General Guidelines to all Employees:

- Strict disciplinary action will be taken against employees found violating below given instruction
- Do not use defective tools or equipment.
- Never leave power tools with connections to power source
- All tools and equipment to be used with their respective guards and safety devices in place.
- Never operate tools that aren't assigned to you.
- Use always the right tool for the right purpose.
- Never indulge in unsafe working condition.
- Use eye protection whenever there is a risk of flying objects.
- Use ear protection while working in noisy condition.
- Use face mask while undertaking spray applications.
- Never wear loose cloths.
- Always wear hard-hat and shoes while working at site.
- Wear hand gloves while using hammering equipment and chemicals
- Never stand near falling weights and aisles.
- Never store materials in aisles.
- Never work under intoxication
- Never try to stop moving objects with sharp edges using bear hands
- Never stand on moving equipment
- Never use compressed air to clean your body parts
- Make sure of good house keeping
- Report all injuries immediately to superiors
- Know where to locate the first aid in the event of an emergency.

Points for good housekeeping:

- Keep the working area free of loosely lying tools and equipment
- All spillages should be effectively cleaned to avoid any slippery effect
- A safe storage area to be demarcated and secured prior to arrival of materials to work site
- All required materials for smooth execution of the works to be neatly stockpiled easy access
- Assign responsibilities to individuals depending on the size of the job, for issue of materials from the storage area
- Provide trash cans at sites to collect and dispose wastes that accumulates on a daily basis





AREAS OF SPECIALIZATION

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Combo Roof System

The life of the building could very much depend o he quality and integrity of the root The ability of a roof to perform effectively on a long term basis depends on the quality of material, design of the roofing system and quality of workmanship The extreme heat in the Middle East demands excellent insulation to prevent energy wastage. The Henkel Roofing system does just that with a swing of over 40 in energy it also provides for a perfect waterproofing thus making the ideal and t effective system.

Combo Roof a comprehensive system comprising of waterproofing thermal insulation and finishing for the roof. The system is also approved by various authorities like Dubai Municipality. Sharjah Municipality Sharjah water and Electricity authority and Trakhees. Combo Roof system is an assured solution for your roof.

Spray foam roofing starts out as two liquid components-Polyfoam / Polyol, known as the A component, and a resin (or MD), the "B" component. When the liquids are mixed at a one-to-one ratio, a chemical reaction occurs and the mixture expands 20 or 30 times forming a solid, monolithic (seamless), closed- cell, fully adhered roof system that provides excellent water-resistance and thermal insulating abilities. Polyurethane Foam mechanics can spray applies a tapered roof system with the foam which eliminates the need for costly tapered insulation systems. The vertical wall terminations are also spray applied making them an integral part of the roof system and minimizing additional component costs.

Polyurethane foam adheres to just about everything so it can be installed over concrete wood, by all major property developers consultants and contractors. This system provides a manufacturers Guarantee of 25 years against any leakage. The system meets all latest thermal insulation standards and regulations in UAE and is accepted

Procedure and Scope of Work

- Upon casting and complete curing of roof slab manufactures engineer shell visit the site to inspect the roof and accept the roof for water and heat insulation work. A preliminary site inspection shall be carried out and proofing of the main any further work if required shall be brought to the attention make Prior to commencement of roof waterproofing main contractor make sure following conditions are met:
- All joints existing between roof stab other than expansion joints provided shell be filled with mortar
- Rain water outlet shell be place at specified height as per slope
- Vertical parapet wall shell be plastered to required height.
- Roof door threshold shell be in place.
- AC or water pipe sleeves shell be place at minimum height of 400mm
- All other work shall be completed on roof prior to commencement of waterproofing works
- On acceptance of roof from the main contractor application crew of the approved manufacturer shell visit the site to commence merchandized cleaning operation using compressed air to free entire subtract from dust and any other loosely laying particles
- On completion of cleaning works, other preparatory works shell be under taken like covering of parapet wall and other utilities, fixed on the roof to avoid risk of over spray
- Supply & spray apply of polyurethane over the entire roof area including the up stand to a height of max. 200mm
- Supply & Apply of RBE coat over the entire foam area and allow to dry for minimum 25 hours
- Supply & Apply of GEOTEXTILE protection layer over the entire roof area
- Supply & lay Supply protective screed in panels and cure as per standard procedures
- Supply & Apply polybond SBR bonding agent o all corners and up stands
- Prepare angle fillet all around pa skirting area (For foundation- Angle filet to be done only for direct slab foundation) and up stands using sand cement mortar.
- Supply & Apply of POLYSEAL PSPG sealant to all construction joints including backing rod
- Supply & Apply POLYFLEx-coMBo over the entire roof area including up stands and allow drying for 48 hours,
- Final inspection shall be carried out and THE MANUFACTURERSHALLISSUE ALFETIMEGUAR OF 25



Typical Combo Waterproofing Detail



Joint Treatment





Rain Water Outlet Termination Details



Skirting Details



CREEN ROOF WATERPROOFING

Green Mat - Ideal for Green Roofs

Green Matt is %100 natural. Due to its feature of light weight Green Matt does cause harm or effect various building elements such as building roofs, pillrs and building Foundation Comparatively speaking with other conventional planting methods on s that require large volumes of soil.

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Environmental Benefits

Green Roofs reduce the Urban Heat island (UH) effect the overheating of and suburban areas com- pared to the surrounding country side, due to increased paved, built-over, and hard surface areas

Green Roofs can be considered beneficial for their storm water retention capability

Green Roofs can also reduce pollution by filtering out dust particulars and other pollutants as the air passes over the plants

Building Benefits

Green Roof protect buildings from extreme solar radiation, regulate the internal building temperature and decrease the energy required to cool the building

Green roof help protect roofing membrane from extreme temperature fluctuations and reduce the negative impact of ultraviolet radition

Green Roofs can be used as a sound barrier for the building

Increased outdoor space or gathering area with fresh air

Green Roofs increase the aesthetic value of the property





Plantation Green Mat 2nd layer Growing media Green Matst layer Sweet soil Geotextile Subsoil modular drainage layers of water roof Reinforcement concrete

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Membrane Waterproofing

Bituminous products are perfect for the waterproofing of roofs on buildings as they move with the structure as they are not too rigid and do not absorb water, waterproofing membranes systems are designed to protect both residential and commercial buildings through a mixed substance made up of organic liquids that are highly sticky and viscous and also can be used as a continuous waterproofing membrane for foundations, basements, tunnels, concreate etc, and it is applied by flame bonding

Bituminous membranes are made up of more than one product. Bitumen mixed with a filter (limestone or sand) component such as sand. Polymers are added to the bitumen such as APP (Atactic Polypropylene) a plastic additive that gives rigidity and tear resistance, or SBS (styrene butadiene styrene a rubber additive that gives more elastic benefits

Base Products

Polyester, fiber glass, rag fiber (Hessian) and paper. These products are bought in roll format and are pulled through the bitumen mixes on huge rollers. The base product become saturated in huge tanks by the tar like bitumen substance, creating rolls of waterproof material.

Advantages of this system

- Uniform Thickness
- Membrane can be polyester re-enforced ensuring dimensional stability
- Excellent stability at high & low temperature applications & service
- Higher tear & impact resistance & excellent
- Available in plain or mineral finish for light foot traffic

Process Description

Surface Preparation

- Surface shall be clean, dry and free from loose particles
- Dust, loose materials and protrusions must be removed and cracks holes made good
- For better performance surface may be dampened but not wet, particularly in hot and dry weather

Inspection

Prior to start the start of applying primer work the surface shall be inspected and approved by the concern QAQC engineer

Health & Safety

- Protective clothing such as gloves and goggles should be worn when handling the product. Treat any splashes to the skin or eyes with fresh water immediately.
- Ensure that the container is available for Medical attendant to examine any relevant instructions and content details.

Application Bituminous Primer

Apply by means of brush, roller into the entire coverage area of the substrate and allow drying, The drying time depends on the porosity of the substrate and the environmental conditions (approx. 30-10 hrs)

Application Bituminous Membrane

- Bituminous membrane shall be laid fully torched on blinding concrete with minimum of 100m end laps and 150mm side laps
- Waterproofing membrane installation shall be performed using cylinder fed propane gas torch, trowel to seal the seams of the membrane and knife for cutting.
- The membrane is then placed in the correct torching on position then re-rolled for about half of its length without changing its orientation
- The membrane is then un rolled again and torched on pressing the melted area against the substrate.
- Repeat till the entire length of the membrane is bonded firmly onto the surface then the second membrane is laid in the same way with an overlap of 150mm at the end and 100mm at the side.
- An extra length of minimum 300mm of the horizontal membrane shall be left to carry up the vertical surface to maintain continuity of the membrane and be protected as above.
- The membrane on the exposed external vertical surfaces shall be carried up to a minimum of 150 mm above the finished ground level (Le. side walk, retaining wall, columns etc) and tucked into a continuous groove provided for the same and secured approved sealant/mastic firmly recommended by the manufacturer of the membrane.
- Inspection would be submitted for approval of the Engineer, and tucked into a continuous groove provided for the same and secured firmly with approved sealant/mastic recommended by the manufacture membrane.
- Inspection would be submitted for a of the Engineer