



**SPECIFICATION FOR ROOF WATERPROOFING
AT
88 JOR BAGH
US Embassy Residence**

STATEMENT OF WORK

- The U.S. Embassy New Delhi has a requirement to re-store roof waterproofing for property #88 Jor Bagh.
- Contractors are advised to visit the site, verify measurements as mentioned in the SOW.
- Any ambiguity found later will be at the discretion of the contracting officer for any modification.
- Complete waterproofing job shall be done by the manufactures (as mentioned in the scope of work) skilled/professional workers.
- Project requires a qualified Roof Contractor to perform a restoration according to US standard and roofing industry practices.
- The contractor shall be given total 35 working days to complete this project.

GENERAL REQUIREMENTS

- The Contractor shall provide all required labor, material, equipment, and supervision to complete the requirements in this statement of work.
- All work shall be performed in a skillful/professional manner.
- The Contractor shall follow security and safety directions as mentioned here and explained by the COR.
- The Contractor shall submit the construction bar chart within 5 working days after getting the letter to proceed.
- The Contractor shall submit all the cut sheets / brochures and material samples for COR approval before delivery of material at site.
- All materials shall be delivered, hoisted on the exterior and stored as per space allotted.
- To remove debris proper chute to be made to have minimum disburse to surrounding area.
- Contractor shall dispose of all the debris from the site and keep the site clean and in workable condition throughout the project duration

SCOPE OF WORK

- Remove existing roof tile, pavers, marble chips complete with mortar layer underneath of main house roof including barsati room. The contractor shall remove layer of polystyrene insulation to reach up to RCC slab. (app. 2500 sq. ft.)
- Contractor shall provide temporary support to the existing water pipe lines as well as solar water heaters during the project.
- The slab shall be cleaned thoroughly of any dust and other particles. The contractor shall remove the plaster of parapet wall up to the top of new built up roof level.

- The contractor shall chase parapet wall about 12” high from existing main slab level and make groove 2” deep to lay waterproofing felt inside the groove.
- Contractor shall do necessary repair to the slab with recommended polymer mortar of Fosrock or equivalent makes.
- After repair of RCC slab, provide a layer of bituminous primer of STP makes or equivalent on entire slab.
- Provide and install bituminous felt (3mm thick APP modified plastomeric bitumen, non-woven polyester felt of make “BITUMAT” or equivalent) over the freshly laid bituminous primer with hot bitumen of 85/25-grade spread @ 1.7 kg/sq. mt. Torch-apply by heating membrane in accordance with manufacturer's recommendation to achieve continuous edge flow and complete bond. The terminated end of bitumen membrane shall be done as per site condition requirement.

Note: The longitudinal side of felt shall be overlap minimum 4 inches and end laps minimum 8 inches. All the gaps and overlaps/ joints shall be sealed with hot bitumen.

- On top of the bituminous felt, layer of vermiculite shall be poured mixed with cement in ratio 6:1 in which six parts will be of vermiculite and one part of grey cement grade 43 in slope. The slope in vermiculite shall be 2% towards rain water drains and thickness of vermiculite shall be minimum 1” and any points. Contractor shall cure the layer of vermiculite for at least 3 days.
- Once vermiculite layer is completely dry, contractor shall provide a coat of bitumen primer on whole roof and vertical sides of parapet walls before installation of other layer of bituminous felt.
- Over the primed surface, provide and apply a coat of hot bitumen @ 1.7 kg/sq. mt. to seal all the pinholes or hair cracks.
- Provide and install second layer of APP modified plastomeric bitumen, non-woven polyester felt 4mm thick POLYFLAME of make “BITUMAT” or equivalent over the freshly laid bitumen on top of vermiculite layer. The terminated end of bitumen membrane shall be properly chased in side wall or parapet wall or shall be properly laid over the coping as per site condition requirement.
- The felt will be laid with hot bitumen of 85/25-grade spread @ 1.7 kg/sq.m. Torch-apply by heating membrane in accordance with manufacturer's recommendation to achieve continuous edge flow and complete bond. The longitudinal side of felt shall be overlap minimum 4 inches and end laps minimum 8 inches. All the gaps and overlaps/ joints shall be sealed with hot bitumen.
- The contractor shall provide and lay 300-micron polythene sheet of transparent color over the membrane and also over Polystyrene Insulation.
- Contractor will provide and install 2” (50 mm) thick inter lockable Extruded Polystyrene Insulation (Roof mate) of make **DOW or equivalent**. The insulation will be applied in parallel rows and all sides/end joints will be installed closely but not forced.
- Provide and install 2” thick cement mortar (1 cement: 4 coarse sand) with chicken wire mesh on top of the ply/membrane. The contractor shall mix “Plastocrete Plus” or”Sika

Nitobond AR

- ◆ Acrylic Emulsion cement modifier and water based concrete bonding agent.
- ◆ Compressive Strength 40 N/sq.mm (wet)
- ◆ Tensile Strength 3.5 N/sq.mm

Bituminous Primer

- ◆ Consistency Brush able or Spray able
- ◆ Setting time 24 Hours at normal application
- ◆ Flash point Above 40 degree
- ◆ Specific Gravity 0.9

Extruded Polystyrene Insulation (make DOW)

- ◆ Closed cell and homogeneous structure.

- ◆ Moisture resistant.
- ◆ Low Thermal Conductivity.
- ◆ Density – 32 – 354 Kg/cum
- ◆ Thickness – 50mm
- ◆ Shiplap

MATERIAL

MAKE

Bituminous Primer	STP/BITUMAT
Bitumen	STP/BITUMAT
APP modified plastomeric bitumen,	
Non-woven polyester felt	BITUMAT [®]
Extruded Polyester Insulation	DOW
Non-porous vitrified floor tiles	KAJARIA/NAVEEN
Grouting material	Sika/Laticrete/BASF

Materials/Makes

Contractor shall provide sample of all the material as mentioned in above specifications for the approval from COR before using it in the project or before delivery of material at site.

Contractor shall use material of brands or make as given above or equivalent quality material.

SITE CLEANING

- Contractor shall broom clean the entire site and the storage area after the completion of the project and on each at close of business.

- Contractor will paint the area of the exterior walls or other areas which will be affected during the project matching to existing paint and shade.

CONTRACTOR'S RESPONSIBILITY

- The Contractor shall be responsible for the professional quality, technical accuracy, and the coordination of all construction and other services furnished under this contract. The Contractor shall correct or revise any errors or deficiencies in its construction and other services without additional compensation,
- The Contractor shall identify a Project Manager/Supervisor who shall be responsible for the overall management of this Contract. Project Manager shall be qualified and have the experience in same type of job.
- The Contractor is responsible for safety and shall comply with all local labor laws, regulations, customs and practices pertaining to labor, safety and similar matters. The Contractor shall promptly report all accidents resulting in lost time, disabling, or fatal injuries to the COR.
- The Contractor shall be responsible for connection of temporary utilities to existing utilities including water and power. All temporary connections to local water and power shall be coordinated with the Embassy.
- All expenses towards mobilization at site and demobilization including bringing in equipment, workforce and materials, profit and overheads, dismantling the equipment, clearing the site etc. should be included in the rates quoted by the contractor. No separate payment on such expenses shall be entertained.
- Contractor should keep the site clean and accessible to Embassy employee all time

SAFETY

In addition to the attached Accidental prevention clause contractor will be responsible for

- Any miss-happening at the site due to negligence in the safety measures.
- Contractor will provide all Personal Protective Equipment for the workers as per the requirement of the site. Work will be stopped in case proper protection equipment are not found with the workers and lapse of the time will be at the part of the contractor.
- Contractor will make sure that all the arrangements for the work are working conditions are safe in all respect. Under no circumstance Embassy will be held responsible for any incident happen on the site due to negligence of the contractor / worker.

General Notes

- Once the project starts, it is contractor's responsibility to secure the roof against any kind of seepage / leakage to the floors underneath. Any damage / seepage / leakage occurred to the slab or to the other parts of the building while project is in progress will be contractor's responsibility and will repair the damages matching to existing.
- Contractor will be responsible for the safety of all the existing wires running on the roof during demolition phase.

- Contractor will provide all the material required to complete the job in satisfactory manner.
- Contractor shall provide and use LPG gas kettle for heating of bitumen. Contractor shall arrange for fire extinguishers while the gas cylinder is in use at the site. Under no circumstance wood will be allowed for heating the bitumen. In case of any miss-happening Embassy will not be responsible.
- Contractor should arrange the visit of the professional in this field from manufacturer side time to time (once or twice throughout the duration of the project) to supervise the project during work in progress.
- One qualified technical supervisor from contractor side should always be present on the site. He should be able to speak and understand English language.
- All demolished material shall be removed from the site, unless otherwise specified, on daily basis. The contractor will be entirely responsible for the disposal of all the trash and debris, and will be the only one to attend to any fine or penalty imposed by city authorities for improper disposal. The contractor shall take all necessary precaution/protection and approval from local authorities for disposal of debris.
- Embassy will provide electrical and water connection at one point. Contractor shall arrange all material and labor for further distribution.

Working Hours

- Working hours shall be 8:30 A.M. to 5.00P.M. Monday to Saturday. No work shall be done on Sundays and holidays unless otherwise approved. Total 35 working days shall be given.

Contractor:

Site Address:

Safety Officer Name:

Signature for Acceptance:

SAFETY STANDARDS TO BE FOLLOWED AT CONSTRUCTION AND RENOVATION SITES

General

1. All contractor employees engaged in maintenance/construction activities must wear proper shoes appropriate for their trade. No open toed sandals, flip-flops, or bare feet are permitted at work site.
2. All workers shall be fully clothed. No half pants and other non-appropriate clothing (Dhoti) will be accepted.
3. Malba / trash accumulated on the site shall be removed at a regular intervals (if possible on daily basis) to prevent trip hazards.

4. Employees exposed to occupational hazards shall wear personal protective equipment (hard-hats, eye protection, ear protection, etc.). Appropriate protective equipment for any operation varies with the size, nature and location of work to be performed.
5. Drinking water must be made available to all contractor employees.
6. It is the responsibility of the contractor to provide all personal protective equipment (PPE) per the requirements at the work site and as directed by the COR. Any mishap due to negligence on the part of the contractor shall be entirely the contractor's responsibility.

Hot Work/ Metal Work

1. All contractor's employees who are arc welding at the work site shall use a full face shield with #10 or darker lenses. No contractor employee will be permitted to arc weld with sun glasses, no matter how dark the lenses.
2. All the contractor's employees grinding and sanding shall have approved face masks and goggles for face and eye protection.
3. Contractor's employees handling heavy metallic material shall have appropriate gloves and steel toed safety shoes.
4. Lifting and shifting of the heavy material shall be done with the help of appropriate number of employees or machines.
5. Compressed gas cylinders shall be properly marked and should always be kept in standing positions secured from falling.
6. Hoses connected to the cylinder should be in good condition.
7. The contractor shall provide ventilation during interior arc welding operations.
8. Contractor shall use sight shields during welding to protect against any potential vision hazard.
9. Always keep an approved fire extinguisher near the site of welding.
10. Workers working with metal sheets must wear appropriate gloves to avoid any cuts on the hands.

Ladders Safety

1. Contractor shall use aluminum or fiber glass ladders for most purposes. Wooden or bamboo ladders are not allowed on the site.
2. Proper ladder for the specific job shall be used (for example fiber glass ladders for electrical work etc.).
3. Damaged ladders or ladders with missing supports, shoes, etc. shall not be used at the work site.
4. Height of the ladder shall be at least two feet above the required height for the work.

Electrical

1. All the equipment / machines to be used for the execution of the job shall be properly grounded.
2. All the extension boards to be used at the site shall have proper grounding.
3. All connections to any of the outlets shall be through three pin plugs. Direct connection of wires into receptacles is not permitted.
4. Machines/Tools with damaged wiring/ cabling shall not be used at site. The extension cord or wire with the machines shall be solid core with no breaks.
5. Electricians working on the site shall wear non-conductive shoes with rubber soles and shall use rubber gloves during execution of the work.
6. Any heavy equipment requiring voltage higher than 220VAC shall be connected under supervision of an embassy electrician.
7. No taped joint or undersize wiring is allowed at the site for the work.

Carpentry

1. Carpenters shall have dust masks to protect from the potential hazards from saw dust. Sanding machines used at the site shall have proper guards and operator shall wear suitable PPE, for example safety goggles, safety shoes, gloves etc.
2. All lumber used at the site shall be stored and must not pose a trip hazard.
3. Entire site shall be kept clean from the saw dust at the end of each work day.
4. Carpenter shall use machine guards on all machines used at the site.
5. All power carpentry equipment used at the site shall be properly grounded and wired.
6. Contractor shall use proper tools and tackles for the execution of the work at site.
7. Nails and other sharp material posing a laceration risk shall not be scattered about the site.

Fire

1. Contractor shall provide and place fire extinguishers at the work site.
2. No flammable material shall be stored inside the premises and must be removed at the end of the work day.

Lock Out / Tag Out

1. Lock out/tag out devices should be used during the testing of the electrical points and wiring.

Confined Spaces

1. If contractor's employees must work in a confined space the contractor shall contact the COR before proceeding with the work. Contractor shall arrange all the equipment as instructed by the COR to accomplish the job in a safe manner.

Hearing Protection

1. Contractor's employees working in excessively noisy environments shall wear proper hearing protection.

Height Protection

1. Contractor's employees working at elevations greater than 8 feet shall use sturdy metal pipe scaffolding. Alternatives to scaffolding shall require approval of the COR.