Method statement for installation of marbles and granites

This policy is a must read for all the members of CM team and also other concerned departments like Design, Procurement, Cost Management, etc.

Finishing protection policy (dated: 24 Nov, 2011) is a must follow up read for this policy.

Objective:

The objective of this policy is to lay down uniform and standard process for preparation of surface, preparation of tile and installation of marble / granite for flooring / cladding.

This policy shall apply to all buildings (not projects) where flooring works have not commenced as on 30.6.2011.

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Natural stone usage guidelines:

Natural Stones: Any material which is quarried from a natural stone including marble, granite, kotah, etc.

Objectives:

- To ensure high degree of aesthetic elegance
- To minimize wastage of material
- To minimize processing at site
- To ensure ease of handling at site

Guidelines:

- Prescribed size of natural stones cannot exceed 8 sq. ft. per piece. Of this at least one dimension should be 2 ft (600 mm) or lesser. Rectangular pieces are preferable over square pieces.

- As far as practical, natural stones should be brought in pre-cut tile format to site.
- Similarly, skirting should also be brought with pre-cut height OR alternatively, natural stone skirting can be avoided by using aluminum (or other equivalent) non natural stone skirting.
- Pre-polishing may be considered if feasible, else polishing may be done after installation at site.

Processes and best practices for various types of stones:

Type of stone / Process	**White colored imported marble (e.g. Sattuario)**	**Other imported marble (e.g. Armani brown; Riviera grey)**	**Agglomerated marble - flooring / cladding**	**Granite – wet fixing (e.g. ramps, kitchen slabs, etc)**	**Dry fixing on vertical surfaces - typically granite (e.g. water walls, entrance portal, etc)**
Preparation of surface	Floor bedding shall consist of white Port land cement and Gujarat river sand in the proportion (4:1 ratio by volume).	For Armani brown marble the bedding to be prepared in river sand and grey cement in proportion 4:1 by volume. For Riviera grey or other lighter and porous stones, use Gujarat White sand and Port land white cement for bedding.	River sand and cement (6:1 ratio by volume) slurry shall be used in bedding for flooring. Scratch coat plaster shall be applied on the wall for cladding. For light shade agglomerated marble, bedding is same as the one for white marble. In case of light shade agglomerated marble being used for wall cladding, use white cement slurry and rendering.	For normal dark shade granite use, river sand and cement (in ratio of 6:1 for horizontal surface; in ratio of 4:1 for vertical surface) slurry shall be used in bedding. Ratio may vary depending on weight of granite slab. For wet fixing of grey / light tone granite on a horizontal surface, Gujarat river sand and white cement slurry shall be used for bedding. As this granite has tendency to absorb the bedding material, this system will prevent stains coming on the granite surface. White cement slurry shall be	RCC pockets shall be provided in masonry at cleat locations and gridlines are marked on the wall.

				used for light tone granite on vertical surface.	
Preparation of tile	A coat of aqua seal or similar sealant shall be applied to the marble (on the bottom surface and all the four edges) before installation to avoid stains.	A skim coat of white cement shall be applied on the marble tile (on the bottom and edges) immediately after removing fiber marble backing to avoid color change or any sand impurities. In case of expensive (> Rs. 500 psf*) marble or those deemed to be highly susceptible to discoloration, a coat of aqua seal or similar sealant shall be applied to the marble (on the bottom surface and all the four edges) before installation to avoid stains. *As in 2012, subject	White cement paste shall be uniformly applied on the back as well as the edges of the marble tile for flooring. A uniform layer of chemical adhesive shall be applied on the backside of marble tiles for cladding.	Granite (esp. flamed ones) shall be sealed with an oil-repellent penetrating sealer (e.g. Bellinzoni, Dupont, Stone care, Akemi) to prevent staining and reduce soiling. Sealing the stone is a wipe on, wipe off procedure. The surface shall be clean before sealing. Any sealer residue from the surface shall be completely removed after it has absorbed into the pores below the surface.	SS 316 angle cleats (40 x 40 x 25 x 4.5 mm) OR MS angle painted with metal oxide paint OR galvanized coating to the MS angle (0.85 microns) shall be used for anchoring. The angle shall be anchored to block wall with expansion bolts or SS screws (with rawl plug) or equivalent. The expansion bolts thickness and length shall be determined based on the weight of the said slabs. Holes as per pin diameter are drilled into edge of stone. Holes shall be drilled in bottom edges for all marbles except in the base row. Porous stones shall be edge stiffened by gluing hard stone strip along edges.

		to normal inflation in natural stone costs.			
Laying	Only Port land white cement slurry shall be used for laying the marble.	Marble tile shall be fixed using cement slurry.	Marble tile shall be fixed on the floor using white cement slurry spread uniformly on the horizontal surface. Cladding shall be done using epoxy adhesive/any other chemical adhesive. Slab shall be fixed on the wall using a prop with cloth padding / anchor fastener system. Epoxy based grouts shall be used to finish the work.	Tile shall be fixed using cement paste mixed with @ 20% Neeru and chopped jute hemp to control shrinkage cracks. Plastic spacer pins shall be used to maintain uniform joint width. Joints shall be grouted with white cement or other grouting material like epoxy depending on type of granite and surface.	Stone is placed in its position starting from the lowest row and holes are filled with adhesive (araldite). SS pin is inserted through the cleat into the hole drilled into the starter slab. After base row is done, marble in the next row is seated by socketing the slab onto the pin protruding half length above cleats in the first row. A cornice/capping shall be put to seal gap between the wall and any other surface at the top (say ceiling). Joints shall be filled with silicon sealant.
Protection	After penultimate polishing of surface, entire surface shall be covered with bubble wrap or thick plastic / cloth in case of horizontal surfaces and adhesive plastic sheet or bubble wrap or ply for vertical surfaces (in order of preference). Any cutting for nahani trap or switch plates shall be done using a pre-made 'farma' to ensure cutting in proper shape; rotary cutters with carbon or tungsten bits are ideal for these cutting procedures. For flamed stone (granites generally), the surface shall be coated with wax or oil to stop grout and cement bonding to the finished surface. The oil / wax shall be cleaned at the time of handover.				

Guidelines for cutting of marbles / granites:

It is preferable for pre-cut slabs to be delivered to site, rather than having on-site cutting (see 'Natural Stone Usage' guidelines, reproduced above):

For whatever cutting is required to be done at site, following precautions shall be taken while cutting marble / granite slabs:

- Ensure that the blades are new in order to reduce the loss of dimension due to cutting and to avoid any damage to the edges
- Adequate clean water supply shall be available for cooling in order to avoid any stains
- After cutting, the slabs shall be kept on a soft surface so that the edges of the cut tiles are not damaged
- For fine work machine, the edges shall be slightly champhered and sanded

General guidelines:

Following guidelines shall be followed while installing marble / granite slabs:

- The properties of marble or granite being used shall be studied before commencing the bedding on the said surface
- It shall be ensured that the marble or granite bedding is laid on proper reference level before commencing the work
- For large area flooring, expansion and contraction joints shall be left between marble/granite tiles at proper distance
- A small gap (~6mm) shall be left between the top face of the flooring and underside of skirting
- Grouting shall not commence until slabs/tiles have been laid for a period of 2-3 days
- Grout shall be done for at least 2/3rd of the depth of the tile and the sides of tiles shall be clean before grouting
- Excess grout shall be removed using a wet sponge with soap water
- It shall be ensured that the mason always uses the protection cover attached with the handheld marble cutter machine
- Masons shall be instructed to wear safety groves and safety goggles at the time of cutting or grinding any marble / granite stone