



2010 On Site Review Report

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by *Gökhan Karakuş*

## **Nishorgo Oirabot Nature Interpretation Centre**

*Teknaf, Bangladesh*



**Architect**

*Vitti Sthapati Brindo Ltd, Ehsan Khan*

**Client**

*Md. Ishtiaque Ahmed, Ministry of Environment & Forests Bon Bhaban*

**Design**

*2006*

**Completed**

*2008*



# **Nishorgo Oirabot Nature Intepretation Centre\***

*Teknaf, Bangladesh*

## **I. Introduction**

The Nishorgo Oirobot (Elephant) Nature Interpretation Center is an eco-tourism visitors center located in the forests of Teknaf Game Reserve, a protected area outside of the town of Teknaf in the southern most point of Bangladesh on the banks of the Naf River bordering Myanmar. Nishorgo meaning *the environment or natural conditions in which people live* in Bengali is a social program initiated in 2004 by the Bangladesh Forest Department and USAID, a US government agency. It is a comprehensive effort to conserve forests through co-management between government and local people by aiming to provide economic sustainability to local residents. The design of the Nishorgo Oirobot Nature Interpretation Center by Vitti Shtapati Brindo architects of Dhaka, the result of a winning proposal of a national competition in 2006, is a central part of the eco-tourism strategy of Nishorgo providing education and information to visitors through exhibition panels. The architecture of the Center relies on standard building materials rendered onto elements of a vernacular house typology to realize an expressive structure that is robust yet does not degrade the natural environment.

## **II. Contextual Information**

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

The history of Teknaf located in the Cox's Bazar district of the Chittagong division history has to be taken as part of Chittagong's and Cox's Bazaar 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 the coast line between Chittagong and Cox's Bazar has been a sea faring area 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 Malayan chronicles from the fourth century B.C. Arab sailors and traders knew these ports in the ninth century AD. The area was subsequently ruled by Muslim cultures starting from the 13th century up until the Portuguese and Arakanese pirates took control of the coastline and ports in the 16th and 17th centuries. Muslim rule was reinstated in 1666 with the Mughal conquest who ruled over the area into the early 19th century. With British ascendancy in India in the early 19th century, this area became part of the interests of the British East India Company.

Cox's Bazar District is a district capital in the Chittagong Division of Bangladesh. It is named after Cox's Bazar, which is one of the world's longest natural sea beaches (120 km) including mud flats. It is located 150 km south of Chittagong. The modern Cox's Bazar derives its name from Captain Cox (died 1798), an army officer serving in British India. It is also is one of the

major fishing ports of Bangladesh. Teknaf located to the south of Cox's Bazar shares this area's history of mixed Arakanese, Bengali and British culture.

Chittagong, the division capital, developed as a municipality while it was under the British Raj from 19th 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.

Cox's Bazar is a booming resort area catering to national Bangladeshi tourism. Today it is undergoing rapid change with the construction of hotels and condominiums in a speculative real estate market.

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

The Nishorgo Oirobot Nature Interpretation Center located in the Domdomia, Jadirmura, Noyapara, Mochoni villages of the Teknaf Game Reserve Area (112 sq km, population, 4800) is typical of the many villages and small towns of the Cox's Bazar district of the Chittagong division. Like most of Bangladesh, the architectural character of Teknaf is related to its topographic location. Local building is tied directly to the realities of construction characterized by topography with the vernacular architecture centering on the locally available building materials such as bamboo, brick and mud from the clay rich soil. In the Teknaf area we can identify three house types based on location either on flat plain, higher dry land or on the forested low hills typical of the tribal Chittagong Hill Tracts to the east.

The first group is the mud walled houses of sun dried earthen blocks of one to two feet thickness. These mud walled houses are generally oblong in shape and covered with roofs of clay tiles, thatch or corrugated iron sheets. The application of these construction materials depends on their availability and the resources of the residents. In these regions land tends to be normally above flood level with relatively less rainfall, dry climate and lateritic soil which becomes very hard when dry being the primary rationale behind the mud constructions.

Relatively smaller groups of populations in Cox's Bazar and Teknaf build houses with timber walls. Generally, these houses are built on raised wooden platforms for safety from snakes and other animals. The lower parts of the houses are also used for various purposes like storage, domestic animals, and different family activities. The walls are generally permeable allowing for ventilation. Another motivation behind this wooden construction is the availability of wood in the forest areas.

The hilly areas of Chittagong are characterized by a third house typology based on raised platforms built with bamboo or timber. Among the tribal people, the larger versions of these houses are built with wooden platforms while simpler versions are of bamboo. About half the portion of the platform is used as a living room and the rest as a veranda for multipurpose family outdoor activities. Walls comprise of wooden lattices allowing for cross-ventilation. A ladder made with bamboo approaches this platform or veranda. The lower part of the platform is used for domestic animals though it can also be seen as protection from wild animals from the hilly forest areas.

Typically the vernacular architecture of these villages consists of groupings of houses based on extended family relationships. They can either be in clusters or linear. Those in clusters tend to have communal courtyards, *uthan*, which provide centers for formal and private gatherings and work areas.

In Bangladesh for public buildings the architectural character can vary based on the size of the community and the practical dictates of available material, budget and scope. From brick to reinforced concrete, public buildings in especially remote areas of Bangladesh are built using a wide variety of building techniques. There is no dominant motif or architectural language as a simplified and crude reinforced concrete architecture with brick infill and basic detailing being the most common. Residential housing can sometimes be also be of this reinforced concrete systems in more well-off communities. The plans of these houses vary but are noteworthy for halls that allow for cross ventilation.

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

Teknaf has a humid tropical monsoon climate. Located on the banks of the Naf River, it sits at 20.5° above the Equator, at about the same latitude as Hong Kong. It has a total area of 338 square kilometers while the Teknaf Game Reserve Area is 112 square kilometers. The area due to its seaside position near 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 significant destruction to the built environment in the past years notably the typhoon of April 30, 1991 that killed 125,000 people.

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

The Nature Interpretation Center is located off of 1 km to the west of the main north south Cox's Bazaar - Teknaf Road in the Teknaf Game Reserve. It sits on top of a sloping hillside above the road with views towards agricultural fields, the Naf River and Myanmar in the distance. A combination of village houses in mud, timber, reinforced concrete and bamboo are 500 meters away while behind the Center lays the hilly forests of the Teknaf Game Reserve which continue westwards toward the southern end of the Cox's Bazaar beach.

The Forest Department has built a number of simple reinforced concrete buildings around the Center including a student dormitory, gate house and public toilets that are not connected to the Center project or its architecture. Directly adjacent to the Center is a pond and the entrance to the hiking trails up into the hills.

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

The topography of Teknaf Game Reserve is hilly, densely forested area bordered by the Bay of Bengal, Cox's Bazar beach on the west and the marshlands of the Naf River to the east. These hills of about 200-300 meters in height carve out valleys home to elephants, tigers and other game.

### **III. Program**

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

The project was initiated as part of the Nishorgo Program founded by the Department of Forests of the Ministry of Environment and Forests in 2004, funded by USAID and managed by the International Resources Group, a consultancy from Washington D.C., USA. The Nishorgo Project describes its goals this way...

“The Nishorgo Program is a comprehensive effort to improve the management of the country's Protected Areas of all kinds. At the heart of Nishorgo is a focus on building partnerships between the Forest Department and key local and national stakeholders that can assist in conservation efforts.

Nishorgo is the overall Program for improving the management and conservation of Bangladesh's protected areas with the general goal of ensuring a coherent and integrated PA strategy. The Nishorgo Program is a comprehensive effort to conserve the forestry through co-management by aiming to provide economic sustainability for the local people. Nishorgo Program was officially launched in Bhawal National Park on February 24, 2004 with the motto “Let us save nature for our future generation”.

As the name Nishorgo implies, the Program is in essence an enhancement and preservation of the unique beauty and biodiversity of the tropical forest of Bangladesh for our future generation. Further, Nishorgo will also promote the beauty of these natural forests through facilitating nature visits.

The stakeholder will get ownership of the of program not only in terms of benefit sharing but also management decisions will be taken collaboratively and through discussion”.

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

There was a national architectural competition organized by the Forests Department and Bangladesh Institute of Architects in 2005-2006 for the design of Nature Interpretation Center for Lawachara National Park in northeast Bangladesh. Vitti was judged the winner from 32 submissions by a jury of architects and engineers representing the Ministry, BIA and USAID.

#### **C. *General Programme Objectives***

In Bangladesh, where ecosystems are under intense pressure, ecotourism is seen to provide economic incentives to local people for conservation of natural resources. Information on ecology is an important function realized in visitor's centers which are essential tools for development of eco-tourism in Protected Areas providing visitors with pertinent information about Protected Areas through interpretive exhibits, visitor information kiosks, programs, printed materials, and interactive media displays. They are intended to educate the public about the importance and methods of conservation and non-destructive ways to enjoy nature. As a benchmark, Forest Departments across the globe have built visitor centers to educate their citizens and tourists. The Nishorgo Project arranged this competition in 2006 to ensure

that advanced and environment friendly design would be built in Lawachara National Park in northeast Bangladesh and subsequently could be adapted to other sites as we have seen in Teknaf and another built but inoperative example in Chumati.

#### **D. *Functional Requirements***

Based on the competition brief the requirements were to design an innovative, ecologically sensitive and community-focused Visitor Interpretation Center for the Lawachara National Park 300m<sup>2</sup> building with the following functions:

- Entry
- Information Kiosk
- Services (WC, wash basin)
- Outdoor meeting pavilion
- Semi-open exhibition area
- Rest and observation area
- Exhibit gallery
- Multimedia screening room
- Electrical and plumbing system

### **IV. Description**

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

The current two story reinforced concrete building consists of a total 288m<sup>2</sup> with the ground floor and first floor of 130m<sup>2</sup> with 28m<sup>2</sup> entry ramp.

#### **B. *Evolution of Design Concepts***

The design concept originated from the architects study of the basics of the dominant vernacular house types of hilly areas in this part of Bangladesh, namely the house on stilts and the elevated house with large verandas. A basic sketch of two slabs on columns in a sloped forest of trees was the guide for design through competition drawings up to the competition proposal and through to construction at Teknaf. The contemporary architecture was abstracted yet functionally aligned to the vernacular retaining the positive ecological and climactic elements. Despite the use of reinforced concrete the buildings thin slabs and extended cantilevers at the veranda and entrance ramp provide a degree of lightness. The first floor space seems to float as the horizontal structural members get visually lost in the forest of trees. The sense of space and lightness is allowed to mix with shadows and light to increasingly obfuscate the massive buildings presence in nature. The connection to the ground is lost in the shaping of space, mass and visual perception. Through these formal design strategies the lightness of the vernacular architecture in timber is successfully translated into the much heavier concrete through highly formal yet simple gestures. The building is both light and durable.

### *Response to Physical Constraints*

Response to physical constraints is a minor issue because the design of the Nishorgo Nature Interpretation Center originating from the competition was originally for a different location. The architect was able to choose his optimal site at the entrance clearing of roughly 1000m<sup>2</sup> of the 120,000m<sup>2</sup> site area. The architect's response to the physical constraint in the case of Teknaf was to site the building on a north-south axis with the veranda facing south towards the southwest wind and east towards the view of the Naf River. Sensitivity to trees dictated that holes would be "punched" in the roof slab to accommodate three trees. None of the surrounding topography was affected by the construction of the Center

### *Response to User Requirements*

The two main spaces of the Center comprise the main function of exhibition and gathering on the upper floor and services on the lower ground floor. These functions are in line with the elevated vernacular house types in timber and bamboo used as a model. Users initially require orientation which is provided by the visual cue to enter the building towards the area between the information desk and the foot of the entrance ramp. Users are then led up the ramp towards the outdoor exhibition area and veranda while gaining multiple views of the surrounding forest as they walk up.

The first floor veranda and outdoor exhibition area provide an area of rest, observation and the first information panels explaining the flora and fauna of the Teknaf Game Reserve. The large wooden door then leads into the main exhibition gallery. This exhibition gallery has tinted windows on both sides that filters the light coming through the visually dominant horizontal wooden lattices (derived from vernacular models) bolted on to iron stanchions on the exterior. Exhibition material is attached directly to the walls or free standing iron frames (not designed by the architects). The last remaining volume is the closed multimedia room which is the cantilevered box on the north edge of the building. From here visitor can exit down the staircase towards the hiking trails of the Protected Area or return down to the main gate and parking area. Because the building depends on information graphics and signs for use, outside the scope of the architecture, there is some confusion as to the entry and entrance of the building via the ramp and stairs.

The ground floor comprises the bathrooms, wash basins and utility room for the building again in the spirit of local vernacular house examples which locates these in the ground floor volumes.

### *Purely Formal Aspects*

The architects have through a mastery of vernacular Bangladesh architecture managed to render the aesthetic and architectonic values of this timber architecture into heavier and durable materials of concrete, steel and brick without losing their essential values. The transformation is radical and new and at this point difficult to categorize. It can not be labeled as regional because the expression of structure in this move produces a much different scale and geometry. It can also not be called modern because it does not aim at for simplicity in abstracted geometry. The architecture retains connections to the local but because of the



highly articulated and plastic application of meaningfully expressive structure takes advantage of the capabilities of reinforced concrete and brick made by hand. It advances architecture into a new direction in Bangladesh through a process oriented abstract understanding of the vernacular's capabilities elegantly mapped onto a new architectonic condition.

### *Landscaping*

The ground floor area has been paved with brick and gravel but due to the natural setting the architects have purposefully not landscaped the area around the Center.

## **C. *Structure, Materials, Technology***

### *Structure*

The Nishorgo Interpretation Center is built using reinforced concrete with local hand made brick infill. The two story structure consists of two slabs supported on three load bearing shear walls and two columns. Each shear wall and column has individual footings below grade which are connected by grade beams. The entrance ramp is supported by two separate columns. No piling was necessary because of the good soil condition. All concrete has "clear cover" i.e. the section is 5-8 cm. bigger to protect against salt corrosion.

The two original aspects of the structure are the variations in the slab thicknesses and the extension of the shear wall footings underneath the multimedia room. The tapered roof slab is done for appearance and economy. The roof slab extends 1.2 meters' beyond the lower first floor slab and is 30cm's thick towards center, and 20cm towards the perimeter. It tapers towards the side of the building because less support is needed and gives a thinner appearance. The second feature is the structural support below grade of the cantilevered multimedia room. The supporting structure underneath the multimedia room uses a visible beam below that extends the distance of the multimedia room for support. This beam connects to the shear wall that connects to the foundation footing. The foundation footing which is not visible also extends the same distance below grade to support the weight of the cantilevered room. This only occurs with this shear wall foundation as the others are the same below and above grade.

A completely exposed structure is expressed as the main architectural strategy. Exposed surfaces reinforce the building's expressive structure and relate it to the structurally expressive local vernacular in bamboo and wood.

### *Materials*

The materials are locally available standard materials installed and cast on site. All of the materials have been sourced locally either from the regional capital Chittagong or district center in Cox's Bazar. Stone, cement and other materials have been tested and approved by the Local Government Engineering Department. There has been an effort made to use local materials with a concern for sustainability for example the wood timber for the doors and

louvres in *chapalish* (*Artocarpus chama*) were selected by the client of the project, the Ministry of Environment and Forests.

The main structural material, reinforced cast concrete is from cement, mild steel and gravel from Bangladesh. The primary structural members are concrete shear walls and columns sitting on footings and grade beams. Walls are shear walls, brick or glass. The flooring includes the treated exposed surface of the concrete slabs and on the ground floor a combination of brick or gravel, originating from northeast region Bangladesh of Syhlet.

There are metal hand rails of square profiles with cables around the verandas, balconies and significantly as a design element on the ramp. Aluminum and tinted glass from Chittagong are used on either side of the exhibition gallery.

Timber for the doors and louvers of the wooden lattice are locally sourced and produced.

#### Infill Materials

The building is comprised mainly of the exposed structure of columns and sheer walls requiring less infill materials such as the brick. These bricks can be seen in the walls of the bathrooms and utility rooms on the ground floor. The primary infill material is the locally available solid red bricks brought from a brick field 2 kms away for the site. There is a bit of hypocrisy in this as the bricks are fired in ovens using timber from the local forest which this Nature Interpretation Center is ostensibly supposed to protect.

#### Renderings and Finishes

The primary finishing material is exposed concrete finished in different ways. Fair-face concrete is used to finish most of the interior and exterior walls while the exterior of the protruding multimedia room volume is given a rough wood cast face. The seams of the concrete face are emphasized and provide a grid geometry that complements the horizontality of the wood lattices of the louvers. Lines of rope cast a 1 cm wide fiber twine is used as a drip course and aesthetically integrated into the slab in a precise manner. The quality of the surface of the raw concrete both rough and smooth is quite accomplished and gives the building its definitive character. Some local residents thought the building was “not finished” because of this structurally expressive architecture.

A local ceramic technique of in-laid broken ceramic pieces on plaster is used to cover the surfaces of the concrete benches inside and outside of the building. These glossy recycled multi-colored ceramic tiles laid out in random provide splashes of color and texture in contrast to the matte finish of concrete and brick.

The aluminum glazing of the exhibition space is composed of tinted glass on the dark aluminum floor to ceiling frames of the windows.

### *Construction Technology*

The technology used for the structure of the Nature Interpretation Center is standardized reinforced concrete construction techniques applied throughout Bangladesh to primarily public buildings and larger multi-story commercial and residential buildings. The contractors M/S Nazmul Haque from Cox's Bazar are a smaller firm but are able to access technological capabilities from the booming construction sector of this newly popular beach resort area of Bangladesh. Zaynal Abeden Kajol from M/S Nazmul Haque stated that he applied techniques learned primarily from government contracts for infrastructure projects such as a culverts and bridges and occasional small scale touristic/residential buildings to this project.

The overall construction technology while utilizing fairly standard techniques common throughout Bangladesh also integrated local craft techniques including ceramic tiling and the woodwork lattice and doors.

### *Building services and site utilities*

The Nature Interpretation Center located in the preserved forest area has only a limited set of utilities.

The building's most detailed utility system is a lighting design system for the exhibition display consisting of individual spot lights in the exhibition area and down lights throughout. It should be mentioned though that there is no serious desire by the Ministry of Environment and Forest to use the building at night. This is partly due to the fact that the building is connected to the local and fairly unreliable electrical grid.

There is no heating or cooling system. A storage tank on the roof and water from the village system provides water for the bathrooms and basins.

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

### *Technology*

All construction techniques are standard throughout Bangladesh. Due to the remote setting in the southern most point of the country both supply and sustainability issues limited the use of technology. Thus a very low level of technology was used with the most advanced systems being the lighting and tinted aluminum glazing sourced and applied from regional centers Chittagong and Cox's Bazar a few hours trip north on the main road.

### *Materials*

All the primary materials, cement, brick, steel, sand, gravel, steel and timber are local.

### *Labour Force*

The labor force consisted of skilled construction workers and laborers (mostly from the local villages) organized and supervised by the builder/contractor Zaynal Abeden Kajol of M/S

Nazmul Hague of Cox's Bazar. At the peak of construction during the pouring of concrete 100 people were on-site with 20-30 of those being skilled workers (wood mold formers, steel workers etc.). During detailing and finishing work this number was 10-15 workers of which 10 were skilled. The laborers originating from the local villages are today the same individuals that are the volunteer members of the Community Patrolling Group who are under the Nishorgo program important stakeholders in the building and surrounding Forest Preserve.

### *Professionals*

The professional team consisted of the team of architects and engineers at Vitti Sthapati Brindo Ltd of Dhaka, Bangladesh led by Principal Architect/Director Ehsan Khan, Structural Engineer Tofazzel Hossain, Resident Engineer Nurul Islam Akash, Managing Director and Associate Architect Iqbal Habib. Vitti is a practice formed in 1991 under the guidance of the well known modernist architect Mazharul Islam as a partnership of Ehsan Khan, Iqbal Habib and Ishtiaque Zahir focusing on projects in a variety of categories. Vitti has built a range of projects for corporate, private and government clients in Bangladesh with the most notable being the Bangabandhu Shamadhi Shoudha mausoleum and memorial to Sheikh Mujibur Rahma, the founding leader of Bangladesh in Gopalgonj.

Construction was undertaken by contractor Zaynal Abeden Kajol of M/S Nazmul Haque of Cox's Bazar, a local construction firm experienced in infrastructural projects.

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

### **A. History**

The project was initiated via a national architectural competition organized in 1995 by the Nishorgo, Bangladesh Protected Area Management Program of the Forests Department, Ministry of Environment and Forests (an old institution dating back to British rule) and Institute of Architects of Bangladesh (IAB). The competition brief was for the design of an innovative, ecological and community-focused Visitor Interpretation Center for a location in the Lawachara National Park (in northeast Bangladesh) but that could also be applied to other sites. The competition drew eighty one registrants and a total of 32 projects were submitted. The jury consisting of three architects from Bangladesh (Dean of Architecture School at Bangladesh University of Engineering and Technology, representative from IAB and Forest Department) and an American representative of USAID, the main funding body behind Nishorgo. Winners were announced and exhibited in August of 1996.

From the announcement of Vitti as the winners of the competition the process moved quickly to construction 7 months later. The project commission was given to Vitti by the Department of Forests in October 2006 for the site in the Teknaf Game Reserve. Design was completed in November 2006.

For construction, a bidding process was initiated in February, 2007, by a newspaper announcement. Notification was given to the winners M/S Nazmul Haque in March 2007 and

construction started in April 2007, finishing in November 2007. The building was opened for use with an official ceremony in July 2008.

**B. *Costs***

Total construction cost of the project was \$48,571 at \$169 per square meter excluding architects professional fees at \$6,785. All costs were paid for by the Forest Department, Ministry of Environment and Forests, Bon Bhaban, Agargaon. Funding for the building and the competition was provided by USAID through Nishorgo.

**C. *Comparative Costs***

Costs for the Center at \$169 per square meter were half the existing rates for construction in this part of Bangladesh due to a combination of sustainable architectural strategies which relied on basic techniques and building materials some of the them recycled, the low labor rates of the area and the efficiency provided by the local contractor operating from their winning bid price.

**D. *Maintenance Costs***

Maintenance of the Mosque amounts to about \$56 a month which includes salaries for a ticket collector, expenses of a “caretaker” and electrical costs.

**E. *Ongoing Costs and Life Performance Costs***

The major long term costs will be to maintain not the building itself which because of its rudimentary structure, spare materials (concrete, brick) and vocabulary will require little in the way of upkeep beyond the maintenance of the exhibition materials. The wood lattice, metal handrails and glazing system are the only features that would require some degree of maintenance all of which are available from specialists in Cox’s Bazar.

**VI. *Technical Assessment***

**A. *Functional Assessment***

The Nishorgo Oirabot Nature Interpretation Center is a lean and robust building that provides basic educational and information services in a fairly remote, rural setting. Based on the competition brief the primary goal was to house the exhibition and educational material for the Nishorgo Program. As an important link in the eco-tourism initiative for the Teknaf Game Reserve, Nishorgo aimed to have these centers “provide visitors with pertinent information about Protected Areas through interpretive exhibits, visitor information kiosks, programs, printed materials, and interactive media displays....educate the public about the importance and methods of conservation and non-destructive ways to enjoy nature”.

The design provided for these functions as we could see in the circulation from the entrance ramp up to the exhibition areas. The overtly circuitous entrance ramp throws the visitor into

the forest exposing them to trees and flora before returning back towards the exhibition areas. Arriving at the veranda the first exhibition materials are encountered followed by main gallery space and the as yet not implemented multimedia room. Both the height and width of these galleries were more than adequate for the material presented there. The architect's decision to visually link the gallery space to the surrounding forest through the transparency provided by the floor to ceiling glazing emphasized the presentation.

While the architecture has functionally provided for all those informational elements set out in the competition brief, the program managers at the Forest Department and Nishorgo have not been able to organize themselves to operate this building successfully. The information on display has not been adequately programmed into the space with some elements such as a clear circulation route and access to printed matter missing. Because of this programmatic confusion, while visitors are supposed to start at the Center before heading into the forest, some skip the building all together heading straight into the forest paths.

Perhaps the most successful aspect of the building's function to "protect" the forest has not been through education but by its presence alone. The building's architecture especially the veranda presents welcome places to rest and relax to escape from the hot sun or rain for the local populous. Many local residents, children, patrolling soldiers and others use the building this way creating a constant circulation in the forest that establishes the position of the community and governmental administration in this contested area dissuading and reducing illegal cutting.

#### ***B. Climactic Performance***

The building lacking any heating or cooling systems relies on its architecture to provide climactic performance. Its highly permeable and open structure provides many areas for air and wind flow in this tropic setting. The veranda provides the most effective of these as a large space open on three side towards the southwest winds. The wider roof slab also provides protection from sun and rain but not completely. The architects wanted visitors to interact with the natural setting by making the veranda opening gap wide and high enough for some rain and sun to enter.

Similarly the glazing and wood lattice around the main exhibition allows a balanced amount natural light into the exhibition space. The space is lit reducing the need for artificial lights but not heated up to require air conditioning.

#### ***C. Water and Rainfall***

The building's open structure allows all water to run off the building directly into its surrounding with minimal intervention. The slightly tapered roof larger then the floor below covers the exhibition space allowing run off directly into the forest.

#### ***D. Environmental Response***

The Nature Interpretation Center using the characteristics of the local vernacular architecture has a relatively small footprint compared to its size. The columns and shear wall raise the

building above the ground with relatively minimal foundations. Almost like a tree house the primary activities occur above the natural surroundings allowing views towards the forest from many points. The raised posture similar to the local vernacular houses on stilts also is intended to keep grazing and wild animals such as elephants and water buffalo from wandering into the building. The robust structure also is strong enough to resist the impact of these animals.

Siting in the forest was carefully done as to not displace the existing trees. Holes were opened up in the roof slab to accommodate three trees as the building carefully integrates into the environment.

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

The choice of materials reflected the realities of building in this remote location and the sustainability of the architecture in the future. The building's natural setting does not require it to adapt into an existing habitation. Freed from any social need the architecture through its expressive structure, basic materials and adaptation of the ecological advantages of the vernacular makes a definitive statement perhaps not possible outside of this natural context. Concrete is adapted to an ecological need yet is aesthetically and functionally designed in-line with the vernacular village buildings in timber and bamboo that are raised above floor of the forest.

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

The area around Teknaf 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.

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

A fairly simple building with no mechanical systems means that beyond small details of the glass windows, basic plumbing and electrical system there is little to break down or degrade over time that cannot be fixed by local means. The wood lattice, doors and cabinets would perhaps require periodic treatment. Pesticide has been sprayed on the foundations of the building to protect against insects.

The concrete has been detailed with joints and drip courses to prevent cracking and damage through water accumulation.

**H. *Design Features***

The Nature Interpretation Center is a large public building in a remote corner of Bangladesh. Its highly articulated structure in reinforced concrete with a neat concrete finish gives it a unique appearance tied closely to its program. Circulation paths, observation points, verandas and balconies clearly visible on the building are important elements of the design that work to make the experience of interacting with the forest while moving through the building an

important part of the educational experience. The architectural strategy tries as much as possible to unify the encounter with the forest and the interaction with the educational material as one experience. In this way, the visitor is made to feel comfortable with the surroundings before setting out into the hiking paths of the forest as was intended by the program despite the failure of the wayfinding signs. Raised above the ground, possessing a wide veranda, open to cross ventilation, these are the principal architectural strategies picked up from the local vernacular typologies of residential buildings that are here used to great effect to create a pleasant and hospitable environment.

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

The project has increased circulation to this corner of the forest as required by the program. Being a preserved natural area care was taken in siting to not cause undue stress on the surrounding environment. The path leading from the entrance to the Nature Interpretation Center is continued seamlessly towards the forest paths.

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

The project managed by governmental and non-governmental agencies is highly dependent on the continuation of the policies that led to its construction continuing. While the Nishorgo Program funding has been extended through 2013, IPAC, the project consultants financed by USAID have declared that the overall economic sustainability of the project through the ownership of the Co-Management Committee of local resident and governmental officials can not be achieved for another 10-15 years. Changes in policy could at any time past 2013 cause funding to be stopped and the Nishorgo project including the Nature Interpretation Center to be shuttered. While the architecture of reinforced concrete is specifically meant to be durable in the long term, without a function, the strength of this building will make it difficult to recycle or remove in the case of dried up funding.

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

As it is primarily an exhibition space the Nature Interpretation Center's interior furnishings are minimal. The exhibition spaces are open, bounded only by thin metal hand railings. There are a number of concrete benches with broken ceramic inlay in the local manner. The ground floor information kiosk in wood and concrete and the basin in concrete have a neat cement finish providing a clean look despite the rough and natural surroundings.

**VII. Users**

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

According to the outlined policy, "The Nishorgo Program is a comprehensive effort to improve the management of Bangladesh' Protected Areas of all kinds. At the heart of Nishorgo is a focus on building partnerships between the Forest Department and key local and national stakeholders that can assist in conservation efforts".



Within the social and economic policies of Nishorgo, the Nishorgo Oirobot Nature Interpretation Center is intended to serve two primary sets of users, visitors as part of the eco-tourism effort and local residents to provide them incentives and alternative sources of income to decrease dependency on forest resources.

Of these two groups, visitors seem to be benefiting from the Center more than the local population. During our time at the Center there was a small but significant amount of primarily Bangladesh tourist's visiting the site. These tourists were taking advantage of what is one of the few public facilities in this area. They were all generally happy to see that this facility existed and were satisfied with the building and how it functions. Half-way between the resort area of Cox's Bazar and the natural beauty of St. Martin's Island in the Bay of Bengal, the Teknaf Game Reserve is ideally located to take advantage of this tourism. While poor road signage and what seems like insufficient outreach to the local tourism industry limits the number of these types of tourists, the ones that do arrive use the building and facility as it was intended raising awareness of the forest and providing income to the local Co-Management Committee. From Dhaka, Chittagong, Cox's Bazar and Teknaf, professionals, merchants, university students were but a few of the types of tourists we interacted with in our short stay.

The other user group, the local residents, members of the Co-Management Committee, Community Patrol Group set-up by Nishorgo and residents from the surrounding villages seem to be benefiting less. Denied the opportunity to use the forest as a resource but compelled to take on volunteer work such as patrolling day and night, these residents are caught between their previous subsistence life based on the forest and the as yet to develop sustainable economy. Of course, these social policies have no direct relation to the building itself but they do affect how the local residents feel and interact with the building which they as representative of this system.

The villagers both men and women also do visit the Center but primarily to use it's veranda as a cool spot to relax and enjoy the view or for the children who play in its regularized environment. Despite however much economically this building might not be serving their interests at the moment they seem proud to have it in their locality.

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

The architecture of the building was both the winner of the competition in 2006 and the Berger Award for Excellence in Architecture awarded by the Bangladesh Institute of Architects in 2009. The architecture has received uniformly high praise for its balance of the functions of timber vernacular architecture transformed into reinforced concrete in a seamless manner.

The most significant criticism is not of the building but of the overall Nishorgo program. A very detailed critique by Mohammad Tanzimuddin Khan was published by the Centre for the Study of Globalisation and Regionalisation at University of Warwick entitled "Chevron's Seismic Survey, USAID's Nishorgo Project, the Lawachara National Park of Bangladesh: A Critical Review" (2008). In this assessment Nishorgo is described as to "...appear to have some other purposes which are largely related to the economic interests of the

USA....members of the local public and private agencies appear to partner with their international cohorts, and neglect the genuine responsibility of conserving the forests, thus further complicating the principles of public-private partnership empirically”.

## VII. Project Personnel

Family Name	First Name	Position	Company	Role in Project	Remarks
Roy	Prantosh Chandra	Site Coordinator	Integrated Protected Area Co. Management (IPAC)	Site Coordinator	
Ahmad	Ishtiaq	Conservator of Forests Deputy Chief	Bangladesh Forest Department	Project Director, Implementor, Client	Ministry of Environment and Forest Department, Nishorgo Support Project
Zaynal Abeden	Kajol	Owner	M/S Nazmul Haque	Builder/Contractor	
Avtar Ram	Sharma	Deputy Chief of Party	Integrated Protected Area Co. Management (IPAC)	Managing Field Operations/Client	
Habib	Mohd. Iqbal	Managing Director	Vitti Sthapati Brindo Ltd.	Associate Architect	The importance of co-existence of the structure as ‘beholds’ rather than ‘inspirator’. emphasized ideal level of participation. Concept development
Hasan	Jubair	Associate Architect	Vitti Sthapati Brindo Ltd.	Associate Architect	Feel the nature
Akash	Nurul Islam	Residence Engineer	Vitti Sthapati Brindo Ltd.		
Karim	Md. Nurul Quazi	Assistant Conservator of Forests	Bangladesh Forest Department	Supervise the overall work from Forest Department	
Khan	Ehsan	Principal Architect/Director	Vitti Sthapati Brindo Ltd.	Principal Architect	

## **IX. Bibliography**

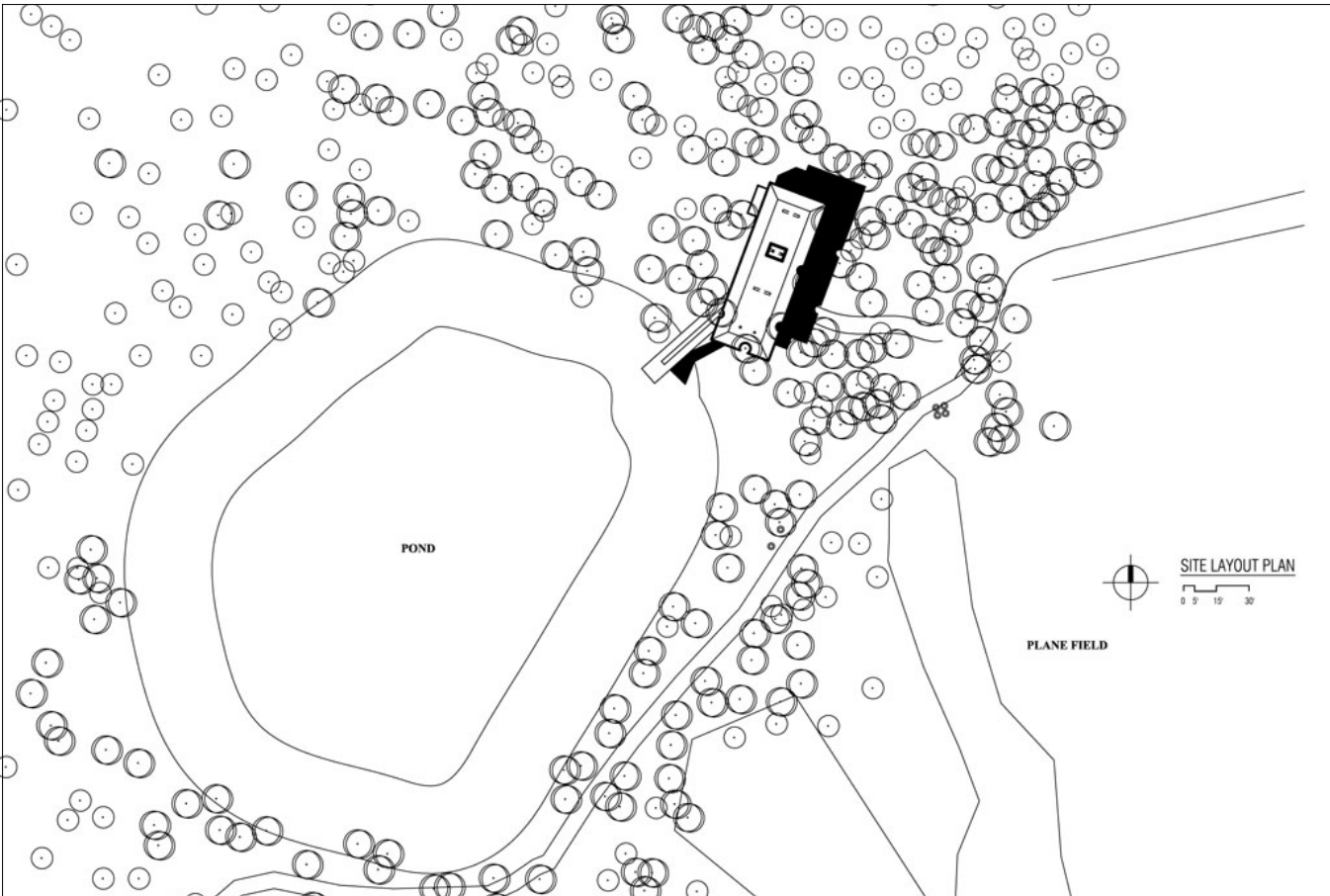
This project has not been published. It did win the Berger Award for Architecture in Bangladesh in 2009 garnering publicity in the Dhaka newspapers.

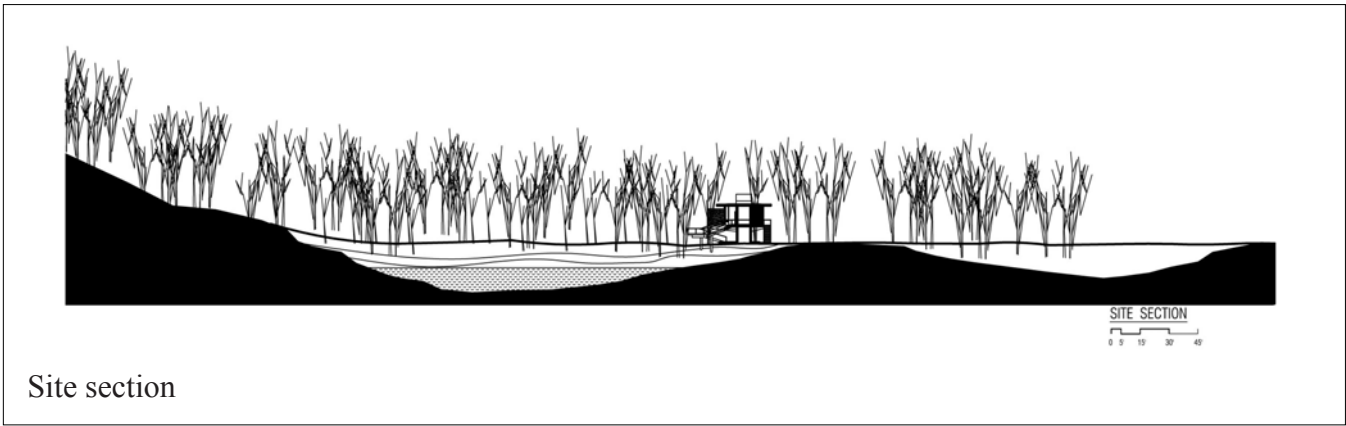
**Gökhan Karakuş**

*May 2010*

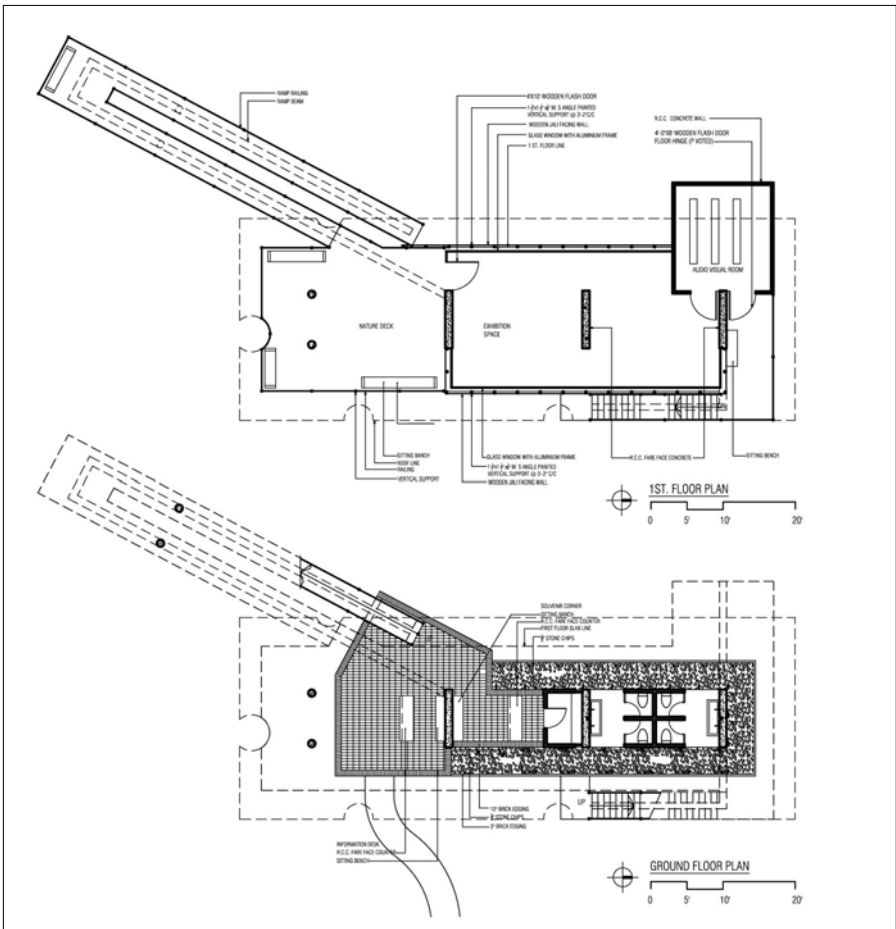
\* This report is the original, unedited version sent by the author on the 18<sup>th</sup> May 2010.



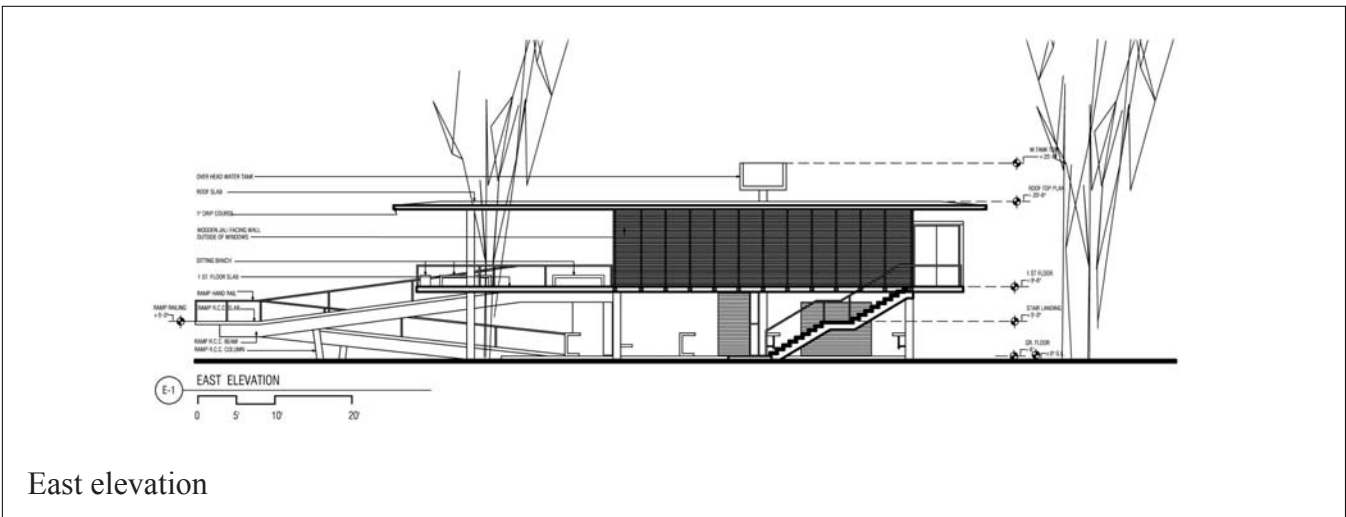




Site section



Ground & first floor plans



East elevation



South-East view.

South-West view.





Ramp and pavilion.

Ramp and pavilion looking out over the pond.







Ramp landing sitting connects visually with the hill at west and the pond.

Service blocks at ground floor.





Night view of the terrace.

Detail of the terrace, opened to preserve trees.





Toilet facilities on the ground floor.

Concrete stairs.





Service block.



Entrance to the exhibition room on the first floor.



Exhibition room on the first floor.

Exhibition room at night.



