MARVI MAZHAR & ASSOCIATES

Date 17/10/2016

J.M.B GIRLS SEONDARY SCHOOL (SITA RAM BUILDING)

Project: Documentation and Restoration
Building Type: Residential
Location: Muhammad Bin Qasim Road, opposite Jama Cloth Market, Karachi, Pakistan
Province: Sindh
Period: British Raj Period
Construction Material: Limestone/Yellow Gizri Stone

Figure 1- J.B.M Girls Secondary Secondary School[1]

[1] Photograph credit: Marvi Mazhar and Associates

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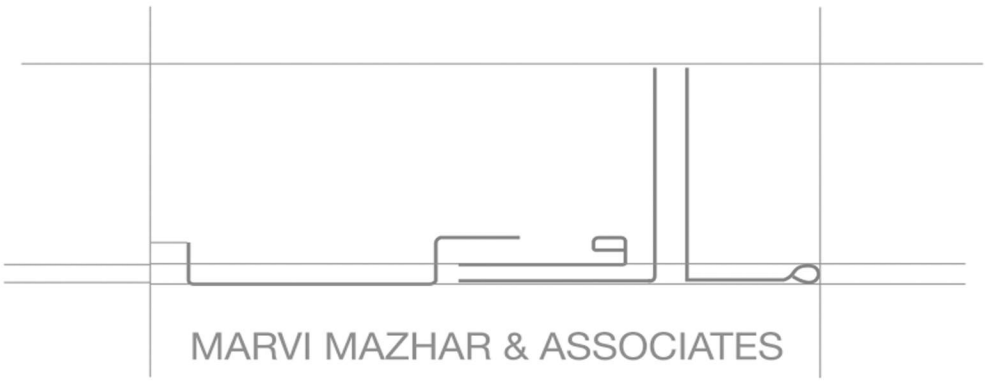


Introduction

The J.M.B Girl's Secondary School was previously known as Sita Ram Building which was built during the British Raj. It is a three story building with a covered area of 16,720.29 sq. ft. It was initially used as a residence, later it was used as a school and now it is used for commercial as well as residential purpose.

Location

The J.M.B. Girl's Secondary School is located in the area of Saddar, of Saddar town. It is present on Muhammad bin Qasim Road opposite Jama Cloth Market and is in the walking distance of Municipal Park

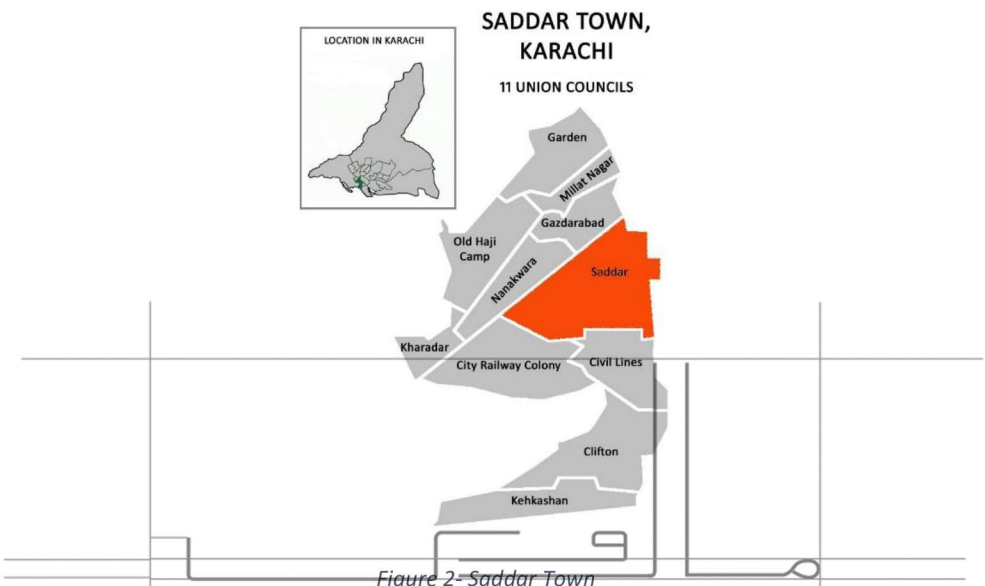


Figure 2- Saddar Town

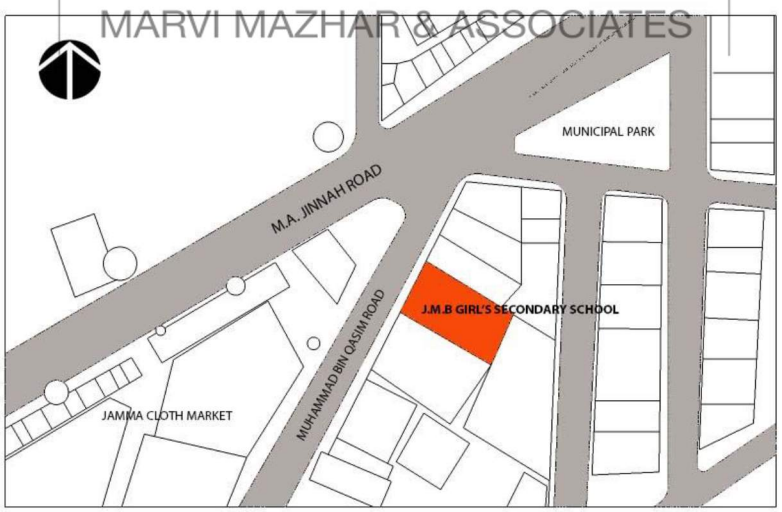


Figure 3- Site Plan

Architectural Influences

Due to the absence of documentation of J.M.B School, the architectural background of the building can only be derived through visual study and comparative analysis. The building material used is the yellow Ghizri stone, which was the local material available at the time of construction. All the buildings built during the British Raj, such as KPT Head Office and Empress Market, were all built from the same stone.

Figure 4-Yellow Gizri Stone, KPT (Karachi Port Trust) Building Karachi, Pakistan.

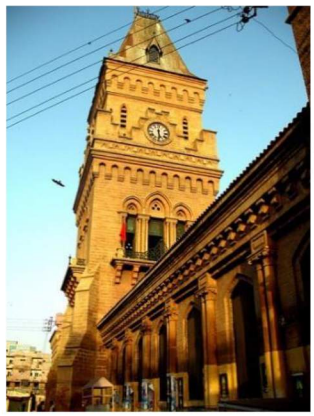


Figure 5-Yellow Gizri Stone, Empress Market, Karachi, Pakistan.

Figure 6-Yellow Gizri Stone, Empress Market, Karachi, Pakistan

The architecture belonging to the early Colonial era was usually built with mud-built walls (gonda) or with sun-dried bricks (katchi int). Later wall construction was improved and Ghizri stone replaced the wood and mud construction. This stone became the common material used for construction and continued to be used till as late as Second World War.

Existing Use of the Building

Presently, the building has commercial activity on the ground floor, living squatters on the first and second floor while the third floor is vacant.

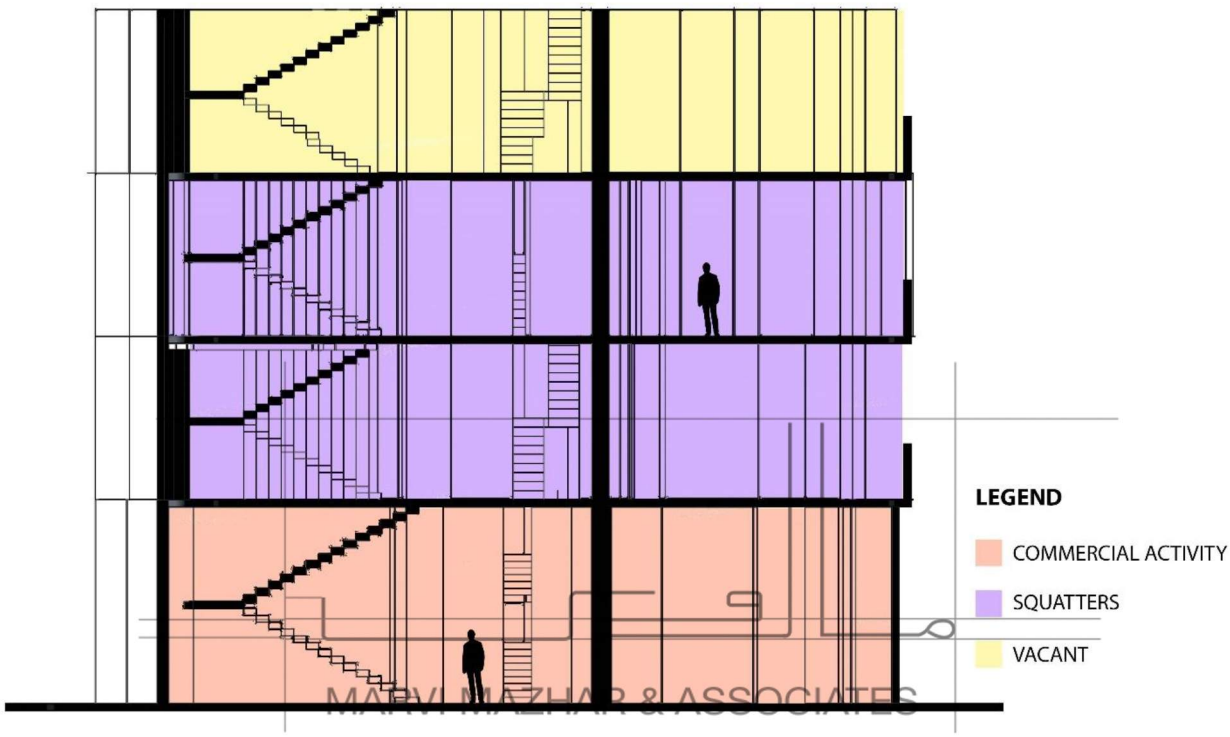


Figure 7- Building use diagram

Existing Condition

Due to lack of maintenance of the building, the structure has decayed and deteriorated over a period of time and now poses as a threat to the users of the building. Parts of the structure are on the verge of collapse; doors, windows and staircases are damaged, therefore, the building needs to be restored.

Figure 8-Existing part of the facade in dilapidated condition

Figure 9-Existing damaged window

Figure 10-Existing part of the building in dilapidated condition

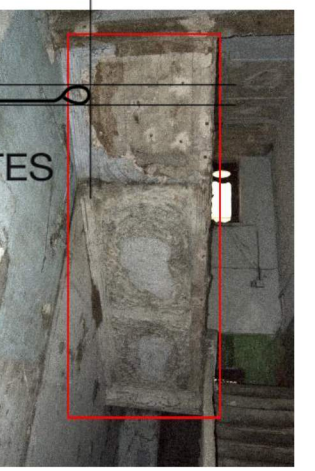


Figure 11-Existing deteriorating staircase

Figure 12-Existing damaged decoration of the ceiling

Figure 13-Existing chipped floor tiles

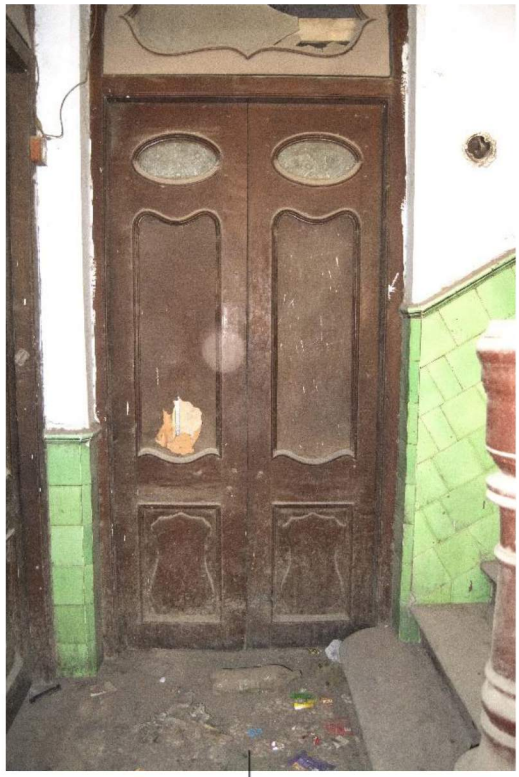


Figure 14-Existing damaged door

Figure 15-Glass absent in the existing ventilators

Figure 16-Damaged railings of the existing sraircase

Damage Assessment

Damage assessment which is the main part of condition survey. The first step is visual observation which leads to detailed analysis if it is necessary.

Inspection of the structural elements and building itself is done based on the parameters listed below:

- General information
- Physical information
- Photographs of the building
- Dimensions of the structural elements
- Roof structure and its decays/damages
- Floors and their decays/damages
- Structural elements (walls, columns, arches, transition elements and domes)

Causes of Deterioration

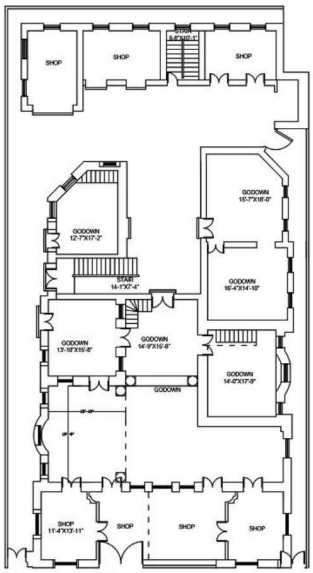
1. Direct Exposure to the Elements and Extreme Weather
    - 1.1 Discoloration
    - 1.2 Decay of the painted wall
    - 1.3 Rusting of the roof coverings.
    - 1.4 Weakening of plaster and mortar of stone walls.

2. Structural Defects
    - 2.1 Weakened structural columns
    - 2.2 Cracked and weakened sheer walls.
    - 2.3 Sagging and weakening of floors and grits.
    - 2.4 Foundation Problems

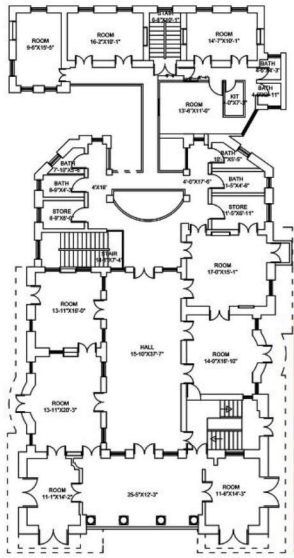
3. Termite and Dry Rot Infestation
    - 3.1 Termite and dry rot infestation in any places.

PROBLEMS		Possible CAUSES	Solutions
General	Specific		(treatment options/ repair)
A. Surface Accumulations (positive alterations)	• Dust, dirt, grime • Soiling, accretions • Bird droppings, graffiti, patina • Removable Stains	• Pollution • Lack of maintenance • Vandalism	• Cleaning • Maintenance
B. Biodeterioration	• Cracking, fissures • Bacterial growths • Moss, algae, lichens • Superior Plants • Insects, pests, tunneling	• Weakening of structure due to roots • Humidity, rising damp • Metabolism products of biological agents • Rodent, insects settling	• Cleaning: cut, brush • Water Spraying, etc • Biocides and herbicides • Maintenance
C. Chemical Transformations (negative alterations)	• Pulverization • Alveolar erosion • Increased porosity • Salt crystallization • Encrustations • Chromatic alteration: fading /discoloration • Staining (iron oxide, copper salts)	• Soluble salt re-crystallization/ • Dissolution • Hydration/ de-hydration • Rising damp • Condensation/ evaporation • Release of carbonates • Acid rain, flooding, pollution: particulates	• Desalination • Electro osmosis, siphons • Thermal Insulation • Roof drains, • Add width to roof • Trenches/ canals • Damp course • Consolidation • Protective treatments
D. Physical Alterations	• Cracks and fissures • Splitting, scaling, pitting • Stains, losses • Mechanical abrasion • Salt /frost bursting,	• Vibrations/ movements • Fluctuations in relative humidity & temperature • Thermal expansion • Plasticity due to stress • Wind • Natural disasters	• Plastic repair: • Pointing • Grouting • Plastering • Consolidation • Protection
E. Structure related Damages	WALLS • Leaning • Bulging • Settling • Fracturing JOINTS • Open • Deeply weathered • Very powdery • Decaying around the joints	• Settlement of ground • Removal of ties • Collapse of restraining arches, vaults or buttresses • Inappropriate alteration • Wash out of core filling • Stronger mortar than stones • Poor adhesion between mortar and stones • Unsuitable mortar used in earlier repair	• Take down and rebuild sections • Introduce grout • Introduce underpinning • Introduce ties and stitches • Rake out, hand grout, tamp and rake • Rake out and point only • Cut out and re-point • Rake or cut out, plug and point • Use water repellant (rarely)

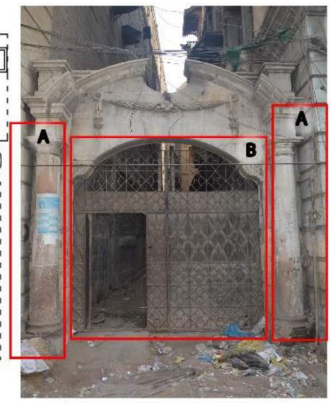
Figure 17-Conservation Problems, Causes and Solutions



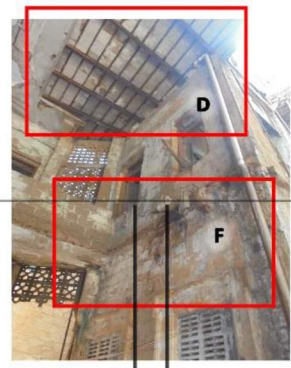
Ground Floor Plan



First Floor Plan



S.NO	ELEMENT	CONDITION	CAUSE
A	Column(Capital&Base)	Stone Detoriation & Discoloration	Weathering or exposure to Extreme Climatic Conditions
B	Door	Corrosion and Rusting	Weathering or exposure to Extreme Climatic Conditions
C	Parapet	Dismantled/vandalized or cracking visible on parts	Building Mafia, Roof Structure Stress, Weathering
D	Roof	Structural Damage	Weathering or exposure to Extreme Climatic Conditions
E	Slab	Structural Damage	Weathering or exposure to Extreme Climatic Conditions
F	Wall	Uneven surface of bonding plaster and discoloration	Weathering or exposure to Extreme Climatic Conditions
G	Window	Biodetoriation & Physical Alteration	Weathering or exposure to Extreme Climatic Conditions



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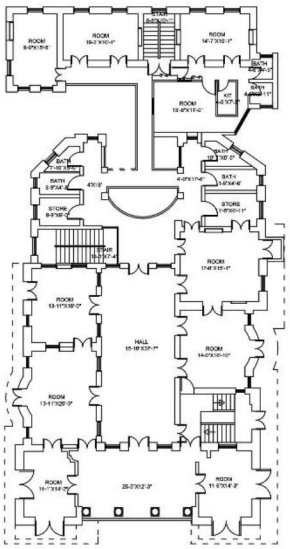
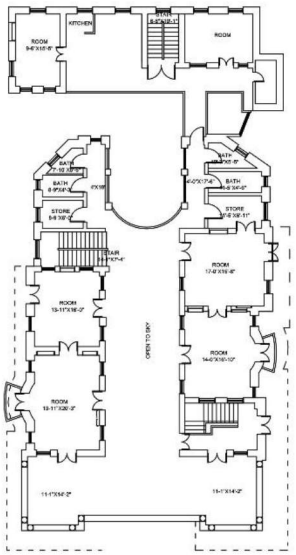
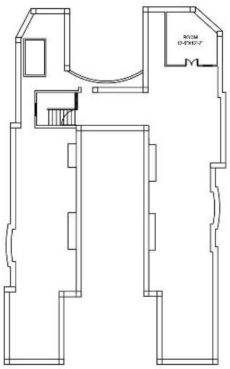


Second Floor Plan

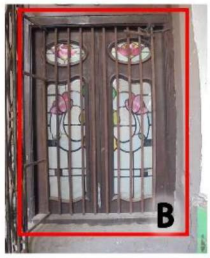


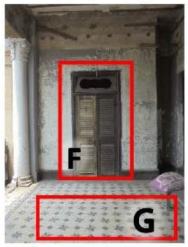
Third Floor Plan

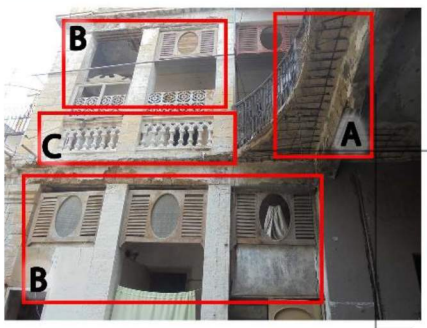


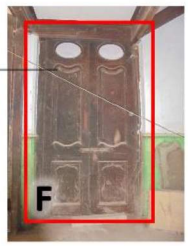
Roof Plan

S.NO	ELEMENT	CONDITION	CAUSE
A	Slab	Structural Damage	Weathering or exposure to Extreme Climatic Conditions
B	Window	Biodeterioration & Physical Alteration	Weathering or exposure to Extreme Climatic Conditions
C	Parapet	Cracking and discoloration visible on parts	Weathering or exposure to Extreme Climatic Conditions
D	Ceiling	Discoloration & Biodeterioration & Cracking	Fluctuations in relative humidity, structural stresses and weathering,
E	Column(Capital&Base)	Stone Detoriation & Discoloration	Weathering or exposure to Extreme Climatic Conditions
F	Door	Biodetoriation & Physical Alteration	Weathering or exposure to Extreme Climatic Conditions
G	Flooring	Discoloration and cracking	Structural stress, thermal expansion, weathering
H	Staircase	Biodeterioration, structural damage and physical alterations	Vibrations/movements, thermal expansion and Weathering,









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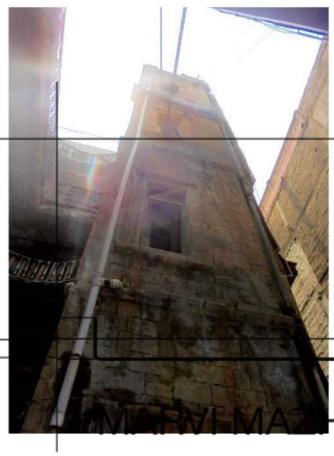
Architectural Value:

SITARAM Building has a well placed location that gives a visual preview of the architectural influence ofthe britsh raj architecture. Intricately detailed, the facade opens up to the main Muhammad Bin Qasim Road and offers vistas of the cityscape. It's internal planning lets in ample daylight through it's central courtyards and balconies. The layout is a perfect example of how these british raj complexes promotedsocial interactions of the residents. The experiential quality of this complex far supercedes that of present multistory complexes.



ARCHITECTURAL VALUE SITARAM Building (JMB Girls School), Karachi

Methodology:

In order to obtain measurements of building and document certain equipment are required.

1. **Professional Digital Laser Distance Meter**

   The digital laser distance meters were used to measure distances and heights of greater magnitude that are more difficult to measure efficiently. For example, while measuring the height of the ceiling from the floor, the device is placed on floor with the laser facing the ceiling at a right angle. The distance between floor and ceiling would appear digitally in 3 decimal points.

Figure 18- Students assessing the building

Figure 19- PVC connectors and pipes for measurements

2. **Standard Measuring Tape:**

   The primary source of measurement was the standard measuring tape. The standard measuring tape was useful in measuring detailed dimensions of architectural features like windows, columns, doors etc.

3. **PVC Pipes and Connectors:**

   PVC pipes were connected using connectors to make an extended measuring tape. Two team members collaborate together while using these pipes to measure length of objects that are high.

4. **Butter paper and Graph paper:**

   Measurements and rough draft was recorded on butter sheets and graph paper and then translated on-scale through CAD.

Recommendations and Remedial measures for the Rehabilitation of Sita Ram Building
Situated on Muhammad Bin Qasim Road, opposite Jama Cloth Market,
Karachi, Pakistan.
No. 189 on the Sindh Cultural Heritage Act 1994

Repairing of all lime stone masonry to be done with lime mortar prepared with slaked lime and lime stone crush of fine grain in ratio 1:3

1.1 Cleaning of Stone:

The cleaning will be carried out by the following process.

Repairing of the existing stone masonry on all areas, including chiseling of existing cement mortar joints, cleaning loose mortar by brushing, filling of gaps with lime mortar and repointing of mortar joints with lime mortar and cleaning the stone surface by simple brushing and washing with water spray.

Stepwise procedure for cleaning the stone:

Step 1:

- Gently brushing off all loose particles; sand, dust, etc. with medium grained sandpaper and mild detergent. Removal of loose fragments of rounded and notched as well as those pieces of stone dislodged by alveolar weathering. The location of these will be mapped and marked on site or photographs. Lime paint will be treated with wet paper putty and can partially remain as a second layer of history.

Step 2:

- Temporary filling or repairing of the open mortar joints and decayed pointing is to be done before applying chemicals.

Step 3:

- Cleaning of soiling and black with Ab-57 jelly. If the biofilm is wet, it will be allowed to dry first. Dried bio-film will be brushed and the surface applied with solvent jelly Ab-57. The jelly has a pH of around 7.5 and the following composition.

  Composition of Ab-57 jelly:

  Add:
  2.5 gr. desogen mixed in 2.5 ml. of water.
  2.5 gr. of ammonia bicarbonate in 100 ml. of water.
  15 gr. carboxymethyll-celluse in 100 ml. of water.
  Mix the three to get 50 ml of jelly.

The solvent jelly is applied to the areas to be cleaned, with a brush. The area is then covered with a sheet of polythene and left for a few hours. It is then cleaned by a sponge, dipped in distilled water.

If algae persist in certain spots, these can be treated with biocide treatment. This is done with a solution of 10% benzyl chloride or 2% zefiran in water. But this should be done after the necessary repair works.

Step 4:

Repair work, where deemed necessary should be undertaken after cleaning with gel and before biocide treatment. The lime mortar use in all repair works must be prepared according to the specifications in section 5.2.3. Repair works include;

- Re-pointing and filling of gaps with permanent lime mortar.
- All horizontal lime surfaces of windowsills and cornices to be sealed, by covering the whole surface with a layer of lime mortar. Once the surface are sealed, the water will drip over the edges of these surfaces. These areas should be regularly monitored and repaired whenever required.

Step 5:

- Salts that have already penetrated inside the building, especially in areas where the problem of rising damp occurred, can be cleaned by paper pulp technique. This should be done after the problem of rising damp has been dealt with. First the building will be aired and allowed to dry completely. Salt deposits/ salt crusts or efflorescence that appear on surface after drying, can be simply brushed off. The remaining salts can be cleaned with paper pulp technique. In this method, paper sheets wetted with distilled water, are applied on areas which have crystallized salts. The paper is left to absorb all soluble salts, and the taken off.

1.2 Lime Mortar Treatments:

Lime mortar treatments are to be done for damaged or decayed mortar joints, as well as for re-pointing and filling of gaps in masonry. It can also be applied as a protective layer on horizontal surfaces, for prevention against further deterioration. Lime mortar of specified composition should be used for this purpose.

It is observed that for previous re-pointing treatments, use of cement mortar was employed. It is an established fact that use of cement with stone, results in damage and eventual disintegration of the stone. However, removal of cement pointing is not recommended here. As the cement mortar adheres strongly with stone, if taken out forcibly, it may result in damaging the edges of stone masonry blocks. Only loose cement mortar may be removed by scrapping. After a thorough cleaning of the loose mortar, all open joints and gaps in joints should be repointed with lime mortar.

Lime mortar may also be applied to areas where the stone is heavily deteriorated, such as the base of the building and the areas where damage of stone has occurred due to chiselling. Loose stone fragments can also be consolidated by grouting the lime mortar.

For consolidation and protection of weathered areas of stone, protective coatings are sometimes suggested. But no treatment of protective coatings has so far proved completely successful. They are either not long lasting or change colour over a period of time. Taking this fact into consideration it is better to leave the stone as it is.

Preparation of lime mortar for repair. The lime mortar to be used for these repair works should have higher porosity and water absorption, whereas density and strength than that of stone. According to the research done on repair plasters of historic building in Karachi, it was found that these were lime plasters of a high water absorption capacity and porosity, and low density. Their binder-aggregate ratio was also different from the ones normally used. Generally, binder and aggregate ratio in mortar is 1:2 or 1:3. Whereas, laboratory tests of old plaster samples of British period repair lime mortar, show lime (binder), sand (aggregate) ratio of 3:1. This lime mortar has better cohesive properties, thus recommended for used in all repair works.

The lime mortar prepared for repair of joints, filling of gaps, and protective coating of horizontal surfaces should either have a ratio of 3:1 (lime : sand) or it should be 1:3 (lime : aggregate) in which two parts of the aggregate should be of crushed limestone of the same type as used in the construction of the building. This mortar should have higher porosity and water absorption capacity, whereas less density and strength, than that of stone used in the building.

1.3 Lime plastering of internal side of external walls:

1" to 1.5" thick lime plaster (applied in tow layers if necessary) applied after fixing wire mesh on all masonry surfaces. The lime plaster should be prepared according to the instructions given in the specifications of this document. Sample of the plaster to be provided for approval of the architect on site before proceeding with work.

1.4 Restoration of Windows, Doors and in Teak wood and Grill work:

After a thorough sweeping of dust from doors and windows, the wood can be further cleaned by rubbing it with cotton, dipped in alcohol. If dark coloured stains appear after this preliminary cleaning, they can be removed by a dilute solution of hydrogen peroxide.

Cleaning of stains with hydrogen peroxide should be done in three steps. The hydrogen peroxide solution used should be very dilute, i.e. 1% or 2%. For cleaning prepare three sticks with cotton bud tip, and follow in three steps;

- First dip one stick in hydrogen peroxide solution – quickly wipe across the surface to be cleaned.
- Clean the surface with a water dipped stick
- In the third step, clean water with a third stick dipped in water.

If there are small gaps and cavities in the timber surface due to some chipped or deteriorated parts, these can be filled with Alvar-jute Kaolin dough.

Preparation of Alvar-jute-kaolin dough:

- 800 gr. Alvar 770 (polyvinyl acetal)
- 1260 ml. acetone
- 504 ml. industrial methylated spirits
- 370 ml amyl acetate

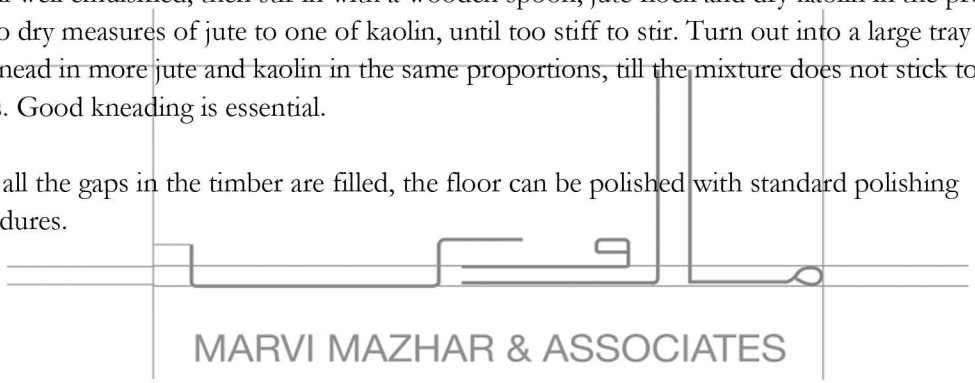
Stir and leave for 2 hours in a covered container.

Add:

- 928 ml. xylene (benzene or toluene)
- Stir well, then add;
- 480 ml water

Stir till well emulsified, then stir in with a wooden spoon, jute flock and dry kaolin in the proportion of two dry measures of jute to one of kaolin, until too stiff to stir. Turn out into a large tray or slab and knead in more jute and kaolin in the same proportions, till the mixture does not stick to the hands. Good kneading is essential.

After all the gaps in the timber are filled, the floor can be polished with standard polishing procedures.



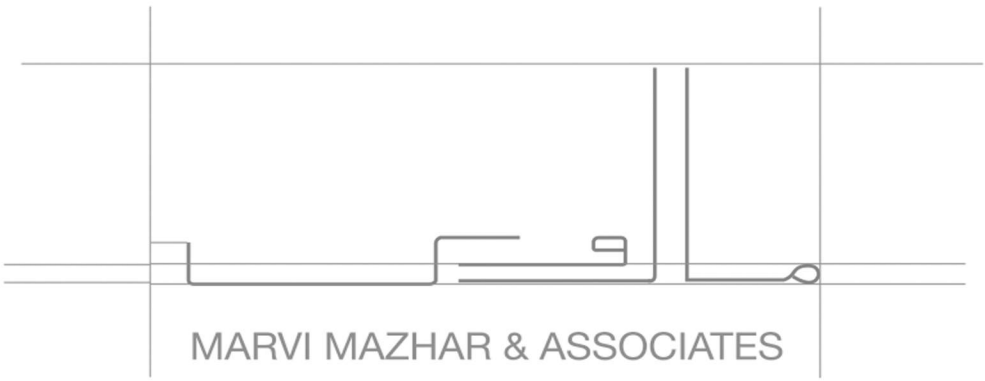
Design Objectives and Strategy for the Rehabilitation of J.M.B Girl's Secondary School (Sita Ram Building)

Situated on Muhammad Bin Qasim Road, opposite Jama Cloth Market,
Karachi, Pakistan.

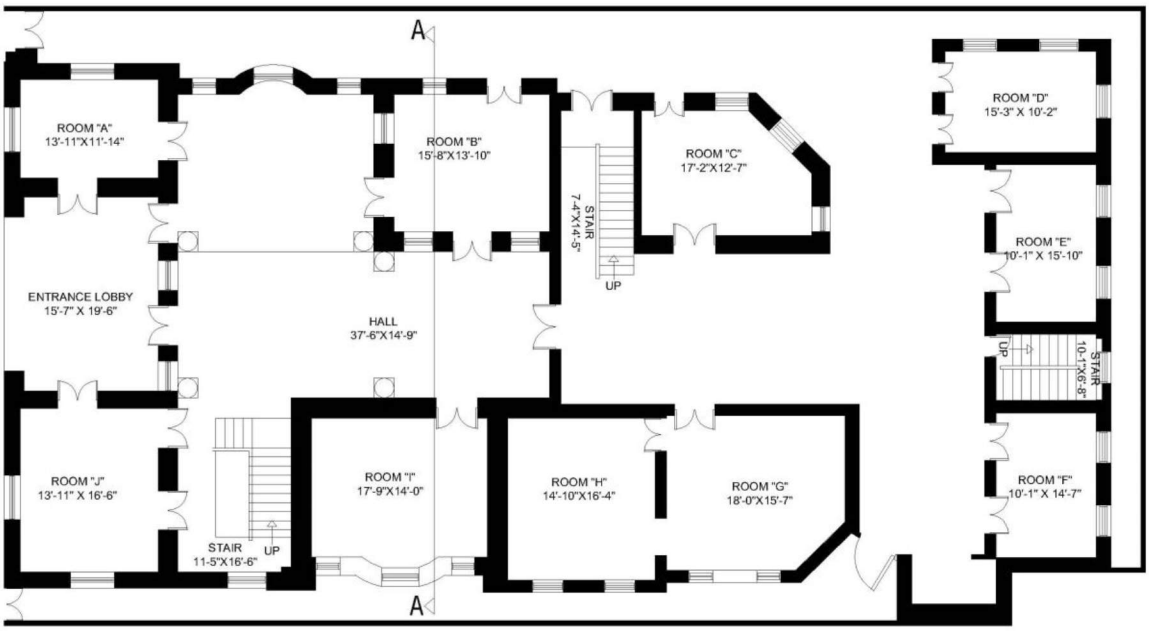
No. 189 on the Sindh Cultural Heritage Act 1994

	Design Objectives	Design Strategy
1	To restore the façade of the building with its original aesthetic qualities and to respect the character of the façade while designing the new office building.	The proposed rehabilitation of the building will be according to the conservation methods as elaborated in Appendix-01, Appendix-02 and drawings AH-01 to AH-23 and these will be documented during implementation. A detailed progress report will be submitted to the Advisory Committee during and at the end of the project for their review and archive. The following strategies will be employed; • The return of Sita Ram Building's past glory, but embedded in a new economy where heritage buildings are too often considered as a burden to the real estate value of the land. • The potential of the existing structure is an important piece of Neo-Classical Architecture that should be given all attention and restored according to international standards. • The conservation of the building could be set as an example for the heritage building in the city and can create an added value to the whole project.
2	To emphasize the presence of the original building on Muhammad bin Qasim Road and to integrate it into a new architectural complex which responds to the demands of present day economy.	The rectangular sandstone of the building evokes monumentality through uniformity of material and simplicity of profile and helps in maintaining the importance of the colonial style of architecture.
4	Phasing, in order to bring back the glory of the building ASAP.	In the first phase, the owners would request to be granted the permission to upgrade the building without hampering the detailed restoration. This will involve the repair of damaged doors and windows, removal of graffiti and miscellaneous later additions. No sand blasting will be permitted.

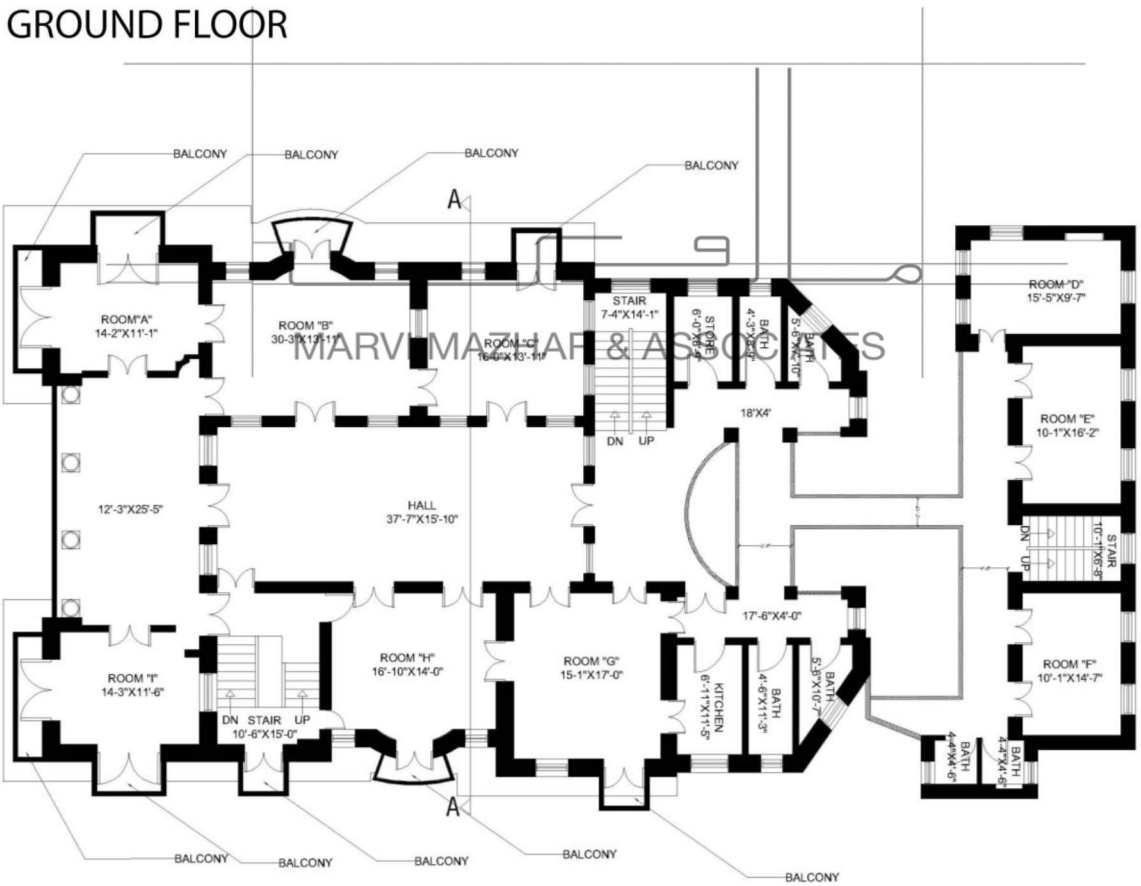
		The repair of the existing foot path and the provision of urban street furniture such as light poles, trees, dustbins, flood lights etc….. can transform the image of J.M.B Girl's Secondary School (Site Ram Building) at an early stage of the project implementation.



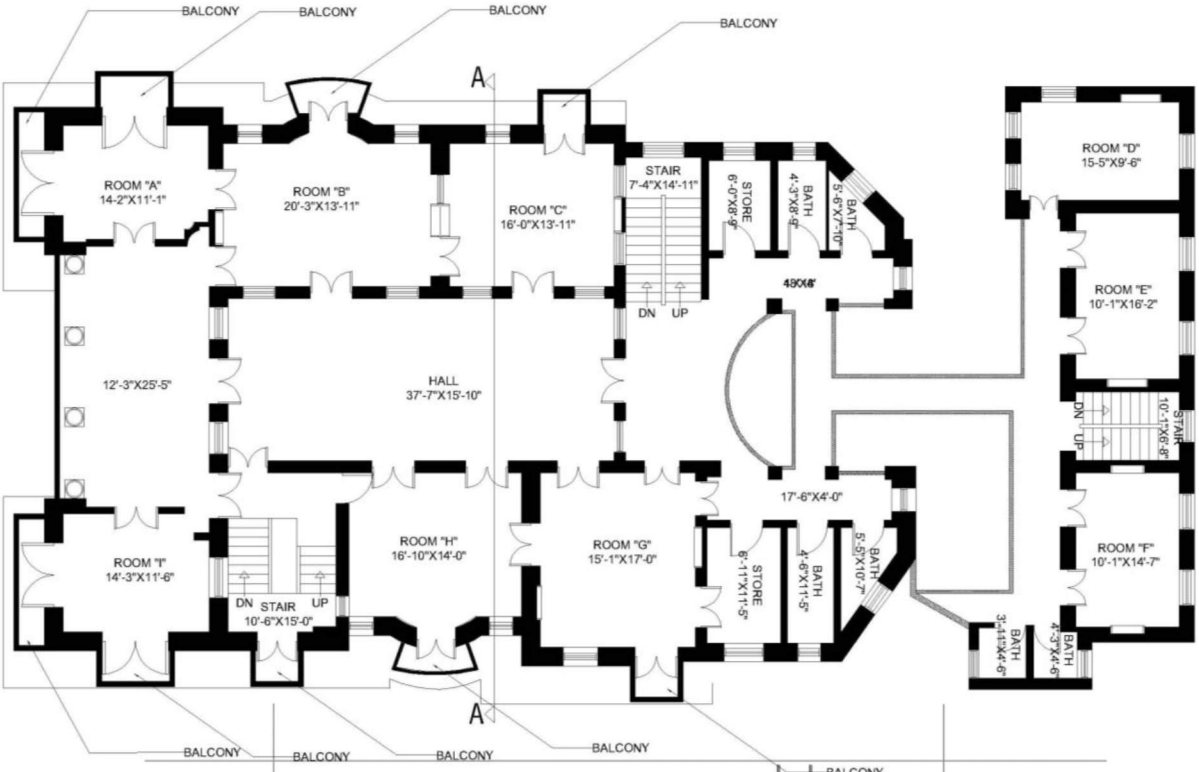
Proposed Plan:



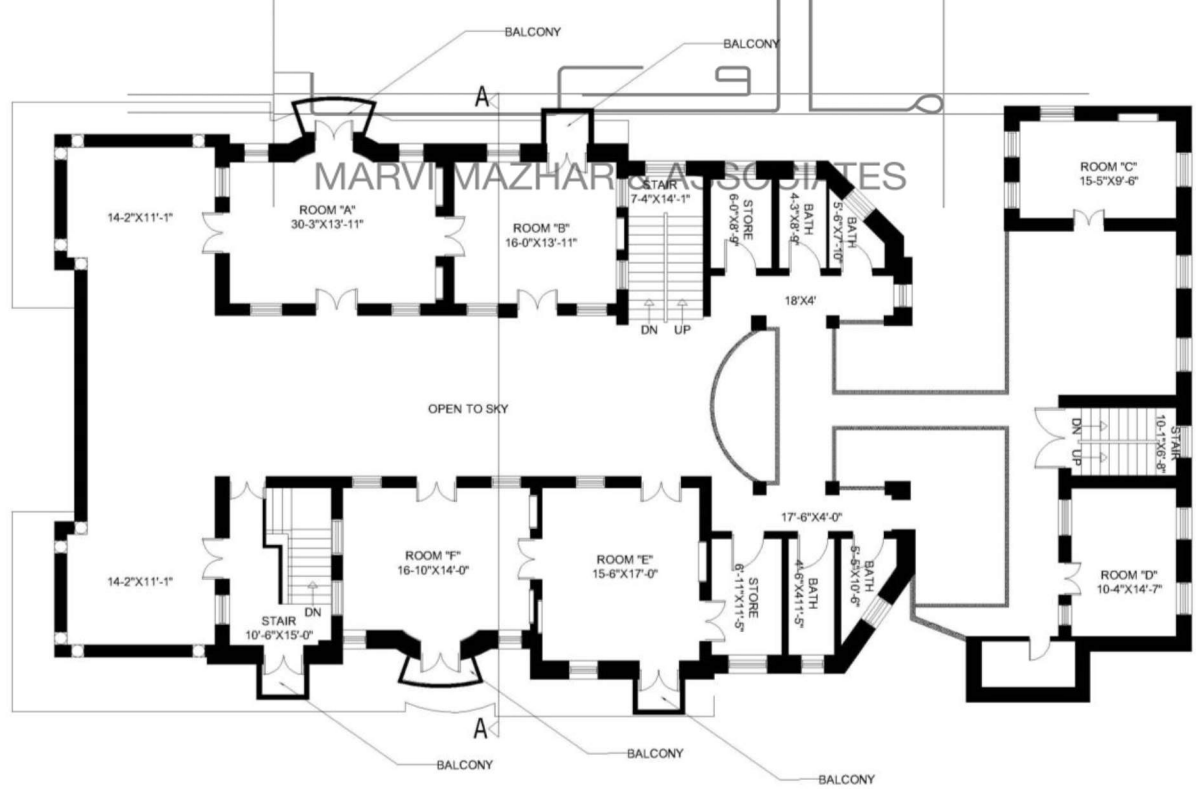
GROUND FLOOR



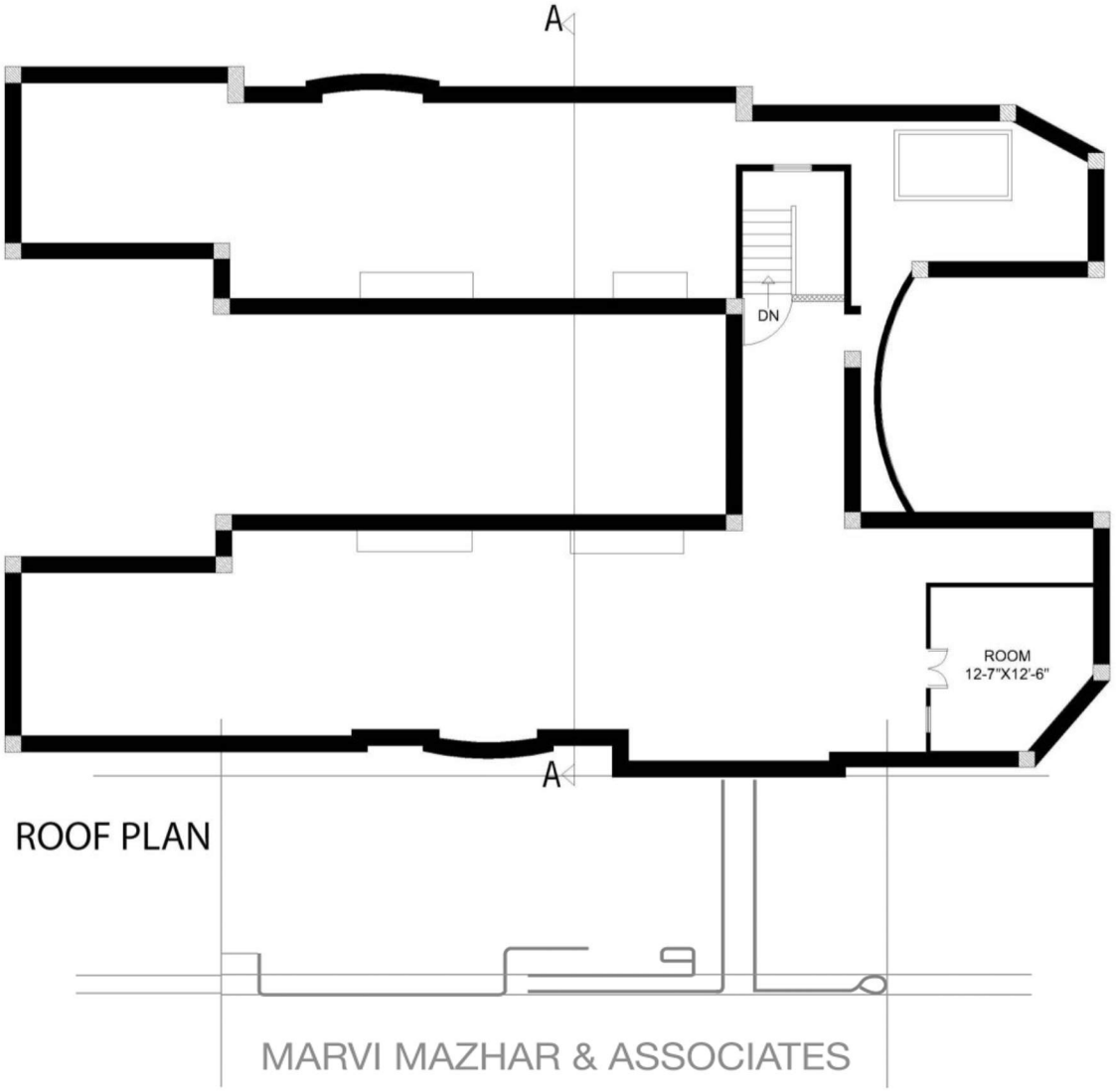
FIRST FLOOR



SECOND FLOOR



THIRD FLOOR


A
DN
ROOM
12-7"X12'-6"
A
ROOF PLAN
MARVI MAZHAR & ASSOCIATES

GOVERNMENT OF SINDH
PLANNING COMMISSION

PC-1 FORM

(INFRASTRUCTURE SECORS)

1.	**Name of project**	Conservation of JMB Girls's Secondary School (Sita Ram Building), Karachi
2.	**Location**	Karachi
3.	**Authorities responsible for:**	
	i.Sponsoring Agency:	Culture, Tourism & Antiquities Department Government of Sindh
	ii.Execution	Planning, Development, Monitoring, Implementation and Evaluation Cell Culture, Tourism & Antiquities Department
	iii. Operation and maintenance	Directorate General Culture Sindh Culture, Tourism & Antiquities Department Government of Sindh
	iv.Concerned Provincial Ministry	Culture, Tourism & Antiquities Department Government of Sindh
4.	**Plan period**	The project is reflected in the ADP 2015-16 with an allocation amount of Rs.10.000 million
5.	**Project objective and its relationship with sector**	The project is initiated on the direction of Honorable Sindh High Court Karachi vide orders in C.P.D-0000/2014 wherein the main objective of the project is to establish a rigorous and responsive conservation of the heritage declared building; which was previously utilized for education purpose, but now it is abandoned and in possession of shopkeepers; who are using it as good downs. **Output:** The rigorous and responsive Conservation system may assist in the protection of the building as follows: a) Timely completion of projects within the approved costs (PC-1) b) Adherence to quality standards. c) Identification of impediments in project implementation and reporting to concerned quarters. d) Improvement in the project management. e) Implementation of policy of Government Sindh and to make framework for the integrated policy of conservation of historical heritage buildings. f) Operationalization of Conservation Projects Management System (CPMS)

		g) Feedback for future planning (i.e. assist in strategic allocation and utilization of scarce resources.) h) Availability of updated information on the status of project activities. i) Introduction of pre, mid, final and post terms monitoring and evaluation mechanism in project implementation. j) Enhanced coordination among the administrative departments on the progress of physical and financial targets. k) Imparting and conservation of the cultural antique building.
6.	**Description/ justification**	The scheme is prepared on the direction of Honorable Sindh High Court Karachi for the preservation and conservation of the historical heritage building; which was previously utilized for a Girl's High School. The building is declared as a heritage asset of the nation. Keeping in view of the declaration of heritage protected building; it is responsibility of the Department to protect it as per international standards of conservation of heritage buildings. The building is built in the Raj period, where major portions are constructed with stone masonry, plaster, wood work and tile work. The workmanship of the building is adorable and needed to be conserved. The building is ground plus three storied which has covered area measuring 16720.29 square feet. The building has suffered from certain factors of decaying; aging and soil based problems, all are involved in the dilapidated situation of the walls, roof and other portions of the building. However the main cause of the structural setback is noticed with the boring saline water in the building, leakage on the roof and dampness in the walls. These all factors have damaged the structure, surfaces and the decoration of the building. The structure requires immediate conservation to stop the decay of destruction day by day. Further incompatible and unqualified additions and distortion to be removed and cleared. The consolidation of roof and walls will be carried out and rising dampness will be controlled as a major work. While the stability of the structure and soil tests will also be carried out to ascertain and measure the level of harm and take necessary steps to ensure the protection of the building. Keeping in view of protection, preservation and conservation work of the heritage buildings; the PDMI & E

		Cell of this Department is untrusted to carry the execution, controlling and monitoring of the projects, hence the work on this building will be carried and executed as per international standards of conservation.

MARVI MAZHAR & ASSOCIATES

DETAIL SHEET-A

NAME OF WORK:- CONSERVATION OF JMB GIRLS SECONDARY SCHOOL KARACHI.

S #	Name of Building	Plinth Area	Cost of Conservation		W/S & Sanitary		Electrification		TOTAL
			Rate	Amount	Rate	Amount	Rate	Amount	
1	2	3	4	5	6	7	8	9	10
	Conservation Of Building				155.0	1,686,976.0	140.	1,501,788.7	3,188,764.7
	1) Ground Floor	2,265.86	3,558.24	8,062,500.0					8,062,500.0
	2) 1st Floor	2,265.86	3,558.24	8,062,500.0					8,062,500.0
	3) 2nd Floor	2,265.86	3,558.24	8,062,500.0					8,062,500.0
	4) 3rd Floor	1,881.19	3,558.24	6,693,735.2					6,693,735.2
									34,070,000.00

Activity Wise Implementation Plan

Name of Component	2016-17				2017-18			
	Nov-Jan	Feb-Apr	May-Jul	Aug-Oct	Nov-Jan	Feb-Apr	May-Jul	Aug-Oct
Survey and Preparation of PC-1								
Modification and Administrative Approval								
Preparation of Bidding Documents and NIT								
Commencement of Work and Strategy of Execution								
Rehabilitation of Site								
Publication of Documentation during execution								