DOCUMENTATION AND CONSERVATION REPORT

Karachi Port Trust (KPT) Head Office Building

STATE OF CONSERVATION REPORT

PROJECT TEAM

Project Architects:
Farida Abdul Ghaffar
Fariha Tahseen

Field Survey, CAD Drawings & Photography Team:
Tabish Tariq (Architect)
Samina Kamran (Cad-Technician)
Anila Rahim (Cad-Technician)
Zia ur Rehman (Field Helper)

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Prepared by: Heritage Cell, Department of Architecture & Planning
NED University of Engineering & Technology, Karachi

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1. Introduction

Karachi Port Trust (KPT) building as one of the architectural heritage treasures of Karachi, Pakistan needs a thoughtful attention. The building reminds the magnificent legacy of historic architecture, dates back to the British Empire (1858 to 1947) in sub-continent. An impressive and magnificent façade stands out at the intersection of M.A. Jinnah (Bunder) Road and Eduljee Dinshaw Road. The rusticated fabric building constructed of yellow Gizri sandstone, standing on other side of the Merewether Tower, is located in the historic quarter of Macchi Miani.

The magnificent edifice was inaugurated on 5th January 1916 by Lord Willingdone, the Governor of Bombay. It was found through a plaque (fixed in the wall of main entrance hall) that initially this building was converted into a 500 bed hospital, named as No. 1 General Hospital. During the First World War this building served as one of the 'five great war hospitals'. Later this building attained its built purpose when the army vacated these premises in 1919, since then it is one of the earliest trading houses of Pakistan.

This building serves as a visual treat due to unique character of its semicircular planning; forward looking façade, consolidate structure and rhythmic features of renaissance style of architecture. A thoughtful architectural masterpiece of past should be well protected since the historic buildings add

Figure 1: Front View of KPT Building facing M. A Jinnah Road

grace and elegance to the built environments. KPT building holds the same character, therefore, under the Sindh Cultural Heritage Preservation Act 1994; this building was protected and listed as a heritage property of Karachi in 1995. KPT building was given the enlistment numbers 1995-181, 1996-101 & 1997-285 in the records of Department of Culture, Government of Sindh.

The construction and management authorities of the Karachi Port Trust head office aimed to set a project for repair, maintenance and facade lifting of the building. To develop restoration proposals for the project, Heritage Cell – Department of Architecture and Planning, NED University (HC-DAPNED) as conservation consultant was invited by the management authorities of KPT. Nature of work for this project was primarily research based. Scope of work consists of extensive documentation including mapping, condition assessment, archival research, preparation of the state of conservation report, and developing proposals for the conservation/ restoration of the building. Since there were certain complex issues needed to be addressed and resolved for which there were overlapping specialist areas, therefore, a multidisciplinary team was required to undertake this project. For conducting and implementing research studies, the conservation team comprised of architects, building materials' expert, engineers and field surveyors.

1.1 Aim and Objectives

This report aimed to prepare a thorough documentation of KPT building with regard to its historical and architectural significance. An in-depth documentation of existing building provided a base to formulate conservation policies and strategies. In order to protect this building, the conservation strategy followed the principle of taking effective measures to prolong the decay process. The building as an overall is fairly in good state of condition. Certain areas are well maintained but not in the high spirit of heritage conservation. Numerous alterations made, beyond the extent of conservation policies, due to which several problems have been raised. Among the conservation interventions, the prime focus is on the issue of rising damp and deterioration of stone

façade. The conservation assessment was undertaken with following objectives;

- Address the present state of deterioration faced by the building due to the alterations and interventions being done in this historic premise.
- Propose appropriate remedial measures with minimal interventions to retain general character of the buildings' stone fabric.
- Seek economically viable solutions for the long lasting use of this property.

Prior to formulation of conservation/ restoration strategies a systematic approach required to be developed and followed to commence the project. There are four stages supporting a conservation report i.e., documentation, identification of problems, analysis of problems and suggestions for remedies.

1.2 Conservation/ Restoration Methodology:

In light of above mentioned stages, the research methodology for this project is based on following procedures;

i) On-site Survey and Documentation: Measurements survey (preparation of drawings) and photographical record supplemented this survey. Site observations along with record of notes and sketches also accomplished this survey.

ii) Archival Research: Before conducting and implementing research studies for this report, literature review had been undertaken at initial stage which proved helpful to make decisions for final stages.

iii) Laboratory Test: A pit was excavated on the site to mark underground water level and to analyze the water contents by taking a sample for laboratory test. A cross-sectional drawing was produced after the physical survey of the building's plinth foundation and subsoil water level. Establishment of laboratory work by direct means was carried out to analyze composition of underground water. Findings and results of this laboratory test are included at the end of this report.

The information collected by above mentioned procedures were then sorted out, analyzed and evaluated finally for developing recommendations in this report.

1.3 Project Developmental Phases:

The KPT building project aimed to be commenced in two progressive stages; each having the following identified targets:

Phase I: Documentation
(9 December 2013 – 22 February 2014)

The first phase is the major component of a conservation/ restoration project. It involves detailed documentation of the property by using on-site measured survey. A measured survey includes precise documentation of the building plans, elevations and sections. Existing floor plans and front elevations of the building, as provided by the client, were lacking in details and their authenticity was questioned too thus work on building plans and layouts needed to be commenced afresh. Keeping in view the scale of the structure, it was anticipated that preparation of these drawings will take around ten weeks. Outcome of this survey resulted in producing a complete set of measured drawings including;

1. Site Plan and Plans of all levels of the building
2. Elevations of front and rare side of the building
3. Partial sections
4. Details of architectural features (Columns, Coupled Columns, Arched windows/ ventilators, Pediments/ Broken Pediments, Roundels/ Rosettes, Cornices/ Moldings, Grills/ Iron works, Opening with fixed *jalis*, Decorative parapet, Courtyard, Dome, Pilasters)

Due to hugeness of scale and circular geometry of the building, supportive team from survey lab of the Civil Engineering Department – NED joined hands. Under the supervision of Mr. Mubeen, height of the building at various locations was established through a device of 'total station'. After an extensive survey of 60 days; first draft of measured architectural drawings was produced. This documentation was followed by mapping of problems and issues of the site with an observational and analytical understanding.

A photographic record of the major deterioration problems also supplements the on-site survey and is included in this report.

Phase II. State of Conservation Report – Proposals and Recommendations (22 February 2014 – 14 April 2014)

At Second phase of the project an extensive descriptive report is prepared and presented to state and analyze the present condition of building. This report identifies problems within the building, or material deterioration. The information is recorded in pictures, notes and mapping which is a technique of graphical representation. The report also quotes faulty or inappropriate interventions and alterations being implemented on the historic premise which have been proved harmful with the passage of time. After analyzing the problems, occurred due to natural processes or man-made alterations, a list of remedial measures is proposed. For the restoration of building, remedial measures are proposed with minimum interventions in order to retain the original character of building.

Besides this brief introduction about the project, next chapter is an overview of the KPT building. It's a description about the urban settings, historical background, architectural significance and noticeable features of the building. The third chapter is an analytical review of the issues and problems of the historic building with a critical reflection of the several alterations and interventions being implemented. The last chapter proposes remedial measures to prevent the building from decaying and to retain the historic character of this historic premise.

2. Understanding the Building and Setting

2.1 The Site and Surrounding Settings

KPT building, holding a landmark value, is located at the intersection of Edulji Dinshaw Road and M. A. Jinnah (Bunder) Road. The building has an independent compound with open spaces all around. The custom house and the KPT building are surrounding the plot periphery facing the main road. The custom house was built a year later than KPT building as a continuation of KPT offices. The construction of new building commenced in 1914 and was completed by 1917, replaced an existing structure which was working for the same functions of customs. The structures, added later, on two ends of the main building are among the historic developmental phases of the site. The plot boundaries of KPT is also housing KESC substation and annex building. The KPT building with its extension block and annex building are surrounding an irregular central courtyard (refer site plan for further information). There is a big fountain in center of the internal courtyard with 'Allah' sculpted inside.

Since the KPT building is holding a strategic location and its unique plan typology is entertaining a semi-circular façade, therefore, this building received public eminence. This building lies in one of the main commercial hubs of the city. The site of the KPT building is accessible by all means of public and private transportation due to its prime setting on one of the busiest traffic arteries, i.e. M.A. Jinnah (Bunder) Road of Karachi city. There are two separate entrance gates of this building for pedestrians and vehicles. Adjacent to the building of KPT, there passes a KPT flyover. The flyover provided a shaded space underneath which is utilized as parking lot for the employees of the KPT and custom house building. The Merewether Tower and Qamar House are in close vicinity of KPT building.

Figure 3. A View of KPT Flyover

Merewether Tower and Qamar House are in close vicinity of KPT building. Most of the plots neighboring the KPT building offer commercial activities. KPT building lies in the historic quarter of Macchi Miani. Apart from the historic structures in this quarter, there are several new constructions in the neighborhood with Floor Area Ratio (FAR) as 1.3 for residential and 1.6 for commercial plots as per prevalent building bye-laws.

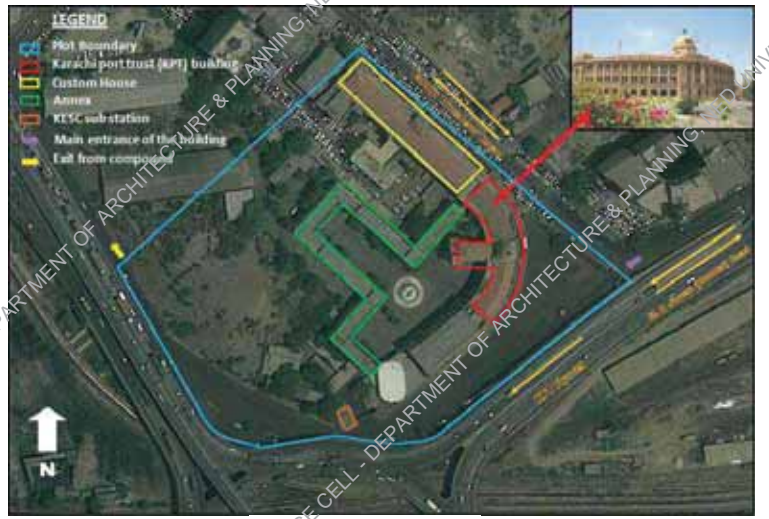


Figure 3. Site Plan (Google Images)

2.2 Historical Background.

Karachi, the largest city of Pakistan lies on the South Western region of the Indus delta. The city originated as a small fisherman village settled by the Baloch tribes. It is been famous that the historic name of Karachi 'Jo-Kun Kolachi' (the ditch of Kolachi) was named after an old fisherwoman Mai Kolachi, who took settlement here. Due to the geographical and strategically location of the city along the coastal lines of Arabian Sea, the city remained an important harbor for trading purposes since 1700 A.D. The settlers of Kolachi village started trading customs with Gulf regions. Therefore this city tremendously grew as a commercial hub and a port for trade.

An uncommon but interesting tale about the site of KPT building is establishment of a raised platform as an open shed/ stage called as *Chabootra* by the Mirs in 1780. This place used to serve as Mirs' custom house where import export goods were checked and taxed (Hassan, 2009)[1]. Later, a custom house building was constructed. Due to growing importance of the port, the Harbor was established in 1879, but as the port activities flourished and also begun to use for the troops, the Commissioner of Sindh was asked to prepare a scheme for the establishment of a Port Trust in place of Harbor Board. Although the Port Trust Bill was enacted in 1887, it was in 1909 that the Port Trust acquired its full

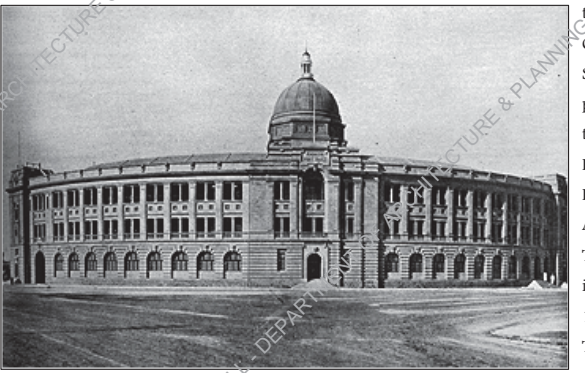


Figure 4. Historic View of KPT Building

[1] Peerzada Salman, 2009-06-07, Dawn.com

time chairman, Charles Mules (Fieldman 1970: 51). The existing building of custom house was demolished to construct a new building under the Karachi Port Trust.

The KPT building was designed by George Wittet, a consulting architect of the Government of Bombay. Wittet was also the architect of 'Prince of Wales Museum' (Gateway of India) in 1908. Some of his building designs were inspired of Anglo-Mughal style of architecture. With a new approach, he designed KPT building as reflection of renaissance style of architecture with traces of Georgian style of architecture which is evident in some of the building's architectural features. KPT building's construction was completed in 1915 under the supervision of Engineering Department with cost of Rs.9,74,990/- incurred on the entire project. Lord Willingdone, the Governor of Bombay inaugurated KPT head office building on 5th January, 1916. At that time this building occupied an area of 1400 sq. meters. Another historical memory related to this building is its conversion into a 500 bed hospital for 3 years (1916-1919), during the First World War, as one of the 'five Great War hospitals' run under General Fowler (Lari, 1996). Considering purpose of the building and accentuating the building structure, site selection was done consciously after a topographical survey due to nearness of the Sea beds.

2.3 Architectural Significance:

While stepping in the site, through the main gate, one can see flocks of pigeons fluttering around an old age building. An aura of historical times can be felt. Like a ship nosed up to a dock, the KPT building held steady at the front yard (serving as a dock) and tied firmly with black iron anchors. The aerial view of the KPT

Figure 5. Pigeons fluttering around KPT Building

building looks as if its foot print is a symbolic interpretation of a massive ship.

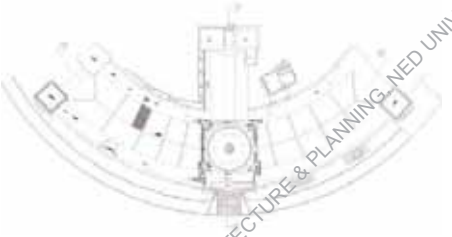


Figure 6. Roof Plan of KPT; Symbolic Interpretation of a Ship

Figure 7 (a, b). Anchors Assembled at the Front Facade

KPT building, a representation of classical grandeur of the British Raj period, is a manifestation of renaissance style of architecture. Unlike the Anglo Mughal architectural style which Witted used for some of his buildings, he adopted renaissance style of architecture to design KPT building. However, there are some traces of Roman style of architecture. This is evident from the dome on roof top and the arcade surrounding central courtyard. The building was constructed in two phases. In first phase, the semi-circular structure constructed of stone was built in 1915 during the British Empire. In 1919, as second phase of construction, an extension block of KPT building was designed but it was built at a later date. This block has been built in brick masonry and as in continuation of existing building it follows the same color and design pattern. Part of the building which is old and constructed during the British rule is the main focus to be worked upon.

Construction of KPT building is in stone masonry and its structure is load bearing. A large proportion of Karachi's architectural heritage buildings, built in colonial period, are constructed of yellow Gizri sandstone taken from the queries of 'Gizri'. At that time this place was situated in the outskirts of Karachi, but now it has been occupied by housing

developments. Taking an account of plan configuration of this building it is found that a unique plan typology of colonial period is on the edge to get extinct due to the growth of commercialization and replacement of significant historic buildings with new construction. The historic environments are diminishing gradually.

2.4 Architectural Features.

The architect beautified the curvilinear building with an austere character. The combination of circular and rectangular shapes worked unanimously for the façade design. The exterior of the building is forward looking. In a bird's eye view, it makes a curve on both sides of the square. Since the site was a corner plot which is facing two main roads at a time, it was cautiously planned into a semi curve. Looking at the building footprint it seems that building steps back from the square and is forward looking too. A low boundary wall with grill iron rods does not obstruct visual clarity of the building façade from the main road.

A vast space was left in front of the building as a front yard. Later, this space was covered with asphalt coating for vehicular movement on the site. The three storied structure has been built within an independent compound surrounding open spaces.

Figure 8. Front Facade of KPT Building Facing Front Yard

The internal façade faces an irregular courtyard with a water body placed in the center. These open spaces serve as breathing spaces and create a soothing environment for the employees working here. The

Figure 9. Fountain & Sculpture in the courtyard.

main building covers an area of approx. 22064 sqft.

Figure 10: Demarcation of Courtyard in the Site Plan

Entrance Portal. Elaborate and magnificent building entrances had been a typical representation of grandeur in architecture of British Raj period. An entrance portal at the front facade facing main road is a significant feature of the building. The entrance portal looks quite massive from a certain focal point and provides an architectural illusion but in actual it is slightly projected outwards and it lies exactly at the center of the building's curve. It has been designed in a way it looks elegant and classy but less ornamented. It is emphasized with a lantern mounted on a cupola placed on the roof top and elaborated with a large arched window. These features, altogether, give a central focus to the building. At the moment this portal is not used as the main entrance.

Figure 11: Entrance Portal of KPT Building

Dome and Lantern. The building has a total height of approx. 122 ft. from existing ground level; excluding 21 ft. (approx.) high dome on which a 17 ft. (approx.) high lantern is mounted. Dome is a vaulted structure with circular plan, exerting an equal thrust in all the directions. It looks as half of a sphere. The lantern as a decorative element and superstructure is crowning the dome. The dome is resting over an octagonal drum 18 ft. (approx.), decorated with bends of cornices.

Figure 12: Dome

Figure 13: Lantern

Building Composition. Two equal arcs of the building volumes are extending out from the central entrance portal. Both the curved blocks holding entrance portal at the center have 10 consecutive arched windows.

Figure 14. Series of Coupled Windows on Front Facade

The curved volume finally culminates with two vertical rectangular blocks at both ends of the original stone building. Roundel, an architectural module of ornamentation is intricately carved as a symbolic representation of an anchor. It has been carved on a stone pilaster, mounted on top of the vertical rectangular blocks. These blocks having pediment windows are housing staircases and also function as a side entrance door. Both ends of the segmental building define balanced composition of the building volumes and set the principle of equilibrium.

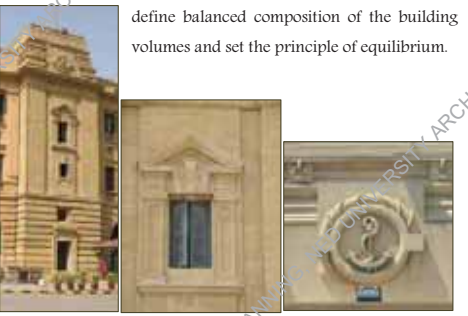


Figure 15. Side Entrance portal with Pediment Window and Roundel

Front Façade.

The upper two stories of the building façade, facing main road, follow repetitive pattern of coupled windows and arches. At the ground floor level the façade is decorated with horizontal grooves. Keeping

Figure 16. Pattern of Windows and arches

in view building's magnitude, besides horizontal expansion, vertical features have also been given for the length of the building.

Another aspect of this building's design is symmetry and repetition. It is a three storied building. The ground floor has an arcade with 8 ft. high semi-circular arches facing the front yard and the courtyard. These arches, lacking in ornamentation and detailing, are determinant for the simplicity of building façade. They also serve the purpose of air circulation throughout the building. The exterior face of the building façade has white marble clad up to 9 ft. height from road level (refer drawing). The bottle shaped stone balustrades are fencing the arch openings of first floor, whereas, iron grills are fencing the arch openings of second floor.

Figure 17. Arcade facing Courtyard

Figure 18. Arch Openings

Figure 19. Building rare side facing courtyard

Pilasters. Pilasters with capitals inspired from Ionic order are placed in between the window bays. Pilasters are the decorative features imitating columns, but in actual they are not the supporting structures. In KPT building, stone pilasters are constructed as a projection of a wall and decorated with several layers of cornices and traces of slight ornamentation.

Figure 20. Pilaster

Figure 21 (a, b). Twin Windows of 1st & 2nd Floor

Coupled/ Twin Windows. Coupled/ twin windows are an interesting feature of this building. The two window panes are standing together in the same window frame, separated by a pilaster. The windows are slightly distinguished by using small pilasters in the middle story and small Doric columns in the top floor. There is a series of 10 coupled windows in both wings of the entrance portal.

Crowned Doors and Windows. Arched doors and windows have been installed at various locations in the building both inside as well as outside. The entrance doors and the windows of staircase well have been adorned with stone crowning to give prominence. Many of the windows maintain their original design but a few are altered as per need. Teak wood used for window frames have been coated with green enamel paint.

Figure 22 (a, b). Crowned Doors

Figure 23 (a, b, c). Crowned Windows

Arched Doors and Windows. Most of the windows and doors in KPT building are arched both in exterior as well as in interior. They are available in both the well preserved manner as well in damaged or in dilapidated condition. The arched doors are made of teak wood and polished. The arched windows are composed of glass panes in the center whereas the bottom

Figure 24. Arched Door

portion has solid teak wood shutters covered with metal sheets. Inside the building there is an interesting feature of some bar doors.

Figure 25 (a, b, c, d). Arched Doors and Windows at Various Locations

***Jali* Work.** Below the window sill level one can see small squares of tracery or *jalli* work. *Jalli* work or tracery is a carved pattern, engraved on various materials like stone, wood or metal. In KPT building traces of this rich architectural feature can be found as series of small square shape *jallis* of 2'x2' size, carved in stone, placed at a distance of 4 ft. 8 in. from each other.

Figure 26. Jalli Work

Decorative Cornices. All around the building runs multiple bends of cornice/ moldings at parapet level. A cornice is generally any horizontal decorative molding that crowns all around the building. The function of the projecting cornice of a building is to throw rainwater away from the building walls. It is also used as a decorative element. In KPT building, the cornices have very less decorative aspect and their purpose is to crown the building and the window openings.

Figure 27. Decorative Cornices

Pitched Roof. Roofing of the building has been done with timber construction. An inclined pitched roof with two slopes is supported at a central ridge. It makes a gable at both ends of the roof. The roof has been covered with red terra cotta (*khaprail*) tiles. Wooden

Figure 28. Pitched Roof with Hanging Wooden Pelmets

pelmets have been assembled at edges of the roof slops for the sake of roof ornamentation. Lighting system was added, later, to enhance the building ambience at night.

Major portion of the roof is covered with timber pitched roof except for the two blocks projected slightly outwards at both ends of the building mass, where there is RCC flat slab.

Figure 29 (a, b, c). Pitched Roof Covered with Khaprail Tiles

Brackets. In KPT building, small stone brackets are fixed right under the edges of the pitched roof as an architectural decorative module. Bracket is a support projecting horizontally from a wall to bear the weight of a cantilever, to strengthen an angle or merely as a decorative element. In this building, the brackets are decorative in nature. They are placed at a center to center distance of 6 ft. from each other. As the building is constructed on the principle of equilibrium, symmetry and repetition, the number of brackets are also equal. There are 12 brackets on each side of the entrance portal.

Figure 30. Brackets under the Edge of Pitched Roof

Flooring. The original flooring of the building was done by using pigmented cement concrete (cc) tiles but now they have been replaced with different types of flooring materials like marble tiles, ceramic tiles and vinyl coatings.

Figure 31 (a, b, c). Pigmented CC Flooring

Plan Configuration. The semicircular plan configuration of the building offers radial arrangement of the rooms with minimum or no architectural embellishments. The internal walls have brick masonry construction, plastered and painted with several layers of enamel paint. The largest room that is under the dome is the board room where KPT holds its meetings. The various floors are connected through a RCC staircase. Later an elevator was added, in the well of the staircase tower, to facilitate the users.

Areas Occ.	Sq.feet Apx	Sq.Yard Apx	Sq.Meter Apx
Ground Floor	22064	2452	2050
First Floor	22064	2452	2050
Second Floor	22064	2452	2050

2.5 Alterations, Interventions and Additions. It has been a common observation that with the passage of time, numerous historic buildings/ monuments have endured several alterations and additions on need basis. Under certain contexts such interventions are considered as part of the historic development of the building and shall not be disregarded under any conservation policy.

The additions and alterations in KPT building, found during the field study, are broadly classified under three categories. First category comprises of several additions in the building lot. Second category is based on extensive description of alterations in the building exterior facades. Third category covers alterations to the interior of the buildings.

Additions in the Building Lot. The KPT building was initially built in an independent compound area under the Port Trust. A year later, with growing requirements, custom house building lying next to KPT was built. Extension of KPT main building block was carried out

Figure 32. Extensions to the Main Building Block

in the adjacent area. Construction of KESC sub station and Annex building took place in the same lot. Placement of water filtration plant in the courtyard was another addition.

Figure 33. Custom House Building

Figure 34. Extension of Main Building

Figure 35, 36. Water Filtration Plant in the Courtyard and Placement of Manholes on the Site

Apart from these major additions, there are some additions apparently minor in observation but have major impacts. These include placement of a monument, asphalt pavement all around the building and placement of flower beds/ hedges all along the building plinth towards courtyard. Placement of several manholes on the site was followed by addition of toilets in individual offices and some other areas. These additions proved to be quite significant for the long term impacts on building.

Figure 36(a, b). Addition of monument, asphalt pavement & hedges along building

Alterations in the Building Exterior. There have been substantial amounts of repairs done to the building façade, evident from stone surface treatments being used. These repairs include application of paint coat, sand blasting, plastering (color crete) and marble cladding. An off white paint coat was also applied which was removed in 2007 by using sand blasting technique. Sand blasting is an abrasive treatment for cleaning stone surfaces.

Figure 37. KPT Building Coated With an Off White Paint Coat

Color crete (pigmented cement sand plaster applied manually) has also been practiced to consolidate the minor loss of surface materials in powder or granular form due to deterioration and erosion of the binding material. Due to rising dampness into the walls from underground water, white marble cladding was applied up to the height of 9 ft. (from road level) to hide the deterioration and discoloration of stone. To close the arches of first and second floor jaffery has been used. Inside the corridor overhead *jalis* are also sealed with *jaffery* to abstain pigeons from coming inside.

Figure 38. Marble Cladding

Figure 39. Color Crate

Figure 40. Added Jaffery in the Arch Openings

With the passage of time, exposed service ducts like rain pipes, plumbing pipes, electricity wires and AC units have also been installed on the building façade. Overhead water tank was also placed over the building rare side elevation.

Figure 41. Exposed Plumbing Services on Building's rare side

Figure 42. Exposed AC Units

Figure 43. Exposed Electric Wiring

Alterations in the Building Interior. Significant alterations can be seen inside the building, particularly the first and second floor with overall modified interior spaces. Inside the building, most of the spaces on all the floors have been subdivided into cubicles with low height or full partition walls. Block masonry was chosen for full height partition walls to create enclosed offices. Wood and glass materials have been used for low height partition walls to create cubicles as semi enclosed offices. Partition walls of block masonry appears more permanent than that of glass and wooden partitions

Figure 44 (a, b). Low height and full height partition walls

. The internal walls are also equipped with cupboards and storage shelves. Walls of several rooms have been cladded up to 3 feet with wooden panels. False ceilings have been assembled for aesthetics and lighting purpose.

Figure 45. Wooden Panelling installed on the walls

Continuous flooring of spaces with borders all around; indicates the wholeness of a room. As part of the original scheme, all floors of the building were having pigmented c.c. flooring with black and white border tiles. Later, flooring of various spaces was replaced with cemented flooring, marble tiles, vinyl tiles and ceramic tiles. The replacement of flooring has usually undertaken with reference to the function of that space. Vinyl flooring in computer section has applied on the previous pigmented flooring to minimize the noise level. Pigmented cc flooring has also been repaired with usual application of cemented flooring.

Figure 46 (a, b, c, d, e). Altered Floorings

Some of the doors, windows and arches of the building are altered while installation of AC units, exhaust fans, wooden partitions, wooden shelves, iron grills or filled with

masonry. These changes have been carried on need basis. Other doors, windows and arches are serving their regular functions. Some new glass doors and partition walls have been added on need basis. Few broken window glasses or cracks in the stone surfaces or broken/ damaged cornices are casting negative visual impact on the building façade.

Figure 47 (a, b, c). Altered Doors

The internal walls are coated with an off white paint. There are some stone masonry walls inside the building which have also been coated with the same color of paint. Since the ceiling level is high enough (about 16 ft.), therefore, lofts (slabs resting on metal girders) have been added in several areas. Some rooms have false ceilings which were added later for better lighting and aesthetics.

Figure 48 (a, b). Paint Coat on Stone Walls

Figure 49. Added Loft

Over the years, these alterations and additions have been adopted in the original layout to accommodate the growing needs and changing technologies. Since all these changes have been undertaken to make the functions more efficient, therefore, recommendations for any kind of reversal to original state may further damage the building. They have become a part of the building, since long. All these alterations and changes need to be treated as significant, but on the other hand they need to be examined for any diverse effects on the building fabric. Possible rectification will be proposed, for identified cases, under a well formulated program.

In the next chapter a descriptive and analytical study has undertaken to understand and identify the problems and shortcomings of the conservation processes adopted for the KPT building with an objective to suggest possible guidelines for the betterment of this historic property.

3. Present State of Conservation and Maintenance

The Karachi Port Trust (KPT) building has been fairly lucky in this regard as it has been in constant and efficient use since the time of its construction. Regular upkeep on daily basis as well as occasional repair and maintenance procedures, by the successive managements of the building, have made it possible for this historic premise to survive in relatively better condition till the present day. During the time span of ninety nine years this building has undergone several alterations and modifications to accommodate the growing needs and emerging activities, but it has retained its original character and strength. Since the regular maintenance and upkeep processes for this historic building were not considered in accordance with the specialized areas of conservation/ restoration principles, therefore, several interventions undertaken in good faith turned into a hazard for the historic edifice. Some of the decisions do not support the aesthetic value of the building and leave a negative impression on overall ambience.

The historic building materials and construction techniques were unique in their time and are not in common practices today. Labors as well as common professionals are generally not aware of the qualities and behavior of old materials. Due to this fact, the suggested interventions proved to be harmful for the building fabric in the long term impacts.

Overall, the exterior of the building is structurally sound and retains its glory with traces of deterioration of less intensity. The deterioration occurred due to two factors. Firstly, due to the natural decay process as a consequence of local climatic, environmental and sub-soil topographical factors, secondly, due to faulty and inappropriate interventions.

Identification of structural deformations have not been found anywhere in the building, however, minor forms of material deterioration and decay have been found due to water penetration issues causing disintegration of mortar joints, cracks, soiling and weathering of stone surfaces. Moisture is regarded as a key agent causing gradual deterioration of heritage buildings. In the KPT building, it was found that rising dampness, due to capillary action of

underground water, is the main cause for stone deterioration. It has risen up to 11 ft. height (from road level, also refer drawing). An environmental impact like weathering is evident at certain locations. In an attempt to cover the deteriorating stone walls and hide the rising dampness, outer walls of the building facing the courtyard are cladded with white marble tiles up to 9 ft. height (from road level).

Dust layer can be found all over the exposed stone façade particularly on windows, doors and arches of the first and second floor. Bird droppings, microbial growths and stains of beetle nut spitting are also found at some locations. Inappropriate plumbing and electricity services also need consideration.

All the building floors are entirely occupied and modified as required to facilitate the users. Large sized rooms are sub divided into small cubicles with partition walls. The overall condition of original flooring varies in different rooms as in some rooms it only requires thorough cleaning and slight repair works, however in some other rooms tiles have lost top layer of glaze and color. Paint blistering and inappropriate electric wires fittings were found extensively on ground floor level.

3.1 Location, Identification and Documentation of Conservation Issues

The deterioration factors for heritage buildings can be broadly categorized and sub categorized as;

- Atmospheric influences
  - Moisture content of air/ rainfall
  - Air pollution
  - Solar radiations
- Topographical conditions
  - Underground water with salt contents
  - Earthquakes
- Urban context
  - Bird droppings
  - Vegetation
  - Road traffic
  - Neighboring buildings
- Human activities

During the field survey of KPT building, accessible exterior materials were carefully examined together with literature review to consolidate the visual observations with research findings. Among the identified problems in KPT building, 'stone deterioration' is the particular issue of concern. All the deterioration factors mentioned above are responsible for the weathering of natural building stone. The time to time repairs being implemented on the building surface have aggravated the stone walls. This section of the report gives an overview of the typical conditions of the stone. This also analyzes the typical repairs being implemented and their results.

1. Stone Deterioration

In a close visual inspection of KPT building façade surface and internal walls demonstrate following problems;

1. Staining – this is an indication of excessive dampness.
2. Crumbling – this is an indication of moisture penetration due to excessive underground water content and hard sand blasting.
3. Mortar cracking – indication of popping out of cement mortar, being hard enough.
4. Paint blistering – this is an indication of moisture trapped behind paint (this was found on the internal walls).

Water penetration is the particular issue of concern which needs to be treated effectively. In the historic buildings there are three main sources of water infiltration.

- Moisture infiltration from ground
- Direct rains
- Poor site drainage/ plumbing

Water moving by capillary action depends on three aspects;

- Capillary size of the material
- Thickness of the wall
- Evaporation at the wall surface over the area of capillary rise

Sub-Soil Water Intrusion. In the field survey, the conservation team found that subsoil water and hedges along the building periphery, facing internal courtyard, were the main causes for water intrusion into the building walls. Underground water can cause massive damage to the heritage buildings. The moisture remaining within floor and walls cause serious problems that may eventually wear the building away if untreated as the KPT building is in close vicinity with the coastal lines of Arabian Sea.

Figure 40. A pit excavated to identify Plinth Foundation Depth and Water Level

Originally, the unpaved open spaces around the KPT building served as path for evaporation of underground water, being rising up. Later, all the open spaces were paved with asphalt coating. It resulted as blockage for water evaporation. The underground water ultimately drifted towards the building foundations, from where it got a passage for rising up into the walls due to capillary action.

Figure 51. Staining of Stone

Figure 52. Crumbling of Stone

Figure 53. Paint Blistering

Figure 54. Mortar Cracking

Planters/ Hedges. Another source for moisture penetration is the planters/ hedges along the building plinth/ boundaries. The water trapped in mortar joints or cavities in stone masonry results in degradation of stone. Underground

water penetration into the building walls and longer dry periods left the consequences of major as well as minor stone disaggregation and discoloration.

Figure 55(a, b). Hedges along building's periphery, marble cladding & rising damp

Faulty Plumbing. The exposed plumbing pipes have been observed at different locations in order to facilitate the later added washrooms and washbasins inside different rooms of the building. Leakages of these pipes were found due to which seepage issue has been observed at several points. Vertical sewerage pipes servicing all the floors were found exposed inside several rooms; dampness was also evident. Excessive moisture penetration was also found where there were main gutter lines and manholes. On the North side of the main entrance portal, outside the pension cell, there was a manhole enclosed with sewerage pipes and raised gutters. This portion also does not get direct sunlight. For these reason stains of moisture penetration and microbial growths were observed.

Figure 56. Inappropriate Plumbing Services on Front Façade

The root cause of water penetration issue was left unattended. White marble cladding was applied in an attempt

to overcome the water intrusion problem and hiding the decaying surface. This further worsened the situation, by acceleration and raising the water above 9 ft. height. Measures should be taken up to stop the water rising in the masonry or else this problem may become more severe.

Figure 57 (a, b, c, d, e, f). Dampness due to faulty plumbing

2. Stone Cracking

Solar radiations as an impact of atmospheric influences and vibrations being produced by surrounding urban context may be responsible for this damage. Objects heat up causing their materials to expand and contract, often at different rates to each other. They can also dry out, again causing differential movement causing cracking and crazing of some surfaces. The sources for vibrations affecting buildings include road traffic, construction vibrations, blasting and earthquakes. Another reason may be the sub soil settlement due to digging and construction activities for roads and building construction. Cracks do appear when settlements occur. In the case of KPT building, there is

movement of heavy vehicles on Eduljee Dinshaw road and M. A. Jinnah road, also a number of new constructions took place in the close vicinity. The KPT building is directly encountering both these influences. Some minor cracks are found at certain locations and a large crack is found on the circular window of a wall facing the water filtration plant.

Figure 58 (a, b). Cracks in Stone Surfaces

3. Damaged Stone Texture

Inappropriate cleaning and coating treatments also cause major damages to the historic buildings. The overall building stone façade was coated with an off white paint. Sand blasting, a technique of abrasive cleaning was implemented in 2007 to remove paint and expose stone as originally built. This technique is usually not acceptable for old and historic masonry. [2] It removes the hard exterior surface of stone and leaves a negative impression on visual character of the building. Sand blasting causes severe damage to the fabric of the building by increasing roughness of the surface, and destroying details and textures of the stone. This also causes an increase of stone porosity which accelerates the water absorption rate and rapidly deteriorates the stone surfaces. As the porosity and surface roughness increases, the corrosion process takes place deeper inside.

Figure 59. Damaged Stone Surface

[2] Conservation of Heritage Buildings; A Guide, Nirman Bhawan, July 2013, New Delhi

4. Inappropriate application of Color Crete

Removal of inappropriate repairs being done with materials like pigmented cement sand plaster (color crete) needs to be undertaken since they cause further deterioration and disfiguration of stone surfaces with a negative impact on historical character of old materials. Thin smears of cementitious patching chipping off from the stone surface applied as color crate can be seen on lower surface of the building up to 8 ft. height.

Figure 60: Color Crete

Figure 61: Moisture Stains

Color crate is cement/sand mortar with required pigment added to it. This technique was applied over the deteriorated and exfoliated stone surfaces. However, the composition of color crete does not have compatibility with physical and visual character of stone surfaces. These thin surface applications eventually easily chips off as it does not have bonding with stone. Rising damp with accompanying salts encountered with hard Portland cement mortar accelerates the deterioration of the stone beneath and around the patches. This mode of deterioration is evident more in the lower portions of the building because of water intrusion from ground.

Figure 62: Disintegrating Color Crete

Figure 63: Disintegration and Exfoliation of Plaster and Stone Surface

5. Seepage and Paint Blistering

The lower portion of outer structure as well as inner masonry walls have dampness. Faulty plumbing services and rising dampness from sub soil water sources are the reasons for long term moisture penetration. Areas of the building with lesser exposure towards direct sunlight increase the time period of dryness. Its impacts are evident as seepage and paint blistering of the internal masonry walls mainly at ground floor level.

Figure 64 (a, b). Seepage and Paint Blistering of walls

6. Macro and Micro-biological Growths

Growth of micro-biological film and weeds has been observed at some locations due to excessive dampness and absence of sunlight. The area where there is a continuous leakage of sewerage pipes promotes microbial growths. On the building front façade, outside the pension cell there was a drainage manhole. Microbial growths and weeds were evident due to moisture content of drain pipes and lack of exposure to direct sunlight. At the building's rear side water dripping off from an AC unit caused fungal growth.

Figure 65. Macro biological Growth due to Faulty Plumbing Services


Figure 66 (a, b). Microbial growths due to dampness

7. Beetle Nut Spitting Stains

Stains of beetle nut spitting impart negative visual impact and are unhygienic too. At the north side of the building front façade, near the side entrance portal next to Habib Bank branch, ugly spots of beetle nut spitting were found. On the rear side of the building where there is water filtration plant and sewerage outlets there are some very deep stains as if it is a common practice. Beetle nut stains are also evident along the walls surrounded with hedges.


Figure 67. Beetle Nut Spitting Stains

8. Ferrous Anchors or Pins

Embedded ferrous anchors or pins are another damaging source for the stone walls. There were some iron nails identified on the building main façade and the rear side of the courtyard. Inside the arched corridor many iron nails were found on walls and ceiling. Previously installed anchors or pins, which are no longer in use, may corrode and cause damage to the stone. At present, this problem is not very severe since the building has undergone through abrasive cleaning treatment, due to which the corrosion stains are not evident but they may impart the corrosion stains after some years.


Figure 68 (a, b). Iron Nails on Stone Walls and Ceiling of Corridor

Figure 69. Ferrous anchors stain

Figure 70. Iron Nails on Front Façade

9. Cavities and Holes

At various locations on the building surface, unnecessary holes or cavities are observed. Some untreated cavities and many small holes (probably created due to sand blasting) were found on the building front façade. Few filled cavities were found on the front façade and rear side where there is a water tank on the roof top. It could be anticipated that few holes were made purposely for some installations but later it was filled up. In an effort to fill the cavities, cement grouting has been identified which is not in compatibility with aesthetical and physical properties of the stone.

Figure 71. Cement Mortar Grouting in Holes Drilled for Some Installations

Figure 72 (a, b, c). Holes and Cavities at Various Locations

10. Damaged/ Disintegrated Architectural Features

Since the building is classical but less ornamental and due to the timely maintenance and upkeeps there are not many exposed significant architectural features which have been damaged or disintegrated except for the decorative cornices which are damaged or disintegrated at some locations. The mode of damage may be due to cracking or crazing of the stone due to natural weathering process caused by intense heating of direct solar radiations or vibrations induced by surrounding urban context. However, some cornices are broken due to some technological installations. In a close observation of the front facade, it was found that cornices were damaged and disintegrated at several locations. Some damages are untreated and at numerous locations inappropriate repairs have been made with cement mortar. These repairs are aesthetically unpleasing; therefore, it is required to remove these repairing. On the front façade of the building there are few windows with broken glass which is visually unpleasing. Some windows were damaged while installations of exhaust fans and air coolers.

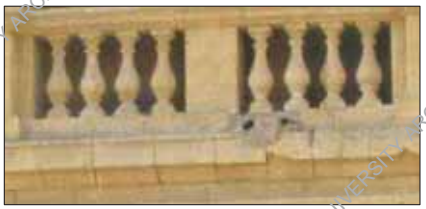


Figure 73 (a, b). Broken Cornices

Figure 74. Affected Windows of Front Facade

Figure 75 (a, b). Inappropriate Repairs of Damaged Cornices

Figure 76. Inappropriate Repairs of Damaged Cornices

11. Activities of Pigeons

It has a common observation that historic buildings have an attraction for birds particularly for the pigeons due to spaces appropriate for their nests. The building is less affected by the activities of birds as there is vegetation, foliage and shade around the immediate surroundings of the building for birds perching. There are some large trees fencing the front yard of the site. However, building cornices and small square shaped *jallis* are the common perching sites for the pigeons. Pigeon droppings are found on the threshold of vertical

stairwell before the entrance portal, outside the area of pension cell, decorative cornices, pitched roof, dome and at various locations inside the main corridor. Bird droppings have acid content and their accumulation may harm the stone and the marble, therefore they should be removed with mild chemical treatments. Birds' nests were also found in several windows outside the building and inside the building as well. The lantern above the dome is inaccessible due to an eagle's nest there.

Figure 77. Pigeons' Droppings

Figure 78. Birds Perching on Building Cornices

Figure 79(a, b).Birds Droppings and Bird's Nest in Window of Front Façade

12. Electric Wiring and Fitting

Inappropriate electric wiring has caused damage to the stone walls, since they were clipped with iron nails. With the passage of time, all along the internal arcade exposed wirings and fittings have been added haphazardly. Exposed electric wiring and broken fittings were identified in several rooms. On the front façade dangling wires are affecting aesthetics of the building façade.

Figure 80 (a, b, c). Exposed Faulty Electric Wiring inside Corridor

Black stains of wires apparent on the dome and few other locations of front and rare façade impart unpleasing visual impact. These mesh of wires need to be planed and reassembled in a proper way without affecting the building's aesthetics.

Figure 81 (a,b). Exposed Electric Wires on Dome & Front Facade

13. Haphazardly Placed AC Units

Another identified problem in the building is the unplanned air conditioning of the various rooms and areas of the building. Random placement of air conditioning units show that the entire air-conditioning has been accomplished through piecemeal efforts from time to time. Air-conditioning units all over the building are a major reason for the defacement of the building and have become one of the causes of developing moisture stains in the building. These units are placed everywhere without any concern to the impact they are having on the exterior as well as the interior of the building. Most of these units are placed arbitrarily just out of the window openings, or are hanged at the buildings' face with rusting iron angles. Water dripping over the stone surfaces may cause fungal growth and damage to the stone masonry.

Figure 82 (a, b). Haphazardly placed AC units on building rare side

14. Improper Flooring Repair and Need for General Maintenance

Initially there was c/c pigmented flooring as part of the original scheme, later the damages in the flooring were

repaired improperly with cement mortar. This repairing measure has actually given an ugly look to the spaces. The marble flooring of internal arcade replaced the original flooring. Similarly ceramic tile flooring for most of the interior spaces has completely replaced the original pigmented c/c flooring. These modifications have been done at different times therefore variety of flooring materials and patterns can be seen in different rooms. There is need for general cleaning and polish of replaced flooring since they have accumulated dirt due to lack of cleaning and maintenance. Some broken tiles were found. In some of the rooms original pigmented tiles are in poor state of conservation since they have lost upper layer of glaze and texture; they require to be replaced with same pattern of new tiles. In some rooms original flooring needs thorough cleaning and a protective coating to abstain further damages.

Figure 83 (a, b). Improper Floor Repair with Cement

Figure 84 (a, b). Dust Accumulation on Floors

15. Mortar Openings Repaired with Cement Plaster or Untreated

On a close visual inspection of stone surfaces of the building it was found that there were several mortar openings and cracks in mortar joints. In the previous maintenance exercise the mortar gaps in

Figure 85 (a, b). Mortar Cracks filled with Cement Mortar

the lower portion of building façade were filled with cement pilaster. Mortar gaps found in first and second floor are untreated. Cement mortars are strong and fast setting, but have poor and uncertain bonding. Lime based mortars are water repellent and flexible, but week and susceptible to frost action.

16. Dust Accumulation and Soiling on Exposed Surfaces/ Features

The façades of this building show some signs of soiling, apparent by a changing color of stone, due to dust accumulation, moisture penetration and micro-biological layer observed at some locations. The dust particles accumulation works as protective film against moisture penetration, corrosion, microbial growth or other atmospheric influences. It is recommended to save the patina of building surface in order to retain the historic character of the heritage building. However, due to the environmental issues, dust particles adhering to the building fabric requires an overall general cleaning. Exposed features like windows, railings, balustrades, jallis and cornices need to be cleaned thoroughly. Dust accumulation and spider webs on walls was also found in several rooms of ground floor level.

Figure 86 (a, b, c, d) Dirt Accumulation and soiling of various surfaces

16. Wooden Insertions in Stone Surfaces

Wooden insertions have been identified at several locations, both inside the corridor of building and outside as well i.e. on the façade surfaces. It is required to take out these unnecessary insertions and fill the cavities with appropriate mixture as suitable with stone composition.

Figure 87 (a, b). Wooden Insertions in Stone

17. Broken Roof Tiles

Mangalore tiles of the pitched roof, accumulated with dust, needs cleaning. This can be done by simple washing with high pressure low volume distilled water. At some locations, tiles are broken which needs to be replaced with new tiles of same design, pattern and color, however, there should be a mark of date indicating the year of repair.

Figure 88. Broken Roof Tiles

KPT building has endured several rounds of repairs under the constant possession of Port Trust. The emerging problems, as a consequence of natural decay process or man-made alterations, need to be addressed for prevention of further decay to the property. The problems occurring in an old age building need to be analyzed for their compatibility with the historic premise and to make a decision for retaining or removing them in restoration process

4. Proposed Remedial Measures & Conservation Interventions

Different forms of damages are mapped and alterations/ interventions are discussed in this report to be helpful in understanding and identifying the causes of damage and deterioration. The suggested remedies take this understanding into account that first rectify or eliminate the source of problem then approach the repair and maintenance measures. In reflection of the identified deterioration factors, a sequential remedial proposal is enlisted here to increase the longevity of the building.

1. Prevention of Rising Dampness

The root cause of stone deterioration is raising dampness from sub soil water. Besides this direct source of deterioration there are some indirect means as well. It is required to unplug the sources which are directly as well as indirectly responsible for water intrusion. To rectify the problem sources, following measures can be adopted.

a. Excavation of French Drain.

Historic buildings often get affected by underground water. Before taking any preventive measure for restoring the building materials it is recommended to first eliminate the source for this deterioration. In the KPT building, since sub soil water is found to be the major source of stone deterioration, therefore the first step of overall conservation policies is based on eradicating or disconnecting the water penetration into the building foundations. For this purpose an on-site excavation was carried out under the guidance and supervision of Engineer Mushtaq Dawood to find out the sub soil water level. A 3.5 ft. deep pit was excavated, water was collected from the pit for laboratory tests to analyze the water contents (reports are included at the end of this report).

Figure 89. Pit Excavation near Water Filtration Plant in Courtyard

Figure 90 (a, b, c). Excavated Pit along Building Periphery

Based on the above mentioned practice and findings, the underground water is required to be circulated in a channel for two reasons. First reason is to disconnect the water passage towards the building's foundations and second is to provide a passage for the water for evaporation. This can be achieved by excavation of a water trench (French Drain), all along the building periphery, to provide a channel for the water to evaporate and prevent further penetration into the building foundations and walls after application of appropriate water proof coating. It should be covered up with perforated iron grills to prevent the solid wastes for causing blockage.

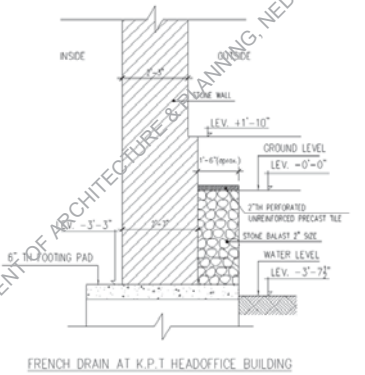


Figure 51. Design Proposal for French Drain along Building Periphery

b. Remove the Planters

The second remedial measure for prevention of rising dampness into the building walls is to remove the planters/ hedges along the building periphery towards the courtyard as they serve as a constant augmentation of water content.

c. Remove the Asphalt Pavement in the Courtyard

When the KPT building was built, there were not many significant buildings constructed on the plot as it is now having cluster of buildings in the close vicinity. Therefore, much of the land was left as ground or patches of land were left for lawns and plantations. The sub-soil water could easily evaporate. But with the passage of time, several new buildings were constructed on the site and also for the vehicular access it was required to pave the entire plot with asphalt coating (road construction material). This intervention led the ground surface to seal underground water from evaporation. The sub soil water had no path except to raise into the building walls (by capillary action) for evaporation. In order to save the building stone from further deterioration by water penetration it is therefore recommended to either remove the entire asphalt pavement of the plot and replace with concrete pavers or to remove some patches from asphalt pavement to provide some ground surface for water evaporation. Concrete pavers on loose sand can be used to serve the aesthetic functions besides the remedial measure for sub soil water evaporation.

d. Removal of White Marble Cladding

The marble tile cladding on the walls around the courtyard and in the corridor was a later addition to hide the rising dampness and deteriorated stone surfaces. Water raised above the marble cladding up to approx. 11 ft. from road level. Removal of white marble cladding from stone walls is based upon stone laboratory testing to determine strength of the stone (For details refer Annexion 2).

Laboratory Investigations.

In order to propose conservations interventions for façade uplifting of KPT building, the research methodology was also based upon laboratory investigations to propose the recommendations.

Water Test.

Due to sub soil water intrusion into the building walls, a laboratory test was required to analyze water contents for proposing appropriate interventions. (Refer Annexion 1)

Stone Test.

The stone walls towards central courtyard are cladded with white marble tiles. To recover the condition of stone, it was required to make a decision if the marble cladding shall be removed or not. Specialists from material engineering department procured the stone samples from the site for analyzing the strength of stone. In order to determine if it would be advisable to remove the marble façade, the following tests are recommended on the sample;

1. Hardness Test
2. Water Absoption
3. X-Ray Diffraction Analysis

KPT management is advised to get this testing done as per recommendation by the Material Engineering Department of NED University. (Refer Annexion 2)

2. Removal of Color Crete from Stone Façade

The damaged and affected areas of the stone are covered with cement/ sand plaster as color crete. It hides the original texture of the stone, though deteriorated. Due to the dampness factor and matchless properties with stone, the color crete is chipping off at numerous locations on front façade. The inappropriate or failing patches of color crete which does not match with physical and visual character of stone needs to be removed altogether. It is recommended to remove these existing failed patches to access the condition of stone.

The lower portion of front façade affected with application of color crete requires to be restored in two steps. In the first step remove the applied layer of color crete with great care as not to damage the stone surfaces. A small portion of the façade requires to be checked for appropriate method of plaster removal. Hammering or machines are not recommended to carry the process. Manual tools are suggested to be used for gently removing the plaster. As a second step, surface of the deteriorated stone is suggested to be chiseled. The original condition of stone surface was

deteriorated on which color crete was applied. After removal of color crete the condition of stone surface may not be good enough to preserve as it is. Some treatment is required to restore the original character of the stone surface to the possible extent. Since the building is load bearing structure and wall thickness is sufficient therefore, removing half inch surface will not affect the walls strength. The suggested depth of the material to be removed is approximately half inch. The same precautions as for plaster removal shall be applied for chiseling as not to hammer or use the machines. Manual tools shall be used.

To hide the detgriorated stone surface another attempt was made by stone veneering process, as test sample in a small portion, inside the corridor of ground floor level. As per conservation principles this method is not recommended since original material has to be restored and preserved in the original state.

Figure 92. Stone Veneering as Sample Test

3. Repair/ Sealing of Cracks and Cavities in the Walls

The front and rear facade of the building was closely inspected to identify cracks, cavities, holes or open mortar joints before cleaning and preventive water proof coating of the building stone surfaces. Few cavities and holes were identified on the front façade of the building drilled for some installations.

Cracks of minor degree were found at certain locations on front façade and a major crack was found around the circular window of building's wall facing the water filtration plant. The damages are not of severe nature thus can be rectified with simple interventions. It is

recommended to use lime based fillers for the cracks and gaps which occur in the stone masonry buildings with the passage of time.

Some cornices are found as broken or disintegrated at numerous locations. Replacement and/ or retouching of missing parts shall be carried with lime mortar. The pieces of cornices that have been damaged beyond repair will have to be replaced with new ones of similar design, detail and material. Since first hand authentic information is available on the original design of all such elements, replicating these with precision of detail and design will not be a difficult task. (Detailed drawings for each element are produced to refer). These should however, have a mark of date indicating the year of repairs.

The unnecessary iron insertions should be taken out and the cavities and holes should be filled with lime mortar to prevent further harmful effects of water/ moisture penetration or any other source. These holes and cavities should be treated with lime mortar as recommended for stone treatments.

Open mortar joints were extensively found on first and second floor level. Mortar joints repaired with cement mortar fillings were largely found in the lower portion of front façade. In the previous maintenance session cement grouting was applied for filling the cavities and holes at some locations on the front façade. Repointing is required for the open and cracked mortar joints. Repointing, also known as 'pointing' or 'tuck pointing' is a process of removing deteriorated mortar from the joints of a masonry wall and replacing it with new mortar. While repointing, it is essential that either duplicate the original mortar mix or match the original mortar joint. Since cement mortar does not have physical and aesthetical compatibility with stone, therefore it needs replacement with an appropriate mortar mixture. While cleaning procedure for the building, any loose mortar shall be brushed off with hard brushes and the gaps or cracks shall be repaired with fine lime mortar of approved finish, color and quality.

(Refer Appendix II wherever lime mortar is recommended)

4. Removal and Prevention of Biological Growths

Presence of moisture is the main cause for biological growths. Besides the subsoil water source, hedges and plumbing services as damaging factors for the stone surface of KPT building, plumbing services were found to be responsible for microbial growths as well. Outside pension cell, near the main entrance portal there were biological growths due to excessive dampness, shade (absence of direct sunlight) and drainage pipes. After rectifying this source appropriate measures for cleaning of surfaces soiled by organic growth can be carried out. These would require proper cleaning using mild chemical treatments and scrubbing. First attempt at cleaning can be done with simple brushing and scrubbing with dry bristle or soft wire. The surface can also be washed by jetting with high pressure, low-volume water lance to soften the crusts. However, rapid re-colorization is most likely if the source of moisture is not eradicated completely. Use of mild toxic wash can be effective for delaying the reoccurrence (Refer Appendix I for detail).

Macro plant growth can be killed by spraying with an appropriate weed killer. It is important to kill the roots and remove any humus which may encourage future growths. Any gaps or cavities created due to the removal of plant growth should be repaired/ filled with lime mortar.

5. Cleaning of Stone Walls

A thorough cleaning of overall stone façade is required before practicing other preventive measures. The exposed features of the building façade show signs of soiling and dirt accumulation. Specks of dust can be witnessed on cornices, balustrades, *jallis* and windows too. At the building rear side, unwanted heaps of mud, dirt accumulation and stains of beetle nut spitting at some locations on the walls were found. There is need for general cleaning besides. More stubborn stains like beetle nuts would require intense cleaning. This act should be strongly discouraged in the heritage buildings through forbidden symbols or by taking some other measures.

Cleaning should be done with great care. A test patch is advised to ensure there is no damage to the masonry surfaces. The first stage is to brush off the dry and loose dirt particles with hard brush. A cautious approach needs to be

followed during the process to ensure that no loose particles of the stone itself are lost. If found, the loose or detached pieces of stone, their strength would be tested to suggest consolidation or repairing before the application of general cleaning and washing procedures. The second step is general washing of the entire stone surfaces with mild soap and distilled water. The third stage cleaning procedure is applied for stubbornly adhering dirt patches and soiling. Poulticing (with ammonium bicarbonate solution) as a chemical treatment of removing beetle nut and other stains is also required. (Refer Appendix I for more details).

6. Protective Coating

After satisfactory cleaning or necessary repairs of all surfaces a transparent sealer as a protective coating is required. A transparent water proof coating as a last resort to reduce the transpiration of moisture will be applied to minimize the accelerating decay process after sand blasting and to control atmospheric moisture contents, dirt accumulation and other environmental impacts. The choice of sealant will be based on the following three factors: UV resistant, colorless and should not discolor/ disintegrate after weathering. Sample tests must be undertaken before application on the entire building. The procedure for application of water proof coating is described with details in Appendix IV of this report.

7. Repair and restoration of wooden doors/ windows

The doors and windows of the building are made of teak wood. Restoration of the original state of doors and windows is recommended though the present green color coat on the front façade windows was done in effort to aesthetically benefit the building. Once the accumulated layers of paint on the windows scrapped completely to the extent that the original color and texture of wood is exposed, a clear laquer polish is recommended to be applied on the doors and windows to become coherent with interior and exterior finishes. A transparent protective coating as preservative and water proof for wood can be applied to increase the decay period (Refer Appendix IV for recommended sealer). In addition to this, cleaning of window glass panes along with replacement of broken glass panes is desired. Placement of air coolers and AC units assembled in the windows are disfiguring the façade character. These

alterations should be reverted and carry the necessary repairs to restore these to the original state.

8. Installation of proper ducting system and wiring conduits for ACs

A detailed plan for proper ducting system along with installing AC units need to be developed. This should include proper locations for the ACs, their drainage ducts and wiring conduits. It is recommended that the system should be worked out either on central air conditioning program or use split units. Window type units should not be used, as they are the major cause for the defacing of the building facades. Placement of the outdoor unit of the split AC should be done on the roof to protect the building from defacing. The drained water from ACs can be recycled and used for watering the planters.

9. Plumbing and Electrical Works

The haphazardly installed plumbing pipes at the building's rear side towards internal courtyard, the dangling wires on the building front façade and the faulty exposed electrical wiring in the building arcades need to be fixed in an organized manner. Proper PVC conduit channels must be used to conceal the electric wiring without spoiling the aesthetics. The rain drainage pipes which are leaking and corroding needs to be replaced with new ones. The external light features mounted on the building for lighting at night should be replaced with more appropriate architectural lighting. It is recommended to mount the light fittings on the ground or around the building to light up the building in evening. The wires leaving black stains on the stone surface need to be replaced with concealed wiring method, further it should be reinstalled inside the building, not on the façade.

10. Cleaning and Repair of Interior Floors

Original pigmented flooring in certain rooms of ground floor has lost texture and glaze. They are accumulated with dust, soiling and stains. As they are in poor state of conservation, therefore, it is suggested to replace them with new tiles of same color, design and pattern. In certain rooms of first and second floor, original pigmented flooring is in fairly good state of preservation. Some tiles with broken edges or chipped off layers need to be replaced. The damaged areas would require spot repairs/ replacements. The entire flooring

needs proper cleaning to remove soiling and other stains. They are further required to be polished after the repair and cleaning measures are satisfactorily undertaken. Application of a protective coating may be considered, but the decision on this should be taken after checking the weathering behavior of applied material through sample test panels. (Refer Appendix IV)

The marble tile cladding on the walls around the courtyard and marble flooring in the corridor was a later addition. If removal of marble cladding would not be possible, it would require general maintenance/ cleaning. A detailed procedure for marble polishing is described in Appendix III of this report. A protective coating may be applied over polished surfaces to control water absorption and discourage dust accumulation.

11. Re-painting of Interior Spaces

The interior spaces, significantly the ground floor has paint blistered surfaces. Salt deposits are also visible. Seepage has risen up to the ceilings. After rectifying the water penetration issues, once all the surfaces get dried, the accumulated layers of paint chipping off the surfaces shall be removed properly by scraping. When the plaster surface will become clearly visible, it shall be further sanded with a coarse grade emery paper. The surface will then be prepared for application of a fresh coat of paint; prior to which it should be ensured that no chemical treatments were previous applied on these surfaces which are causing the peeling of paint (besides the presence of moisture). Fresh coat of paint will then be applied on the walls and ceilings.

In stone masonry buildings, gypsum or lime plaster was applied as stone walls have breathing process. Water based paints are recommended to be applied on the gypsum or lime plaster surfaces to allow porosity and keeping the breathing process intact. Enamel or any oil based paints shall not be used in historic buildings since they seal the surfaces. After the fresh paint coat, another coat of transparent protective layer can be applied for the longevity of painted surfaces. (Refer Appendix IV for further recommendation)

12. Uninstallation of unnecessary iron nails

Iron nail insertions were found extensively inside the corridor and rarely on the elevations. Once the iron nails plucked off, the remaining holes need to be filled up with lime mortar filling. Remove the previously installed nails, iron cramps or ties which are no longer in use since they may cause damage to the stone due to the stains of corrosion and rusting.

13. Long term maintenance program

The policy formulated by the conservation committee for the restoration of the KPT building was based on retaining the historic character of the historic premise while rectifying the sources of decay and deterioration. In this regard the primary source of water penetration was identified to be eliminated completely. The suggested approach for treating all external surfaces with water sealants and repair mortars would result in reducing the water penetration to a great degree. But its long term effectiveness would be dependent on other issues like resistance of used materials to external climatic factors and the regular maintenance of the building.

It is thus recommended that the management committees of KPT building develops a long term maintenance program and ensures that the guidelines developed in it are strictly followed. The following should be incorporated in this maintenance program.

a. Periodic Checking of Sealant Treatment on all External Surfaces

The chemical sealants and repair mortars used on all external surfaces should be checked after every four to six months for any signs of damage or decay. Their performance against water penetration should also be checked on site after every rain. Any small indications of decay, damage or disintegration should be immediately reported for immediate repair damages before they get magnified.

b. Immediate Wiping of Floor Surfaces after Rains and Periodic Checkups of French Drain

After every rainfall all surfaces should immediately be wiped and clean off any standing water pools. The underground trench should be checked up for draining out the water and for preventing any blockage.

c. Controlling bird perching on the building

The accumulated excrement of birds typically contains nitrogen, phosphoric acid and potash. They may cause staining due to chemical reaction with stone and growth of pests. The repair recommended is removing such contents by mild chemical treatments. Some measures can be taken to control bird's population around the building and discourage them from perching on the horizontal surfaces of the building. There are few techniques commonly used internationally for controlling bird perching on historic buildings but they have shortcomings as well. These can be applied if desired keeping in view the pros and cons. They are listed below;

- Stretching a synthetic mesh of unobtrusive color across potential roosting sites such as cornices, window openings, roof ridges etc. but these can have an unaesthetic appearance on the building.
- Strips of gel applied on ledges where birds may roost. This provides an insecure footing, discouraging the birds from settling down. But once the gel dries off it can become a nuisance in itself, because it adheres to the surfaces rigidly and could not be easily taken off.
- Low voltage wires, with small electric charge, can be stretches between insulators along the ledges or cornices.
- Other known methods are trapping birds and removing them from the site, shooting or scaring them away by producing noise. But these methods seem cruel and would be criticized by the bird lovers.

As a long term preventive measure regular cleaning of the areas which are soiled by bird droppings should be made as part of the continuous upkeep routine. This will ensure that the build-up does not happen and surfaces are washed off before the soiling becomes so severe that it would require professional cleaning measures. The above mentioned remedial measures should follow a logical sequence to ensure optimum results.

General Guidelines for Conservation Policies

A conservation policy should ensure the following;

- Any later additions or phases of development in the life of the building are respected as part of its history. Those which deface or negate the fabric should be removed.
- Use of any incompatible material should be discouraged. All repair and maintenance interventions should have sensitivity and respect towards original materials.
- The building and its surroundings are treated as a comprehensive part of each other and should be treated to complement one another.
- The guidelines, limitations and preventive precautionary measures for appropriate use of the premises should be conveyed to the users and maintenance staff, to ensure that after any restoration measures, proper care and continuous conservation is being done to maintain the site in an appropriate manner.

Conservation of historic buildings is a continuous task, where the objective is to keep the building intact and surviving for the future generations to witness its true spirit and essence. A comprehensive action plan should be formulated for long term maintenance of historic properties which should also take into consideration training of the staff responsible for the regular upkeep. In addition the users should also be made aware and conscious of the historic significance and value of their premises so that they use it with more respect without causing damages to historic materials.

APPENDIX I

Cleaning of Stone Surfaces

The stone surfaces of the building show dust accumulation as well as soiling at various locations. To clean the entire façades, chemical cleaning by the following process is recommended.

Proposed method for cleaning of stone:

Step 1.

- Gently brushing off all loose particles; sand, dust, etc. Mapping of any loose fragments as well as dislodged pieces of stone should also be done at this stage. The particles or pieces of detached stone that are of substantial size should be examined for strength and if found in good state are recommended to be fixed to their original location by grouting and joining techniques.

Step 2.

- Temporary filling or repairing of the open mortar joints and decayed pointing are to be done before starting wet cleaning.

Step 3.

- Gently spray distilled water on the stone surfaces to be cleaned (starting from upper parts). Scrub with sponge or nylon brushes and rinse off the surface with spray of distilled water. Let the masonry dry off. If black patches of dirt or black crust are still observed then clean only these parts with an Ammonium Bicarbonate poultice, in the following way.

Step 4.

- Cleaning of soiling and black crust with ammonium bicarbonate solution. Before deciding upon the concentration of the solution to be used, treatment test samples should be done. The selected sample treatment areas should be characteristic of the deterioration or soiling found on the building. Sample areas should ideally be as inconspicuous as possible. It is recommended to adopt a sequential approach, starting with the least aggressive methods first and gradually increasing the applications until an acceptable level of cleaning is achieved.

- If the biofilm is wet, it should be allowed to dry first. Dried bio-film will be brushed and surface applied with the ammonium bicarbonate poultice.

Preparation and Application of the Poultice.

- Prepare 10% solution of Ammonium Bicarbonate in water.
- Dissolve the particles thoroughly, and sieve the solution through very fine fabric (e.g. nylon stockings).
- Add paper pulp to the solution till it gives a thick paste.
- Brush off and clean the trial surface area.
- Take the pulp in hand and squeeze off extra solution, then throw on the surface and gently spread with fingers.
- Leave the poultice on surface, for a while, checking at each 10 to 15 minutes interval.
- Take off the poultice at a time when the desired level of cleaning is achieved.
- Brush the surface and wash off with water.

It is recommended that the sample cleaning should be started with the least concentration of solution i.e. only 10% with minimum time of application i.e. 15-30 minutes. If the crust does not remove then only the concentration and time is gradually increased. But the concentration of solution should never go beyond 30% as this is the level of saturated solution. In case the higher concentration solutions also do not work then a sample with very small percentage (only 5%) of EDTA (Ethylene-diamine-tetra-acetic acid) can be attempted.

Poultices should be prepared; first those with a solution in water of 10% ammonium bicarbonate then gradually increasing in concentration if the 10% solution does not give effective results. 25% ammonium bicarbonate up to 30% saturated solution of Ammonium Bicarbonate.

If the poultice is required to be left for a longer time span then it should be 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 5.

Repair work, where deemed necessary should be undertaken after cleaning with poultice and before biocide treatment. The lime mortar used in all repair works must be prepared according to the specifications given in Appendix III.

- Re-pointing and filling of gaps with permanent lime mortar. The mortar is to be applied with metal spatulas, firmly pushed into the gap and further compacted with a hard sponge. The extra mortar on surface should be cleaned with a wet sponge.
- If there are any deeper cracks or fissures these should be filled with mortar using hydraulic lime.
- All horizontal surfaces of windowsills and cornices to be sealed, by covering the whole surface with a layer of lime mortar. Once the surfaces are sealed the water will drip over the edges of these surfaces. These areas should be regularly monitored and repaired whenever required,

Step 6.

If salts have penetrated inside the building, they will start to appear on surface in the form of efflorescence once the masonry is dry. These can be cleaned by paper pulp technique. This should be done after the problem of dampness penetration 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, blotting paper sheets or paper pulp wetted with distilled water, are applied on areas that have crystallized salts. The paper is left to absorb all soluble salts, and then taken off. Repeat the process as many times as required till salt efflorescence does not appear any more.

APPENDIX II.

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 previous treatments of lime mortar are done along the junction of vertical and horizontal surfaces. The application of this repair mortar seems somewhat clumsy. The strength and porosity of these repair mortars need to be checked before a decision for their removal could be taken. If too porous and damaged/ cracked in most areas then it would be recommended to remove it from all places with gentle chiseling, hammering or scrapping. After a thorough cleaning of the loose mortar, all open joints and gaps in joints should be re-pointed with lime mortar. Loose stone fragments can also be consolidated by grouting with lime mortar.

Preparation of lime mortar for repair. The lime mortar to be used for repair works should have higher porosity and water absorption, whereas less density and strength than that of stone. According to a research done on repair plasters of historic buildings in Karachi by Arch. Yasmin Cheema, 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.

In addition to this the mortar samples collected form the site should also be sent for an analysis of their composition and properties and the repair mortar prepared in accordance to the findings.

APPENDIX III

Polishing of Marble Surfaces

- File the surface with Silicon carbide paper – starting with rougher paper and then gradually with finer paper.
- Finally the surface is polished with cloth and some metal oxide like tin-oxide (better for most stones) or lead oxide. (Jewelers use similar method for polishing stone).
- For building stone mechanical disks are used for polishing stone slabs.
- Starting first with 180 paper (wet with water); then 250, 320, 500, and end with 600
- For very rough stone surface smooth it first with machine and then finish with finer grade paper.

APPENDIX IV

Chemical Applications

Transparent protective coatings for various surfaces like stone walls, flooring, internal walls with painted surfaces and wooden frames of windows are recommended to be applied with following chemical coatings.

1. Application of Protective Layer for Stone Surfaces

Silicon based water repellent coating to impart hydrophobicity to the porous surface of stone without clogging the pores. Zahabiya REPECOAT PR – 17/9 or equivalent chemical is recommended which provides water repellence without forming surface layer; remains invisible causing no change in the aesthetic attributes of the surface and retains high degree of vapor permeability. Procedure for application of the protective coating is as follows;

- Clean and preferably dry the surface before application.
- If efflorescence marks (salt stains) are present, cleaning of the surface salts is recommended, using

dilute tartaric acid, phosphoric acid or any other suitable cleaner.

- Care should be taken while handling acids, as they are highly corrosive.
- It can be applied through flooding / showering or by brush until the surface is well saturated.
- For highly porous surfaces, several coats may sometimes be necessary to render them saturated.
- Do not leave long breaks between the coats. Apply the next coat before the surface has dried, but after the shine of the surface has disappeared (wet on wet application).

2. Application of Protective Layer for Paint Surfaces

Zahabiya Special Binder Sealer 16/21 or an equivalent chemical coating can be applied over the fresh painted surfaces. Water borne, acrylic based clear, protective, deep penetrating coating requires to be applied on porous or non-porous surfaces. It should have following properties;

- Water proof, non-flammable, non-toxic, non-staining, weather resistant, U/V resistant and organic growth resistant
- It should be suitable for fare face applications to protect from harmful effects of weather, oxidation, erosion and water penetration. Also work as an aging resistant.
- It can be applied on dry or slightly damp surfaces.

3. Application of Protective Layer for Wooden Frames of Windows

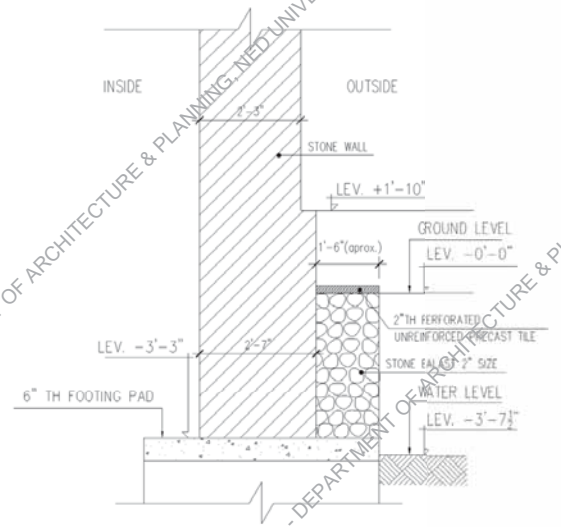
Zahabiya Transparent Sealer ZTS - 14 as a transparent vinyl/ acrylic sealer or an equivalent chemical can be applied on wooden frames of windows as wood preservative and water proof polishing lacquer. The chemical holds following properties; it dries into a clear, strongly bonded glossy film with non-cracking, non-peeling, weather and abrasion resistant properties.

4. Application of Protective Layer on Flooring

The above mentioned chemical can also be applied as U/V resistant protective lacquer, floor sealer/ hardener and dust proofer.

APPENDIX V

Excavation of French Drain



FRENCH DRAIN AT K.P.T. HEADOFFICE BUILDING

Annexion 1

NED University of Engineering & Technology
Department of Environmental Engineering
Water Quality Laboratory

TEST REPORT

Sample from: Mrs. Farida Abdul Ghaffar
Number of Sample: 01
Source of Sample: P& of KPT
Date of Sample Received: March 17, 2014
Date of Reporting: March 21, 2014
Ref No: NED/ICRD/376

Sr. No.	Parameters	Normal Value by WHO	Units	Result Sample # 01
1.	pH	6.5-8.5		7.2
2.	TDS (Total Dissolved Solids)	< 1000	mg/L	770
3.	Turbidity	< 5.0	NTU	810
4.	Chloride	< 400	mg/L	260
5.	Calcium	-	mg/L	132
6.	Magnesium	-	mg/L	67
7.	Sulfate	< 400	mg/L	145
8.	Sodium	< 200	mg/L	109
9.	Potassium	-	mg/L	26
10.	Hardness	-	mg/L	630

REMARKS: _____

TESTED BY: _____

CHAIRMAN: _____ 7/31/5/2014

Annexion 2

FQP/DT/01/00

Internal Memo

☐ URGENT
☐ IMMEDIATE

☐ INFO ONLY
☑ ROUTINE

To:	CM&CRD	From:	M. A. Ghani Chishty (Lecturer)
Subject:	Testing of Samples	Ref:	Lec/CM&CRD/M-14-3/973
		Date:	February 3rd, 2014

Dear Sir,

On January 21st, 2014, I visited Karachi Port Trust with your colleague Ms. Farida Abdul Ghaffar, for the purposes of determining whether it would be recommended to remove the marble façade that lines one portion of the original KPT building, in order to control the phenomenon of water absorption by the "Gizri Yellow Stone" that constitutes the structure of the building.

For that purpose, a sample of the above mentioned stone-brick was procured from the site. In order to determine if it would be advisable to remove the marble façade, the following tests are recommended on the sample:

1. Hardness Test
2. Water Absorption
3. X-Ray Diffraction Analysis

In order to conduct these tests, the following costs will be incurred:

Test / Equipment	Rate / Sample	Samples	Cost (Rs.)
Rough Sample / Abrasive Cut-off Machine	600/-	1	600/-
Hardness Samples / Diamond Cutter	5000/-	4	20000/-
Grinding & Polishing	700/-	4	2800/-
Sample Drying / Oven	2,000/-	4hrs	800/-
Hardness / Vicker's Hardness Tester	1,000/-	3	3000/-
Composition Analysis / XRD	4500/-	1	4500/-
Water Absorption / Weight Analysis	250/-	2	500/-
Total Cost:	-		31400/-

I look forward to your reply.

Engr. M. A. Ghani Chishty
LECTURER/OIC CL
Department of Materials Engineering

DOCUMENTATION AND CONSERVATION REPORT

Karachi Port Trust (KPT) Head Office Building

MAPPING OF DAMAGES & DETERIORATION

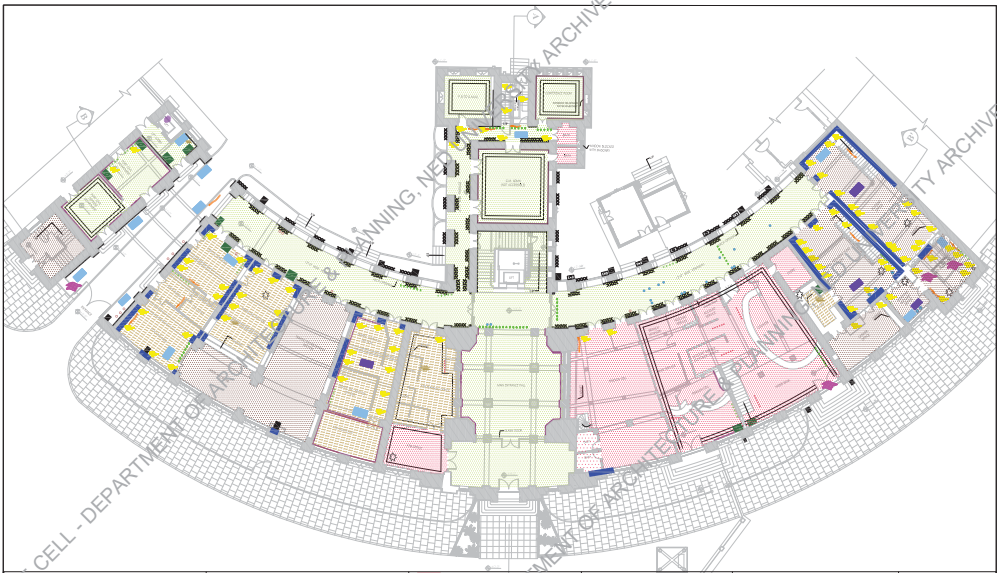
PROJECT TEAM

Project Architects:
Farida Abdul Ghaffar
Fariha Tahseen

Field Survey, CAD Drawings & Photography Team:
Tabish Tariq (Architect)
Samina Kamran (Cad-Technician)
Anila Rahim (Cad-Technician)
Zia ur Rehman (Field Helper)

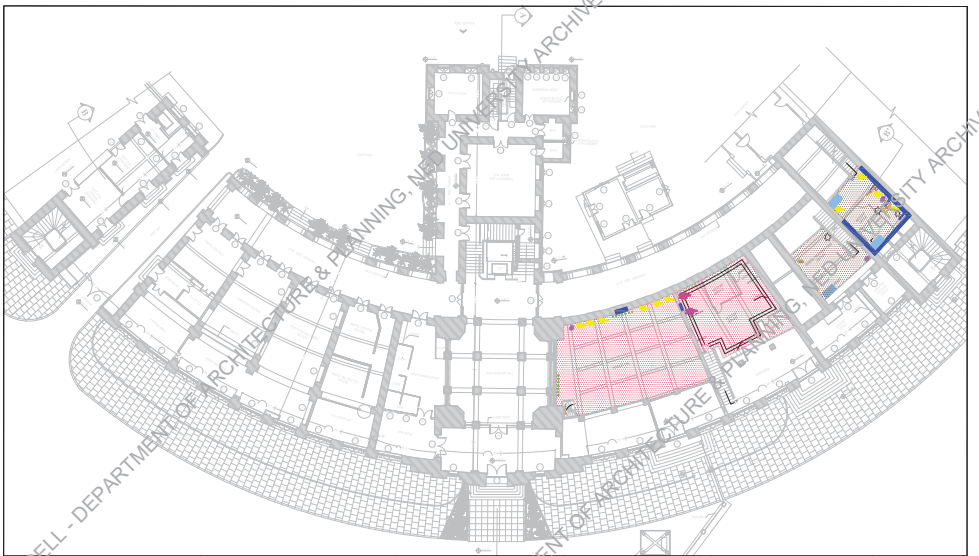
December 2013- April 2014

Prepared by: Heritage Cell, Department of Architecture & Planning
NED University of Engineering & Technology, Karachi



LEGENDS					
A.C UNITS	COLOUR CRETE	DUCT FOR A.C UNIT	IRON NAILS ON WALLS / CEILINGS	ORIGINAL FLOORING	SEEPAGE
A.C UNITS PIPES	CRACK	DETERIORATED STONE	MARBLE FLOORING	OPEN MORTAR JOINTS	SPIDER WEBS
BETEL NUT STAINS	CONSTRUCTION DEBRIS	EXPOSED ELECTRIC WIRING	MARBLE CLADDING	REPAIRING / CLEANING OF ORIGINAL FLOOR	TERMITE
BIRDS DROPPINGS	CERAMIC TILES FLOORING	ELECTRIC LIGHTS	MACRO BIOLOGICAL GROWTH	RUST STAINS	WALL PAINT CHIPPING OFF
BROKEN ELECTRICITY FITTINGS	COLOUR CRETE EXFOLIATION	EXPOSED PLUMBING PIPES	MARBLE TILES FLOORING	REPAIR MORTAR JOINTS	WOODEN PANELS ON WALL
BROKEN ELEMENTS	DUST ACCUMULATION	FALSE CEILING	MOISTURE STAINS	SOILING	WOODEN FLOORING
	DISCOLORATION	HOLES / CAVITIES	NEW ADDITION	STAINS (SPILLED LIQUID)	

PROJECT: DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT: HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE: GROUND FLOOR PLAN DATE: DEC-2013 - FEB- 2014 | FIT TO PAPER	DRAWING NO: KPT-20



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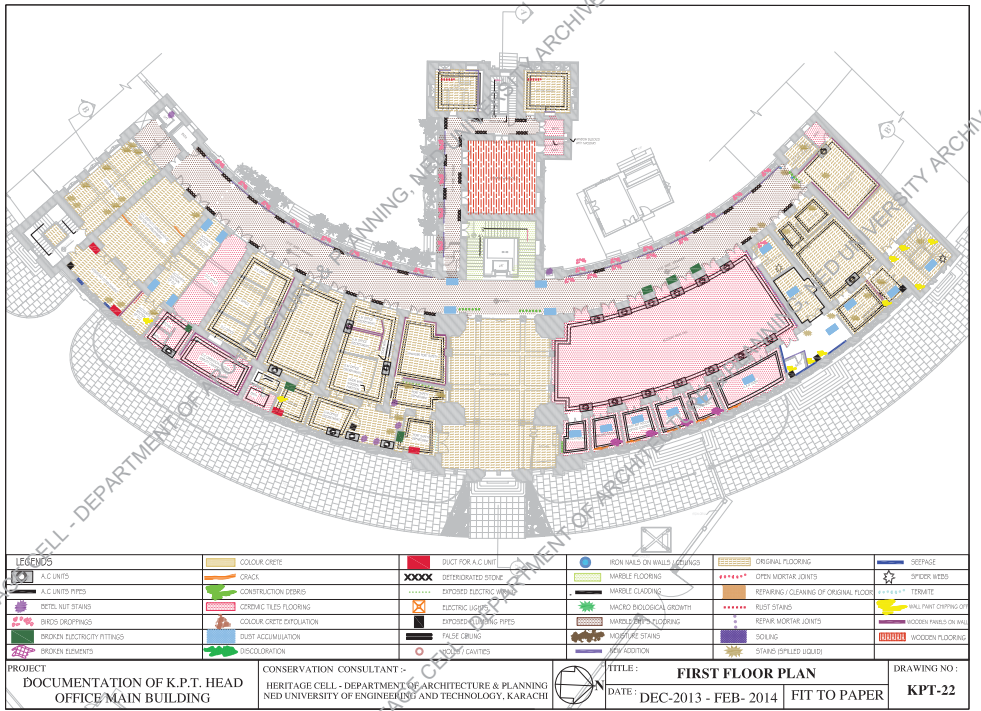
A.C. UNITS PIPES	CRACK	DETERIORATED STONE	MARBLE FLOORING	OPEN MORTAR JOINTS	SPIDER WEBS
BETEL NUT STAINS	CONSTRUCTION DEBRIS	EXPOSED ELECTRIC WIRING	MARBLE CLADDING	REPAIRING / CLEANING OF ORIGINAL FLOOR	TERMITE
BIRDS DROPPINGS	CERAMIC TILES FLOORING	ELECTRIC LIGHT	MACRO BIOLOGICAL GROWTH	RUST STAINS	WALL PAINT CHIPPING OFF
BROKEN ELECTRICITY FITTINGS	COLOUR CRETE EXFOLIATION	EXPOSED PLUMBING PIPES	MARBLE PARTS FLOORING	REPAIR MORTAR JOINTS	WOODEN PANELS ON WALL
BROKEN ELEMENTS	DUST ACCUMULATION	FALSE CEILING	MOISTURE STAINS	SOILING	WOODEN FLOORING
	DISCOLORATION	LOSS / CAVITIES	NEW ADDITION	STAINS (SPILLED LIQUID)	

PROJECT	CONSERVATION CONSULTANT :-	TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	MEZZANINE FLOOR PLAN	KPT-21
		DATE : DEC-2013 - FEB- 2014 | FIT TO PAPER	



PROJECT
DOCUMENTATION OF K.P.T. HEAD OFFICE MAIN BUILDING

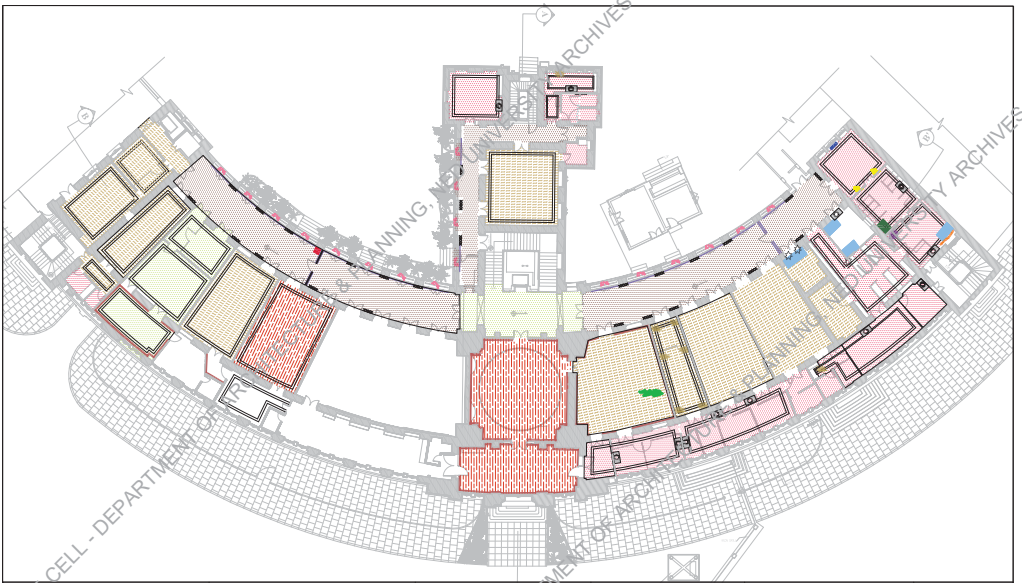
CONSERVATION CONSULTANT :-
HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING
NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI

TITLE : **FIRST FLOOR PLAN**

DATE : DEC-2013 - FEB- 2014

FIT TO PAPER

DRAWING NO : **KPT-22**



LEGENDS					
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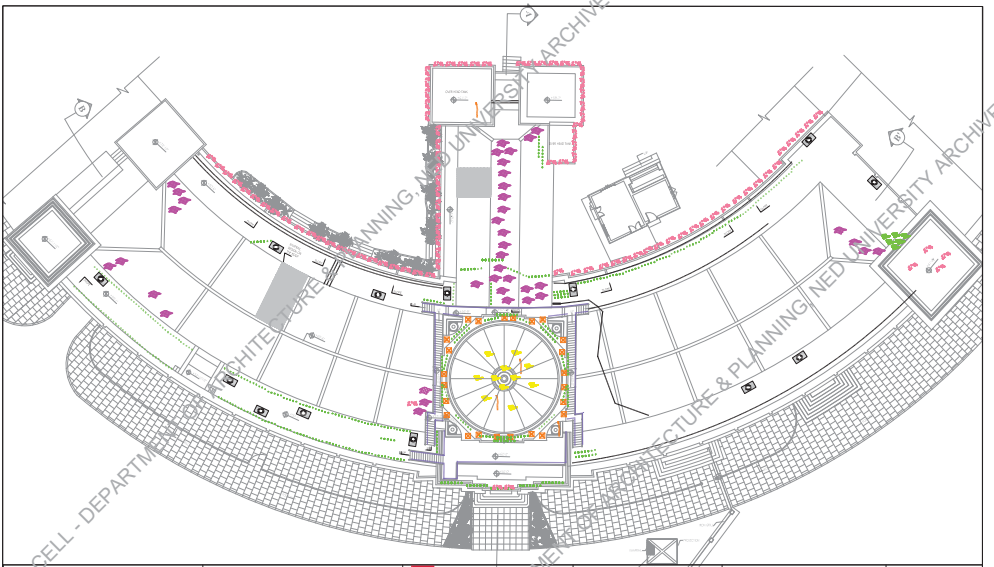
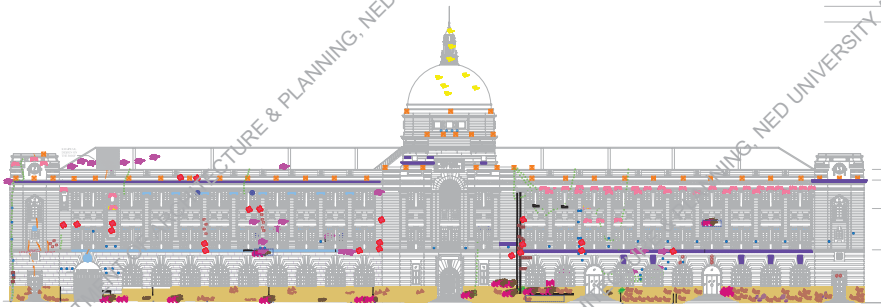
A.C UNITS PIPES	CRACK	DETERIORATED STONE	MARBLE FLOORING	OPEN MORTAR JOINTS	SPIDER WEBS
BETEL NUT STAINS	CONSTRUCTION DEBRIS	EXPOSED ELECTRIC WIRING	MARBLE CLADDING	REPAIRING / CLEARING OF ORIGINAL FLOOR	TERRAZE
BIRDS DROPPINGS	CERAMIC TILES FLOORING	ELECTRIC POINTS	MACRO BIOLOGICAL GROWTH	RUST STAINS	WALL PAINT CHIPPING OFF
BROKEN ELECTRICITY FITTINGS	COLOUR CRETE EXFOLIATION	EXPOSED PLUMBING PIPES	MARBLE TILES FLOORING	REPAIR MORTAR JOINTS	WOODEN PANELS ON WALL
BROKEN ELEMENTS	DUST ACCUMULATION	FALSE CEILING	MOISTURE STAINS	SOILING	WOODEN FLOORING
	DISCOLORATION	HOLES / CAVITIES	NEW ADDITION	STAINS (SPILLED LIQUID)	

PROJECT	CONSERVATION CONSULTANT	TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE MAIN BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	SECOND FLOOR PLAN	KPT-23
		DATE : DEC-2013 - FEB- 2014	FIT TO PAPER

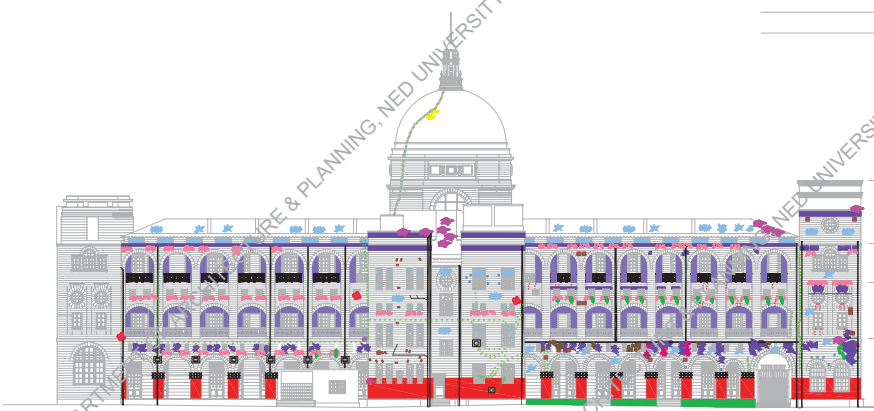


PROJECT	CONSERVATION CONSULTANT :	TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE MAIN BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	ROOF PLAN	KPT-24
		DATE : DEC-2013 - FEB- 2014 FIT TO PAPER	



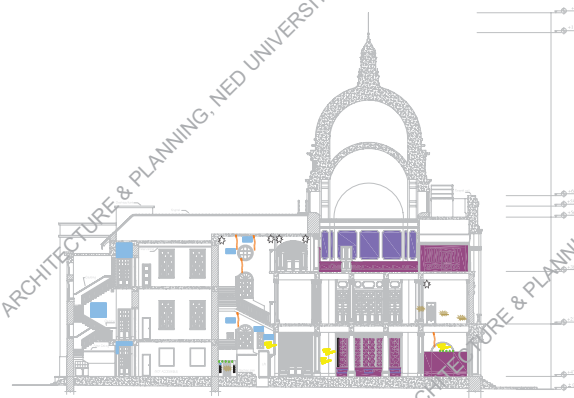
LEGENDS					
A.C UNITS	COLOUR CRETE	DUCT FOR A.C UNIT	IRON NAILS ON WALLS / CEILINGS	ORIGINAL FLOORING	SEEPAGE
PLUMBING PIPES	CRACK	DETERIORATED PAINT	MARBLE FLOORING	OPEN MORTAR JOINTS	STONE DAMAGES (IMPROPER REPAIR
BETEL NUT STAINS	CONSTRUCTION DEBRIS	EXPOSED ELECTRIC WIRING	MARBLE CLADDING	REPAIRING / CLEANING OF ORIGINAL FLOOR	TERMITE
BIRDS DROPPINGS	CERAMIC TILES FLOORING	ELECTRIC LIGHTS	MACRO BIOLOGICAL GROWTH	RUST STAINS	WOOD INSERTION
BROKEN ELECTRICITY FITTINGS	DISINTEGRATED COLOUR CRETE	EXPOSED PLUMBING PIPES	MARBLE CHIPS FLOORING	REPAIR MORTAR JOINTS	WALL PAINT CHIPPING OFF
BROKEN ELEMENTS	DUST ACCUMULATION	FALSE CEILING	MOISTURE STAINS	SOILING	WOODEN PANELS ON WALL
	DISCOLORATION	HOLES / CAVITIES	NEW ADDITION	STAINS (SPILLED LIQUID)	WOODEN FLOORING

PROJECT	CONSERVATION CONSULTANTS :	TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE MAIN BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	FRONT ELEVATION	KPT-25
		DATE : DEC-2013 - FEB- 2014 FIT TO PAPER	



LEGENDS					
A.C UNITS	COLOUR CRETE	DUCT FOR A.C LINE	IRON NAILS ON WALLS / CEILINGS	ORIGINAL FLOORING	SEEPAGE
PLUMBING PIPES	CRACK	DETERIORATED STONE	MARBLE FLOORING	OPEN MORTAR JOINTS	STONE DAMAGES IMPROPER REPAIR
BETEL NUT STAINS	CONSTRUCTION DEBRIS	EXPOSED ELECTRIC WIRING	MARBLE CLADDING	REPAIRING / CLEANING OF ORIGINAL FLOOR	TERMITE
BIRDS DROPPINGS	CERAMIC TILES FLOORING	ELECTRIC LIGHTS	MACRO BIOLOGICAL GROWTH	RUST STAINS	WOOD INSERTION
BROKEN ELECTRICITY FITTINGS	DISINTEGRATED COLOUR CRETE	EXPOSED PLUMBING PIPES	MARBLE CHIPS FLOORING	REPAIR MORTAR JOINTS	WALL PAINT CHIPPING OFF
BROKEN ELEMENTS	DUST ACCUMULATION	FALSE CEILING	MOISTURE STAINS	SOILING	WOODEN PANELS ON WALL
	DISCOLORATION	HOLES / CAVITIES	NEW ADDITION	STAINS (SPILLED LIQUID)	WOODEN FLOORING

PROJECT	CONSERVATION CONSULTANT		TITTLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE MAIN BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	REAR ELEVATION		KPT-26
			DATE : DEC-2013 - FEB- 2014	FIT TO PAPER	



LEGENDS

A.C UNITS	COLOUR CRETE	DUCT FOR A.C UNIT	IRON NAILS ON WALLS / CEILINGS	ORIGINAL FLOORING	SEEPAGE
A.C UNITS PIPES	CRACK	DETERIORATED STONE	MARBLE FLOORING	OPEN MORTAR JOINTS	SPIDER WEBS
BETEL NUT STAINS	CONSTRUCTION DEBRIS	EXPOSED ELECTRIC WIRE	MARBLE CLADDING	REPAIRING / CLEANING OF ORIGINAL FLOOR	TERMITE
BIRDS DROPPINGS	CERAMIC TILES FLOORING	ELECTRIC LIGHTING	MACRO BIOLOGICAL GROWTH	RUST STAINS	WALL PAINT CHIPPING OFF
BROKEN ELECTRICITY FITTINGS	COLOUR CRETE EXFOLIATION	EXPOSED PLUMBING PIPES	MARBLE CHIPS FLOORING	REPAIR MORTAR JOINTS	WOODEN PANELS ON WALL
BROKEN ELEMENTS	DUST ACCUMULATION	FALSE CEILING	MOISTURE STAINS	SOILING	WOODEN FLOORING
	DISCOLORATION	FOLIES / CAVITIES	NEW ADDITION	STAINS (SPILLED LIQUID)	

PROJECT: DOCUMENTATION OF K.P.T. HEAD OFFICE MAIN BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	TITLE : SECTION-AA'	DRAWING NO : KPT-27
		DATE : DEC-2013 - FEB- 2014 FIT TO PAPER	

LEGENDS					
A.C UNITS	COLOUR CRETE	DUCT FOR A.C UNIT	IRON NAILS ON WALLS / CEILINGS	ORIGINAL FLOORING	SEEPAGE
A.C UNITS PIPES	CRACK	DETERIORATED STONE	MARBLE FLOORING	OPEN MORTAR JOINTS	SPIDER WEBS
BETEL NUT STAINS	CONSTRUCTION DEBRIS	EXPOSED ELECTRIC WIRING	MARBLE CLADDING	REPAIRING / CLEANING OF ORIGINAL FLOOR	TERMITE
BIRDS DROPPINGS	CERAMIC TILES FLOORING	ELECTRIC LIGHTING	MACRO BIOLOGICAL GROWTH	RUST STAINS	WALL PAINT CHIPPING OFF
BROKEN ELECTRICITY FITTINGS	COLOUR CRETE EXFOLIATION	EXPOSED PLUMBING PIPES	MARBLE CHIPS FLOORING	REPAIR MORTAR JOINTS	WOODEN PANELS ON WALL
BROKEN ELEMENTS	DUST ACCUMULATION	FALSE CEILING	MOISTURE STAINS	SOILING	WOODEN FLOORING
	DISCOLORATION	FILLED CAVITIES	NEW ADDITION	STAINS (SPILLED LIQUID)	

PROJECT	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE MAIN BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**SECTION-BB'**	**KPT-28**
			DATE : DEC-2013 - FEB- 2014 FIT TO PAPER	

DOCUMENTATION AND CONSERVATION REPORT

Karachi Port Trust (KPT) Head Office Building

PHOTOGRAPHIC DOCUMENTATION

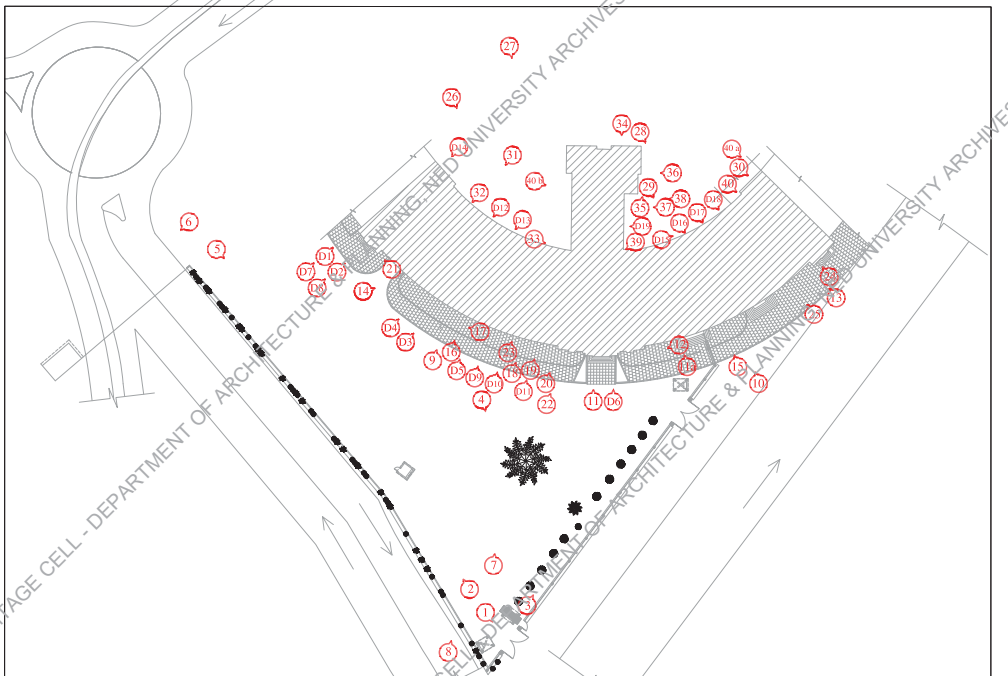
PROJECT TEAM

Project Architects:
Farida Abdul Ghaffar
Fariha Tahseen

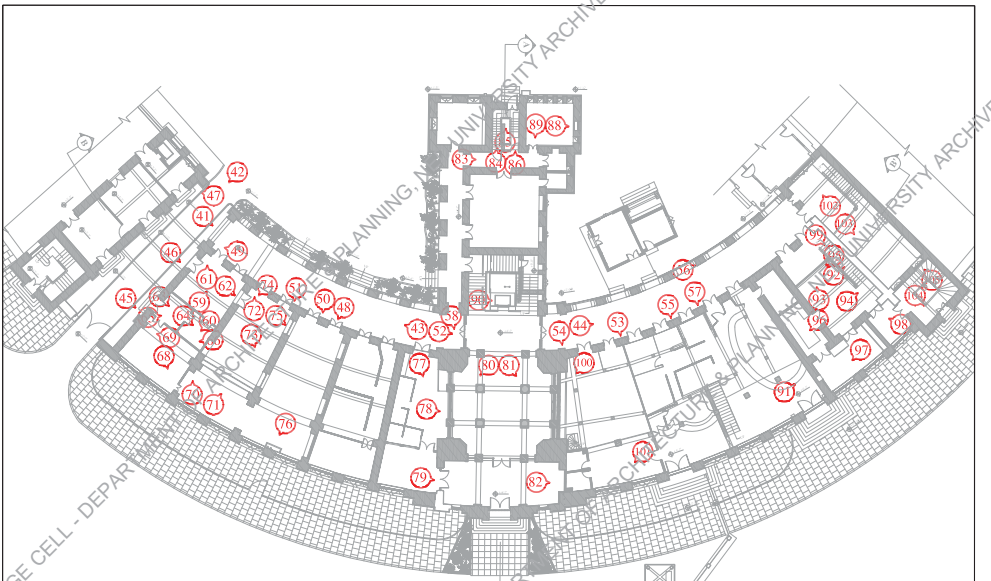
Field Survey, CAD Drawings & Photography Team:
Tabish Tariq (Architect)
Samina Kamran (Cad-Technician)
Anila Rahim (Cad-Technician)
Zia ur Rehman (Field Helper)

December 2013- April 2014

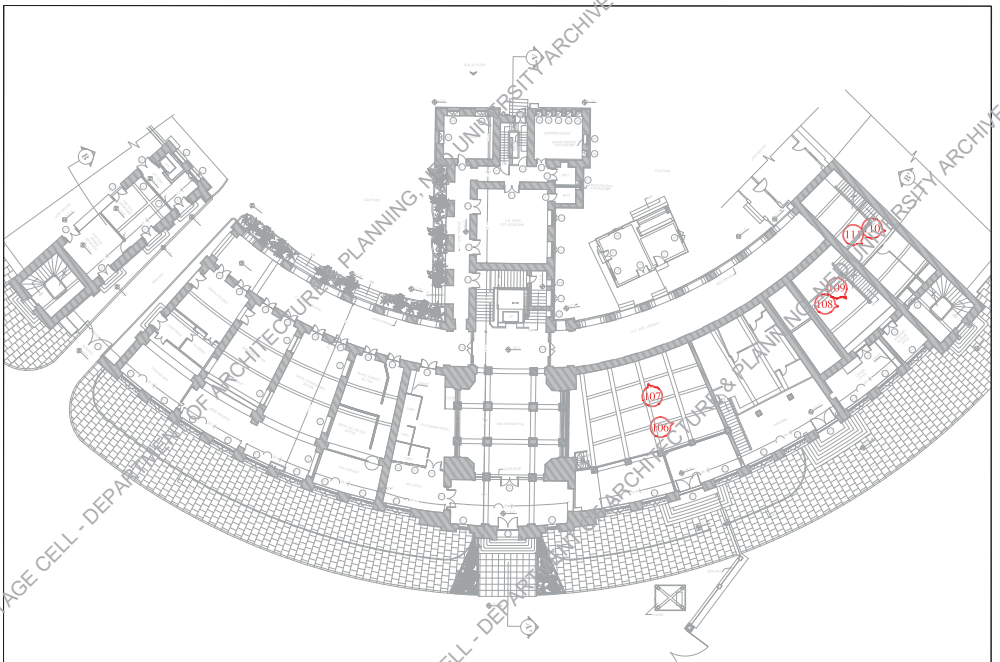
Prepared by: Heritage Cell, Department of Architecture & Planning
NED University of Engineering & Technology, Karachi



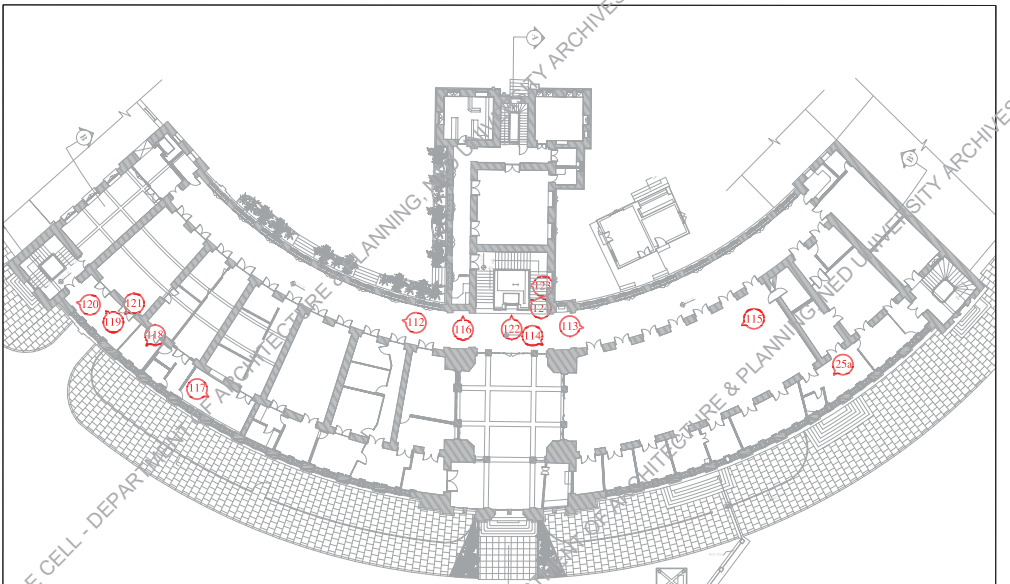
PROJECT	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	SITE PLAN	KPT-29
			DATE : DEC-2013 - FEB- 2014	SCALE :- FIT TO PAPER



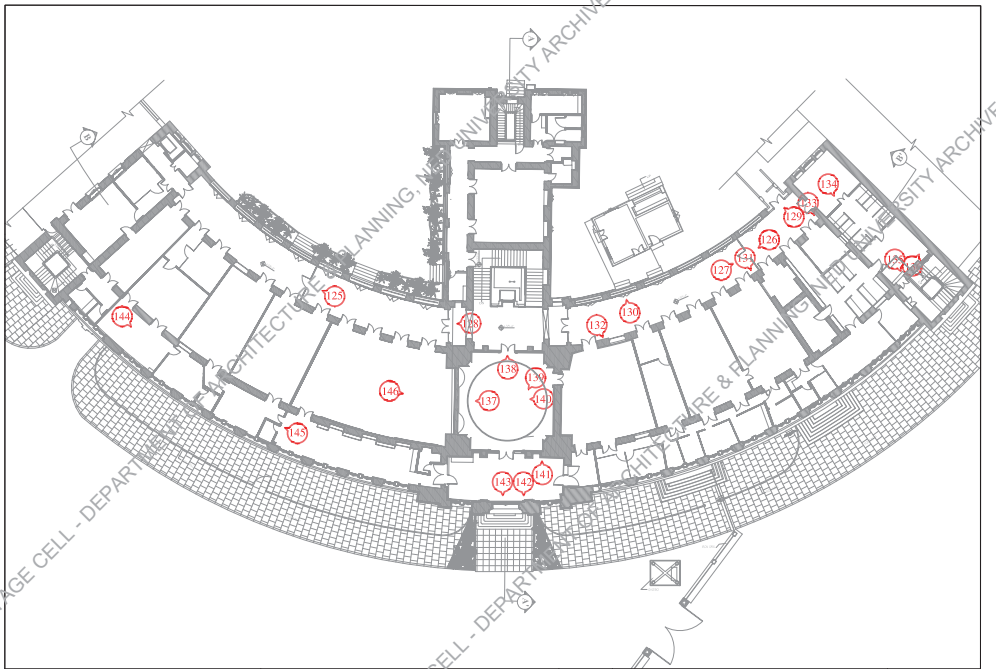
PROJECT	CONSERVATION CONSULTANT :-			
DOCUMENTATION OF K.P.T HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : **GROUND FLOOR PLAN**	DRAWING NO : **KPT-30**
			DATE : DEC-2013 - FEB- 2014	SCALE : FIT TO PAPER



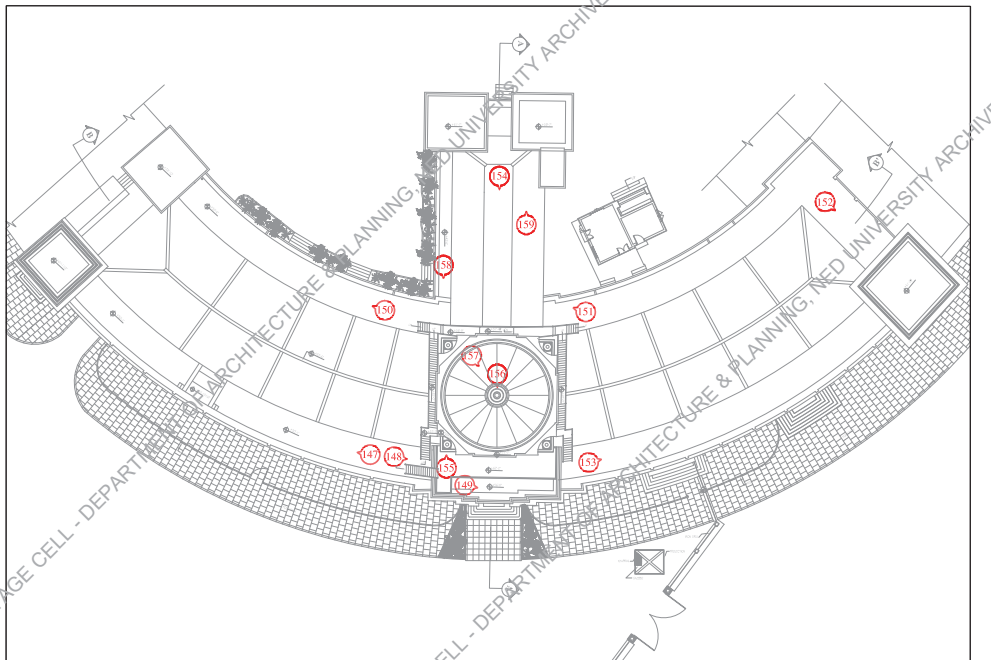
PROJECT	CONSERVATION CONSULTANT :		TITLE :	DRAWING NO
DOCUMENTATION OF K.P.T HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**MEZZANINE FLOOR PLAN**	**KPT-31**
			DATE : DEC-2013 - FEB- 2014	SCALE : FIT TO PAPER



PROJECT	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**FIRST FLOOR PLAN**	**KPT-32**
			DATE : DEC-2013 - FEB- 2014 / SCALE : FIT TO PAPER	



PROJECT	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	SECOND FLOOR PLAN	KPT-33
			DATE : NOV-2013 - FEB- 2014	SCALE : FIT TO PAPER



PROJECT	CONSERVATION CONSULTANT :-			
DOCUMENTATION OF K.P.T HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : **ROOF PLAN**	DRAWING NO : **KPT-34**
			DATE : DEC-2013 - FEB- 2014	SCALE : FIT TO PAPER

PROJECT:	CONSERVATION CONSULTANT:-		TITLE:	DRAWING NO:
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**BOUNDARY WALL**	**KPT-35**
			DATE: DEC 2013-FEB 2014 SCALE: FIT TO PAPER	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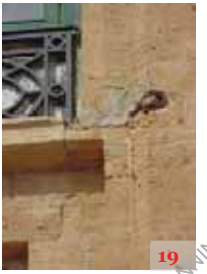
PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : **FRONT ELEVATION** DATE : DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : **KPT-36**

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**FRONT ELEVATION (DETAIL)**	**KPT-37**
			DATE: DEC 2013-FEB 2014 / SCALE: FIT TO PAPER	

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**FRONT ELEVATION (DETAIL)**	**KPT-38**
			DATE: DEC 2013-FEB 2014	SCALE: FIT TO PAPER

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N		**FRONT ELEVATION (DAMAGES)**	**KPT-39**
			DATE : DEC 2013-FEB 2014	SCALE: FIT TO PAPER	



PROJECT :	CONSERVATION CONSULTANT :-		TITLE:		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	FRONT ELEVATION (DAMAGES)		KPT-40
			DATE: DEC 2013-FEB 2014	SCALE: FIT TO PAPER	

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PROJECT: DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT:- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE: **FRONT ELEVATION (DAMAGES)**	DRAWING NO: **KPT-41**
			DATE: DEC 2013-FEB 2014	SCALE: FIT TO PAPER

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**REAR ELEVATION (DAMAGES)**	**KPT-42**
			DATE: DEC 2013-FEB 2014	SCALE: FIT TO PAPER


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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : REAR ELEVATION (DETAIL)	DRAWING NO : KPT-43
			DATE : DEC 2013-FEB 2014	SCALE: FIT TO PAPER


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PROJECT:	CONSERVATION CONSULTANT:-		TITLE:	DRAWING NO:
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	REAR ELEVATION (DETAIL)	KPT-44
			DATE: DEC 2013-FEB 2014 SCALE: FIT TO PAPER	


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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : REAR ELEVATION (DAMAGES)	DRAWING NO : KPT-45
			DATE : DEC 2013-FEB 2014	SCALE: FIT TO PAPER


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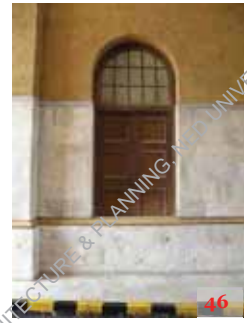
PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : GROUND FLOOR PLAN	DRAWING NO : KPT-46
			DATE : DEC 2013-FEB 2014	SCALE: FIT TO PAPER



PROJECT :	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	GROUND FLOOR PLAN	KPT-47
			DATE : DEC 2013-FEB 2014 SCALE: FIT TO PAPER	

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	GROUND FLOOR PLAN	KPT- 48
			DATE: DEC 2013-FEB 2014 / SCALE: FIT TO PAPER	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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : GROUND FLOOR PLAN	DRAWING NO : KPT-49
			DATE DEC 2013-FEB 2014	SCALE: FIT TO PAPER


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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : GROUND FLOOR PLAN DATE : DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : KPT-50

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	GROUND FLOOR PLAN		KPT-51
			DATE DEC 2013-FEB 2014	SCALE: FIT TO PAPER	

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N		GROUND FLOOR PLAN	KPT-52
			DATE : DEC 2013-FEB 2014	SCALE: FIT TO PAPER	


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PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	GROUND FLOOR PLAN		KPT-53
			DATE DEC 2013-FEB 2014	SCALE: FIT TO PAPER	

PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : GROUND FLOOR PLAN DATE : DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : KPT-54

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**GROUND FLOOR PLAN**	**KPT-54**
			DATE DEC 2013-FEB 2014 / SCALE: FIT TO PAPER	

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :	DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	GROUND FLOOR PLAN	KPT-55
			DATE DEC 2013-FEB 2014 SCALE: FIT TO PAPER	

PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : **GROUND FLOOR PLAN** DATE DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : **KPT-56**


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PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	GROUND FLOOR PLAN		KPT-57
			DATE : DEC 2013-FEB 2014	SCALE: FIT TO PAPER	


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PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	MEZAININE FLOOR PLAN		KPT-58
			DATE : DEC 2013-FEB 2014	SCALE: FIT TO PAPER	


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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : FIRST FLOOR PLAN DATE : DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : KPT-59

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	**FIRST FLOOR PLAN**		**KPT-60**
			DATE: DEC 2013-FEB 2014	SCALE: FIT TO PAPER	


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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : FIRST FLOOR PLAN DATE : DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : KPT 61


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PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	FIRST FLOOR PLAN		KPT-61
			DATE DEC 2013-FEB 2014	SCALE: FIT TO PAPER	

PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : SECOND FLOOR PLAN	DRAWING NO : KPT-62
			DATE DEC 2013-FEB 2014	SCALE: FIT TO PAPER

PROJECT :	CONSERVATION CONSULTANT :-		TITLE :		DRAWING NO :
DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	SECOND FLOOR PLAN		KPT-63
			DATE: DEC 2013-FEB 2014	SCALE: FIT TO PAPER	

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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : SECOND FLOOR PLAN DATE DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : KPT-64


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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : SECOND FLOOR PLAN DATE DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : KPT-65


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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : ROOF PLAN DATE DEC 2013-FEB 2014 SCALE: FIT TO PAPER	DRAWING NO : KPT-66


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PROJECT : DOCUMENTATION OF K.P.T. HEAD OFFICE BUILDING	CONSERVATION CONSULTANT :- HERITAGE CELL - DEPARTMENT OF ARCHITECTURE & PLANNING NED UNIVERSITY OF ENGINEERING AND TECHNOLOGY, KARACHI	N	TITLE : ROOF PLAN	DRAWING NO : KPT-67
			DATE DEC 2013-FEB 2014	SCALE: FIT TO PAPER