



**2010 On Site Review Report**

3503.BAN

*by Gökhan Karakuş*

**Chandgaon Mosque**

*Chittagong, Bangladesh*



**Architect**

*Kashef Mahboob Chowdhury*

**Client**

*Faisal M Khan*

**Design**

*2006*

**Completed**

*2007*



# **Chandgaon Mosque\***

*Chandgaon, Bangladesh*

## **1. Introduction**

The Chandgaon Mosque is located in a village of the district of Chandgaon on the northern periphery of Chittagong, Bangladesh's 2<sup>nd</sup> largest city. Home to the country's largest port on the Bay of Bengal, Chittagong and the region around it have historically been the center of a robust trading and business culture which continues today. The city of 2,500,000 is a crowded, sprawling and heterogeneous urban center typical of South Asia. There is little in the way of meaningful public space or architecture beyond a few historical buildings.

Chandgaon village of around 4,500 inhabitants is on the northern limits of the city in an area that is quickly undergoing change as the result of economic expansion tied to the ready-made garments sector, one of the key drivers of Bangladesh's economy. While the village maintains its age old patterns of a rural and agricultural nature, rice paddies dominate the landscape, the pressures of real estate speculation and sprawl tied to the build up of factories of the garment business is starting to transform this area. The large Chandgaon Mosque sitting in the middle of these dynamics with its monolithic and geometric clarity makes a definitive architectural statement in a different direction. The monolithic and spare Mosque architecture points to the contemporary, to a desire to live in the universal values of the present-day. At the same time as a center for community activities the Mosque seeks to align architecture with a social sensibility. The Khan family, sponsors of the Chandgaon Mosque originating from this village have used the opportunity to construct this mosque as a contribution to the direction this part of Bangladesh can take as it moves into the 21<sup>st</sup> century in complicated times.

## **II. Contextual Information**

### **A. *Brief Historical Background***

Chandgaon's history has to be taken as part of Chittagong's history dating back to the origins of civilization in the Asian sub-continent. From the early Buddhist civilization up through British rule, this area like much of Bangladesh has been the site of many different cultures, languages and religions

Specifically Chittagong has been a seaport since ancient times and its character can be attributed directly to the exchange of goods and ideas from the sea. The oldest records on the city can be traced back to the fourth century B.C. In the Malayan history chronicles of the journey of the sailor Buddha Gupta from Chittagong to Malaya. Arab sailors and traders knew its port in the ninth century AD. The city was subsequently ruled by Muslim cultures starting from the 13<sup>th</sup> century up until the Portuguese control of the coastline and port in the 16<sup>th</sup> and 17<sup>th</sup> century. Portuguese chroniclers of Asia described Chittagong in 1552 as "the most famous and wealthy city of the kingdom of Bengal, by reason of its port at which meets the traffic of all that eastern region". Muslim rule was reinstated in 1666 with the Mughal conquest who ruled over the area into the early 19<sup>th</sup> century.

With British ascendancy in India in the early 19<sup>th</sup> century, Chittagong became part of the interests of the British East India Company which used the area as a source of goods such as tea and jute. Later in the 20<sup>th</sup> century during World War II the British built up Chittagong as a significant military base used by Allied forces and heavily bombed by the Japanese. Chittagong developed as a municipality while it was under the British Raj from 19<sup>th</sup> century to the Bangladesh War of Liberation of 1971. After the liberation war, Chittagong has been the major hub of import-export activities and underwent significant industrialization tied to shipping and ship industries. Around 40% of the heavy industrial activities of the country are located in Chittagong city and adjacent areas with ship breaking on the beach south of the city the major business.

Today, Chandgaon as the northern most administrative section of Chittagong lies within 2<sup>nd</sup> Extended Ward of the municipal Chittagong City Corporation.

### ***B. Local Architectural Character***

Changdoan is typical of the many villages and small towns of the Chittagong district. Like most of Bangladesh, the architectural character of Changdoan and Chittagong is related to their locations on a river delta. Local construction is tied directly to the realities of construction in the delta area with the vernacular architecture centering on the locally available building materials such as bamboo, brick and mud from the clay rich soil.

Typically the residential architecture of these villages consists of groupings of houses based on extended family relationships. The Chandgaon village is very much of this character with members of the Khan family, the client of the Chandgaon Mosque being prominent especially around the Mosque precinct. The placement of houses in the community follows fairly uniform patterns of organization around roads, rice patties and the ubiquitous ponds. These houses can vary in their building materials with bamboo, thatch, straw, grass, corrugated iron sheets, brick, timber, and mud used in different ways. The communal courtyards, Uthan, provide the centers for formal and private gatherings and work areas.

In Bangladesh, public buildings such as mosques the architectural character can vary based on the size of community and the practical dictates of available material, budget and scope. From basic mud and brick to reinforced concrete, the mosques of Bangladesh are built using a wide variety of building techniques. There is no dominant motif or architectonic language beyond the basic use of traditional forms such as pointed arches, domes and screens and these are used with no significant regularity as to constitute a common style. Additionally, historically the influence of other religions, Hinduism and Buddhism can also be seen in local mosque architecture.

These dynamics can be seen in the Chandgaon Mosque which is located next to the older pre-existing mosque building. The older building consists of series of additions to the original simple rectangular structure. This structure which is today used as a medrese (school) has typical features associated with mosques of Bangladesh such as a cupola, pointed windows along with a covered veranda. (According to the long term planning of the Chandgaon Mosque, the older building will be razed). This series of courts, closed and open, with permeable walls is standard typology of the mosque architecture of Bangladesh. From city to

countryside while there might be significant variations in style and materials for these mosques, the organization of a open porch/court and a covered main space is a constant. Even in dense urban areas where these mosques are squeezed into narrow plots this spatial sequence is maintained.

Changdoan also being located on the periphery of the city is the site of more contemporary building stock of reinforced concrete and brick buildings dating from 1950s to the present day. Of these the ubiquitous 3 to 4 story apartment buildings from the 1950s to 1970s are remarkable for their organized modernist architecture. Small in scale, decorated in simple abstract patterns, attuned to their tropic setting with wide verandas and vertical ventilation, these examples of a regional modernistic architecture in concrete and brick stand in contrast to the poor quality of building in the subsequent downturn in both architecture and urbanism in Chittagong. Although there are no accurate analyses to prove this, it seems that rapid urbanization and industrialization starting in the late 1980s was responsible for the haphazardly constructed concrete buildings that dominate Chittagong today. These buildings of no architectural value whatsoever are responsible for the city's current depressing urban character. With very little in the way of public space or notable public structures the city's rapid growth has created a hodgepodge urbanism that today has been taken over by outdoor advertisements that seem to cover the surfaces of many of these drab buildings. Of the newest buildings of the last 10 years, there are many examples of concrete structures with glass facades with kitsch character for example the Mini Bangladesh theme park of miniaturized versions of famous Bangladeshi monuments and the adjacent revolving glass restaurant and tower.

### ***C. Climatic Conditions***

Chittagong has a humid tropical monsoon climate. Located on the banks of the Karnaphuli River, it sits at 22° above the Equator, at about the same latitude as Hong Kong. It has a total area of 157 square kilometers (61 sq mi). The city from its position on the Bay of Bengal receives strong winds from the southwest in the summer and gentler northeastern winds in the winter. Heavy monsoon rains and dangerous typhoons have created mud slides and significant destruction to the built environment in the past years notably the typhoon of April 30, 1991 that killed 125,000 people in Bangladesh in one day, leaving many millions more homeless.

### ***D. Immediate Surroundings***

Chandgaon Mosque is located in a village area of Chandgaon at the northeast limit of the Chittagong City Corporation municipality in between the hodge podge urban fabric of the city and the agricultural lands of rice patties beyond the urban zone. It would perhaps be more appropriate not to call Changdoan a village per se as it is an area that is undergoing change. In parts urban, semi-urban and rural, Changdoan is one place that encapsulates many of the economic, urban and architectural realities of Bangladesh today. The picture is one of change and transformation - bamboo and thatch huts are interspersed with the newer buildings of the rapidly expanding garments sector, the specter of real estate speculation hangs over the landscape as small scale rice production gives way to global industry.

With its clear geometry and organized program Chandgaon Mosque makes a definitive architectural statement in the midst of this urban and economic dynamic. Very much a local project through its sponsorship by the Faisal Khan family, the Mosque's architecture is purposefully different without being pedantically global.

The approach to Changdoan and the Mosque is through the main road and train lines that connects Chittagong to Rangamati and India in the East and Cox's Bazaar and Myanmar to the south. The urbanism here on the main road is characteristic of Chittagong city in general, decidedly unregulated, crude in its construction and dominated by outdoor signs and advertisements. The major bridge over the Kalapati River is also here in Changdoan on this major transportation route.

Turning west off the main asphalt road onto the side dirt towards, there is a quick succession of zones representing different phases of Chittagong's economic development. Initially there are the newer factories and industrial complexes of the garment businesses. These 4/5 story reinforced concrete buildings some of them with glass facades others simply slapdash layers of exposed concrete and brick create a density in contrast with the natural surroundings. Signs with names in Korean and Chinese indicate their global pedigree. Moving on into the next zone there are the buildings of the previous industrialization of the 1980s/1990s, smaller single story industrial buildings again in very basic reinforced concrete designed for small scale manufacturing and workshops. These smaller industrial buildings are mixed with occasional older single and two story residential buildings in reinforced concrete and brick of a decent quality (they are completed, plastered and seemingly designed). This less dense older fabric sitting below the tree line is more harmoniously integrated into the yards and ponds typical of the Bangladesh countryside than the newer, larger factories closer to the main road.

After a series of turns on the narrow tree lined dirt and brick road the Changdoan Mosque appears, its white exterior in distinct contrast to the natural setting. To the east on approach is a tree and gravestone/tomb lined with offerings. Separated from the road by a high wall also in white the Mosque clearly establishes its position next to the road via this perimeter wall (also designed to stop animals wandering into the Mosque). The primary entrance to the Mosque is through a break between the wall and the ablution building. Stepping into the large paved plaza space and its regularized geometry is a dramatic affair after the circuitous journey through the dense mix of buildings and foliage en route. Despite its scale the building is at the same height as the dense green foliage of trees and bushes and does not overpower its surroundings. The perimeter wall provides a buffer on one side while the pond and a clump of bamboos taller than the Mosque leans over the roof of the building framing the composition.

This is visual and formal strategy of contrasting the regularity of the Mosque's simple forms with the texture, color and density of its surroundings is followed throughout the project. The wide horizontal gaps and spaces on the north and south of the building frame both the view in and out. The wide oculus of the first court achieves this same effect towards the sky and clouds. The Mosque architecture's deliberately works to positive affect to aestheticize the environmental ambiance. It's very apparent the Mosque's architecture is not from there but for the architect this apparently didn't mean its architecture could not be *of* there. This compare and contrast approach to design applies also to the neighboring buildings. The highly irregular

older Mosque directly adjacent and the residential buildings across the road all become more visible thanks to the clear visual and perceptive strategies of the Chandgaon Mosque.

Further past the Mosque are the last groupings of the houses of the village. The limits of the village are reached with the start of rice patty fields in a wide agricultural swath towards the west. This landscape is lined by low brick walls parceling out individual fields and plots. This parcelization creates a spare formal geometry of abstract lines that is similar to the simple geometries of the Mosque architecture in delineating space and place. The brick walls anonymously marking space in an abstract geometric way are echoed the Chandgaon Mosque's minimal architecture. The parcelizations of the fields marking territory towards an anticipated future development can also be considered as a social dynamic similar to the Mosques strict geometries marking and territorializing an abstracted space of contemporaneity in this traditional fabric. We should see these as competing forces, the brick wall on the one hand pointing towards a real estate development future for the patty fields that could be home to factories, the communal space of the Chandgaon Mosque pointing towards the community coming together around the space of religion and nature.

#### ***E. Topography***

The topography of Chandgaon is similar to the topography of much of southern Bangladesh, a flat delta of plains, rivers, rivulets, marsh, canals, ponds, rice patties and forested areas. In this particular region the density of human habitation around the city means that certain silted water bodies and marshlands that have been reclaimed by agriculture. While certain sections of Chittagong have small hillocks that are a distinct feature of the city's topography in the center of town, Chandgaon is very flat.

### **III. Programme**

#### ***A. History of the Inception of the Project***

The Chandgaon Mosque project was initiated by Morshed Khan, a businessman, Foreign Minister of Bangladesh from 2001-2006 as part of the Bangladesh National Party and the father of the client Faisal M. Khan. Although no longer residing in Chandgaon personally, Morshed Khan's families have been long time residents of Chandgaon and Chittagong. Morshed Khan with the goal of building a larger mosque to replace the smaller ageing mosque started to purchase land in Chandgaon next to the existing mosque in 1998. Successive purchases of adjacent parcels increased and consolidated the size of the plot to the 5,200m<sup>2</sup> current size valued at close to \$900,000. While this valuation could not be independently confirmed, the real estate speculation in this area seems to warrant this high valuation in light of the premium for land for factories and housing in this newly developing and zoned area.

Faisal M. Khan declared two primary goals for initiating this project, the family's interests in giving back to the community and to be a model for others to invest in a community project similar to models applied in Arabic countries. According to Faisal M. Khan the project initially conceived as only a mosque has now because of the success of the Chandgaon Mosque and its architecture been extended to a Master Plan that also includes an orphanage,

observatory/minaret and perhaps a library. The contemporary design and ecological impact intended to improve the area were also part of the reasoning behind the initiation of this project and its architecture.

**B. *How were the Architects and Specialists chosen?***

The architects Urbana - Kashef Mahboob Chowdhury were chosen by Faisal Khan as per the suggestion of the contractor Nasrul Hamid, a friend and associate of both the client and the architect. The client had received concept designs from other architectural groups but rejected them either for bad planning or lack of design vision. Impressed with the spare and simple design of Chowdhury's (with Marina Tabassum) newly built The Independence Monument and The Liberation War Museum in Dhaka, Faisal Khan commissioned Chowdhury for a concept design that eventually led to his being chosen to design and build the Chandgaon Mosque. Kashef Chowdhury was in this way understood to be an architect favoring minimal and clean geometries that also had international mindset to be able understand the client's larger social objectives.

**C. *General Programme Objectives***

Objectives were to design a large contemporary mosque that would fulfill the clients need to give back to his community of origin while creating a benchmark for the larger community, city and the country. Without resorting to historical types or popular clichés on what a mosque should be or look like the objective was to provide a new formal and contemporary design concept to the established mosque organization typology of Bangladesh (interior main prayer space, covered entrance court). The problem of how to adapt Islamic practice for the needs of the 21<sup>st</sup> century was thought in line with the mosque as a place for gathering for the community and in the future as a social service facility (school, library, orphanage).

**D. *Functional Requirements***

The functional program initially called for a large mosque designed to accommodate different numbers of worshipers depending on the day. Capacity for daily, Friday and funeral prayers were to be balanced with gatherings on important days of the Islamic calendar especially the prayers on Eid. To accommodate these objectives, each of the exterior spaces, the frontcourt and courtyard/entry plaza area would need to accommodate spill over from the adjacent space. In this way each space acts as an extension of the previous. The interior space required around 500 worshipers, the front court around 300 and the entry court at about 1,000 for the major holidays that drew worshipers from all over Chittagong. This capacity objective was to be balanced with requirement for one existing burial plot and a future 8 to 10 plots for the Khan family to be located in the frontcourt.

To the mosque program of mimbar, ablution area, and minaret (not yet constructed) was added the requirement of a dome as it was perceived by the client as a standard feature of mosque architecture. And lastly a small living quarter for the imam was provided inside the ablution building.



#### **IV. Description**

##### **A. *Building Data***

The current single story building consisting of the main covered prayer space and open front court comprises 1,048m<sup>2</sup> of the 5,200m<sup>2</sup> plot. At the time of inspection in March 2010, the entrance plaza of approximately 2,000m<sup>2</sup> had been paved and the small 40m<sup>2</sup> ablution building and imam's quarters had also been completed.

##### **B. *Evolution of Design Concept***

The design concept of the Chandgaon Mosque is based on reduction. Reduction to the basic functions needed for a prayer space in Islam. Using this strategy the architect Kashef Chowdhury derived the base elements - a wall facing Mecca *mihrab*, niche and *mimbar* for the imam and an open space limited spatially for congregation. The simplification of functions broken down to their basics were then increased in scale and highlighted to achieve the completed architecture. Overall the goal was a sense of presence connecting the religious and spiritual to natural elements, to the surrounding flora and sky.

The evolution of the design concept was undertaken by the architect in a series of sketches and models over a year's time with the support of the client. Formally, the client asked for little beyond the dome and the desire for a clean geometry.

##### **C. *Purely Formal Aspects***

The architect having outlined the basic elements of *mihrab* wall, *mimbar* and the walled off congregation space sought to highlight these elements through space and light. The *mihrab* wall is separated from the side walls by a recessed skylight continuing down on either side of the *mihrab* wall to the ground. Light falling onto the wall from the top and sides emphasizes the presence of the wall as a discrete element. The random pattern created by the niches cut into the *mihrab* wall creates another layer of geometric abstraction complementing the lighting effects. The play of sunlight and shadows throughout the day on to the wall is continued through other similar cuts in the buildings. The dome is bifurcated and opened, the interior prayer space and front court are divided by a gap, the ceiling of the front court is open on all four corners of the volume.

These openings and cuts based on a simple orthogonal geometry are continued as a design concept in the horizontal openings that are the primary elements of the façade. The horizontal opening on the entrance articulates the façade rendering it as an arch. The extended width of the gap formally balances with the 3.8 meter high façade to create a sense of balance. Further on, the two sets of horizontal openings as windows in the frontcourt and prayer space perform a similar function and are continuations of the monumental design language initiated on the façade. The large openings frame views into and out of the building, filtering light in and providing a modicum of privacy.

This design concept of shaping volumes and walls to organize space and light has its most dramatic example in the wide oculus above the forecourt. Walking in underneath the

compressed horizontal arched opening to the vertical space under the circular oculus is the 2<sup>nd</sup> dramatic experience of the architecture. Looking up to the zenith of sky and clouds through the oculus the goal of connecting the space of spiritualism to nature becomes apparent. As light drops down into the space, with no trees or other buildings visible this forecourt space is connected directly to the sky. The sense of abstraction and space achieved here is perhaps the most effective elements of this design concept. These gestures of shaping light are subtly complemented by the white walls, flooring and the shiny marble floor of the prayer space to unify the composition.

They are also heightened by the mosques appearance at night where lighting reverses the relationships of mass and space. Light emanates outwards through the recesses, the front and side horizontal openings, the bisected dome and the other cuts. The building glows as a series of floating shapes implying its shape, another geometry is created.

#### ***D. Response to Physical Constraints***

The siting of the Changdoan Mosque is based on the size and shape of the plot and the placement of the mihrab wall on the west. With no serious regulatory limitations, the architects took advantage of the large plot occupying it completely. The two primary volumes of the interior prayer space and front court, of the same size and symmetrical, take up most of this area. The site plan connects the ablution building, entrance plaza, frontcourt and interior prayer space into one continuous space leaving only a slight gap on the north, south and west sides of the building separating it from its surroundings. While a perimeter wall has been built on the east, north and west sides, the south side containing the older mosque and an open space has no wall due to the vagaries of the master plan and the eventual location of a planned orphanage and minaret/tower.

The north south axis of the building becomes apparent in the two sets of horizontal openings in the principal volumes. Lacking walls entirely, the exterior forecourt with its entrance space, two large horizontal openings and passage into the main prayer space almost turns into a pylon. In the prayer space, pivoting glass doors open to provide views towards the trees and most importantly provide cross ventilation that takes advantage of the strong southwest wind in the summer months.

#### ***E. User Requirements***

The two main spaces of the Chandgaon Mosque, one closed and the other open reflect the organization of the traditional typology of Bangladesh mosque architecture. This organization has as its rationale the accommodation of worshipers at a variety of events. Daily prayer, Friday prayer, funeral prayers, holiday prayers, each having different a different number of “users” is accommodated by the ability to spill over worshipers into the adjacent space. In this way, the space flexibly accommodates anywhere from the 30-40 worshipers during daily prayer up to a potential 2000 during a major holiday. For Eid the “Big Mosque” as it is called by the citizens of Chittagong the Chandgaon Mosque becomes a regional center attracting worshipers who believe that their prayers will be answered because of the size of the larger congregation.

Beyond its religious functions, the large open spaces of the Mosque provide areas for respite, meditation and congregation throughout the day. Children especially take advantage of the large plaza as a smooth and clean playground otherwise lacking in the village.

#### **F. *Landscaping***

The recently completed open plaza is the only area where meaningful landscaping has been done. Saplings have been planted in rows on the north and south sides of the plaza. There is also a grass alley between the building and the perimeter wall on the west and north sides of the plot and the grass on top of the burial plots. More interesting the architect has left an existing large clump of bamboos trees leaning and hanging over the south side of the building.

#### **G. *Structure, Materials, Technology***

##### *Structure*

The Changdoan Mosque is a reinforced concrete building with thick beams, foundation beams and wide spans to facilitate the large open spaces. In the forecourt columns are dispersed regularly on the four corners of the “pylon” comprising the outside wall of the building and four interior walls. The horizontal openings and oculus are placed on these columns. In the main prayer space, the heavier load of the roof and dome required more interior columns to create the same sense of open space. There are horizontal beams above the wide spans of the large horizontal openings mirrored with horizontal foundation beams below grade.

Below grade, this heavy building is supported in the soft earth by a dense network of sand pilings and footings underneath each of the columns. These sand piles and reinforced concrete footings are a common foundation solution to the realities of building in the soft delta of Bangladesh.

The dome is a concrete shell cast in place with an edge beam, in-filled and plastered. Lateral steel mullions support the laminated glazing.

##### *Materials*

The materials of the mosque are few in number to achieve a sense of unity and simplicity. The main structural material is reinforced cast concrete. The primary structural members are concrete columns sitting on footings supported by sand piles. On these columns are placed thick beams that carry the horizontal spans, roof and dome. There are also beams below grade underneath these large horizontal openings. The thick walls are in fact cavity walls lined with bricks, plastered and painted. The flooring is white marble and terrazzo that unites with the white painted walls to render the whole building as one unified shape.

There was difficulty bringing in the heavier construction materials especially the marble due to the narrow roads for the village.

The infill material is the locally available solid red bricks that are the shell of the cavity walls. These bricks are then plastered. The roofing is lime terracing, a type of fine cement with waterproofing and insulation properties.

The surface of the building is a type of textured sprayed on white paint over plaster. The interior prayer space is Italian Carrera marble white the forecourt is terrazzo tiles. The burial plots are of polished black granite. The entrance plaza is polished concrete with glass strips.

#### *Construction Technology*

The technology used for the structure of the Chandgaon Mosque is standardized reinforced concrete construction techniques applied throughout Bangladesh to primarily public buildings and apartment buildings in cities and towns. We have mentioned the use of sand pilings and footings to support the building as a common feature of construction in Bangladesh. The contractor's from Dhaka applied these standard systems with a combination of expertise of their own workman brought in for this job with local laborers from Chittagong based sub-contractors and residents of the village.

Largely a labor intensive endeavor, bamboo scaffolds and hoists made on site provided simple machines to facilitate the heavier aspects of the construction. The advanced level of handcraft and workmanship found in Bangladesh while not apparently visible here because of the lack of detailing can be seen in the uniformity and cleanliness of the finishing. The white volume is nearly perfectly organized. The walls are very smooth. The glazing of the windows, dome and doors fit neatly into their recesses. The marble and terrazzo tiling is similarly clean and orderly.

#### *Building Services, Site Utilities*

The main utility in the site is the lighting system. Lacking running water, heating or air conditioning the Mosque's only utility is this advanced system of low energy up lights and recessed fluorescent light fixtures. At night, the lighting design emphasizes the gaps on the façade that gives the building a completely different view then the day.

The other utilities include an array of ceiling mounted fans and an advanced audio system. All cabling and switches are discretely embedded within the plaster or hidden inside cabinets to preserve the clean and minimal look.

The small out building housing the ablution area, toilets and imam's residence provides the only running water in the Mosque complex.

### **D. *Origin of Technology, Materials, Labour Force, Professionals***

#### *Technology*

All construction techniques are standard throughout Bangladesh. A low level of technology was used and in fact there is a reliance on hand made simple machines (hoists, scaffolding etc.) in bamboo for construction.

### *Materials*

All the primary materials, cement, brick, steel, plaster and paint, were locally sourced except for the marble and granite flooring. The Carrara marble was imported from Italy while the black granite originated in India. The high cost of the Carrara marble for a poor country such as Bangladesh seems to be an issue. The glass and aluminum door for the side entrances was sourced and installed by Chittagong based sub-contractor as well as the laminated glass of the dome.

### *Labour Force*

The contractor Hamid Construction, a 70 person firm based in Dhaka, devoted 5 employees to this project. They utilized skilled laborers brought into Chittagong from their construction teams in Dhaka. Of these seasonal skilled laborers there were two main groups, steel workers from Joshor and plaster workers from Rangpur. Sub-contractors from Chittagong associated with the Khan family were used for manual labor. The construction force varied anywhere from 20-50 persons depending on the phase.

### *Professionals*

Kashef Mahboob Chowdhury of Urbana, Dhaka was the lead architect assisted by Faysal Kabir and Anup Kumar Basak. Chodhury is a Bangladesh educated architect and photographer known for formally distinctive residential and public buildings in Dhaka. The structural engineer S.M. Hafizur Rahman and contractor Nasrul Hamid of Hamid Construction are experienced senior specialists in their fields also from Dhaka.

## **V. Construction Schedule and Costs**

### **A. *History of Project Design and Implementation***

The project was initiated with commission for a concept design given to Kashef Chowdhury in March 2006. Design was completed in June 2006. Construction occurred from July 2006 to December 2007 with typical stops for monsoon, heavy rains and the labor force returning to their villages for rice harvesting. The buildings main prayer hall and forecourt were completed in January 2008 with activities starting then. Construction continued after occupancy with the building of the ablution building and plaza in 2009 and the anticipated building of the minaret/observatory in 2010.

### **B. *Costs***

Total cost of the project was \$336,760 at \$321 per square meter excluding the price of the plot of land valued at \$895,493. All costs were paid for by Faisal M. Khan as representative of the Khan family.

**C. *Comparative Costs***

Costs for the Chandgaon are standard or slightly below the existing rates for construction in Bangladesh due to the religious nature of the building. Nasrul Hamid, the contractor, declared that because of his personal relationships and the participation of the Khan family members from Chandgaon costs were kept lower than usual for commercial development.

**D. *Maintenance Costs***

Maintenance of the Mosque amounts to about \$170 a month which includes electricity, water, cleaning and security. There are two caretakers who work 24 hours at the Mosque.

**E. *Ongoing Costs***

The major long term costs will be to maintain the exterior and interior white paint finish in light of weather and pollution. If the master plan is implemented modifications to the existing building might be necessary.

**VI. *Technical Assessment***

**A. *Functional Assessment***

The Chandgaon Mosque works very well as a contemporary Mosque and place of worship attuned to the needs of the local residents yet giving them something new. The attractiveness of the space, its formal design discipline and the detail of its materials are compelling features that draw in a wider variety of worshipers than would be expected in a village mosque. The size of the Mosque, known as “The Big Mosque” by the residents of Chittagong is another draw that can be seen in the major holidays where its large halls and plaza can accommodate more than a thousand worshipers.

The strategy of providing spill over space works well as each space is visually and spatially tied to the whole. When required it is a small and intimate space only amounting to the main prayer hall in the closed volume yet can be easily expanded through quick transformations that still maintains the collective unity of the congregation.

**B. *Climactic Performance***

The major climactic issue is the internal climate of the main prayer hall in the internal mihrab volume. Despite not having an air conditioning system, a major issue in this tropical climate, the combination of ceiling fans and the cross ventilation facilitated by the large horizontal openings on the north and south sides to take advantage of the southwest winds provides reasonable cooling. Certain older members of the congregation declared the need for air conditioners due to the heating caused by sunlight coming through the dome. Of course the combination of fans and cross-ventilation will never achieve the same level of cooling as natural methods but it seems in time the congregation will get used to the conditions.

In the forecourt with its larger oculus there were criticisms of the inability to use this space during rain. This is a valid criticism that the architect is now trying to accommodate with a retractable textile cover.

Overall the deepness of the two spaces and the lowness of the openings provides a measured balance between protection from the sun and rain and the formal strategies of the architecture to filter these natural elements especially sunlight as ambient aesthetics. The Changdoan Mosque is certainly much more successful in this performance than most of the reinforced concrete mosques in Bangladesh.

**C. *Water and Rainfall***

Water is collected on the roof and distributed down into the adjacent canals of the village. The open forecourt has one drain aesthetically placed in the middle of the space.

**D. *Environmental Response***

The Mosque while respecting its environment is not necessarily adapted to it. Out of scale to the normal village fabric, the building places a large foot print on the landscape quite deliberately. Despite its significant presence tries to accommodate the local flora especially the large clump of bamboo trees allowed to lean and hang over the building.

**E. *Choice of Material, Level of Technology***

The choice of materials reflected the need to work with local ways of building while also referring to the global intentions of the clients. Specifically while most of the structural material was sourced locally, the Italian marble of the main prayer hall was a considered gesture to give the Mosque a unique feel not possible through local materials. This did not mean however that the local builders would be confused by the materials as the high level of handcraft and skill of the local masons is apparent in the meticulous way this marble has been laid out. Quality workmanship and attention to handcraft detail in Bangladesh especially plastering exists throughout the country.

The Mosques neat finish and organized appearance as contemporary architecture in this village setting attests to the sensible decisions made by the project team to achieve something new but within reasonable bounds. There are no materials or techniques that are out of the ordinary of the local building culture despite the Mosque's radical appearance.

**F. *Response to Emergency Situations***

The area around Chandgaon is subject to earthquake, typhoons and floods. All these issues have been addressed through structural or design solutions. Its solid construction and scale provide resistance to the strongest of typhoon winds which would be invaluable to the local community also as an emergency shelter. Provisions against earthquake have been accounted for in the 700 sand piles used in the foundation and the robust and interconnected superstructure. For floods, the building is slightly raised above grade and has a perimeter wall.

### **G. *Ageing and Maintenance Problems***

A fairly simple building with no utilities means that beyond maintaining the finish of the white paint and small details of the glass doors, cabinets and electrical system there is little to break down or degrade over time that can not be fixed by local means. Pesticide has been sprayed on the foundations of the building to protect against insects.

### **H. *Design Features***

We have mentioned in the Design Concept all the formal strategies utilized to realize this buildings monolithic and clear shape while providing an environmental ambiance in the shaping of sun and light both day and night. To this we can add the design strategies to reduce the program to it is basic elements of closed main prayer hall with mihrab wall, forecourt and plaza to accommodate congregations of different size. We have also mentioned that despite its massive presence the building falls within the tree line and does not over power its neighboring buildings.

### **I. *Impact of the Project on the Site***

The project has not impacted its context to any meaningful degree. The rural patterns of life have not been changed by the increased traffic to the Mosque especially on Fridays. Perhaps only on the major Islamic holidays is there any noticeable impact to the village but at the same time it is also a source of pride for the residents.

### **J. *Durability and Long-term Viability***

The project seems to be the first successful phase of an ongoing community based investment into the Mosque and other social facilities (orphanage, school, library). The quality of the construction and attention to detail far above the standards of Chittagong ensure that even if the building is not maintained it will continue to operate successfully. The only risk is perhaps interventions by the congregation that degrade the overall design and aesthetic quality for instance the clocks on the mihrab, the addition of air conditioning etc.

### **K. *Ease and Appropriateness of Furnishings***

Beyond the small mimbar, niches for books and glass doors there are no furnishings in this extremely minimal setting. In this way, the clean and spare interior design is coordinated effectively with the exterior. Very little exists that is extra or out of place even the burial plots with their polished black granite and grass are effectively integrated into the whole.

## **VII. Users**

### **A. *Description of those who use or Benefit from the Project***

The users of the Mosque on a daily basis are the men of the village area primarily tradesmen and agricultural workers. This changes during Friday and funeral prayers when more residents



including those outside of the village in the larger Chandgaon district of Chittagong come to worship. This increase also occurs during the major holidays and represents the general socio-economic groups of Chittagong from laborers to businessmen. Elderly men are a constant presence at the Mosque night and day.

## ***B. Response to Project***

Discussions with the congregation of men of various ages revealed that they are very happy with this contemporary facility for its cleanliness and organization while being perhaps slightly confused by its architecture. Younger men especially mentioned their motivation to come to the Mosque because of its architectural qualities which they described as “foreign” influenced. Women from the village who were interviewed who do not use the Mosque also commented on the positive influence of its architecture on the younger people’s desire to go the Mosque for prayers but also as place of public congregation. Children and adults also used the large plaza for recreation (badminton and cricket were mentioned). Generally it was apparent that the villagers felt that his Mosque was the production of an international or foreign agency despite the fact the Khan family is the sponsor. They were not aware and had not been informed about the goals of the Mosque and the possibility of its expansion.

The Imam and Muezin, and caretakers who are constantly in the Mosque expressed their satisfaction with how the Mosque functions, its architecture and the popular reaction. The Imam, an educated man, was especially supportive of the project pointing the respect that must be given to the house of God.

Minor criticisms of the project by some members of the congregation included the desire for air conditioning, the sunlight coming through the dome and the openness of the oculus.

Popular reaction around Chittagong has been positive due to the size of the Mosque referred to as the “The Big Mosque of Chandgaon”. Heavy attendance on Friday and major days of the Islamic calendar attests to this.

The Mosque has appeared in numerous Bangladesh and national design publications. It has received praise in these publication as a mosque reasserting, “... its traditional position as the anchoring place of a given community... (without suffering from) the dictates of economy, constraints of means and the vagaries of kitsch”.

The architectural establishment of Bangladesh seems to favor the project but are perhaps a taken aback by the design language in its overtly massive and monolithic architecture. Some of the more spiritual aspects connecting religion, meditation and nature together also seem to not register with this group.

## VIII. Project Personnel

Family Name	First Name	Position	Company	Role in Project	Remarks
Aziz	Mohammed Abdul	Assistant engineer/ Site engineer	Hamid Construction Limited	Site engineer	Supervised construction work
Khan	Ifteqar	Managing Partner	Classical Traders	Subcontractors/ General	Supplied all raw materials and unskilled labour
Chowdhury	Ahasanul Haque	Supervising Engineer	Urbana	Design and quality assurance for architect	
Chowdhury	Kashef Mahboob	Architect	Urbana	Design lead	
Hamid	Nasrul	Managing Director	Hamid Construction Limited	Builder	Involved in architect selection with client - personal involvement
Rahman	A.H.MD.	Structural engineer		Principal structural engineer	Innovative method for soil improvement to reduce costs
Basak	Anup Kumar	Architect	Urbana	Project architect II	"I feel proud to be associated with the project"

## IX. Bibliography

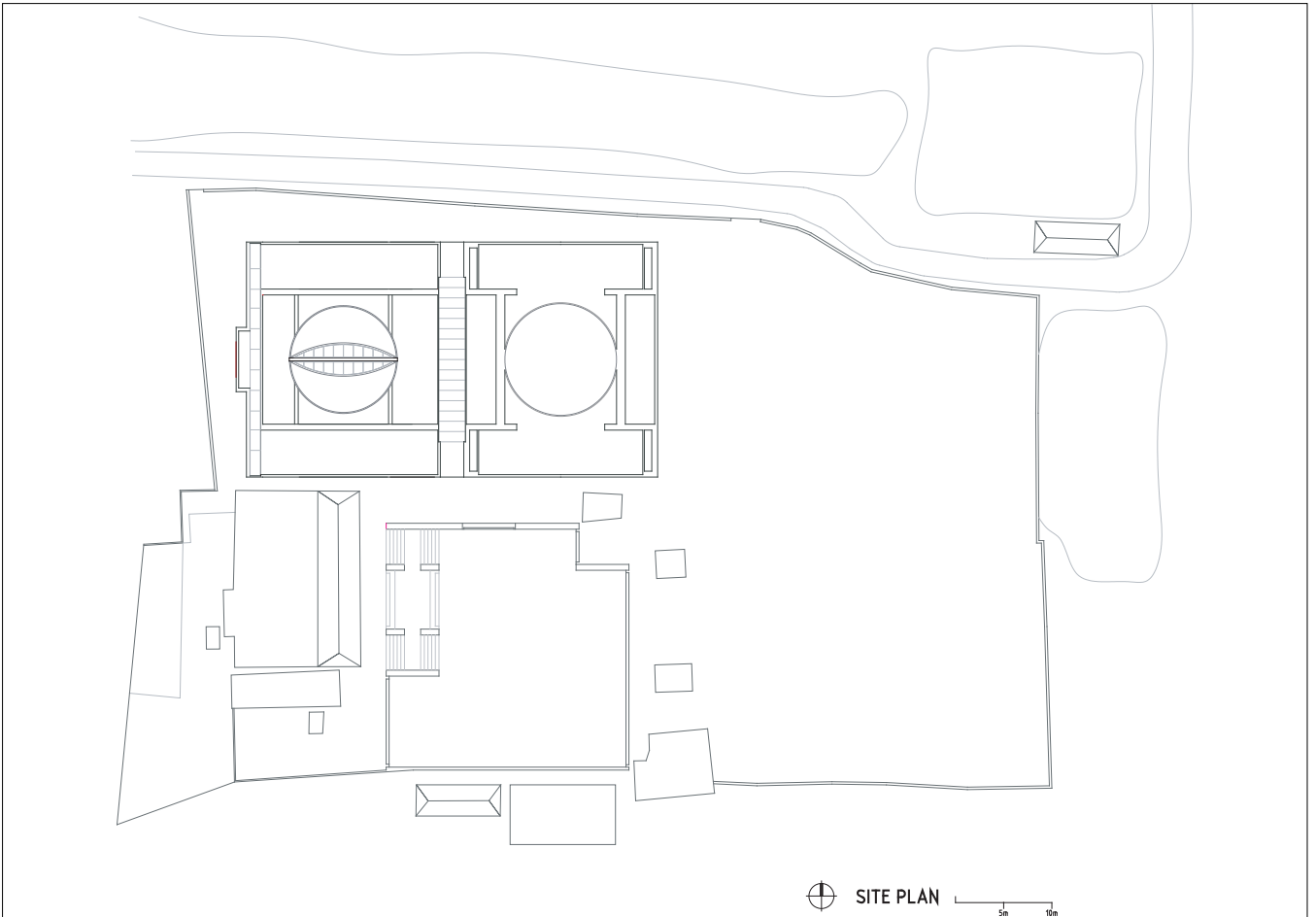
Magazines and Journals:

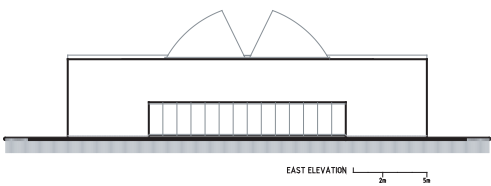
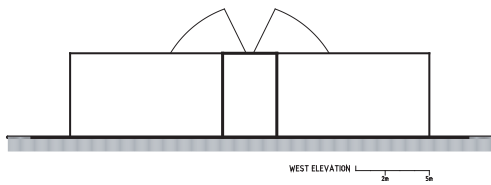
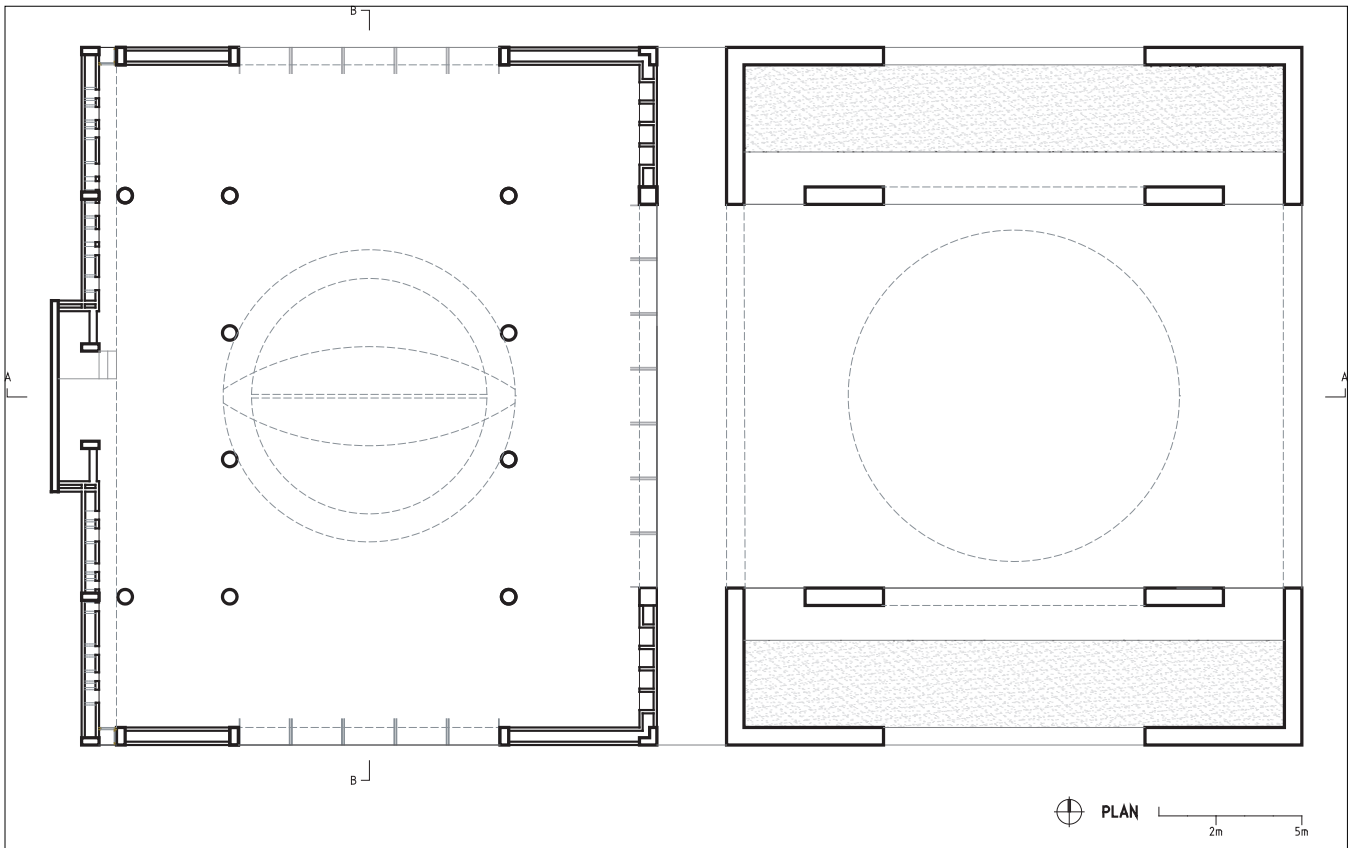
- Architecture Plus, Architecture of a New World, Middle East, Asia, Africa, Indian Subcontinent, vol. 20, 2008.
- Architecture Asia, Issue 2, April-June 2008.
- Design and Architecture, Issue 45, 2008.
- Space, no. 4, 2008.

**Gökhan Karakuş**

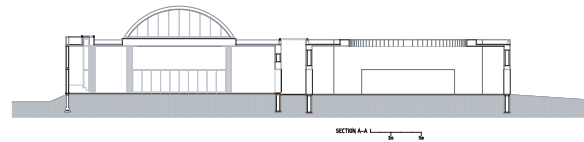
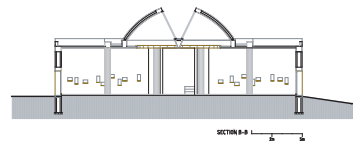
*May 2010*

\* This report is the original, unedited version sent by the author on the 13<sup>th</sup> May 2010.

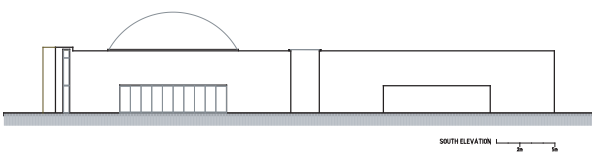
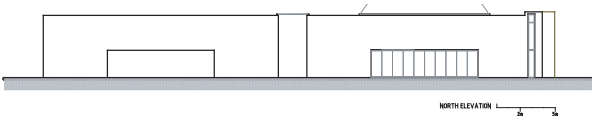




East & West elevations



Sections



North & South elevations



From the adjacent approach road.

Entrance of the Mosque.





Side view of the front court.

Night view of the front court looking towards main mosque.





Covered passage between the front court and the Prayer hall.

Front court looking towards main mosque.





Entrance to the prayer hall.

View of the split dome from the roof.







Split dome and light aperture.

Sun effects on the mihrab





Entrance to the prayer hall.

View of the main court from the prayer hall.





Outside view of the ablation place.

Inside of the ablation place.





Surrounding of the mosque, view from the main courtyard.

View of the mosque from the surrounding.

