Space Consultants

STATE OF THE MARKET

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Building Market

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Market Gap Analysis

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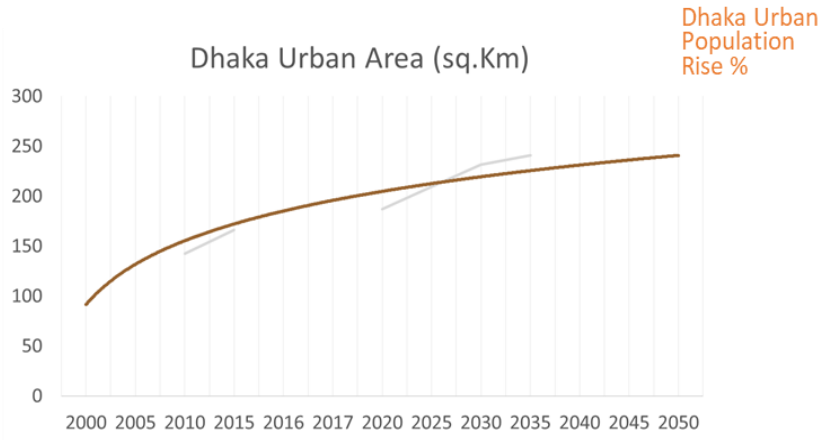
Introduction

Contest in the Bangladeshi real-estate construction market, since the 1980s, has typically come in short waves. Amidst macroeconomic pressures, the recent political stability has given way to a development boom for our economy. A rising GDP, increased consumer spending, and healthier business climate are living testaments to this optimism. Many now believe the economy is transitioning from a sideways market and preparing for the emergence of the next bullish wave, i.e. the current investment and development cycle will be long and immensely profitable. Now we will consider the domestic and regional AEC market to identify emerging gaps and opportunities.

Demand Market

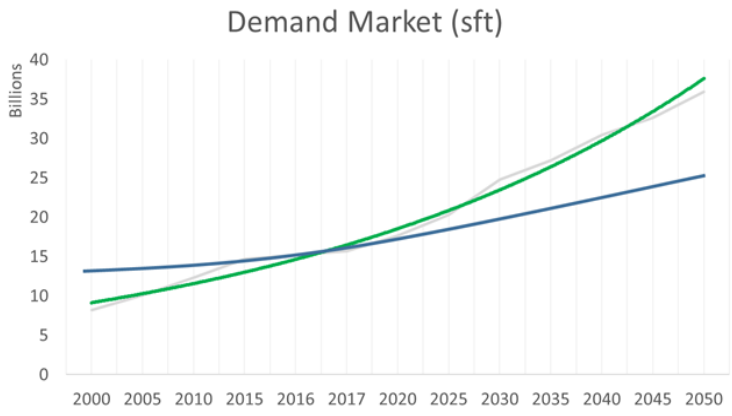
Social migration will drive the next construction surge

Bangladesh has a population of 160 million, most of whom are below 35. With an urban population of 34.3%, or about 55 million, and growing at a rate of 3.55%, Bangladesh is witnessing the migration of more than 2 million additional folks to urban cities every year, while more and more Dhakayas are undergoing social migration into an expanding middle-class. As a result, there is a very high demand for housing, with increasing purchasing power. By 2035, UN anticipates Dhaka to be the 6th most crowded city with a population of more than 26 M – that is, a market of more than 120,000 people per square kilometer, with housing and infrastructure needs (first graph below). Meeting this challenge will require expanding developable urban land by 45 %.



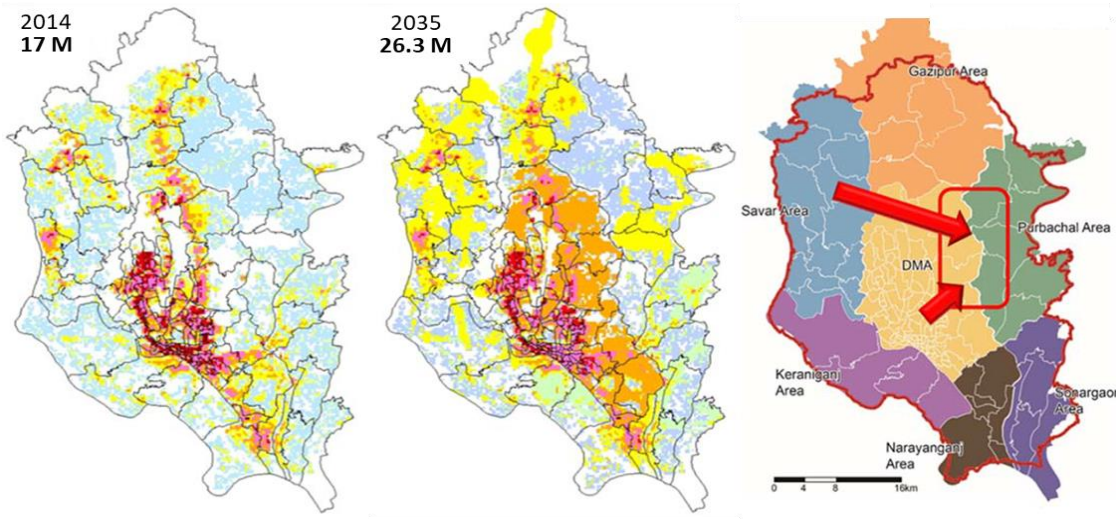
Market Growth Analysis

It is also estimated that by 2050, 18 million more people will be displaced from the low-lying villages of the Gangetic plains near the Bay of Bengal because of rising sea levels. If we consider ongoing and planned construction trendline over the last two decades and forecasted over the next three (second graph), we can identify the emerging housing market gap. Watchdogs have already warned of an acute affordable-housing challenge. There is need for re-generation of urban areas in existing cities and the creation of new, inclusive smart cities. According to the World Bank, meeting this challenge will require expanding the amount of developable urban land by almost 45 % – between 2010 and 2050.



Future new developments to be focused on North-Eastern direction towards Purbachal

Explosive population growth from rapid peri-urban expansion over Savar and Gazipur region is now saturated above the average growth rate of the entire region. Now, population density easing dictates we accommodate the growth in certain points in a compact way outside of the core city towards existing urban agglomerations, such as in Uttara RA, Purbachal New Town, and Jhilmil in the immediate future.



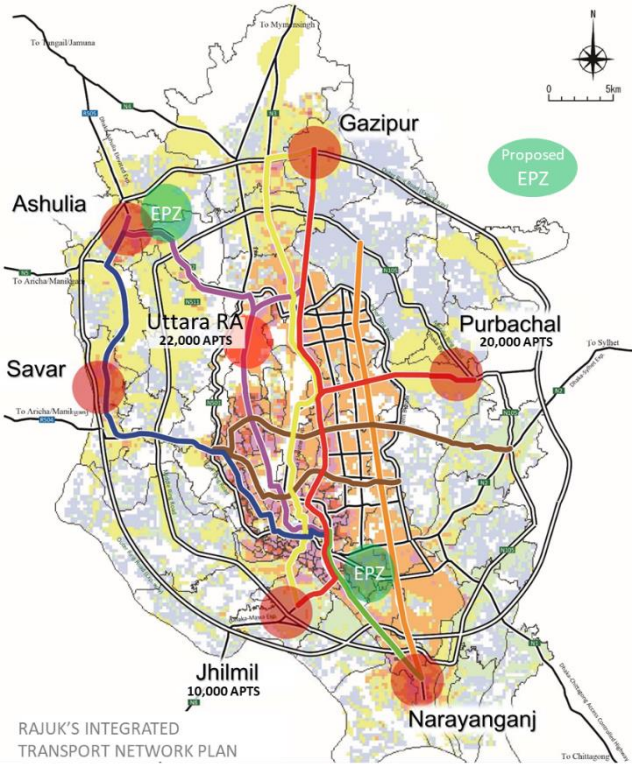
Even the current RAJUK Chairman, M Bazlul Karim Chowdhury, is quoted to have said :

> "*The government has a plan to build Purbachal new town project a smart city where quality infrastructure and all modern amenities will be set up for ensuring residents a high standard of living*,"

RAJUK's Spatial Planning around Monorail and Three-Ring Road Network

Per the 2016 Dhaka Structure Plan plan, RAJUK is currently planning for New Township Development and decentralized Urban Service Centers by focusing on Compact (high-rise) development, where varying concentrations and combinations of retail, commercial, civic, cultural and residential uses are focused around transport facilities. These include High-Rise Apartment Projects such as, to name a few :

- 20,000 Apartment at Purbachal New Town
- 22,000 Apartment at Uttara Residential Area
- 10,000 Apartment at Jhilmil Residential Area
- Developers are already investing in and around Purbachal New Town, with promos such as : Purbachal Hill City, Purbachal Lotus Valley, Purbachal American City, Asian Duplex Town



Real Estate Market

Bangladesh is witnessing a Renewed Focus in Construction

All these investments in infrastructure and private sector development are pivoting the nation to consider bigger and bigger projects. Indeed, both cement, ready-mix and steel suppliers are all enhancing their production capacities in anticipation. This is not surprising, as we are gearing up to become a middle-income nation by 2022.

Infrastructure projects will have huge Spillover-Effect

Under the Hon' Prime Minister's Fast-Track scheme, PPP and EPC projects have recently seen an upsurge. Government, quasi-government and development organizations are hiking spending budget to keep pace with our recent GDP-run vis-à-vis emerging demand gaps. Some the prestigious projects underway are the Payra Sea-Port, Rooppur Nuclear Power Plant, Padma Bridge and Metro Rail. The completion of these projects will see the mushroom growth of compact residential settlements along points of trade and industry. Whether the project is a fly-over or low-cost housing, the default material for infrastructure is precast concrete.

Shifting Demand Market with expanding Middle Class

Today, demand for higher standard of housing and sophisticated spaces is driving the premium residential and commercial construction market. Preference for steel in high-rise buildings and shopping malls has is rising due to curved architectural features, and quicker ROI. The expanding middle class with increasing spending capacity are typically looking for an apartment building at the rim of commercial areas or suburban communities. Businesses are looking for office space in exclusive city-center locations.

Compliance & Safety driving Design-Build in Industry

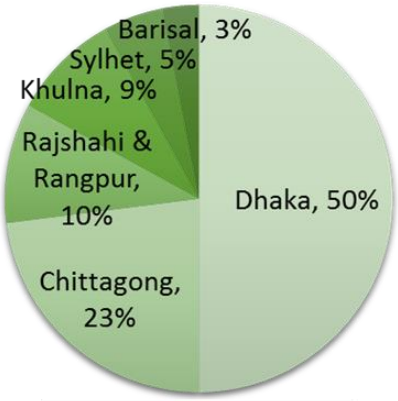
In case of plant superstructures and factories, structural steel is the defacto construction material of choice. Industrial investors are continuously improving and expanding their facilities, evident in the fact that more LEED-certified factories are being built YOY.

Building Market

The Cement and Steel industries are often considered as the backbone of the economy, reflecting the development and performance of the overall economy. A period of industrial growth is typically matched by prosperity in the iron and steel sector. This is true even in the case of Bangladesh, which has seen a robust 6 to 7 % GDP growth since 2010 – significantly higher than for many other emerging markets. As we have seen previously, the demand for composite structures in all market segments is expected to evolve in the future. This is also evident in the shift in import patterns of finished and semi-finished construction materials.

Finished & Semi-finished Construction products	2015 Market			Growth rate % Change	2022 Market			Market share % Change
	Share	Value in Units	Value in BDT		Share	Value in Units	Value in BDT	
Cement & RMC	40%	20 M Tons	Tk. 200 B	20%	29%	24 M Tons	Tk. 240 B	– 11 %
Long steel – bars & rods	39%	2.6 M Tons	Tk. 195 B	15%	46%	5.2 M Tons	Tk. 390 B	7%
Flat steel – plates & sheets	21%	1.4 M Tons	Tk. 105 B		25%	2.8 M Tons	Tk. 210 B	4%
Total Available Market			Tk. 500 B				Tk. 840 B	

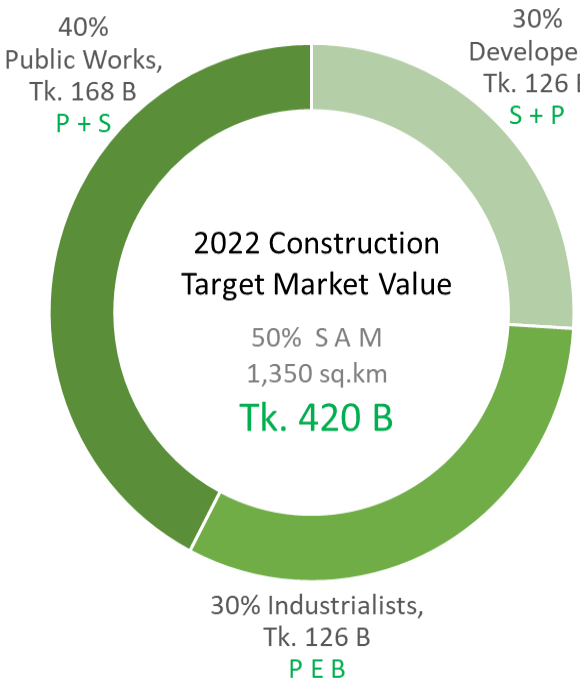
*According to a **Cement** Sector Report by Royal Capital, Prothom Alo and Daily Star articles,* the approx. Cement Market size is around Tk. 200 B, of which Governmental projects through ADB consume around 43%, and on average, 15,000-20,000 MT of cement is being exported every month. Considering the sales distribution of Cement, we can confidently assume that 50% of the building market rests in Dhaka, which is our Serviceable Available Market. However, cement sector return remains in negative zone due to underperformance. While industry experts expect the industry to grow by an annual average of 20-25% over the next 5 years, they also forecast that the domestic capacity might fall short of supply if demand increases in line with big infrastructural public projects are implemented in the future.



Total Cement Sales by Area

In case of Steel, the industry can be categorized into two classes of products based on shape: long steel (MS rod/TMT bar) and flat steel (Plates, Hot Rolled Sheets, Cold Rolled Sheets and Coated Sheet). In Bangladesh, most construction steel can be traced to the local production of long products, most of it in reinforcing steel, or, M.S. Rods. However, there is no exact year-to-year data regarding the production and market share of the industry. According to the leading manufacturers, more than 4 M Tons are currently produced domestically, representing an approx. market value of Tk. 300 B. To segregate the structural steel segment of the construction market, we analyzed import trends and found the split between long steel and flat steel finished and semi-finished products to be 65 – 40%. With an annual industry growth of 15%, production is expected to double in 2022.

High-Rise Economy is emerging despite Capability Gaps



Modeling the previous forecasts suggests cement and RMC suppliers will lose 11% of present construction market share to steel suppliers by 2022 – at which time, the construction market will be worth Tk. 840 B. considering the sales distribution of Cement, can confidently assume that 50% of the building market rests in Dhaka, which is our Serviceable Available Market. Considering Public Works and Commercial consumer preferences, that's a Tk. 168 B Precast Concrete and Tk. 126 B Structural Steel construction market – worth almost Tk. 300 to cross-domain material sales.

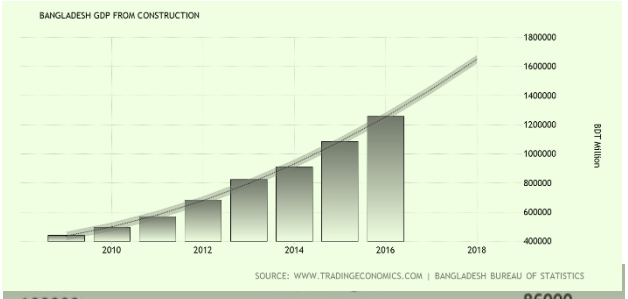
However, a PEB Demand Supply gap is emerging. PEB demand market size is worth 20 B and growing at > 35%, but local suppliers can meet 85 – 90% of demand, while the rest is imported. Thus it is not surprising that import of semi-finished and finished steel products are trending upwards YOY. In response, recent budgetary protection measures are hiking duties on import of finished and semi-finished steel by as much as 45%. This will undoubtedly impose the demand for structural steel onto local steel suppliers.

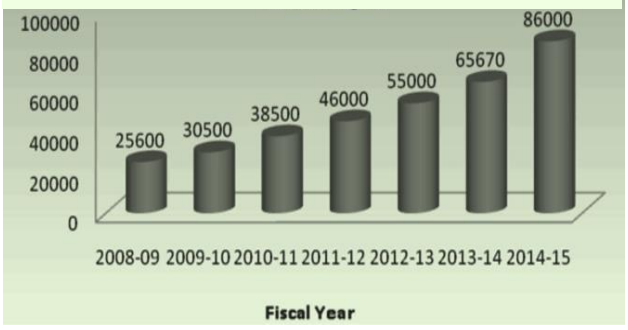
Domestic Construction Market

Dhaka, once dubbed as the fastest growing megacity, is planned for a growing pipeline of large infrastructure projects. Amid continued urbanization, the construction sector of Bangladesh has grown considerably during the last two decades, accounting for about 10 % of the national GDP today. The government's development projects – building of infrastructures, including roads, bridges and flyovers – continues to be a big boost to the manufacturing and construction sectors, resulting in higher production and consumption of steel and cement. Experts remain positive on Bangladesh's construction sector over the long term as the government continues to make meaningful progress in improving the country's institutional and regulatory framework.

According to the World Bank, Bangladesh had the third highest level of private sector participation (between 2011-2015) in infrastructure investments (worth USD2.7bn) in energy, transport, water, and sanitation sectors among 56 countries that are eligible for support from the International Development Association (IDA). US-based think tank, BMI research forecasts a continued construction growth of 9.5% in 2016.

GDP From Construction in Bangladesh is reaching an all-time high of BDT 1,257,537 Million in 2016. In the long-term, the Bangladesh GDP From Construction is projected to trend around 1,445,085 BDT Million in 2020. Cement demand is closely linked to the growth of the construction sector. Hence, when the construction sector is strong, demand increases.





Bangladesh is also investing heavily in infrastructure development, especially in power generation, highways, bridges, buildings and telecom. For the fiscal year 2014–15, the Planning Ministry has allocated Tk. 86,000 crore for infrastructural development under the Annual Development Program (ADP). Figure shows the budget size for the fiscal year of 2014-15 compared to previous years: average budget growth rate of > 22.46% –a clear indication that civil construction development work in the country is increasing.

Poor infrastructure has contributed to immense urban congestion and poor quality of life for our people. It has impeded urban growth and industrial investment since a viable infrastructure is key to mobilize a modern economy if we are to realize our national Vision 2030. As a nation we have just embarked on a serious power and transportation infrastructure-building journey. Few are quick to realize that proper national development is only possible through expansion of industrial capacity and infrastructural support by means of self-sufficiency.

Regional Construction Market

Over its 50-year worldwide history, hollowcore slabs have penetrated in all market segments, from low-cost housing to Olympic stadiums. Hollowcore has proven to be a universally adaptable product, to a host of adverse field conditions. Only recently has precast technology been introduced in our Southeast Asian region. We can already see initiatives in India, where precast has already proliferated the housing industry due to large size projects, need for quality construction with speed & reduced labor force.

Precast is ideal for Affordable Housing

The Advantages that Precast Concrete Technology has to offer can be exploited to the fullest for Mass Housing Projects comprising of small, compact size apartments in large volumes.

SRA scheme at Bhoiwada, Mumbai
2500 apartment Slum Rehab Project
G + 23 Storied 6 Blocks
Precast Solid Slabs (room size) and Load bearing Precast walls

Plaza-type Hostel, Hotels & Hospitals Gain from Repetition

Generally, hospitability buildings like hostel, hotel or hospital are plaza type structures the need large column free spaces for dining halls, restaurants, operation theatres etc. at ground floor level while modular rooms in superstructure. This requirement can be effectively catered for by adopting precast portal frames at ground floor supporting the precast load bearing walls of superstructure. The requirement of modular rooms in superstructure makes the precast concrete technology effective due to repetitions and volume.

Hostel Building, Tamil Nadu
210 hostel rooms
Dining Hall at Ground floor
G + 10 Storied 2 Blocks

Developer Quality Control in Med to High-End Condominiums

Medium / large size apartments can be conveniently constructed using precast concrete technology by adopting precast pre-stressed hollow-core planks as flooring which have a large load / span carrying capacity thereby eliminating the need for load bearing walls between the rooms or even the bearing walls between the rooms or even the apartments. By minimizing the need for load bearing walls, the interior layout of the apartment becomes more flexible; which is a strong sales point for such apartments. The elevation treatment of these buildings can be made interesting by adopting decorative precast walls / spandrels on exterior.

Tata Peenya, Bangalore
1,892 Apartments scheme
Basement + G + 14

Max Speed-2-Market for Commercial Shopping Malls

Commercial buildings are essentially column-beam framed structures requiring large column free areas. This demands high span / load carrying capacity of the floors. The pre-stressed precast hollow-core floor slab is obviously the best solution for such projects. The columns & beams in such structure can also be in precast & the structural stability can be achieved by adopting precast / cast in place concrete walls at core areas.

Marvel Sangria, Pune
Commercial Building of 250,000 sft
Shops at Ground & Mezzanine floor
B+G+3 Storied 3 Blocks

Market Trends

Fast-growing cities will present a wider range of risk and reward. New institutional-grade real estate locations will emerge as the world becomes multipolar. In countries such as China, India and the Gulf states, entire new cities are being built, while in countries such as Brazil, Mexico, Nigeria, South Africa and Turkey, existing cities are developing fast. These cities are competing with each other to become dominant regional service centers. Cities that win these competitive battles and emerge as generators of wealth will provide attractive new prime investment opportunities.

Looking forward to 2020 and beyond, the real estate investment industry in Bangladesh will witness significant economic and social change, which is transforming the built environment. As real estate is a business with long development cycles – from planning to construction takes several years – now is the time to plan for these changes. The changing real estate landscape will have substantial implications for new investment strategies in the construction sector :

1. The global investable real estate universe will expand substantially, leading to a huge expansion in opportunity, especially in emerging economies. World population growth and increasing GDP per capita will propel this expansion. By 2030, investable real estate will have grown by more than 55%.

2. Fast-growing cities will present a wider range of risk and return opportunities. Cities will present opportunities ranging from low risk / low yield in industrial development, to high risk / high reward in commercial development.

3. Technology innovation and sustainability will be key drivers for value. All buildings need to be 'sustainable' in the broadest sense, providing their residents with pleasant places to live. Technologically-driven building design will disrupt real estate economics.

4. Collaborating with governments will become more important. Real estate managers, the investment community and developers will need to partner with government to mitigate risks of schemes that might otherwise be uneconomic. In many emerging economies, governments will take the lead in developing urban real estate and infrastructure.

5. Competition for prime assets will intensify further. New wealth from the emerging economies will intensify competition for prime assets. Industry players might have to develop assets in fast-growing but higher risk emerging projects.

A broader range of new risks will emerge. Climate change risk, accelerating behavioral change and political risks will have impending impact. In order to prepare for these implications, industry players will need to make sure they have optional capabilities and qualities in place, to adapt and switch gears with agility.

Market Gap Analysis

For us, Dhaka city's growth trajectory presents a wider range of risk and rewards as she enters the regional battle with other developing cities to become the dominant wealth generator. What is preeminent, however, is the need for tools that will allow us to meet project complexity at scale. The sheer pace of change being driven by new technologies is changing the competitive landscape. The growing market gap in multiple industries demands smarter products at a lower cost and faster commercial adoption cycles. Accordingly, there is an ongoing shift underway in multiple segments to transition from just creating products to developing critical solutions. In case of AEC sector, BPL has identified the following market opportunities to exploit :

Affordable housing is the beginning of families

Today, public housing is the beginning of families. It's the only affordable housing for young couples; it is protection from economic turmoil.

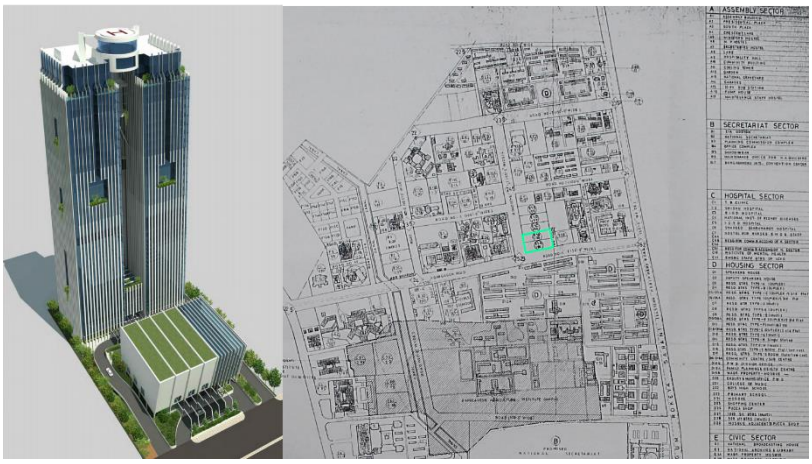
Apt cost	$300k
Combined Salary	$6k
Housing loans / mo	$3k
10-year pays	$360k

Continuous improvement allows for upgrading

Increasing reliance on foreign talent for complex public works and PPP projects

In anticipation of increasing economic activity, the government had already allocated plot to various bodies from the Assembly, Secretariat, Hospital, Housing, and Civil Sectors as per the Sher-E-Bangla Master Plan in 2006. Today, construction activity is underway. It is expected that the proposed development in Agargaon will feature mostly 25 to 35-storey administrative buildings.

Take, for example, the Conceptual Design for $100M IDB-BISEW's 30-storey Commercial HQ in Agargaon. With a -4s car park, the building features 5s of premium commercial space & atrium + 23s office space + 3s Connecting bridge + 3s boutique hotel & Rev. restaurant



It is our aim to position ourselves at the crux of the emerging AEC market gap and capitalize on the Precast opportunity.

Collaborative KPI is winning over the traditional subcontractor model

Increasing cost of raw materials and fierce price competition is diminishing the percentage of domestic value-addition in the domestic AEC sector. Better collaboration is needed not just between peer companies but also between companies of different types along the value chain. The current tendency is to push risk down the value chain instead of pulling innovations out of it. While subcontracting contracts are designed to help control liability, relationships are invariably strained since contractors are working to push down costs while others are seeking to benefit from budget increases. This competition, amongst other systemic and organizational root causes, leads to budget failures and a compromising build quality without owner knowledge. The only effective way to overcome this *Over-the-Wall syndrome* is using new collaborative forms of agreement to explore new liability rules and shift from a *best for me* mentality to a *best for project* mentality, to domesticate business volatility.

Around the world, Builders first solved this complexity by way of prefabrication under factory conditions. Designers solved it using Building Information Modeling. At BHS, we hope to offer the unique combination of BIM + Prefabrication to benefit all stakeholders. In our integrated design process, knowledge is managed virtually, accurately, and reliably. Design is continuously informed about constructability, schedule and cost impacts early in the design process so that decisions can evolve. Once design intent has matured, engineers can get to optimizing the structural model without any loss of project knowledge. In this way, the team acquires a higher level of knowledge about the project congruously by leveraging our integrated information management system from design through built-environment lifecycle. A more thorough building design—rigorously analyzed and imbued with construction knowledge—as a result, generates significant savings and accelerates all subsequent construction phases.

From a TCO perspective, this value addition (integrated design with prefabricated building components, or, Design-Build contracts) actually pushes our project risk tolerance outwards, generating a quicker ROI. In turn, this gives us the opportunity to commercialize design expertise in construction-optimization routines, such as in : Design for Target Cost, which is continuously filtering design options based on project cost impact as they do at TOYOTA; and Design for Assembly, which is incorporating machinability and ease of assembly in design considerations as they so at IKEA, to bring architectural control over constructability in the field. This will, in effect, motivate functional teams to collaborate in problem solving and innovate to mitigate project complexity.