO	TASK DESCRIPTION	STATUS	ASSIGNED TO	START DATE	END DATE	DURATION
1	Planning	Complete	GC	21-Sep-21	11-Oct-21	20
2	Raw Material Accumulation Complete	Complete	GC	01-Oct-21	13-Oct-21	12
3	Basement Creation	Complete	GC	06-Oct-21	25-Oct-21	19
4	Floors Creation	Complete	GC	25-Oct-21	24-Dec-21	60
5	Wiring work	Complete	Electrical	01-Jan-22	27-Jan-22	26
6	Sewage Pipelines	Complete	Plumbing	13-Jan-22	21-Jan-22	8

Applied Project Management Program (APMP) – Case Study #1

7	Painting	In Progress	GC	25-Feb-22	27-Mar-22	30
8	Accessories Installation	In Progress	Plumbing	19-Jan-22	10-Feb-22	22
9	AC Installation	In Progress	Electrical	29-Jan-22	05-Feb-22	7
10	Parking Space	Not Started	GC	29-Jan-22	20-Feb-22	22
11	Appliances	On Hold	Electrical	10-Mar-22	16-Mar-22	6
12	Plumbing	In Progress	Plumbing	10-Jan-22	16-Jan-22	6
13	External development - Hardscape	In Progress	Hardscape	22-Feb-22	14-Mar-22	20
14	External development - Landscape	In Progress	Landscape	28-Feb-22	07-Mar-22	7
15	Final Inspections	Not Started	Architect	27-Feb-22	03-Mar-22	4
16	Wrap up	Not Started	GC	03-Apr-22	13-Apr-22	10
17	House Cleaning	Not Started	GC	10-Apr-22	20-Apr-22	10
18	Complete	Not Started		21-Apr-22	01-May-22	10

Ivan decides to go with wooden doors for rooms, PVC doors for washrooms, Sliding UPVC windows. The Architect suggest going with gypsum plaster for halls, dining space and bedrooms and cement plaster for wet areas (washrooms, kitchen) exterior to which Mr. Ivan agrees. It is decided to go with vitrified floor tiling.

While procuring, the sanitary fitting and accessories, there arises a confusion on the brand as the Architect had considered Hindware. However, Ivan’s son would like to go with Jaguar as he loves the designs of Jaguar. The Architect approves it as the brands are comparable. Considering the total cost of accessories and fittings, Jaguar cost was on the higher side. Ivan had the budget to accommodate the price as he had saved money by doing gypsum plaster in few spaces. Moving on to the fixed furnishings, the GC suggests two options for the finishes of kitchen cabinets, overhead cupboards, wardrobes – Laminate finish and PU Paint. Providing PU paint finish for all cupboards and cabinets was going way beyond his budget dedicate for interior works. Hence, he decides to give PU paint finish only for kitchen cabinets and laminate finish for bedroom wardrobes, overhead storages, and other cabinets. Also, regards to fittings of cupboards, Mr. Ivan asks the GC to provide Hafelle make as the quality is good.

The painting works get completed in the planned time as the GC had mobilised a team with accommodation nearby the site for 1 month.

Ivan’s wife is interested in Gardening and thus, the external development is done with lawns, pebbles, with a small waterbody.

After completion of works, the excess materials, wastages etc. are removed from the project site. A deep cleaning of the house is done. The home appliances are all moved in.

## Applied Project Management Program (APMP) – Case Study #1

The snagging of the house is done, and the following points were noted:

- Alignment of the door
- Alignment of cupboards
- Finishing of grouting done inside the toilet
- Water leakage in ground floor bedroom toilet
- Silicon filling around gaps of windows to be filled and finished properly
- Unevenness of work area wall to be rectified

The issues were all rectified and Ivan moved to the newly constructed house with his family. The balance amount of 5% was given to the contractor after rectification of the dampness in one of the toilets in 1<sup>st</sup> floor.

