

**ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN
BOMBAY HOUSE –
ACTIVITIES AND THEIR LOCATIONS – JAN - JULY 2018**



SAVANI
SINCE 1995

SAVANI HERITAGE CONSERVATION PVT.LTD.
(Formerly known as SAVANI CONSTRUCTION CO. PVT. LTD.)

LOCATION SHOWING THE MONUMENT AND ITS SURROUNDINGS :



Map 01 – Map showing the area of Bombay House and its surroundings (in bigger)



Map 02 – Map showing the area of Bombay House (in bigger)

BRIEF HISTORICAL DETAILS OF BOMBAY HOUSE IN MUMBAI – SINCE BEGINNING TO NOW :

Bombay House is a historic privately owned building in Fort, Mumbai that serves as the head office of the Tata Group. Situated near Flora Fountain, it was completed in 1924 and has been the Tata Group's headquarters ever since. The building is a four-story colonial structure built with Malad stone, and was designed by Scottish architect George Wittet, who designed over 40 buildings for the group and later became the head of Tata Engineering Company Limited, now Tata Motors. The building houses the office of chairman and all top directors of Tata Sons and its core units-Tata Motors, Tata Steel, Tata Chemicals, Tata Power, Tata Industries and Trent-operate.

A plot of ground measuring 2,365 sq yd (1,977 m²) was put up by the Bombay Municipality for sale in Bombay and then purchased by the Tata Group. It was observed that the various Tata concerns could not be accommodated in Navsari buildings and Navsari Chambers which they had been occupying since 1904. The Tata Group is perhaps the only Indian corporate to name its headquarters after a city where it started its journey. At that time, the group ran four businesses-textiles, hotels, steel and power-under the leadership of Sir Dorabji Tata, the elder son of group founder Jamsetji Tata. It was from this Edwardian building that Dorabji Tata diversified the portfolio into insurance, soaps, detergents and cooking oil.

The four-storey Bombay House is owned by The Associated Building Company, part of the Tata Group. The task of this company is largely to manage the building. It earns a rent from the companies that have offices within the premises, which houses about 400 people. The interiors of Bombay House have remained almost unchanged for many decades. After Ratan Tata occupied the corner office in 1991, he retained the set-up of the office left by his predecessor, JRD Tata, for several years. Later, the furniture, including his table, armchair and office stationery, was shifted to Pune, where a replica of JRD's office has been set up on the first floor of Tata Central Archives building. Additions at Bombay House include a visitor's lobby at the entrance on the ground floor.



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ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

1 Activity – Polymer Modified Mortar Treatment

Locations – Beams, Columns and Ceilings in the Basement, Ground floor, 1st floor, 2nd floor, 3rd floor and 4th floor

Activities done from January - July 2018

Ingredients :

- **1** – Bonding coat :
Polyalk Epoxy 1 part
½ part cement
- **2** – Polymer mortar :
2 parts Polyalk Epoxy
5 parts Cement
15 parts Sand



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

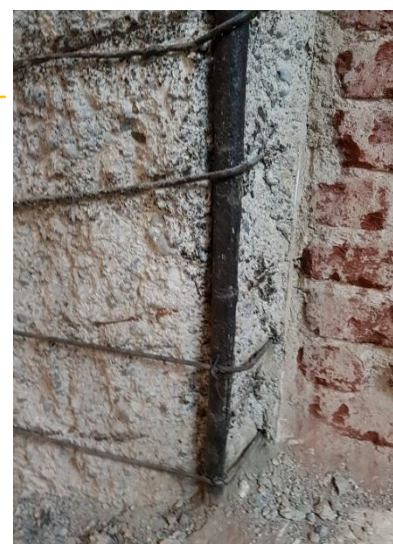
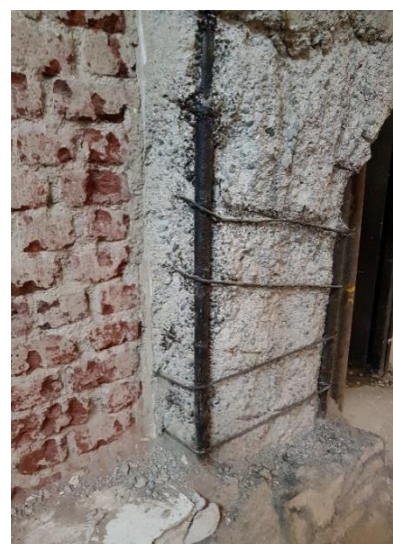
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Activities done from January - July 2018

Preparation – Pre-process :

- 1 – Expose the bars at damaged area
- 2 – Remove all rust by descaling with wire brush
- 3 – Apply 1st coat of rusticide and wait for 4 hours
- 4 – Apply 2nd coat of rusticide and wait for 4 hours



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

1. Activity – Polymer Modified Mortar Treatment

Locations – Beams, Columns and Ceilings in the Basement, Ground floor, 1st floor, 2nd floor, 3rd floor and 4th floor

Activities done from January - July 2018

Preparation – Pre-process : (Ctd.)

- 5 – Apply 1st bonding coat of slurry of cement & FIXOPRIME
- 6 – Apply 2nd bonding coat of slurry of cement & FIXOPRIME
- 7 – Apply bonding coat of Polyalk Epoxy
- 8 – Apply polymer mortar Polyalk Epoxy with hand picking



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

1. Activity – Polymer Modified Mortar Treatment

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The operation involved the following steps :

- 1 – Opening the damaged concrete by manual tools
- 2 – Descaling or derusting of steel bars by steel scrappers or manual tools
- 3 – Brushing or sanding of steel bars by steel wire brush
- 4 – Application of 1st coat of rusticide by soft nylon brush



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

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(Ctd.)

- 5 – Application of 2nd coat of rusticide by soft nylon brush after 4 hours
- 6 – Application of bonding coat of cement slurry with Epoxy by soft nylon brush
- 7 – Mixing mortar as per instructions by portable mixture
- 8 – Manual handpacking of the mortar to the damaged area



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

2. Activity – Cooling Tower – Pedestal Casting and Structural Works

Locations – Cooling Tower at the roof

Activities done from January - July 2018

Preparations :

- **1** – Cooling tower area to be cleaned properly
- **2** – Marking for new 18 nos. pedestals to be done and same to be checked by VOLTAS team
- **3** – Slab anchoring with 16 mm diameter tor steel to be done with HILTI resin HY 200R for a depth of 160 mm
- **4** – 4 nos. of 16 mm dia. tor steel and 8 mm stirrups to be provided @ 175 c/c to all pedestals
- **5** – Shuttering for pedestals of 300 x 300 mm to required depth is to be done
- **6** – Stacking of all materials to cast concrete like cement, sand, aggregate and water at the location



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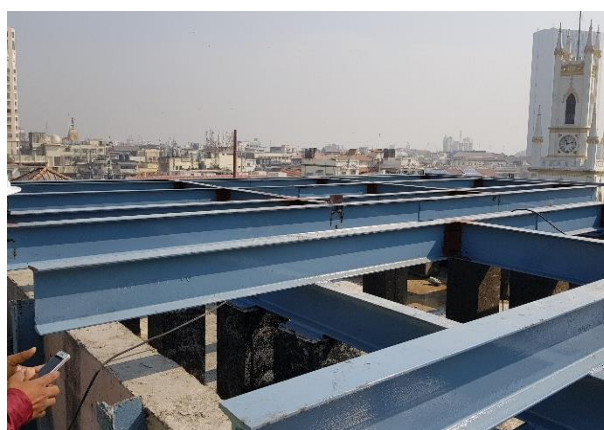
2. Activity – Cooling Tower – Pedestal Casting and Structural Works

Locations – Cooling Tower at the roof

Activities done from January - July 2018

Application :

- 1 – Mix proportion of 1:1:2 (M25) concrete
- 2 – Mixed M25 grade concrete to be poured in pedestals
- 3 – All the pedestals to be casted in same level
- 4 – M.S. base plate of size 250 x 250 x 10 mm thick to be grouted immediately after concreting of pedestals
- 5 – Deshuttering to be carried out after 24 hours of casting and surface to be made rough by hacking with hammer and chisel
- 6 – Water-proofing of slab to be done maintaining slope towards the outlets
- 7 – ISMB 200 3 nos. to be placed in N-S direction first vesting on 6 pedestals each of required length as per drawing and



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

2. Activity – Cooling Tower – Pedestal

Casting and Structural Works

Locations – Cooling Tower at the roof

Activities done from January - July 2018

Application : (Ctd.)

- **7** – welding to be done to M.S.Bare plate with standard welding rods
(Note : This work to be carried out after three days of converting)
- **8** – Then ISMB 200 of 6 nos. to be placed in E-W direction above the ISMB in N-S direction to be welded to bottom ISMB properly
- **9** – Top face of all ISMBs to be at same level
- **10** – Final handover of the area to VOLTAS team

Possible hazards :

- Minor injuries inflicted due to manual and electrical equipments

Control measures :

- **1** – All PPE will be in place
- **2** – Operator will wear hand gloves and eye goggles
- **3** – Quality of bricks as per IS Code will be ensured
- **4** – Quality of sand will be ensured
- **5** – Proper ratio will be measured and maintained
- **6** – Proper hacking to make key will be ensured
- **4** – Quality of sand will be ensured
- **5** – Proper ratio will be measured and maintained
- **6** – Proper hacking to make key will be ensured
- **7** – Straight line and plumb line will be ensured
- **8** – Proper tothing / keys will be ensured
- **9** – Proper water-curing will be ensured

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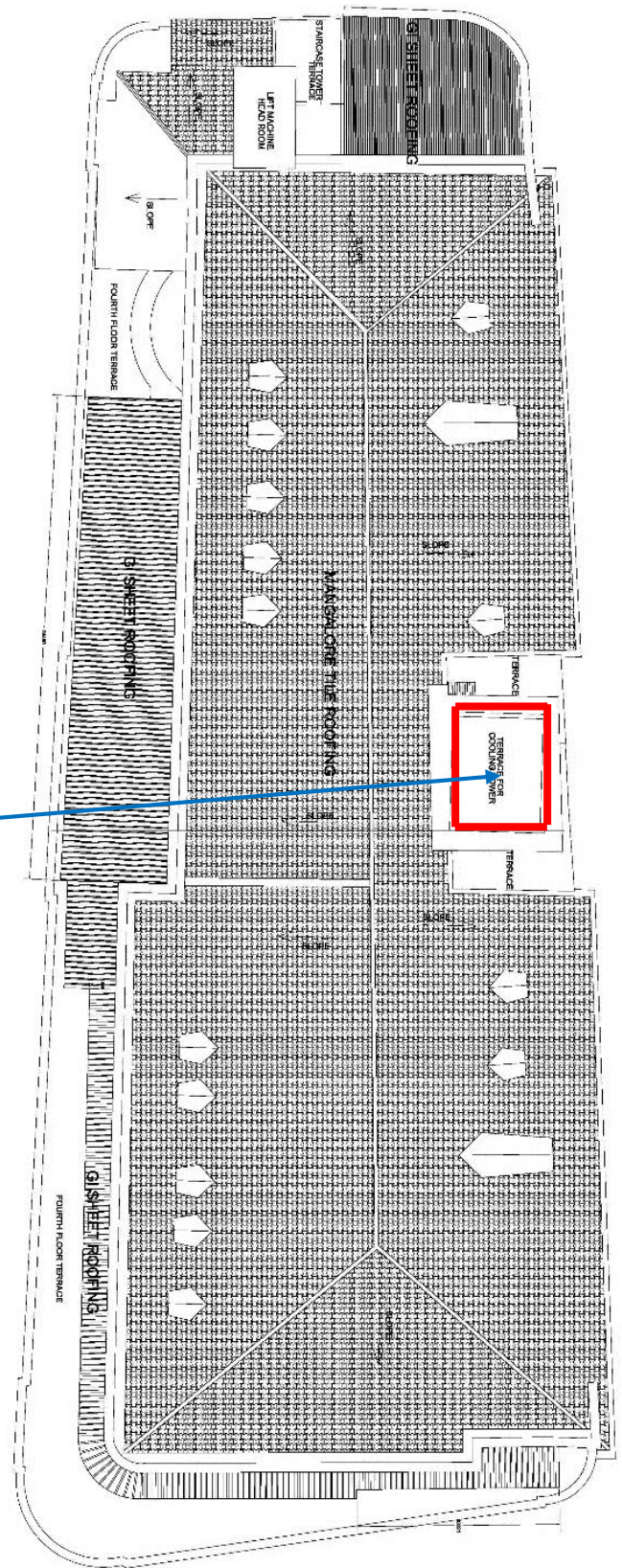
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Locations – Cooling Tower at the roof

Activities done from January - July 2018

Position of the roof where the cooling tower is situated

EXISTING FOURTH FLOOR PLAN



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

1. Activity – Polymer Modified Mortar – Structural Repairing

Locations – Structural columns in the Ground floor , 1st floor, 2nd floor and 3rd floor

Activities done from January - July 2018

Preparations :

- **1** – Removing damaged, loose, disintegrated concrete of RCC columns and slab with wire brush
- **2** – On the first day, application of rusticide with soft brush thoroughly to clean the reinforcement
- **3** – The treated part is left for 6 hours for chemicals to react and second coat is repeated after this and the chemical is allowed to react
- **4** – On the second day, rust passivator POLYALK FIXOPRIME is applied and allowed to react for 6 hours and the same process of POLYALK FIXOPRIME is repeated and left for 6 hours



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Application :

- **1** – Bonding coat of modified polymer prepared with cement slurry mixed by weight with POLYALK EP in ratio of 1 part cement & 0.5 part POLYALK-EP is applied as bonding coat
- **2** – Modified polymer mortar prepared with mixing by weight – 2 parts POLYALK EP + 5 parts cement + 15 parts quartz sand mixed thoroughly and mortar is hand packed filling the cavities and levelling the surface



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Activities done from January - July 2018



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

1. Activity –Polymer Modified Mortar – Structural Repairing

Locations – Structural walls in the Ground floor , 1st floor, 2nd floor and 3rd floor

Activities done from January - July 2018

Preparations :

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Activities done from January - July 2018

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½ part cement
- **2** – Polymer mortar :
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5 parts Cement
15 parts Sand

Preparation – Pre-process :

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- **3** – Apply 1st coat of rusticide and wait for 4 hours



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Locations – Ceilings in the Ground floor , 1st floor, 2nd floor and 3rd floor

Activities done from January - July 2018

Preparation – Pre-process : (Ctd.)

- **4** – Apply 2nd coat of rusticide and wait for 4 hours
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- **7** – Apply bonding coat of Polyalk Epoxy
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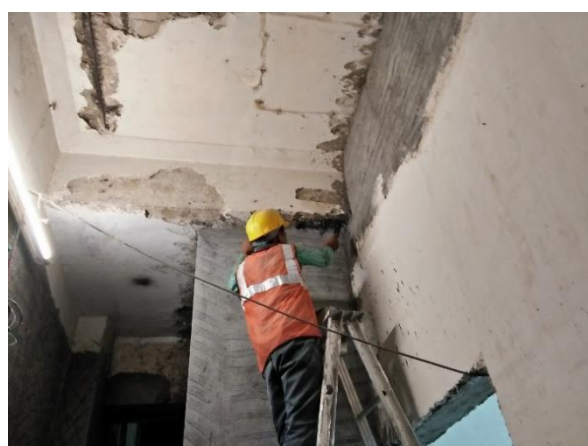
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Locations – Structural walls in the Ground floor , 1st floor, 2nd floor and 3rd floor

Activities done from January - July 2018

- **5** – Application of 2nd coat of rusticide by soft nylon brush after 4 hours
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- **7** – Mixing mortar as per instructions by portable mixture
- **8** – Manual handpacking of the mortar to the damaged area



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

5. Activity – Water Proofing Work – At Fire Tank

Locations – Basement

Activities done from January - July 2018

Preparations :

- **1** – Removing damaged, loose, disintegrated concrete of RCC walls and slab
- **2** – Cleaning the reinforcement with rusticide as per recommended method with rust passivator Polyalk Fixo Prime
- **3** – Corrosion Inhibitor solution of Polyalk CP 113 is applied to exposed steel for better protection
- **4** – The treated patch when moist is applied with slurry of Polyalk EP with cement ratio of 1:0.5 as bonding coat
- **5** – The polymer modified mortar of ratio 2:5:15 (two parts by weight of cement & 15 parts by weight of screened Quartz sand) is hand packed to even surface



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

5. Activity – Water Proofing Work

– At Fire Tank

Locations – Basement

Activities done from January - July 2018

Crack Filling and Grouting :

- **1** – Opening the cracks to desired width and treated with Flexiproof P.U. and allowed to air cure for 12-24 hours
- **2** – For grouting – The holes of 12mm dia. are drilled at subjected area of walls and slab and PVC nozzles are rigidly fixed with polymer mortar
- **3** – The grout prepared simultaneously using cement and shrinkage compensation admixture Sunplex with water to flowable viscosity in ratio of two pouches (330 gms) in 50 kg cement is injected through nozzle till refusal & nozzles sealed
- **4** – The entire area is brushed applied with Fixoproof primer to approx. 0.5 thickness without bleeding with soft brush and allowed to air cure
- **5** – The first coat of Fixoproof P.U. is applied with soft brush in vertical stripes taking care of overlapping
- **6** – The Fibre cloth of around 40 GSM is spread over 1st coat when tacked properly and then allowed to cure for 12-24 hours
- **7** – Second coat is applied in horizontal stripes taking care of overlapping of stripes and uniform coating and this is allowed to air cure
- **8** – The protective screed is done on coated surface with cement and admixture Sunplex in ratio as explained above
- **9** – Pond testing is carried out after 48 hours for testing

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

5. Activity – Water Proofing Work

– At Fire Tank

Locations – Basement

Activities done from January - July 2018

Possible Hazards :

- **1** – The chemical container may topple and cause leakage

Control Measures :

- **1** – All PPE will be in place
- **2** – Operator will wear goggles
- **3** – Operator will wear hand gloves
- **4** – Operator will wear respiratory mask

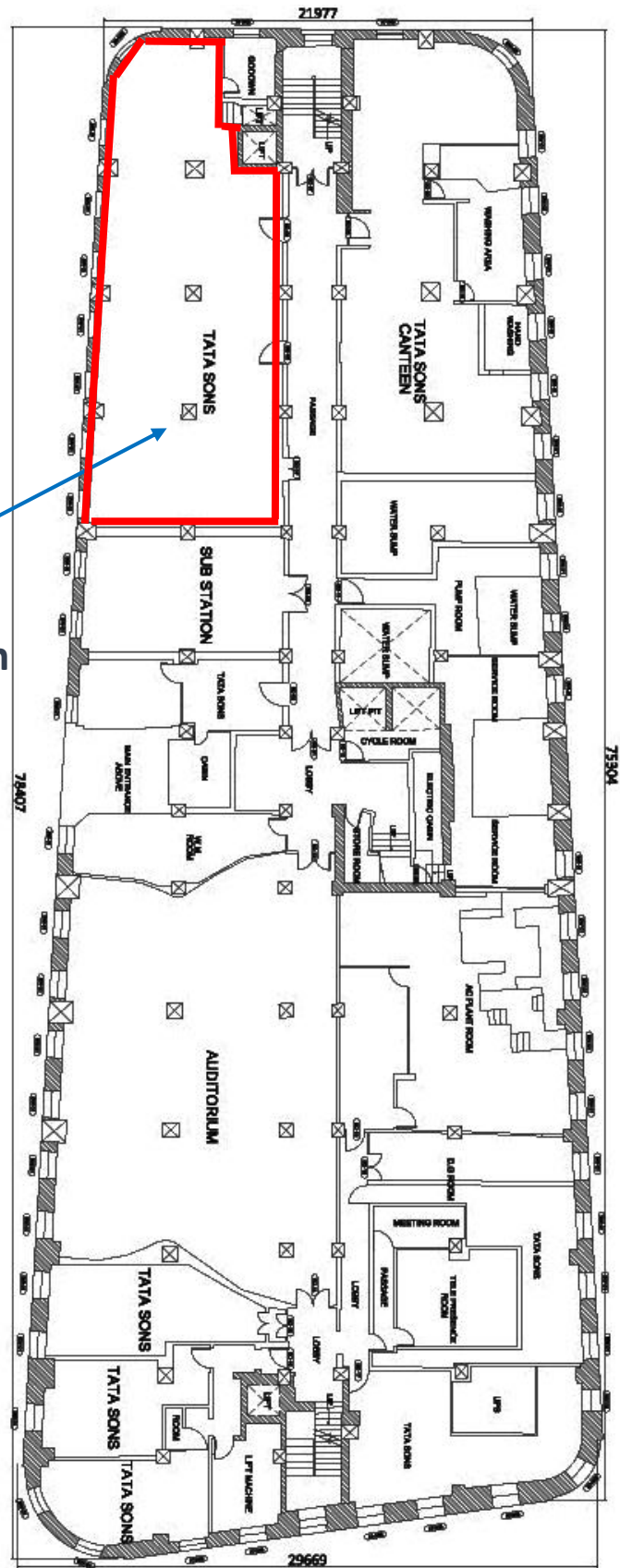
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

5. Activity – Water Proofing Work – At Fire Tank

Locations – Basement

Activities done from January - July 2018

Basement's fire tank space where water-proofing has been done dismantled



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

3. Activity – Dismantling of the ledge wall

Locations – Basement

Activities done till June 2018

Process :

- **1** – The proper scaffolding is erected from inside
- **2** – The walls will be disengaged from inside column and beam bottom side from top manually with hand tools
- **3** – The brick layers will be removed from top – one course at a time taking care of falling debris
- **4** – The process will be repeated for bottom layers
- **5** – The debris collected will be filled in bags and cleared off from site to be carted away



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

3. Activity – Dismantling of the ledge wall

Locations – Basement

Activities done till June 2018

Possible Hazards :

- **1** – Falling debris
- **2** – Dust nuisance

Control Measures :

- **1** – All PPE will be in place
- **2** – Operator will wear goggles
- **3** – Operator will wear hand-gloves
- **4** – Operator will wear respiratory mask
- **5** – Area will be cordoned off

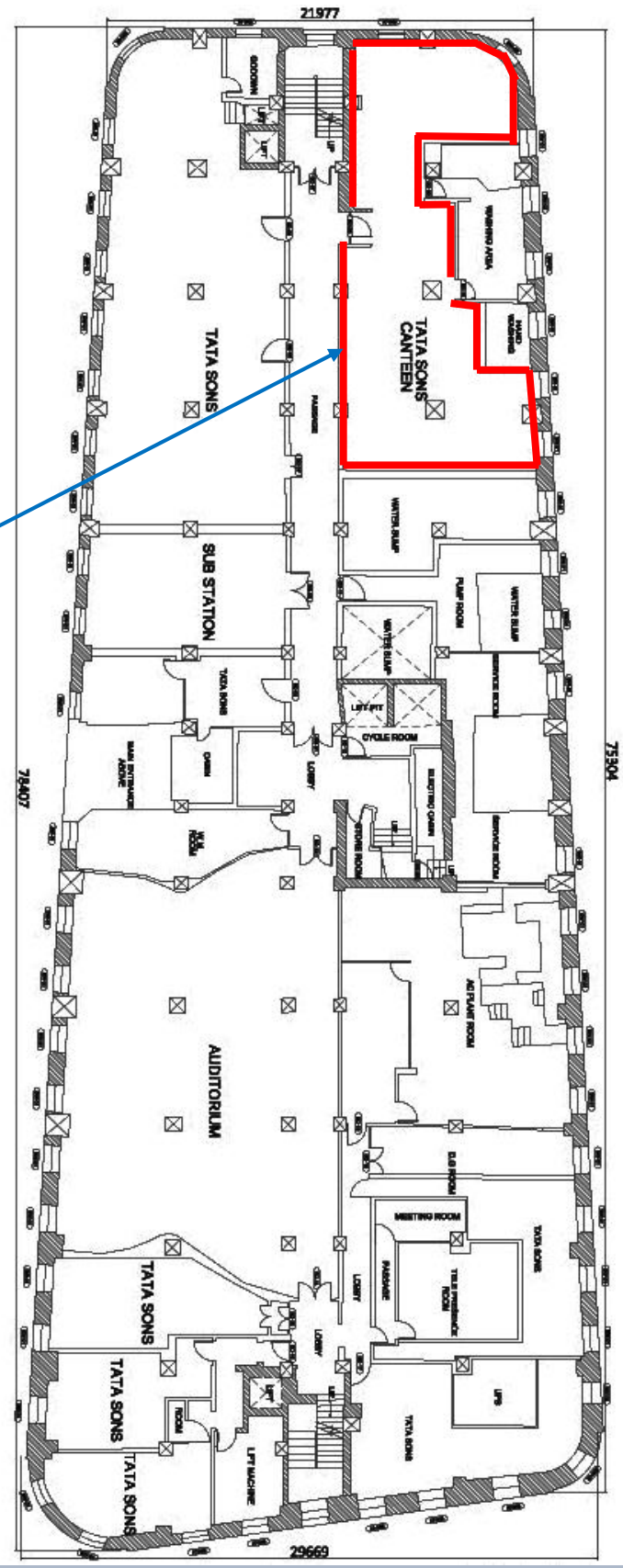
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

3. Activity – Dismantling of the ledge wall

Locations – Basement

Activities done till June 2018

Basement space where ledge wall has been done dismantled



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

4. Activity – Water Proofing Work – At Basement Area

Locations – Basement

Activities done from January - July 2018

Preparations :

- **1** – The cracks are opened up to 10mm wide and 10mm deep to receive crack filling materials by means of portable grinder
- **2** – The surface cleaned off of loose particles, laitance, greasy patches, by means of mechanical or manual methods
- **3** – The colloidal particles in cracks are removed off by compressed air or by blower
- **4** – The paste of required viscosity is prepared with Sunanda speciality coatings pvt.ltd make **SUNPLEX** in ratio of 2 pouches of 330 gms each to 50kg of cement by adding potable water



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

4. Activity – Water Proofing Work

– At Basement Area

Locations – Basement

Activities done from January - July 2018

Preparations :

- **5** – The polymer modified mortar of ratio 2:5:15 (two parts by weight of cement & 15 parts by weight of screened Quartz sand) is hand packed to even surface

Chemical Filling In Cracks :

- **1** – The paste is hard pressed in cracks with the help of small trowel and surface levelled
- **2** – The treated surface is allowed to cure for 24 hours

Levelling Coat Before membrane Coating :

- **1** – The cleaned surface is levelled with cement mortar to fill up the voids, superficial hairline cracks & to get the desired slope & troweled to smooth surface



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

4. Activity – Water Proofing Work – At Basement Area

Locations – Basement

Activities done from January - July 2018

Membrane Coating :

- 1 – The highly elastic elastomeric PU.(Polyurethane) cans are opened and chemical solution is stirred well
- 2 – The first priming coat of PU-FLEXIROOF-PRIMER of Sunanda speciality coatings pvt.ltd makeis applied on entire surface of thickness 0.1 to 0.2mm avoiding the excess bleeding. The surface is allowed to air cure for 12 hours
- 3 – The first of FLEXIROOF –PU of Sunanda speciality coatings pvt.ltd is applied in vertical stripes ,each stripe overlapping each other by means of soft brush covering all pinholes& micro cracks & allowed to air cure to touch dry for 12 hour



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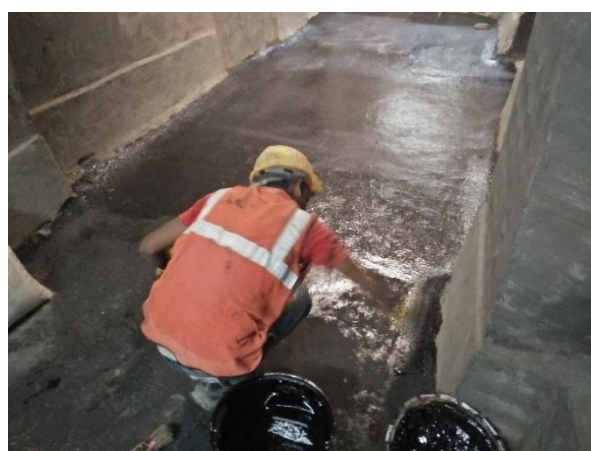
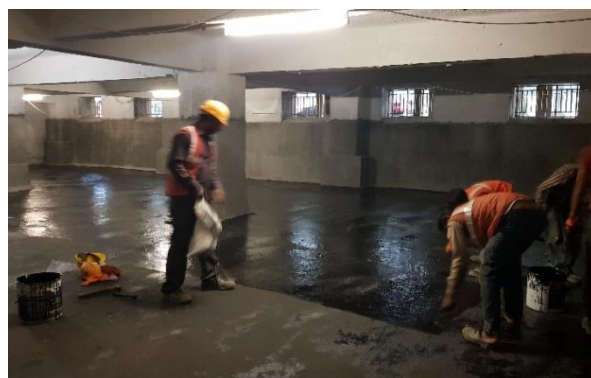
4. Activity – Water Proofing Work – At Basement Area

Locations – Basement

Activities done from January - July 2018

Membrane Coating : (Ctd.)

- **4** – The fibre cloth is spread over the coated surface evenly & gently pressed on it
- **5** – The second of same chemical is applied in horizontal stripes pattern soaking the fibre cloth till even coat is achieved
- **6** – The treated surface is allowed to air cure for 24 to 39 hours before the protective screed of cement mortar is applied
- **7** - The final protective IPS coating is done membrane
- **8** - The area is filled with water for pond testing



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

4. Activity – Water Proofing Work – At Basement Area

Locations – Basement

Activities done from January - July 2018

Possible Hazards :

- 1 – Portable Grinder may harm the operator
- 2 – Dust may cause nuisance
- 3 – The chemical container may topple causing concentrated smell



Quality Control Check :

- 1 – Manufacturer's recommended procedure will be followed by its authorized applicator
- 2 – Ponding test will be carried out for water leakages
- 3 – Proper procedure as set out by the company will be followed
- 4 – MSDs will be studied



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

4. Activity – Water Proofing Work – At Basement Passage Area

Locations – Basement

Control Measures :

- 1 – Proper insulation will be provided
- 2 – All PPE will be in place
- 3 – Operator will wear goggles
- 4 – Operator will wear hand gloves
- 5 – Operator will wear respiratory mask



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

4. Activity – Water Proofing Work – At Basement Area

Locations – Basement Passage, Fire tank area



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

4. Activity – Water Proofing Work

– At Basement Area

Locations – Basement



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

1. Activity –Polymer Modified Mortar – Structural Repairing

Locations – Structural beams and some remaining columns in the Basement, Ground floor , 1st floor, 2nd floor and 3rd floor

Activities done from January - July 2018

Preparations :

- **1** – Removing damaged, loose, disintegrated concrete of RCC columns and slab with wire brush
- **2** – On the first day, application of rusticide with soft brush thoroughly to clean the reinforcement
- **3** – The treated part is left for 6 hours for chemicals to react and second coat is repeated after this and allowed to react
- **4** – On the second day, rust passivator POLYALK FIXOPRIME is applied and allowed to react for 6 hours and the same process of POLYALK FIXOPRIME is repeated and left for 6 hours



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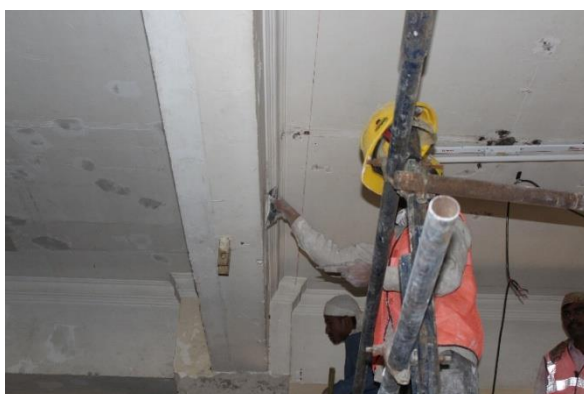
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Activities done from January - July 2018

Preparations :

- **5** – On the third day, the treated rebars are soft cleaned and corrosion inhibitor solution of POLYALK CP 113 is applied to exposed steel for better protection
- **6** – On the fourth day, the previous process of POLYALK FIXOPRIME is repeated and left for 24 hours
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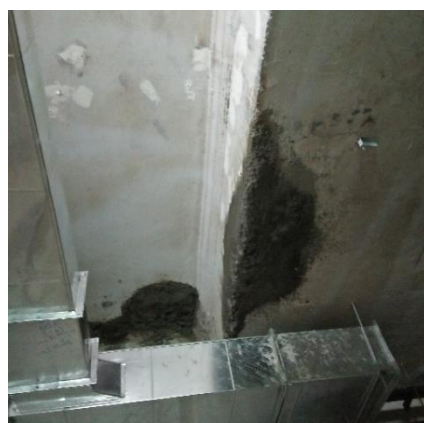
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Activities done from January - July 2018



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

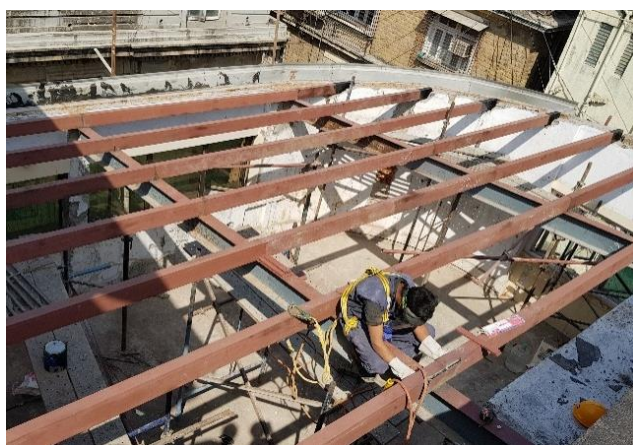
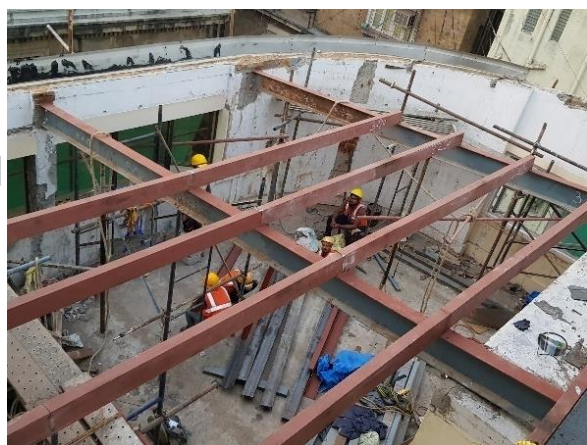
10. Activity – Roof Work – Conference Room-2

Locations – 4th floor

Activities done from January - July 2018

Preparations :

- **1** – The existing raker manufactured of ISMB 250 is cleaned with water sprayed from a fine nozzle sprinkling system
- **2** – The existing rakers are then descaled and derusted using manual equipments and rubbed with sand paper or steel wire brush
- **3** – Application of 1st and 2nd coats of rusticide on them
- **4** – Application of 1st and 2nd coats of enamel paint of the specified color on them



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

10. Activity – Roof Work –

Conference Room-2

Locations – 4th floor

Activities done from January - July 2018

Preparations : (Ctd.)

- **5** – Fixing of purlins of welded full length ISMC 150 at right angles over the rakers at intervals of 900 mm
- **6** – Fixing of 25 mm thick bison board using self taping screws with locking pin at the bottom

Procedure :

- **1** – Fixing of tarfelt sheet over the preceeding layer
- **2** – Fixing of wooden battens over it
- **3** – Fixing of aluminium sheet of strafford profile over the first layer of wooden battens
- **4** – Fixing of second layer of wooden battens over it in laterally opposite direction
- **5** – Fixing of Mangalore tiles over them

Possible Hazards :

- **1** – Minor injuries may be inflicted by slipping and falling down
- **2** – Severe injuries may be caused due to improper handling of heavy materials
- **3** – Minor injuries may be caused due to chemicals

Control Measures :

- **1** – All PPE will be in place
- **2** – Operator will wear hand-gloves
- **3** – Eye goggles
- **4** – Safety jacket is compulsory
- **5** – Helmets are compulsory

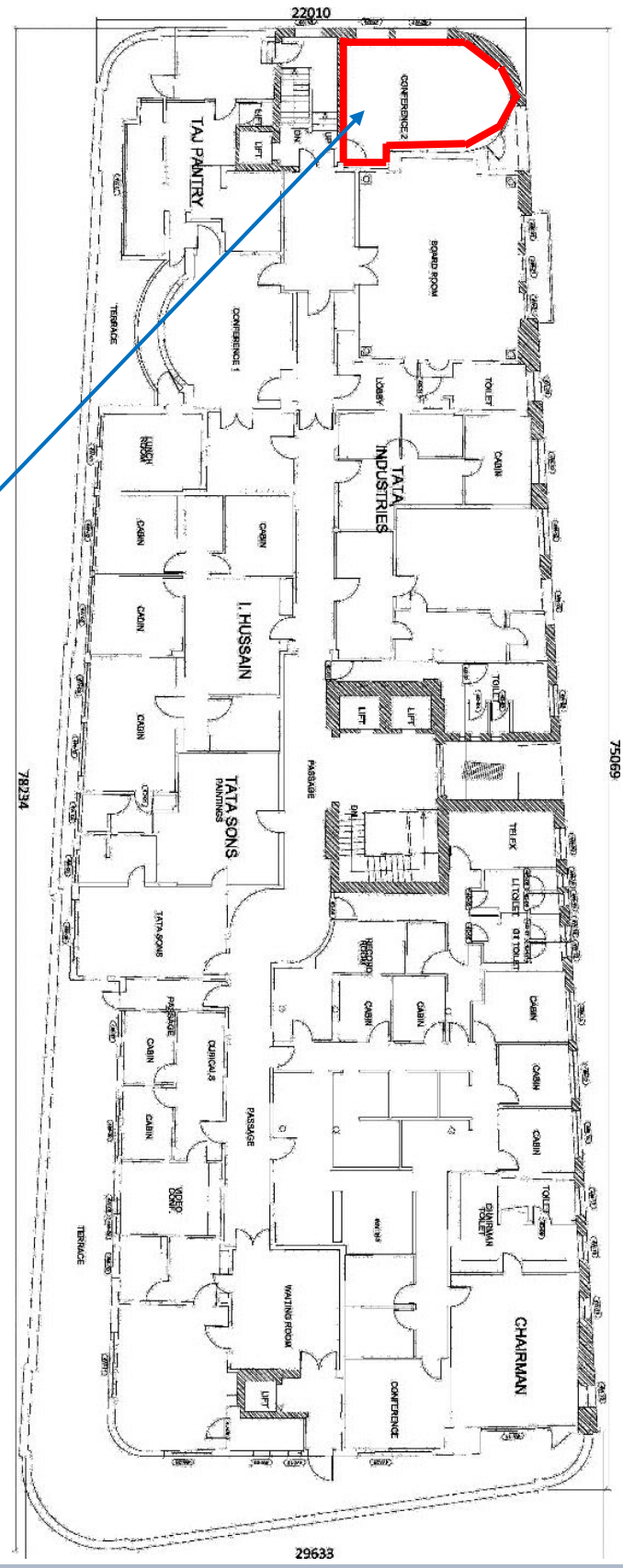
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

10. Activity – Roof Work – Conference Room-2

Locations – 4th floor

Activities done from January - July 2018

Space in the 4th floor over Conference Room-2 where restoration has been done in the roof



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

11. Activity – Replacement Trellis

Locations – 4th floor –Pocket terrace space

Activities done from January - July 2018



BEFORE



AFTER



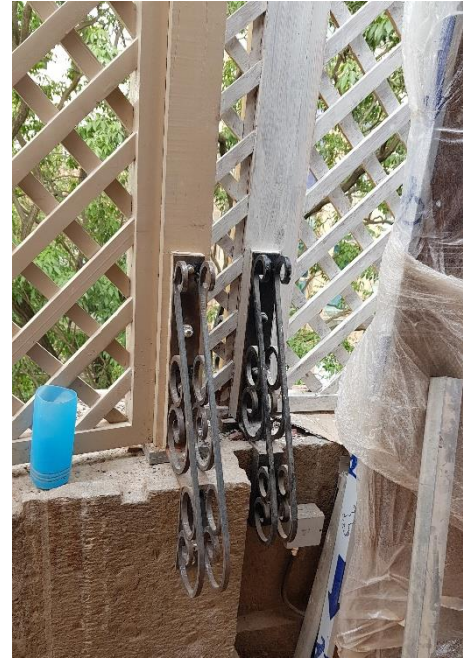
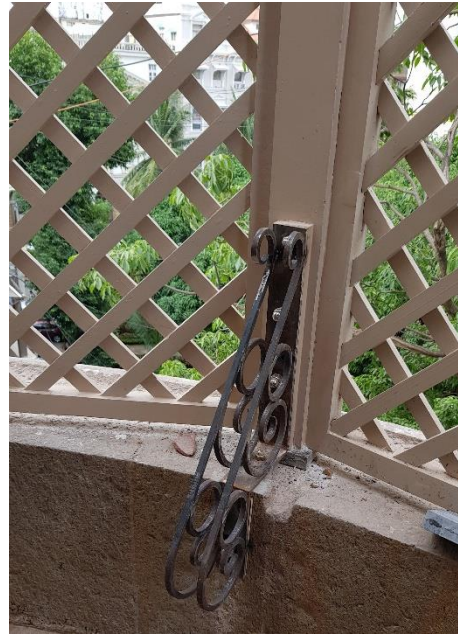
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

11. Activity – Replacement Trellis

Locations – 4th floor –Pocket terrace space

Activities done from January - July 2018

AFTER



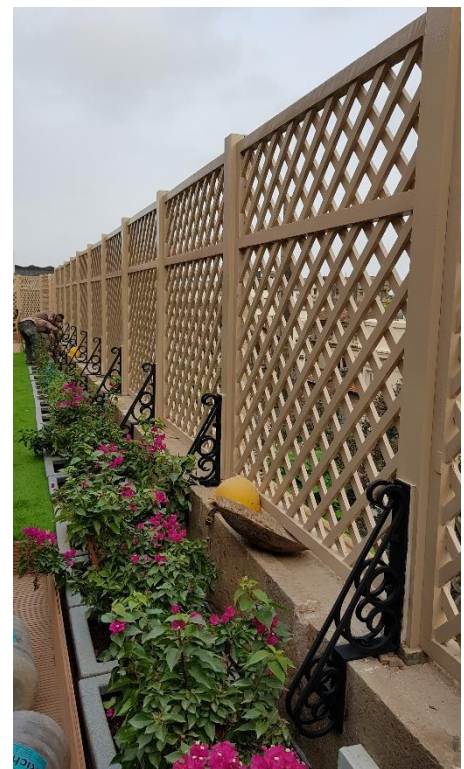
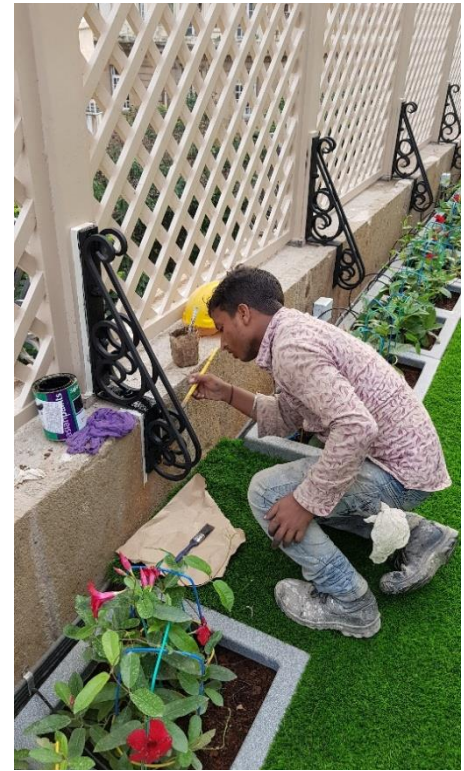
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

11. Activity – Replacement Trellis

Locations – 4th floor –Pocket terrace space

Activities done from January - July 2018

AFTER



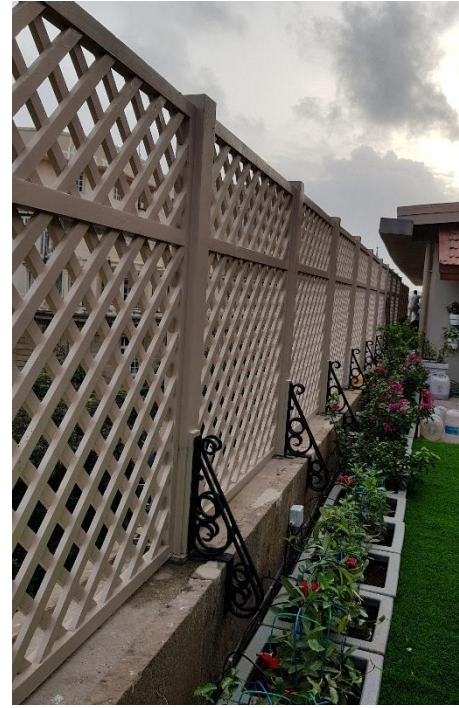
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

11. Activity – Replacement Trellis

Locations – 4th floor – Pocket terrace space

Activities done from January - July 2018

AFTER



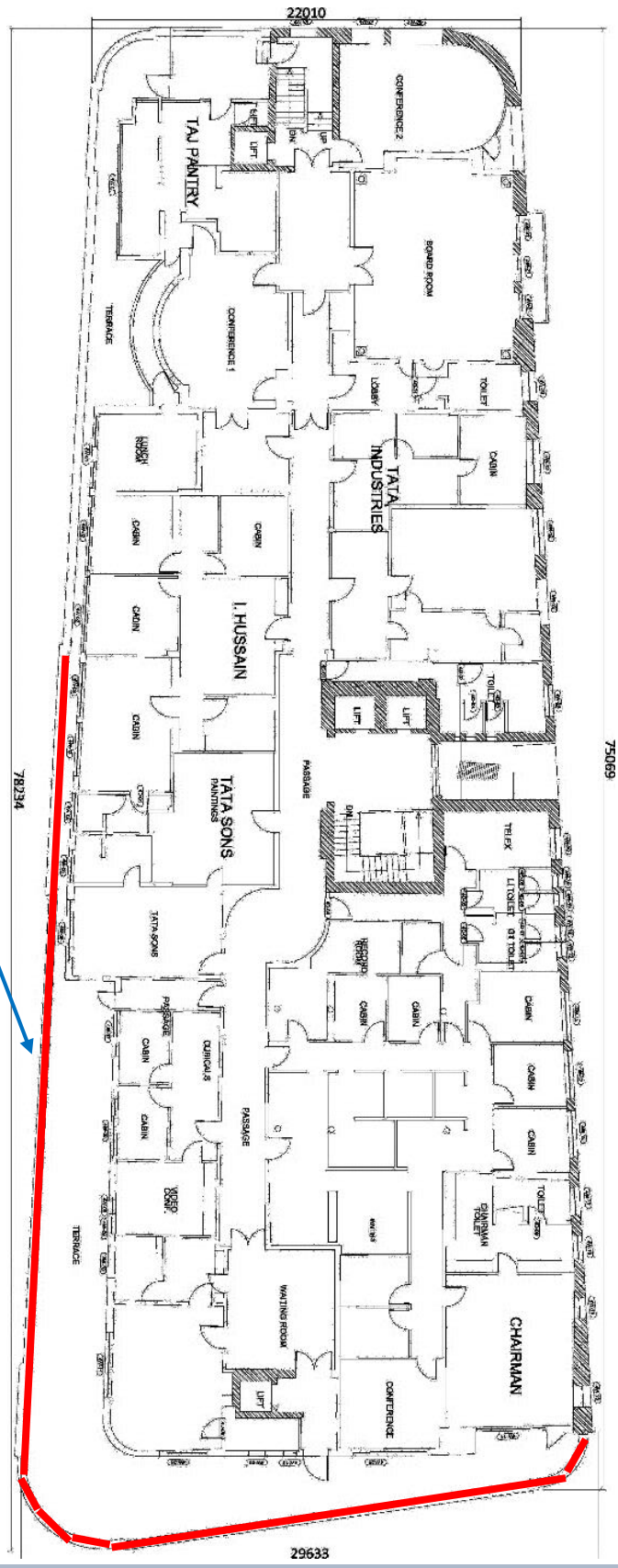
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

11. Activity – Replacement Trellis

Locations – 4th floor – Pocket terrace space

Activities done from January - July 2018

Space in the 4th floor Pocket terrace where Replacement Trellis has been done



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

12. Activity – Water-proofing – Brick Bat Coba

Locations – 4th floor – terrace space

Activities done from January - July 2018

Preparations and Application :

- **1** – After the surface preparation is ready the cement mortar screed is led over the membrane coating to the approximate thickness of 25 – 30 mm taking care not to damage the PU membrane
- **2** – The screed will be laid as per the required slope
- **3** – The brick bats of approx.. 65-75 mm size are arranged over the wet coat of screed with uniform gap between them and preferably arranging them in semi-circular pattern
- **4** – In next operation the brick bats are



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

12. Activity – Water-proofing – Brick Bat Coba

Locations – 4th floor – terrace space

Activities done from January - July 2018

Preparations and Application : (Ctd.)

- **4** – soaked in water for 24 hours for curing
- **5** – The final IPS coat is laid filling all gaps and over the bats to the required slope
- **6** – The china chips are fixed over the IPS and then the resultant surface is finished and cleaned
- **7** – The water is filled for pond testing as per the CMC requirements



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

12. Activity – Water-proofing – Brick Bat Coba

Locations – 4th floor – terrace space

Activities done from January - July 2018

Control Measures :

- **1** – Proper insulation will be provided
- **2** – All PPE will be in place
- **3** – Operator will wear goggles
- **4** – Operator will wear hand gloves
- **5** – Operator will wear respiratory mask
- **6** – Proper procedure as set out by company will be followed and MSDs will be studied

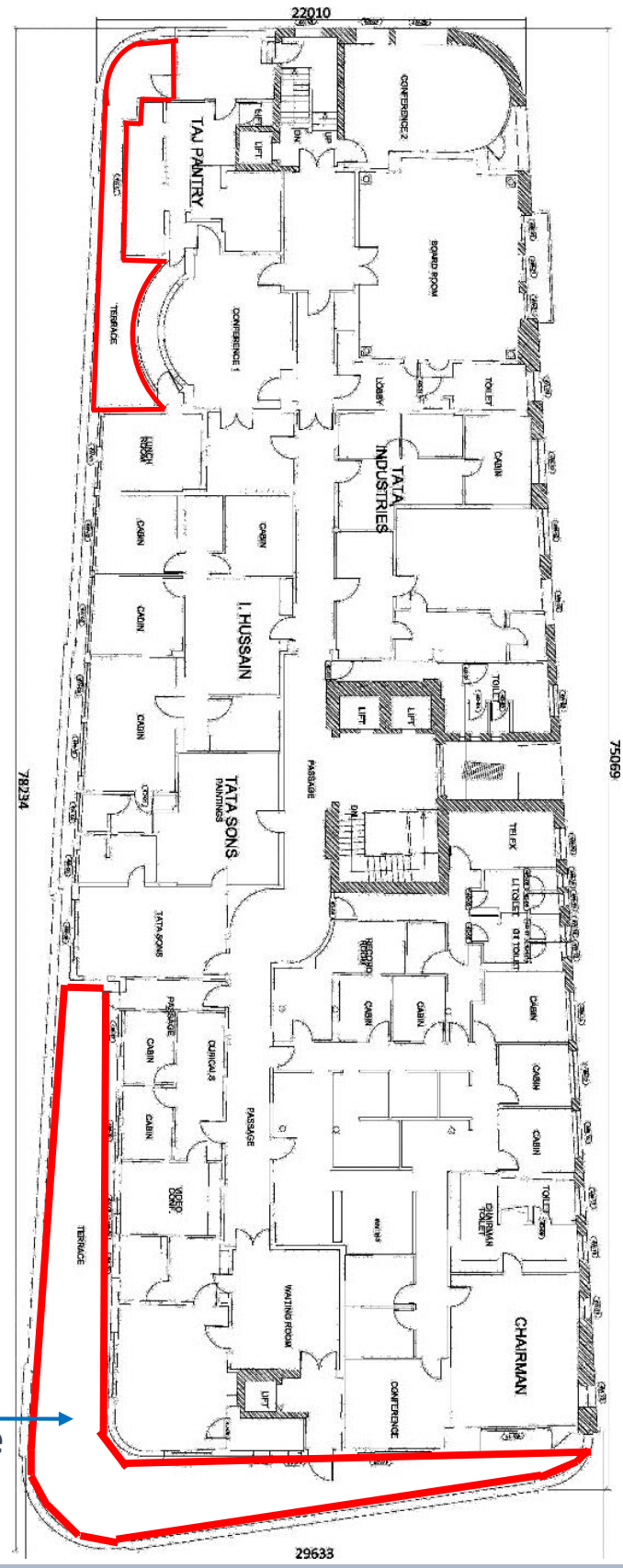


ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

12. Activity – Water-proofing – Brick Bat Coba

Locations – 4th floor – terrace
space

Activities done from January -
July 2018



Space in the 4th floor terrace
where water-proofing of the
brick bat coba has been done



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

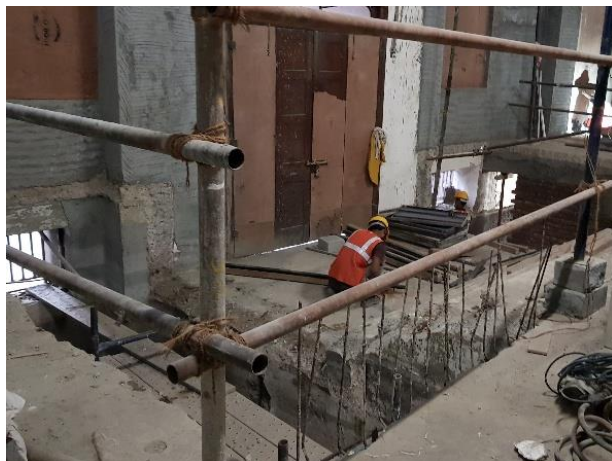
13. Activity – Structural Modification at the Main Entrance – Staircase area

Locations – Main entrance space

Activities done from January - July 2018

Preparations :

- **1** – The required number of props are placed at below the structural beams and slab
- **2** – The cut-out markings are done as per GFC drawing in consultation with structural consultant
- **3** – The brick wall is constructed below the slab of ground floor at basement level
- **4** – Additional support props are given below the RCC structure at basement level



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

13. Activity – Structural

Modification at the Main Entrance

– Staircase area

Locations – Main entrance space

Activities done from January - July 2018

Preparations : (Ctd.)

- **5** – The core cut marks are placed to provide core cuts to pour the concrete in beam below the slab
- **6** – The required area of slab is removed by crusher as per approved vendor's WMS

Execution :

- The concrete chunk is broken bit by bit in small chunks by crusher machine. The exposed reinforcement bars are not cut off. The beams are cut off with same process

Shuttering / Centering :

- The reinforcement for new beam is placed as per schedule and formwork prepared and Rebars placed inside providing spacers for cover
- Additional structural steel supports are fabricated and placed at locations as per GFC drawings
- The concrete of M-25 grade is pored through the core cuts provided at specified locations and compacted with mechanical vibrators

De Shuttering :

- Deshuttering of beam sides is done after 4 days keeping the beam bottom props in its place



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(Formerly known as SAVANI CONSTRUCTION CO. PVT. LTD.)

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

13. Activity – Structural

Modification at the Main Entrance

– Staircase area

Locations – Main entrance space

Activities done from January - July 2018

Possible Hazards :

- **1** – Person using crusher may get injured by machine
- **2** – Injury due to falling concrete debris
- **3** – Shuttering may collapse

Control Measures :

- The area at ground floor and basement is cordoned off and security person deployed there when concrete breaking is carried out
- Signage is put up to keep away from hazard prone area
- PVC hand gloves are used
- The props are checked for its stability

Quality Control Check :

- The cut out area of slab will be carried out with machine and without vibrations
- The concrete cubes are tested for required strength and TC will be submitted

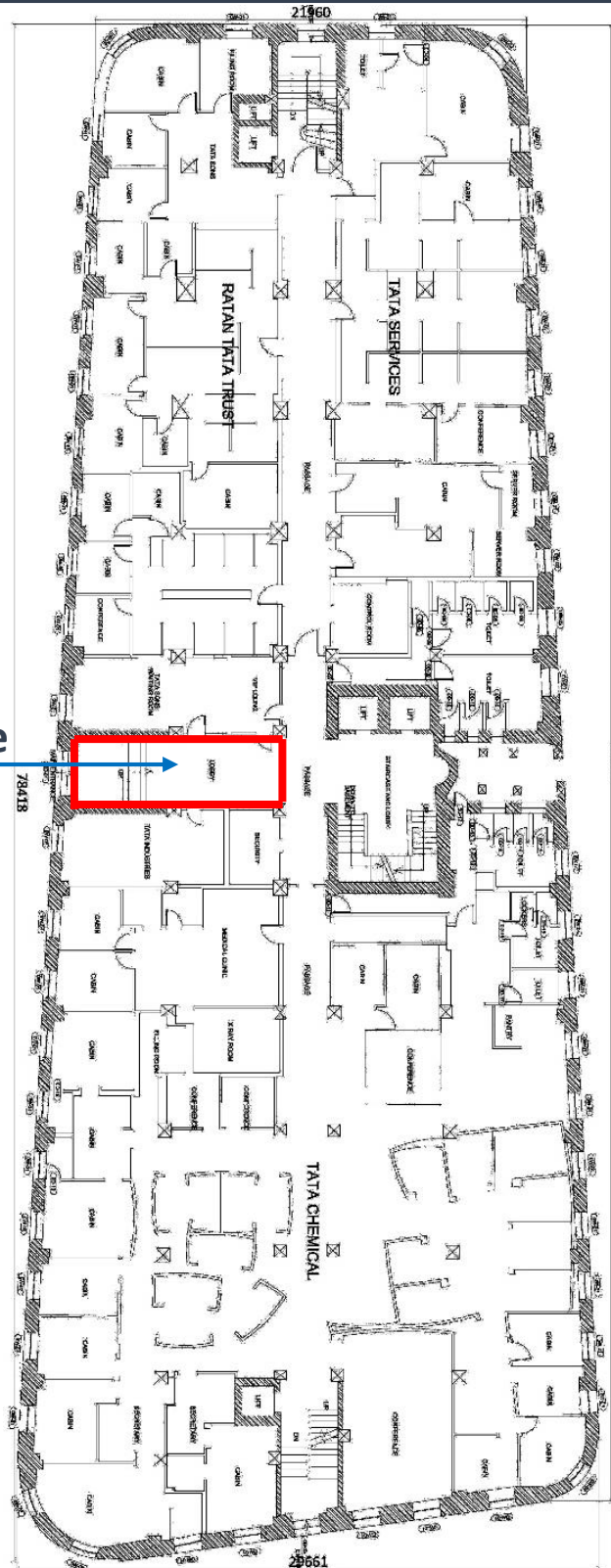
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

13. Activity – Structural Modification at the Main Entrance – Staircase area

Locations – Main entrance space

Activities done from January - July 2018

Main entrance space where structural modification has been done



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

14. Activity – Mass Concreting – Fire Tank Area.

Locations – Basement

Activities done from January - July 2018

Preparations :

- **1** – A pre-cooling procedure will be applied at the concrete batching plant to achieve a minimum concrete temperature supply
- **2** – To minimize time delivery of concrete since being dispatched from batching plant to the workface and to minimize time spending before concrete placement at the workface
- **3** – A post-cooling procedure will be applied during concrete curing upon a completion of concrete placement



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

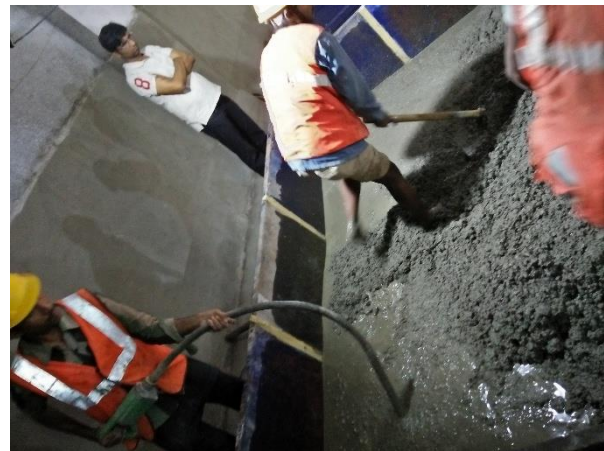
14. Activity – Mass Concreting – Fire Tank Area.

Locations – Basement

Activities done from January - July 2018

Execution :

- A temperature differential between the center of the concrete mass and any about the outside faces will be kept minimum
- Basically , heat on the surface of the concrete is easily released toward the ambient whereas the center remains its high temperatures , this follows that the temperature differential will induce the internal restraint and subsequently introduce thermal contraction cracks
- Special care and planning is required as the volume of pour is large in relation to those normally being place on the workface



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

14. Activity – Mass Concreting – Fire Tank Area.

Locations – Basement

Activities done from January - July 2018

Execution :

- Due to one-go casting of each raft foundations /structures the concrete pouring should be executed during the night time in order that the work face temperature can be minimized during the entire placement period
- Sufficient concrete pumps will be engaged for concrete placement in order that a flow pouring can be achieved
- As such parking time of the concrete trucks waiting for pouring can be kept minimized thus the required placing temperature will be maintained



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

14. Activity – Mass Concreting – Fire Tank Area.

Locations – Basement

Activities done from January - July 2018

Curing :

The set of foams and plastic sheets will be used for curing purposes. This will be done immediately once the concrete is reached its stiffening time by fully cover the whole concrete surface and spread the sand (approximately 10 mm. thick.) onto the whole area of plastic sheets to prevent concrete temperature loss too quick and result high temperature differential between the surface and at the middle. Care must be taken during the entire curing to ensure by reading its temperature through a set of thermocouples that the temperature at the middle of the concrete and any outer surface to be kept minimum

Test and monitoring of the Concrete Mass :

As soon as the concrete has reached its stiffening time approximately 1 hour after pouring a set of plastic sheet will be covered fully the concrete surface. Sand will be filled fully onto the whole area where the plastics sheet cover with approximately 10mm. thick.

The plastics cover and the side forms will be maintained to ensure that the temperature differential between the middle of concrete mass and any outer surface can be kept minimized.

The measurement purposes are to finding the temperature development within the concrete mass. The results will show peak temperature and the temperature differential for such measuring points. In general case the maximum temperature of mass concrete will peak at 48 hours afterpour and will be constant for 7 days and will decrease to the air temperature after 14 days

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

2. Activity – Removal Plaster & Re-Plaster

Locations – Window edges and adjoining wall surfaces

Activities done from January - July 2018

Preparations :

- **1** – Removing damaged, loose, disintegrated concrete of RCC columns and slab with wire brush
- **2** – On the first day, application of rusticide with soft brush thoroughly to clean the reinforcement
- **3** – The treated part is left for 6 hours for chemicals to react and second coat is repeated after this and the chemical is allowed to react
- **4** – On the second day, rust passivator POLYALK FIXOPRIME is applied and allowed to react for 6 hours and the same process of POLYALK FIXOPRIME is repeated and left for 6 hours



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

2. Activity – Removal Plaster & Re-Plaster

Locations – Window edges and adjoining wall surfaces

Activities done from January - July 2018

Preparations : (Ctd.)

- **5** – On the third day, the treated rebars are soft cleaned and corrosion inhibitor solution of POLYALK CP 113 is applied to exposed steel for better protection
- **6** – On the fourth day, the previous process of POLYALK FIXOPRIME is repeated and left for 24 hours
- **7** – On the fifth day, the treated rebars are soft cleaned and corrosion inhibitor solution of POLYALK CP 113 is applied to exposed steel for better protection

Application :

- **1** – Bonding coat of modified polymer prepared with cement slurry mixed by weight with POLYALK EP in ratio of 1 part cement & 0.5 part POLYALK-EP is applied as bonding coat
- **2** – Modified polymer mortar prepared with mixing by weight – 2 parts POLYALK EP + 5 parts cement + 15 parts quartz sand mixed thoroughly and mortar is hand packed filling the cavities and levelling the surface



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

Locations – Core cutting works – 2nd, 3rd, 4th levels

Activities done from January - July 2018

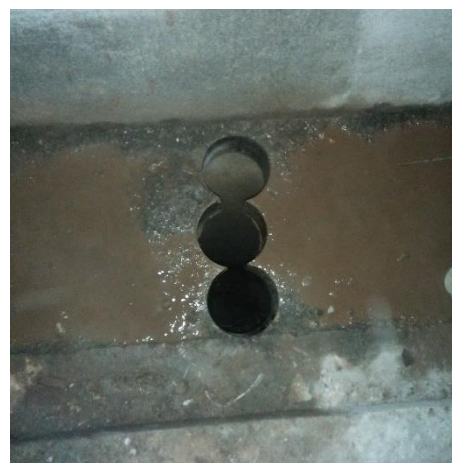
Objective :

- To take out core of 150 mm diameter from the third floor terrace for viewing the cross-section of the existing slab

Preparations before beginning the work :

In addition to the safety precautions, the following preparations at the job-site will be made :

- Before extracting the core from the concrete structure, prop support will be given to the nearby area to prevent relative movement of slab and disturbance that may produce due to the process
- Uniformity of pressure is important, so it is essential that drilling is performed by a skilled operator



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

Locations – Core cutting works – 2nd, 3rd, 4th levels

Activities done from January - July 2018

Preparations before beginning the work : (Ctd.)

- A power supply with earth/ground connection must be available for use
- Proper intimation should be given to the facility management team about the process
- Disconnect all the electrical connection at the area/ surface suggested for core cutting

Procedure :

- The slab to be cut needed to clearly marked and approved by JLL before the start of work
- The marking is done accordingly to the location at third floor terrace as specified by the consultants
- To start drilling the core cutter shall be located perpendicular to the horizontal surface, when possible, with its axis perpendicular to the bed of



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

Locations – Core cutting works – 2nd, 3rd, 4th levels

Activities done from January - July 2018

Procedure : (Ctd.)

- the concrete as originally placed.
- The specimen taken perpendicular to a vertical surface, or perpendicular to a surface with a batter
- Labour assistance with a catcher is necessary from the bottom of the slab preventing the specimen from falling down



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity –Micro-Concreting

Locations – Micro-Concreting works – 2nd, 3rd, 4th levels

Activities done from January - July 2018



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

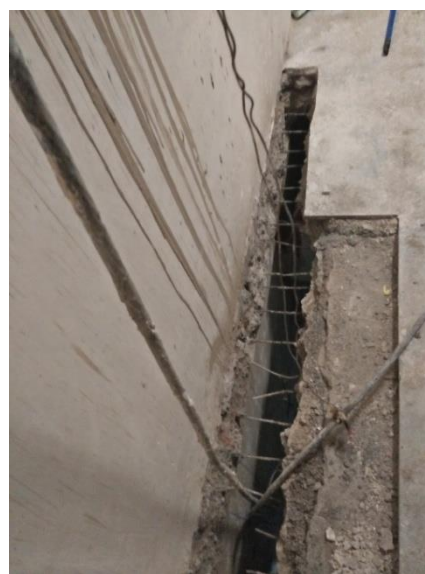
Locations – Core cutting works – 2nd, 3rd, 4th levels

Activities done from January - July 2018

Micro-Concreting : (Ctd.)

should be in place prior to pouring of the material. Pour clean water into the vessel at 4.0 litre/per 25 kg bag.

Add the FOSROC RENDROC RG – Micro concrete powder, into it slowly under constant stirring conditions until lump free until a homogenous mix is attained. Pour immediately to get maximum flow properties. Once placing of micro concrete is complete and form work removed it is necessary to cure the area by keeping it under wet condition for curing as usual.



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

Locations – Core cutting works – 2nd, 3rd, 4th levels

Activities done from January - July 2018

Precautions :

- Use correct tool and equipment for the job
- Follow the rules and regulations as instructed by the safety engineer
- Using pair of safety goggles or tight sunglasses to avoid any debris falling your eyes
- A pair of gloves should for avoiding painful cuts or scrapes
- Use of dust mask is must to get rid of minor particles entering to nozzles

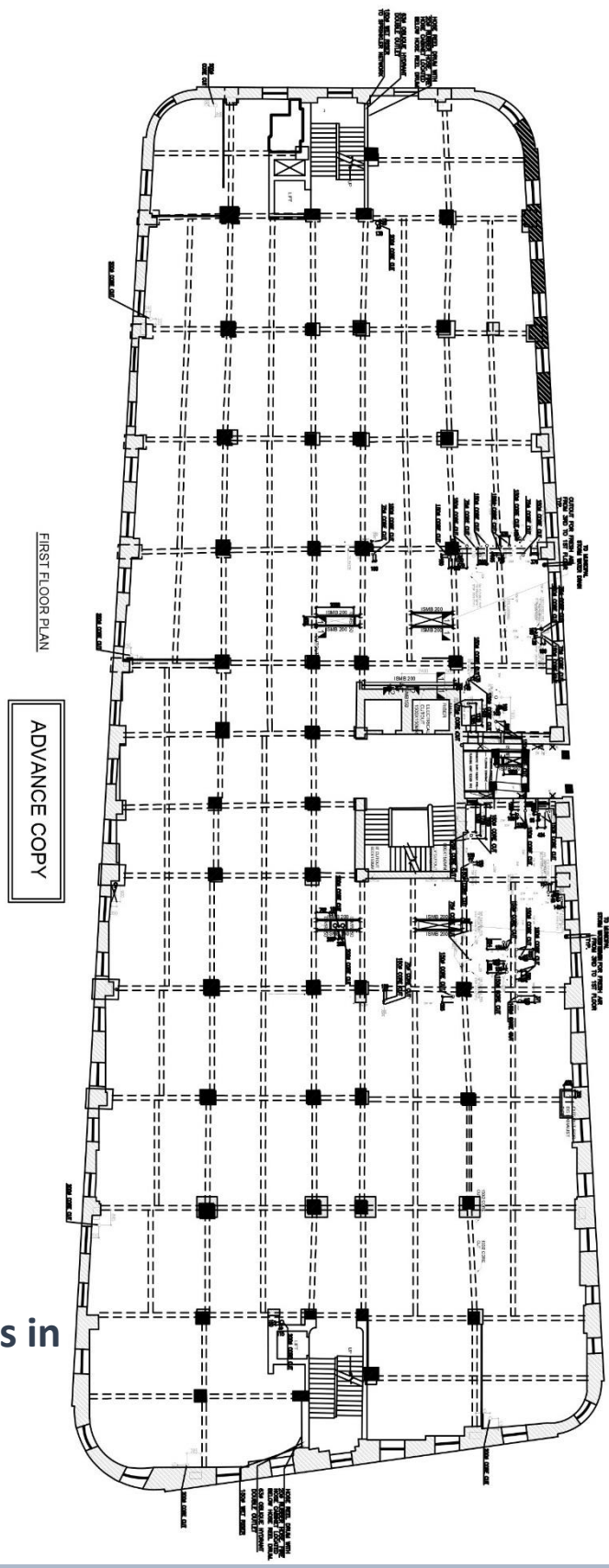


ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

Locations – Core cutting works –
2nd, 3rd, 4th levels

Activities done from
January - July 2018



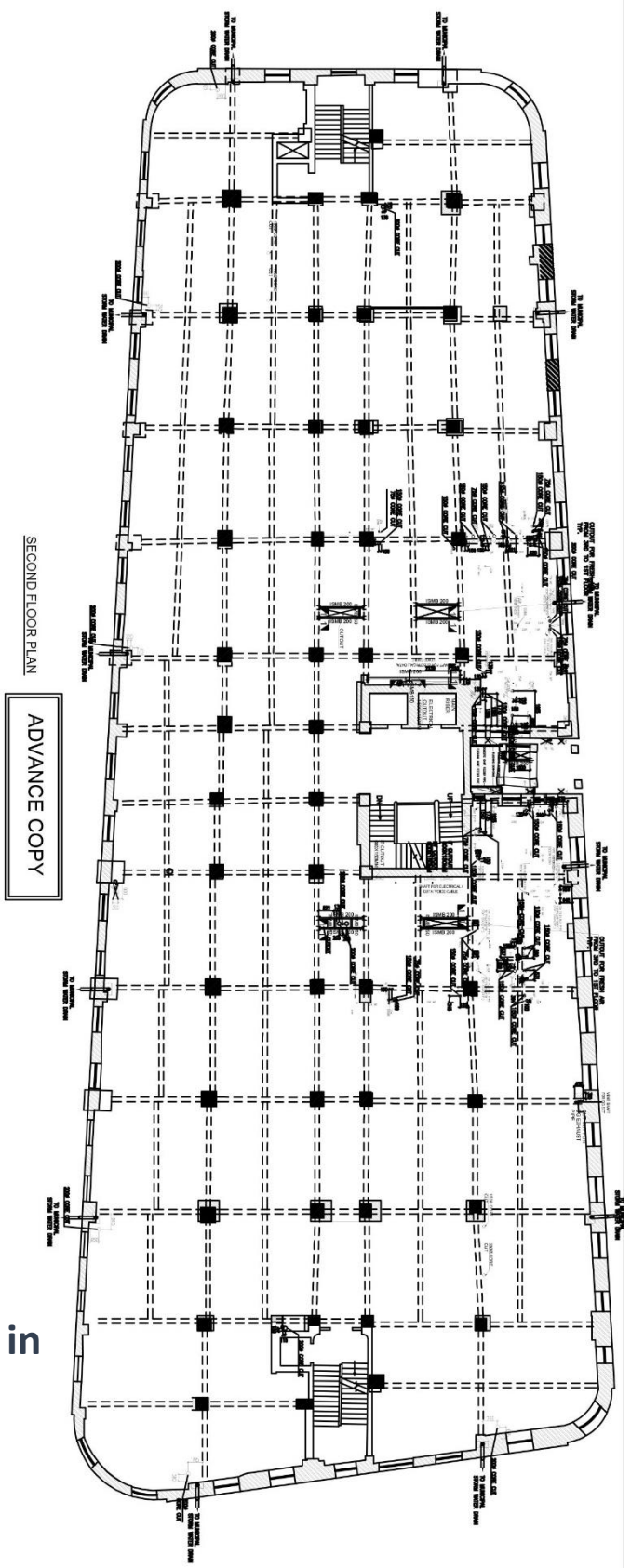
**Places showing core-cuts in
the 1st floor level**

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

Locations – Core cutting works –
2nd, 3rd, 4th levels

Activities done from
January - July 2018



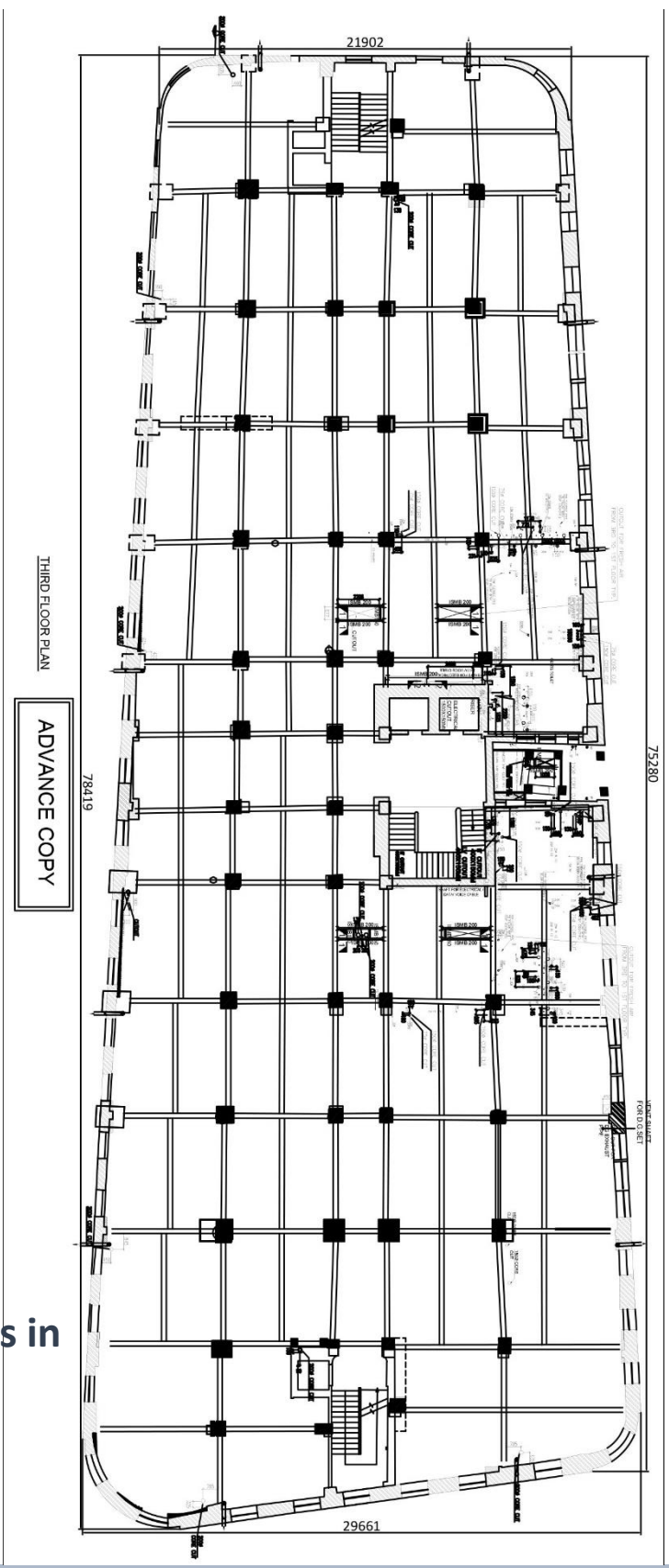
Places showing core-cuts in
the 2nd floor level

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

Locations – Core cutting works –
2nd, 3rd, 4th levels

Activities done from
January - July 2018



Places showing core-cuts in
the 3rd floor level

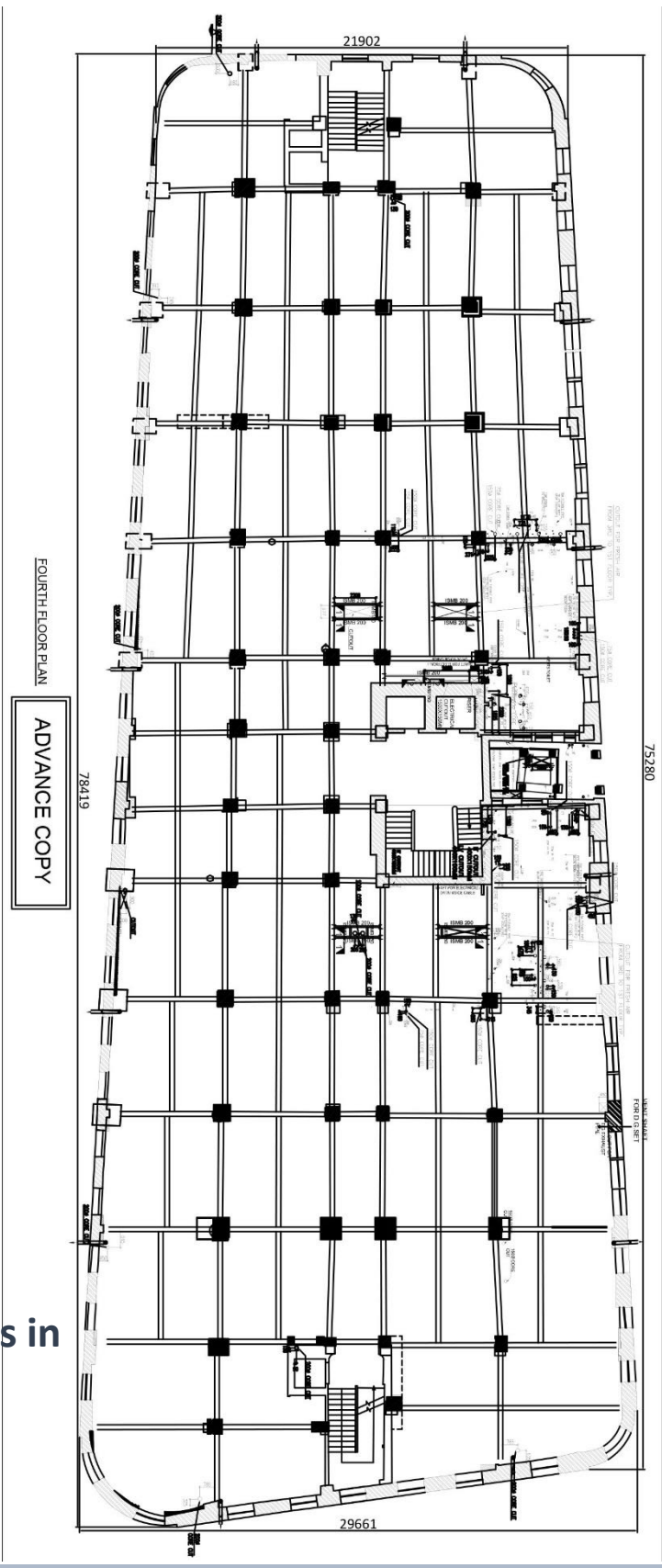


ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

16. Activity – Core Cutting Works

Locations – Core cutting works –
2nd, 3rd, 4th levels

Activities done from
January - July 2018



Places showing core-cuts in
the 4th floor level



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

17. Activity – Brick Masonry Works

Locations – Basement, Main Entrance and 4th floor

Activities done from January - July 2018

Preparations :

- Stacking the good quality bricks, fine sand and cement at location
- Removing the loose dust particles from ground & marking the line of wall
- Preparing the cement mortar in the ratio of 1:5 (one part cement+5 parts of sand) in galvanised tray by mixing the potable water to it and mixing it properly to achieve the required consistency

Application :

- After wetting the marked area the first levelling coat of cement mortar screed is applied on floor & bricks are placed on it adjacent to one another leaving a



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

17. Activity – Brick Masonry Works

Locations – Basement, Main Entrance and 4th floor

Activities done from January - July 2018

Application : (Ctd.)

- gap of 10 to 12mm for mortar to be filled in with reference to straight line
- Second course of bricks is laid on this after a layer of cement mortar of approx. 10 to 12 mm thickness is laid in perpendicular to first raw in straight line
- Subsequent course are laid this way ensuring the wall in proper plumb line
- After finishing of the last course the wall is brushed of all loose mortar of wall surface brush & all joints hacked little to receive the plaster
- The wall thus constructed is cured with water after mortar is set



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

17. Activity – Brick Masonry Works

Locations – Basement, Main Entrance and 4th floor

Activities done from January - July 2018

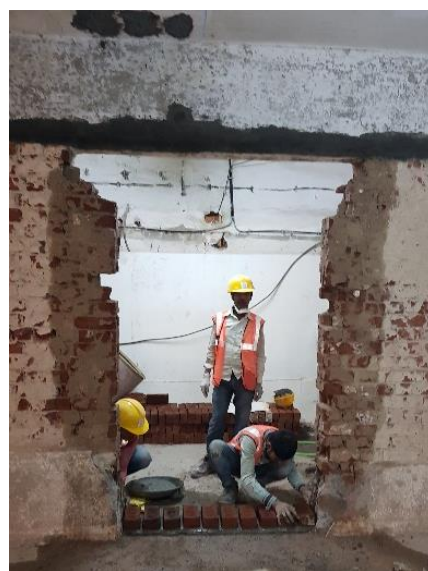
Control Measures :

- All PPE will be in place
- Operator will wear hand gloves



Quality Control Checking :

- Quality of bricks as per IS Code will be ensured
- Quality of sand will be ensured
- Proper ratio will be measured & maintained
- Proper hacking to make key will be ensured
- Straight line & plumb line will be ensured
- Proper tothing/ keys will be ensured
- Proper water curing will be ensured

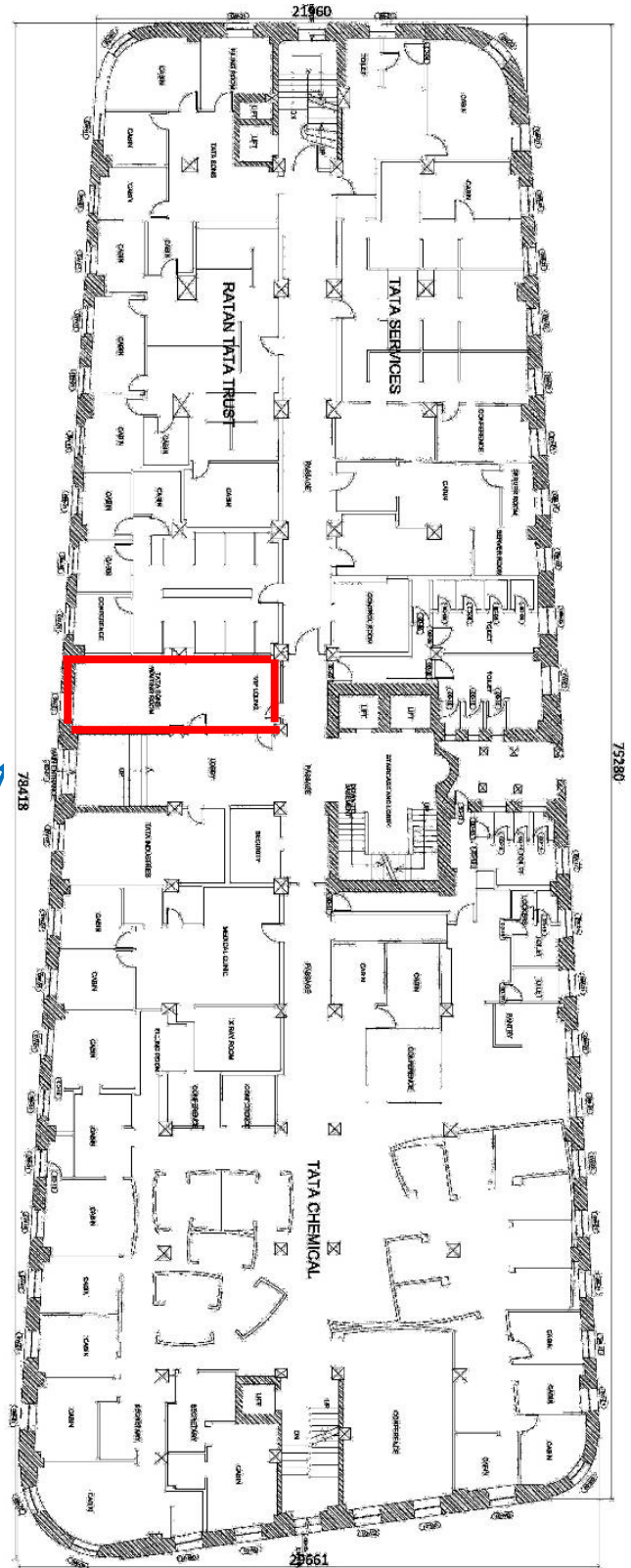


ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

17. Activity – Brick Masonry Works

Locations – Basement,
Main Entrance and 4th floor

Activities done from
January - July 2018



**Walls in the 4th floor space
where brick masonry works
have been done**

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

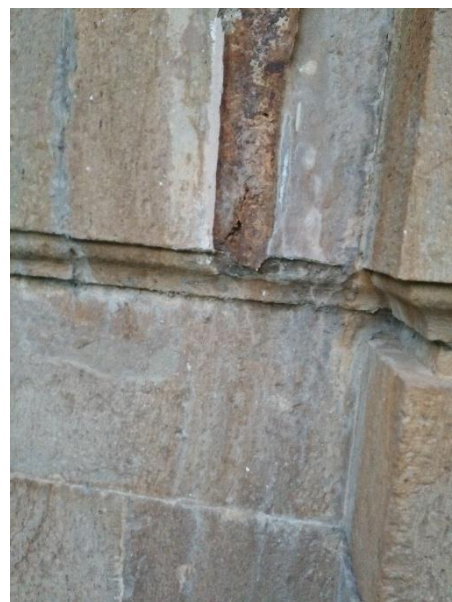
Locations – Building façade on all four sides – North, South, East and West

Activities done from January - July 2018

Preparations :

(Note: The stone surfaces on the external facades exhibit stone staining and accumulation of pollutants and sulphate stains in passage of time, more so, if the facades are not periodically maintained)

- The requires gently cleaning for which water misting and water washing with mild surfactants is generally recommended
- For stringer courses, cornices, capitals, etc. ammoniacal poulticing is employed
- Most surfaces along the external facades will be given gentle water washing using an intermittent fine spray of water to loosen the accumulated dirt and dust particles and this will be done using a fine nozzle sprinkling system that is regulated to spray a fine mist along the surface



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

Locations – Building façade on all four sides – North, South, East and West

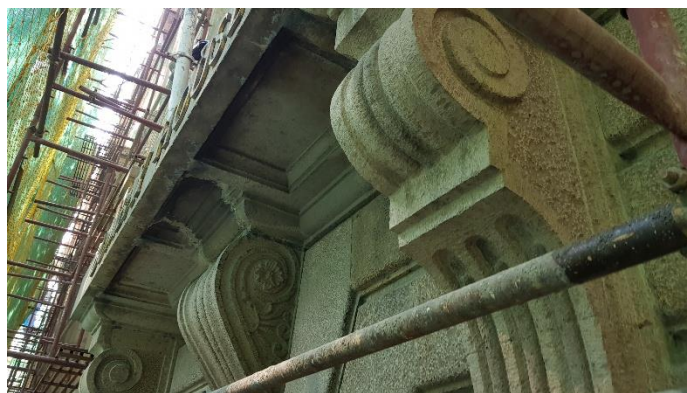
Activities done from January - July 2018

Application :

- Water spraying shall be followed by gentle manual brushing using soft nylon brushes
- In case of very stubborn stains a mild, non-ionic detergent solution like TEEPOL shall be used
- For iron stains, additional application of some chemical such as biowash may be used
- For bitumen stains, petrol, napatha or paraffin may be adopted

(Note: Pressurized water jet duly regulated may also be used if, required)

Potassium hydroxide and sodium hydroxide are effective in stripping paint, waxes, greases and oil stains etc. Dilute solution of caustic soda (sodium hydroxide) or potassium hydroxide may be applied with a brush and the surface washed with water.



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

Locations – Building façade on all four sides – North, South, East and West

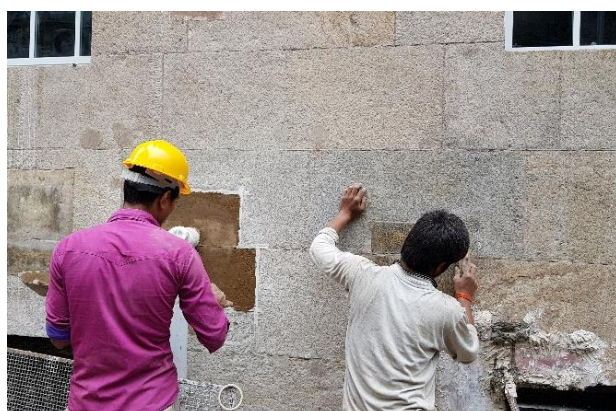
Activities done from January - July 2018

Possible Hazards :

- Severe injuries in case if someone slips and falls down from a height
- Any injuries related to chemical agents
- Injuries related to electrical equipments

Control Measures :

- All PPE will be in place
- Operator will wear hand gloves
- Eye goggles
- Safety jacket is compulsory
- Helmets and if needed face guards also



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

Locations – Building façade on all four sides – North, South, East and West

Activities done from January - July 2018



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

Locations – Building façade on all four sides – North, South, East and West

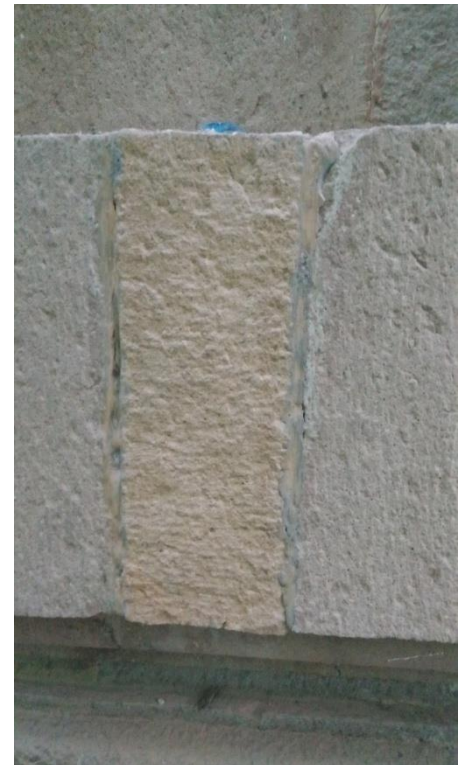
Activities done from January - July 2018



Copper slag blasting



Dutchman Repair



Cleaning Facade

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

Locations – Building façade on all four sides – North, South, East and West

Activities done from January - July 2018



Guard Wash



Lime Plaster

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

Locations – Building façade on all four sides – North, South, East and West

Activities done from January - July 2018



Paper Poulticing



Pointing

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

Locations –

Building
façade on all
four sides –
North, South,
East and West

Activities
done from
January -
July 2018

**NORTHERN
AND
SOUTHERN
FACADES
THAT ARE
BEING
CLEANED**



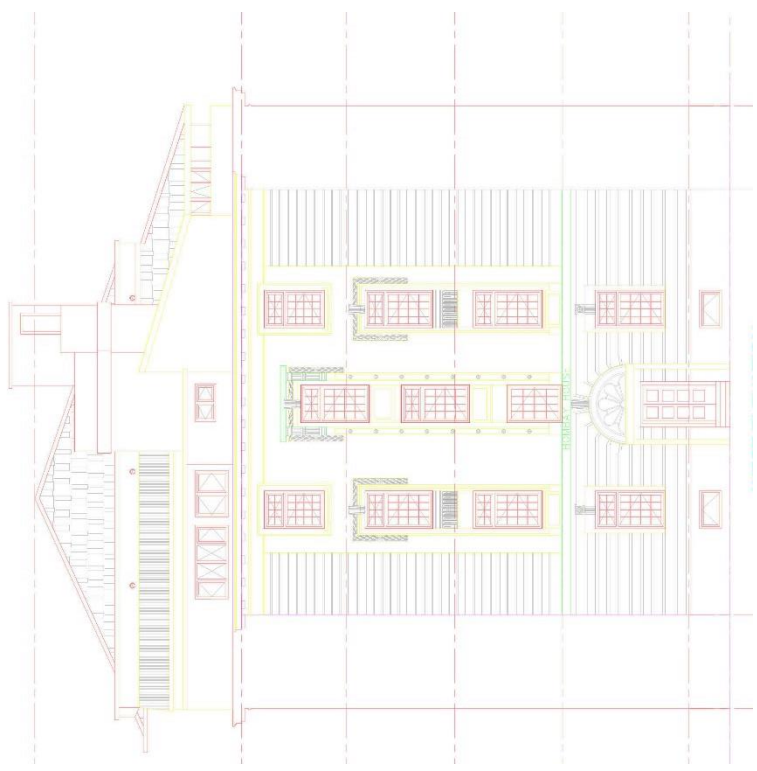
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

18. Activity – Facade Cleaning Works

Locations –
Building
façade on all
four sides –
North, South,
East and West

**Activities done
from January - July
2018**

**EASTERN
AND
WESTERN
FACADES
THAT ARE
BEING
CLEANED**



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

19. Activity – Structural Modification At Entrance

Locations – Main building entrance

Activities done from January - July 2018

Preparations :

- The required number of props are placed at below the structural beams & slab
- The cut out markings are done as per GFC drawing in consultation with structural consultant
- The brick wall is constructed below the slab of ground floor at basement level
- Additional support props are given below the RCC structure at basement level
- The core cut marks are placed to provide core cuts to pour the concrete in beam below the slab
- The required area of slab is removed by crusher as per approved vendor's WMS



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

19. Activity – Structural Modification At Entrance

Locations – Main building entrance

Activities done from January - July 2018

Execution :

The concrete slab is broken bit by bit in small chunks by crusher machine. The exposed reinforcement bars not cut off. The beams are cut with same process.

Shuttering / Centering :

- The reinforcement for new beam is placed as per schedule and formwork prepared & Rebars placed inside providing spacers for cover
- Additional structural steel supports are fabricated and placed at locations as per GFC drawings
- The concrete of M-25 grade is pored through the core cuts provided at specified locations and compacted with mechanical vibrators

Deshuttering :

- DE shuttering of beam sides is done after 4 days keeping the beam bottom props in its place
- Water curing is done

Possible Hazards :

- Person using crusher may get injured by machine
- Injury due to falling concrete debris
- Shuttering may collapse

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

19. Activity – Structural Modification At Entrance

Locations – Main building entrance

Activities done from January - July 2018

Control Measures :

- The area at ground floor & basement is cordoned off and security person deployed there when concrete breaking is carried out
- Signage is put up to keep away from hazard prone area
- PVC hand gloves are used
- The props are checked for its stability

Quality Control Check :

- The cut out area of slab will be carried out with machine & without vibrations
- The concrete cubes are tested for required strength. and TC will be submitted



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

19. Activity – Structural Modification At Entrance

Locations – Main building entrance

Activities done from January - July 2018



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

19. Activity – Structural Modification At Entrance

Locations – Main building entrance

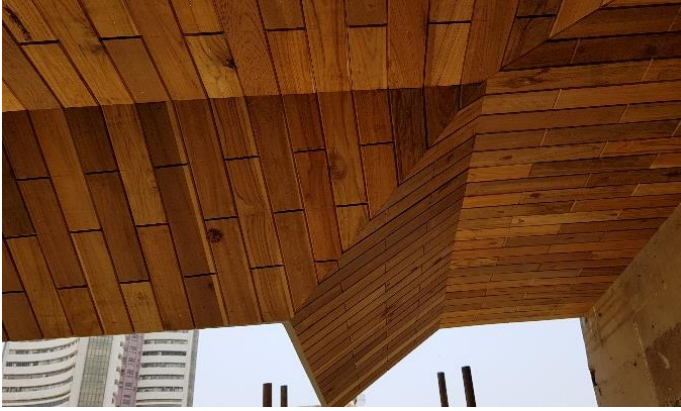
Activities done from January - July 2018

Entrance space situated on the southern façade of the building being structurally modified



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

20. Activity – New wooden battens fixing
Locations – Pocket Terrace
Activities done from January - July 2018



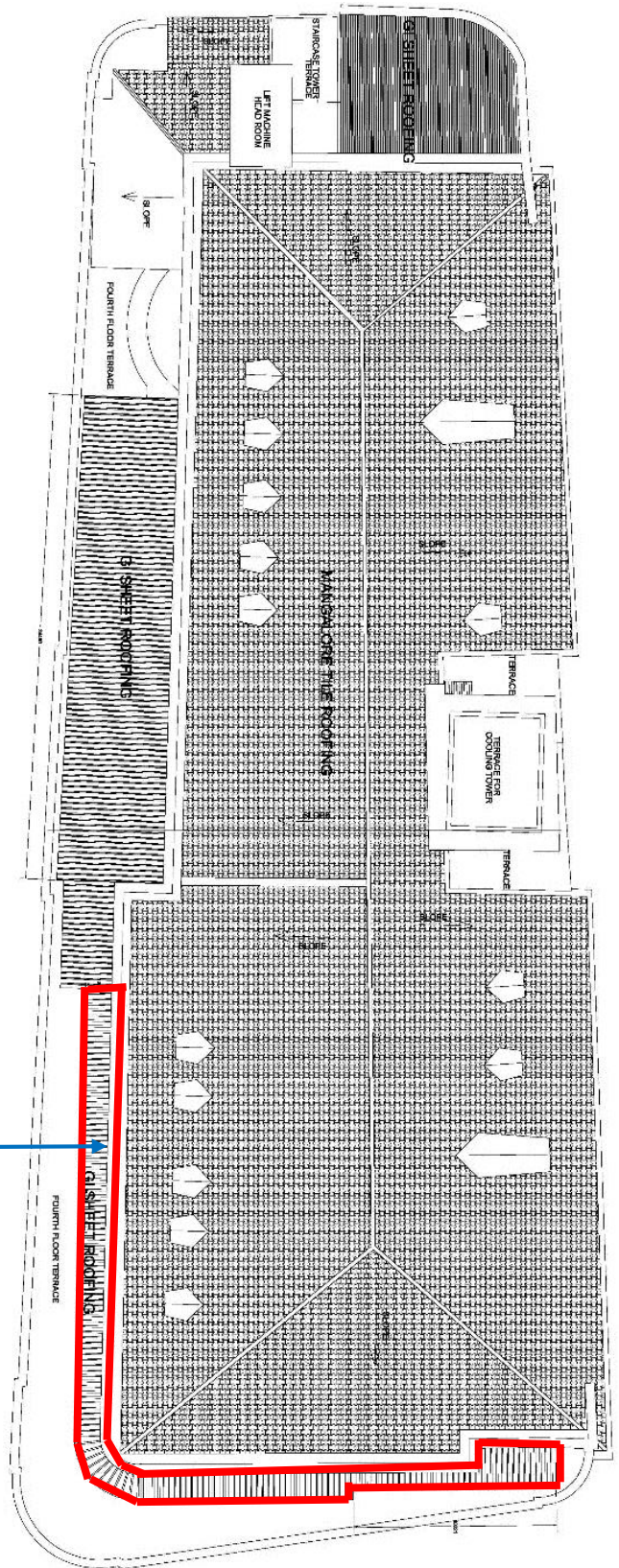
ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

20. Activity – New wooden battens fixing

Locations Pocket Terrace

Activities done from January - July 2018

EXISTING FOURTH FLOOR PLAN



Span of the trellis in the 4th floor – terrace level where works have been done

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

21. Activity – Scrapping of wooden members, anti-termite treatment, painting and fitting of chain link of false ceiling

Locations – Atic Area

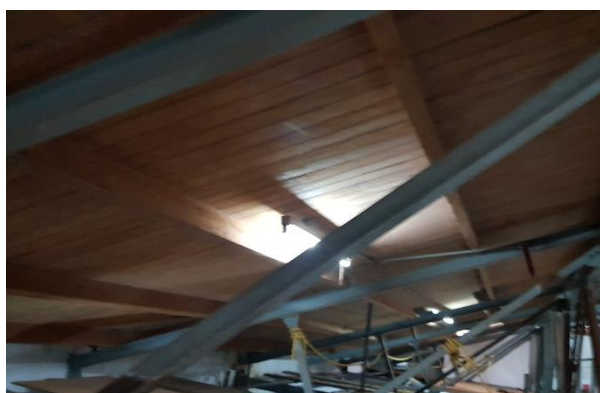
Activities done from January - July 2018

Preparations :

- Application of 1st coat of anti-corrosive paint to chainlink and then its drying
- Application of 2nd coat of anti-corrosive paint to the same and then its drying
- Application of 1st coat of enamel paint (D145) with approved colour
- Application of 2nd coat of enamel paint (D145) with approved colour

Application :

- Chainlink to be placed on wooden members
- Atleast 2 chainlinks to be overlapped at joints then it is to be tied properly
- G.I strips to be used for fixing chainlink on wooden members by screening it at every 600 mm interval



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

21. Activity – Scrapping of wooden members, anti-termite treatment, painting and fitting of chain link of false ceiling

Locations – Atic area

Activities done from January - July 2018

Possible Hazards :

- Very minor injuries inflicted due to manual equipments

Control Measures :

- All PPE will be in place
- Operator will wear hand gloves

Preparations :

- The area is cordoned off for all except certified personnel
- The principal pesticide-CHLOROPYRIPHOS bottle is staked carefully to one side
- The Diluting solution of mineral solvent (Turpene) is measured in pre decided volume in another container



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

21. Activity – Scrapping of wooden members, anti-termite treatment, painting and fitting of chain link of false ceiling

Locations – Atic area

Activities done from January - July 2018

Preparations : (Ctd.)

- The pesticide solution is poured gently in to a diluting medium & stirred slowly for one minute
- The compound so prepared is filled into hand pump having fine nozzle to create mist spray

Application :

- The mixture is filled & compressed in hand pump gently to create required pressure
- The hand pump is wiped clean & fine mist of pesticide mixture is sprayed evenly to subjected area taking extra pre caution not to inhale it
- The area is quarantined for at least 24 hours
- The hands of personnel are washed with soap & abundant of water

Possible Hazards :

- The chemical bottle /container may topple or chemical leakage or spillage

Control Measures :

- All PPE will be in place
- Operator will wear goggles
- Operator will wear hand gloves
- Operator will wear respiratory mask
- Operator will use safety harness as per site condition
- MSDS will be studied and proper procedure as set out by company will be followed

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

21. Activity – Scrapping of wooden members, anti-termite treatment, painting and fitting of chain link of false ceiling

Locations – Atic Area

Activities done from January - July 2018



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

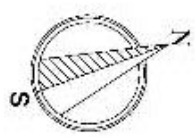
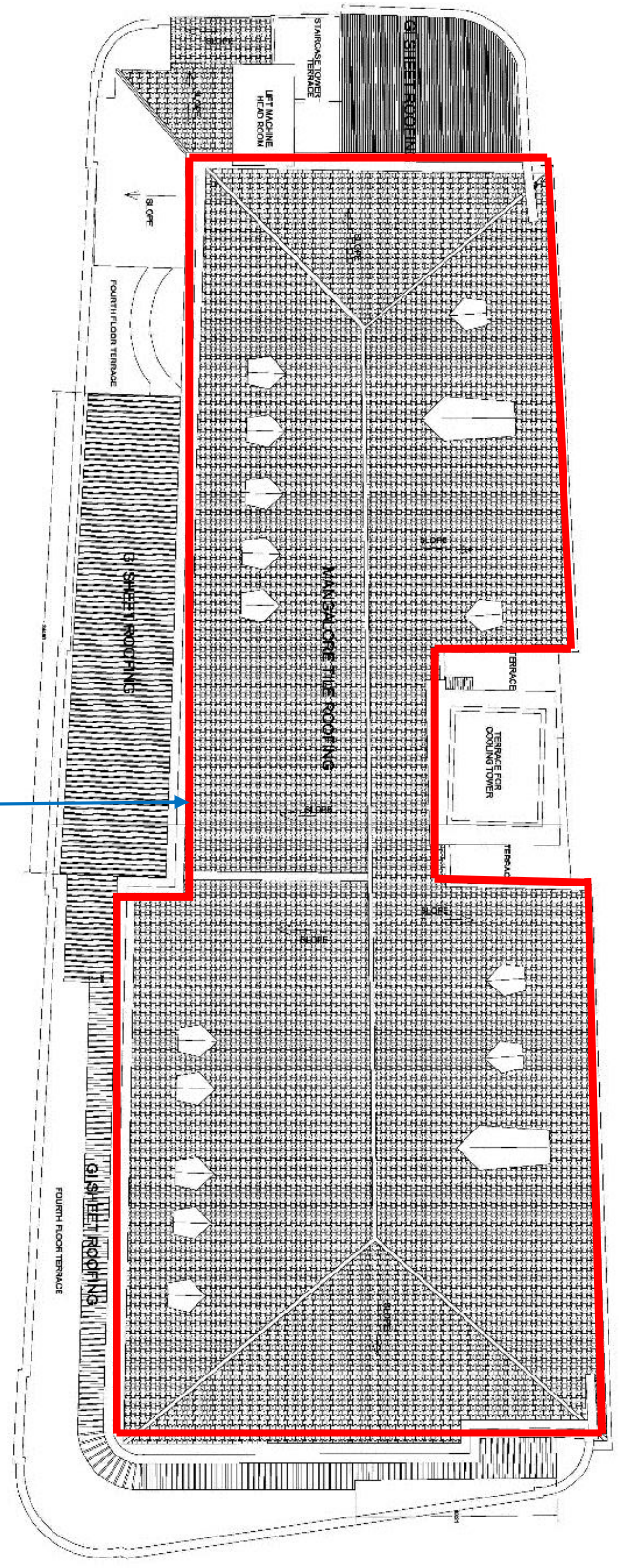
21. Activity –
Scrapping of wooden members,
anti-termite treatment,
painting and fitting of
chain link of false
ceiling

Locations – Atic Area

Activities done from
January - July 2018

Span of the ceiling in the interior where works have been done

EXISTING FOURTH FLOOR PLAN



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

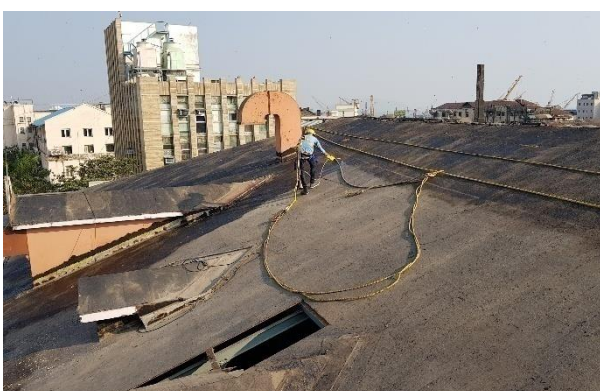
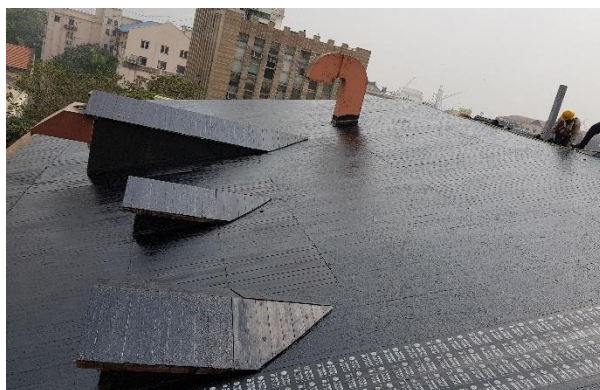
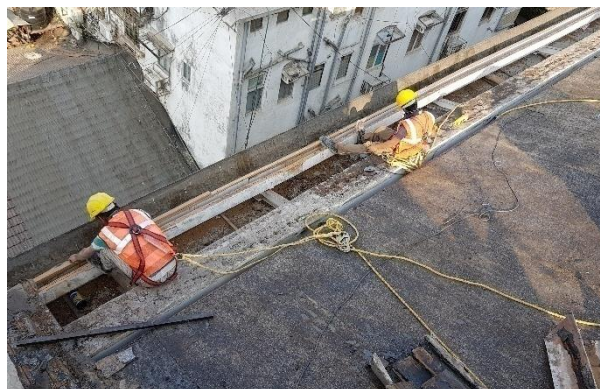
22. Activity – Roof work and anti-termite treatment

Locations – Roof

Activities done from January - July 2018

Preparations :

- The Mangalore Tiles are removed & stacked properly on terrace floor without adding to point load on slab
- Wooden batons & bituminous coating is removed to see the status of wooden planks on Purlins
- The damaged/decayed wooden members are replaced with well-seasoned teak wood members
- The damaged/decayed wooden planks are replaced with well-seasoned teak wood planks of similar size by screwing on teak wood purlins
- The surface area is coated with pre heated **bitumen** (Damar) and **Polyester reinforced Tar felt Membrane of STP** is affixed over hot spread of bitumen



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

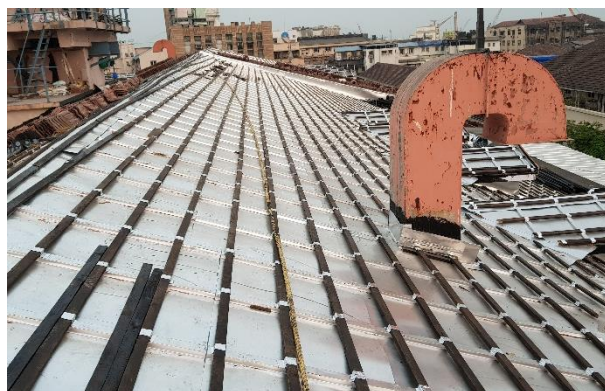
22. Activity – Roof work and anti-termite treatment

Locations – Roof

Activities done from January - July 2018

Preparations : (Ctd.)

- The membrane thus placed is tapped and pressed for better adhesion
- Well seasoned batons are treated with **Chloropyriphos** for termite prevention as per WMS & painted with black japan
- Well –seasoned Teakwood Batons are placed in vertical position in first layer as per aluminium sheet profile
- Second layer of batons are fixed in horizontal position
- The batons are pre coated with black japan paint before fixing
- The aluminium TRAFOLD sheet in profile to cover the batons patterns is fixed over this and sealed properly



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

22. Activity – Roof work and anti-termite treatment

Locations – Roof

Activities done from January - July 2018

Preparations : (Ctd.)

- The water testing is done by spraying water on aluminium sheet
- The Mangalore Tiles are washed on roof with jet pressure machine or manually by scrubbing with brush
- Waste water is drained through eves gutter
- The Mangalore Tiles are fixed in interlock set pattern & sealed at required place with cement mortar after fixing ridge tiles
- Eves Boards & Eves Gutters are fabricated as per design and fixed



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

22. Activity – Roof work and anti-termite treatment

Locations – Roof

Activities done from January - July 2018

Possible Hazards :

- Person climbing on sloped roof may slip downwards to terrace floor
- Fire may erupt while heating the bitumen
- The Mangalore Tiles may break while walking on roof
- Person's hand prone to come in contact with hot bitumen

Control Measures :

- Life line Rope is used
- The person is not allowed to walk on roof with shoes as with shoes person slips
- Only highly trained person with sensitive foot works on roof
- The area at ground is cordoned off and security person deployed there to ward off the passer by entering the project area



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

22. Activity – Roof work and anti-termite treatment

Locations – Roof

Activities done from January - July 2018

Control Measures : (Ctd.)

- Signage is put up to keep away from hazard prone area
- PVC hand gloves are used
- The heating is carried out in secluded area
- Fire Extinguisher is kept handy at place

Quality Control Check :

- The wood & Mangalore Tiles are tested in lab as per parameters set out in terms and TC will be submitted

Water Leakage Testing :

- By spraying water on Aluminium Traftold sheets
- By washing Mangalore tiles on roof



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

22. Activity – Roof work and anti-termite treatment

Locations – Roof

Activities done from January - July 2018

Preparations :

- The area is cordoned off for all except certified personnel
- The principal pesticide-CHLOROPYRIPHOS bottle is staked carefully to one side
- The Diluting solution of mineral solvent (Turpene) is measured in pre decided volume in another container
- The pesticide solution is poured gently in to a diluting medium & stirred slowly for one minute
- The compound so prepared is filled into hand pump having fine nozzle to create mist spray

Application :

- The mixture is filled & compressed in hand pump gently to create required pressure
- The hand pump is wiped clean & fine mist of pesticide mixture is sprayed evenly to subjected area taking extra pre caution not to inhale it
- The area is quarantined for at least 24 hours
- The hands of personnel are washed with soap & abundant of water

Possible Hazards :

- The chemical bottle /container may topple or chemical leakage or spillage

Control Measures :

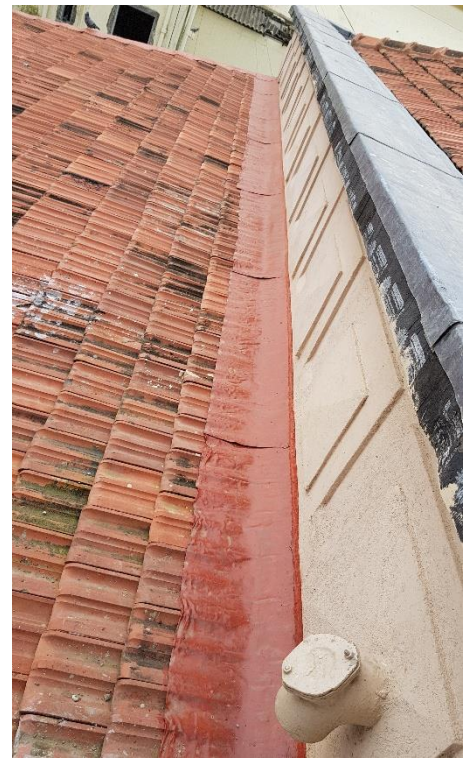
- All PPE will be in place - Operator will wear goggles
- Operator will wear hand gloves - Operator will wear respiratory mask
- Operator will use safety harness as per site condition
- MSDS will be studied and proper procedure as set out by company will be followed

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

22. Activity – Roof work and anti-termite treatment

Locations – Roof

Activities done from January - July 2018



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

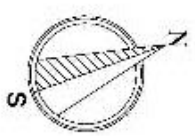
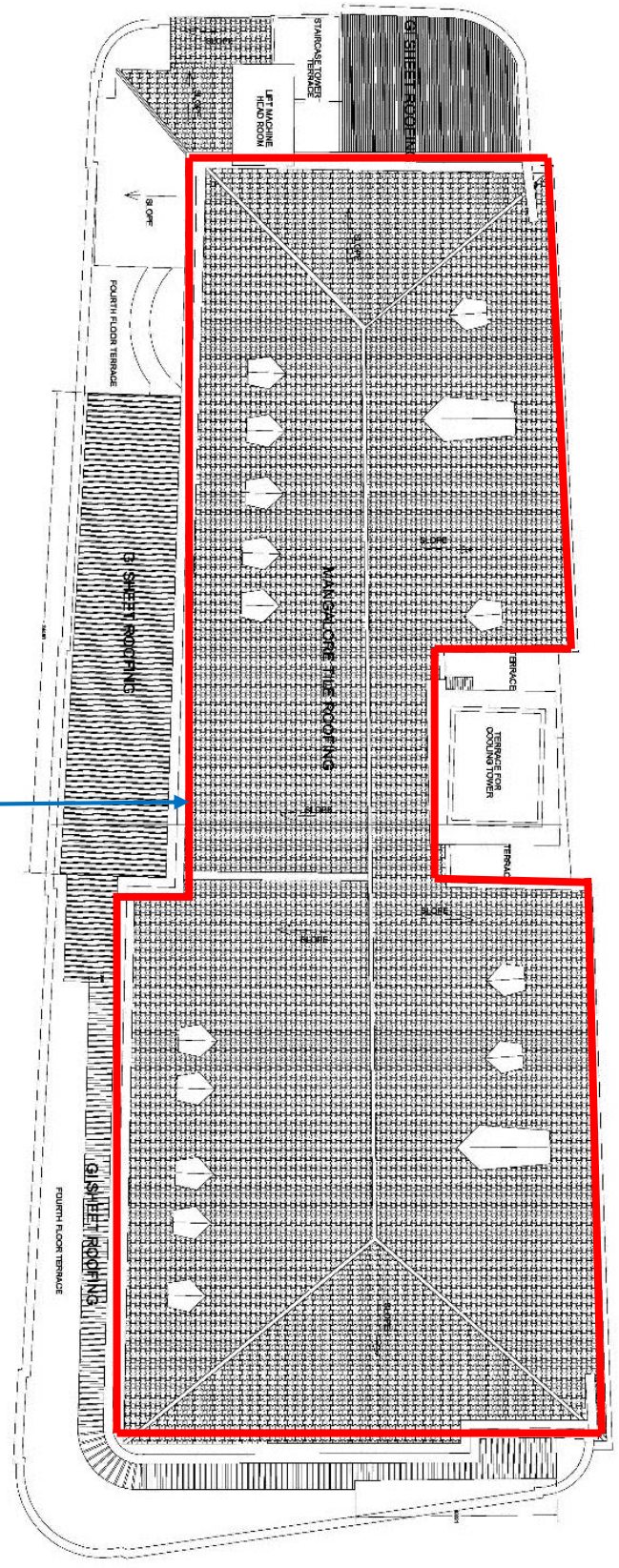
22. Activity – Roof work and anti-termite treatment

Locations – Roof

Activities done from January - July 2018

Span of the roof in which works have been done

EXISTING FOURTH FLOOR PLAN



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

23. Activity – Downtake pipe and fixing of pavers and stones

Locations – Peripheral pavements on the exterior of the building

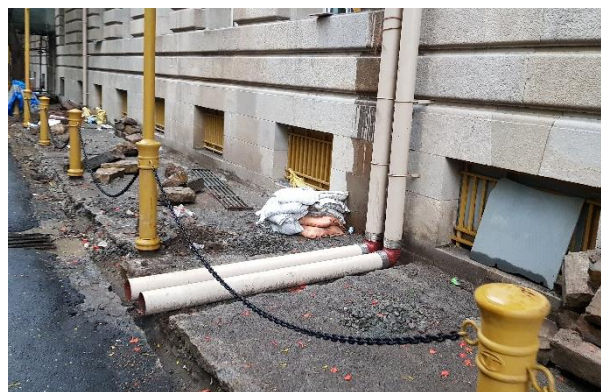
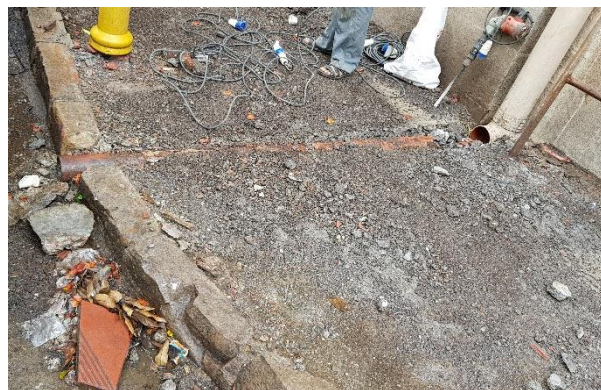
Activities done from January - July 2018

Working principle :

Sand-blasting grit (copper slag) can be recycled on site into precast concrete blocks and can be used as a replacement of marine sand used in mortars for concrete blockworks. Before the recycling of the waste into the recycled blocks, the physical and chemical analysis of the waste are studied

Preparations :

- Mortar cubes 2" x 2" (25.4 x 25.4 mm) are casted of grit and an ordinary Portland cement at ratios by weight of 1:1 (500 g/kg)
- The compressive strength at 3,7 and 28



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

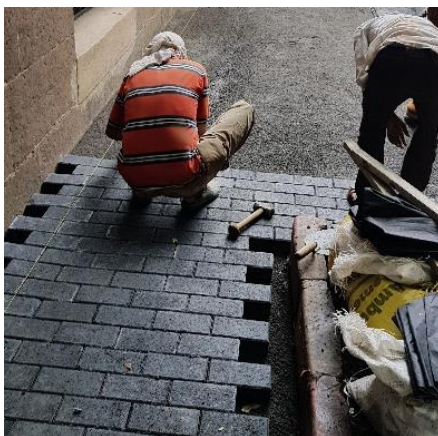
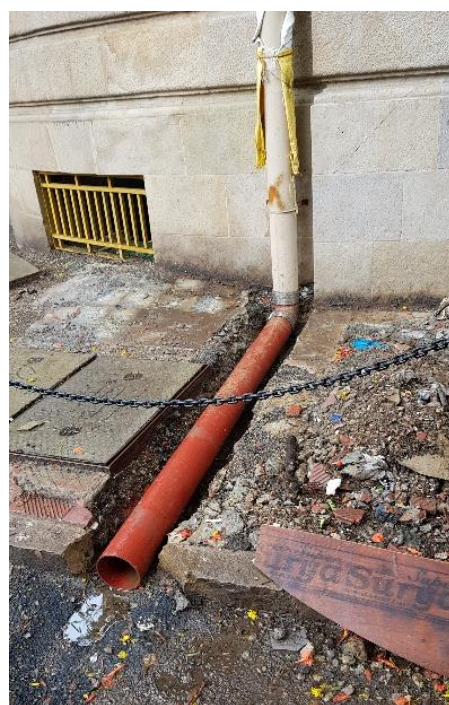
23. Activity – Downtake pipe work and fixing of pavers and stones

Locations – Peripheral pavements on the exterior of the building

Activities done from January - July 2018

Preparations : (Ctd.)

- days is determined
- At 28 days strength values of 35, 34 and 33 N/sq.mm are obtained for mixes with ratios by weight of 1:1, 1:3 and 1:4 respectively
- Concrete cubes of 150mm x 150mm are casted at different water/cement ratios
- The compressive strengths are determined at 3, 7 and 28 days respectively
- The grit is incorporated in the manufacture of 15 cm concrete blocks
- The results indicate an average compressive strength value of 12 N/sq.mm



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

23. Activity – Copper slag blasting and fixing of pavers and stones

Locations – Peripheral pavements on the exterior of the building

Activities done from January - July 2018

Application :

- Before the commencement of the work, it should be made sure that sub-grade is compacted when the area is above natural ground
- The sub-base shall be compacted with vibratory roller, size of roller shall be suitable for the area where it could maneuver and can move back and front
- Once compacted and met the specification requirement for compaction and approved by Engineer, base course shall then be placed above compacted sub-base but the thickness of the bases should be as per approved drawing
- MEP rough-in or underground embedments (wherever applicable) shall be placed before
- In areas of kerb stone, the blinding shall be constructed first serve as the base but it should be as per the drawing
- The importance of pre-installation of kerb stone is to prevent the migration or dis-alignment of the blocks and it will serve as reference line or level



ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

23. Activity – Copper slag blasting and fixing of pavers and stones

Locations – Peripheral pavements on the exterior of the building

Activities done from January - July 2018

Application : (Ctd.)

- After compaction of base-course, the black sand shall be laid on it of 50 mm thick
- The minimum thickness of the interlocking shall be 60 mm with the specified colour
- The dimension, thickness and design shall be as per approved shop drawing
- Land surveying shall be made to mark the required levels, alignments, setting out lines for interlock as per approved drawing
- Once the whole area is completed, fine sand can then be laid on the installed interlock or paving block and sand shall be spread evenly on the whole area
- Plate compactor shall be used to compact the installed interlock or paving blocks
- Once compacted, cleaning shall be followed to remove all excess sand and damaged pieces

Safety :

- All works shall comply with safety procedure or instruction set out in project safety plan and Municipality rules and regulations
- Basic PPE to be worn by all staff or laborers
- All operatives involved in this work shall be inducted before entering the site
- Tool box talk shall be conducted regularly



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(Formerly known as SAVANI CONSTRUCTION CO. PVT. LTD.)

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE

23. Activity – Copper slag blasting and fixing of pavers and stones

Locations – Peripheral pavements on the exterior of the building

Activities done from January - July 2018

Equipments and Tools :

- Interlock cutter
- Plate compactor
- Wheel barrow
- Meter

Materials and references :

- 60 mm thick Interlock Tile or paving block
- Approved drawing
- Specification



**OVERALL
'BEFORE'**

AND

'AFTER

PICS

Of

THE PROJECT

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE



← BEFORE



AFTER

ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE



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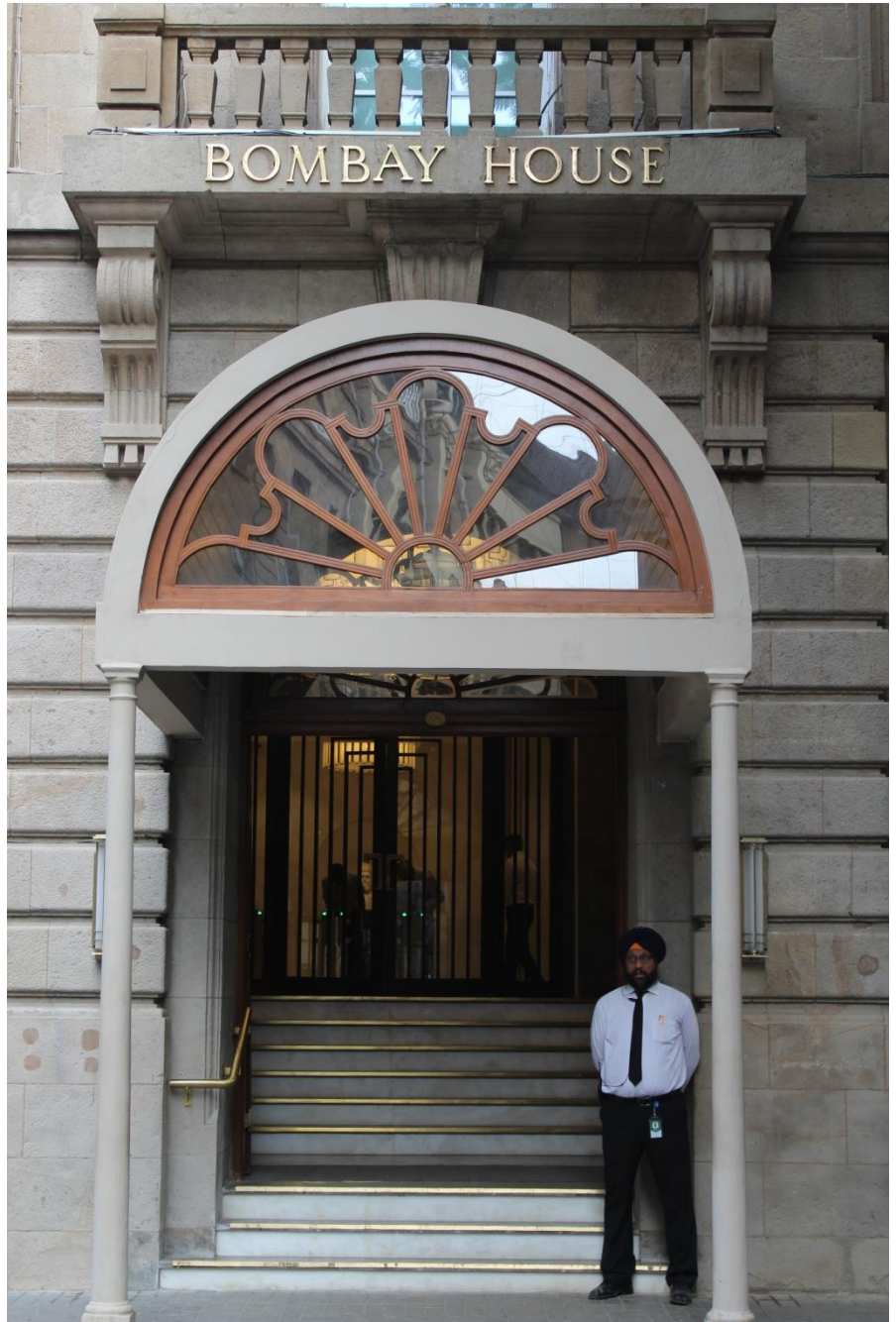


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ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE



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ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE



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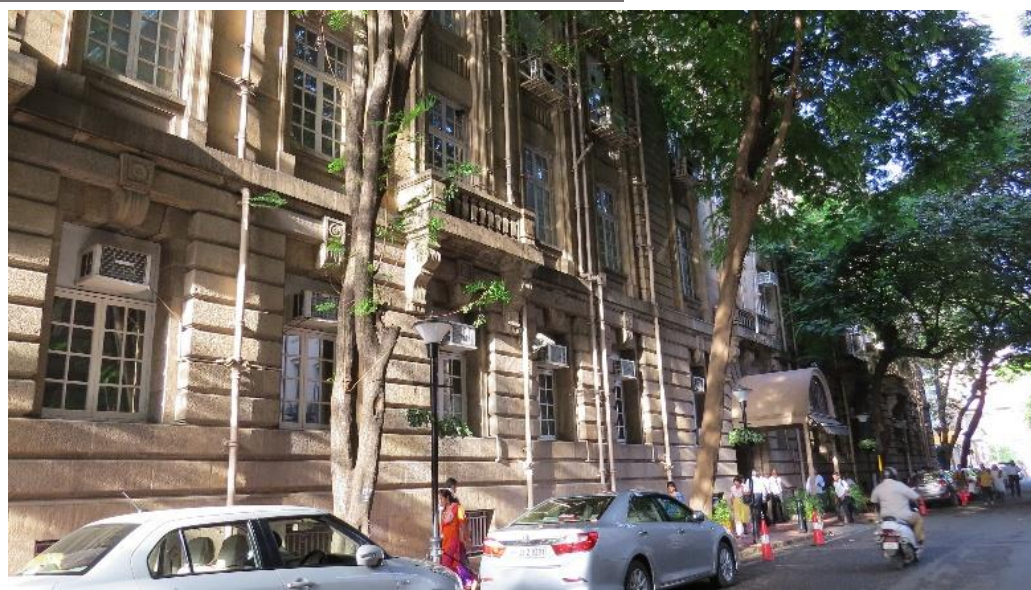
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ACTIVITIES ASSESSMENT of ACTIVITIES DONE IN BOMBAY HOUSE



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