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BUILDING DESIGN SERVICES

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POLYFORCE INTERNATIONAL JOINT SEAL WATERPROOFING

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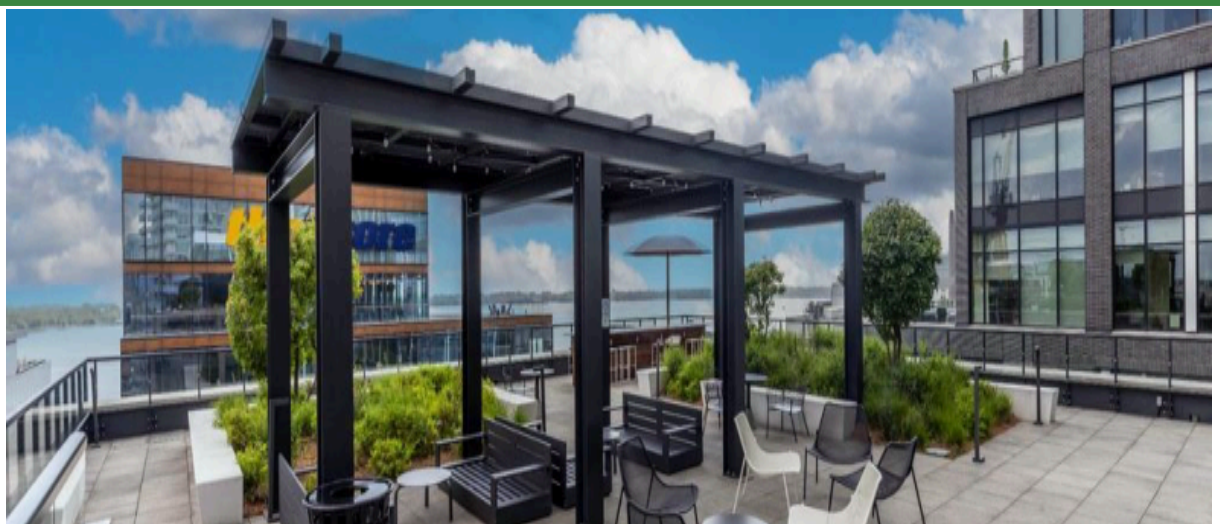
Technical Overview (Proposal Summary Document) for

130 Queen Quay East - Terrace and PG

Site Address

130 Queens Quay E



Prepared for:

130 Queens Quay E

Proposal number:

465

Introduction

Two locations were inspected: the P4 level of the underground parking garage and the rooftop terrace.

Issues with leaking cold joints were also found in the parking garage. The vertical one is so severe that it has caused calcification.

The rooftop terrace floor was inspected, and seven issues were found: leaking anchor point chambers, water pooling in a corner, damaged garden membrane, two leaking cold joints (conference room and the exterior west wall), loose light fixtures, and cracked and loose pavers.

To address these issues effectively, a comprehensive repair plan is proposed, encompassing targeted solutions tailored to each specific problem area.

See Appendix A for details on repair applications.

Repair Specifications

P4 of Parking Garage

1. **Foundation Crack with Calcium Discharge:** The proposed solution involves repairing the cold joint. Once waterproofed, the area should be painted to match the colour of the surrounding wall.

Work type to use:

- **Cold joint:**
  Cold joint waterproofing is a critical process aimed at fortifying vulnerable points in concrete structures where two slabs meet, such as walls and floors, to prevent water ingress and ensure long-term structural integrity. The repair process begins with meticulous opening of the joint to eliminate any loose material and contaminants, ensuring a clean and stable surface for subsequent treatment. An industrial-strength adhesive is then applied to the prepared joint to facilitate strong bonding. Following this, a continuous patch is installed along the entire joint at a 45-degree angle, effectively sealing the joint and enhancing its resistance to water penetration. It is then coated with a waterproofing material. To further reinforce the waterproofing, geotextile sheets can be applied, extending 6 inches upwards on the wall and 6 inches onto the floor, followed by another coating with a waterproofing membrane. This additional layer provides added protection against water intrusion and enhances the durability of the waterproofing system. Overall, cold joint waterproofing is a crucial step in maintaining the integrity of concrete structures and safeguarding against moisture-related damage.

2. **Foundation Crack Above Parking Spot 368:**The proposed solution involves repairing the cold joint. Once waterproofed, the area should be painted to match the colour of the surrounding wall.

Work type to use:

- **Cold joint:**
  Cold joint waterproofing is a critical process aimed at fortifying vulnerable points in concrete structures where two slabs meet, such as walls and floors, to prevent water ingress and ensure long-term structural integrity. The repair process begins with meticulous opening of the joint to eliminate any loose material and contaminants, ensuring a clean and stable surface for subsequent treatment. An industrial-strength adhesive is then applied to the prepared joint to facilitate strong bonding. Following this, a continuous patch is installed along the entire joint at a 45-degree angle, effectively sealing the joint and enhancing its resistance to water penetration. It is then coated with a waterproofing material. To further reinforce the waterproofing, geotextile sheets can be applied, extending 6 inches upwards on the wall and 6 inches onto the floor, followed by another coating with a waterproofing membrane. This additional layer provides added protection against water intrusion and enhances the durability of the waterproofing system. Overall, cold joint waterproofing is a crucial step in maintaining the integrity of concrete structures and safeguarding against moisture-related damage

Terrace Floor

1. **Leaking Anchor Point Chambers:** To ensure there is no leakage into the units below, all anchor point chambers must be caulked.

Work type to use:

- Caulking:
  Caulking involves the application of a flexible sealing compound to close gaps, joints, or seams in various structures to prevent the infiltration of water, air, and other environmental elements. The process begins with the thorough cleaning and preparation of the surfaces to ensure proper adhesion. This includes removing any old caulking, debris, or contaminants from the area. Once the surfaces are clean and dry, a bead of caulk is uniformly applied along the joint or gap using a caulking gun. The bead is then smoothed and tooled to ensure complete coverage and adherence, forming a tight seal. The caulk is allowed to cure according to the manufacturer's specifications, resulting in a durable, watertight, and flexible seal that accommodates slight movements between the materials. This method is essential for maintaining the integrity and longevity of building components, particularly in areas prone to water exposure or thermal expansion and contraction.

2. **Water Pooling:** To address the issue with water pooling in one of the corners of the terrace, the following steps should be taken: pavers must be removed carefully to avoid damage, the underlying surface slope must be corrected, and the pavers reinstalled.

Work type to use:

- Paver Removal:
  Specialised tools and equipment, such as jackhammers or paver strippers, are utilised to carefully dislodge and lift the stones from the substrate without causing damage to the underlying surface. Throughout the removal process, attention is paid to minimise dust and debris generation, as well as to prevent damage to adjacent structures or utilities. Once the damaged or broken stones are removed, any remaining adhesive or residue is meticulously scraped or ground away to prepare the substrate for subsequent flooring installation. This systematic approach to paver removal ensures the integrity of the substrate while facilitating the transition to new flooring materials or repairs as necessary.

- Surface Resloping:
  Concrete surface resloping, or slope correction, involves modifying the grade of a concrete surface to ensure proper drainage and prevent water accumulation. The process begins with a detailed assessment of the existing slope to identify areas with inadequate drainage. The surface is then prepared by cleaning and, if necessary, roughening to enhance the bonding of new material. A high-strength, polymer-modified concrete overlay or a similar resurfacing compound is mixed to the appropriate consistency and applied to the targeted areas. Using screeds, trowels, and other precision tools, the new material is carefully shaped and contoured to achieve the desired slope, ensuring a consistent gradient that directs water away from critical areas. The surface is then finished to the required texture and allowed to cure, adhering to the specified curing time and conditions. This method restores proper drainage functionality, mitigating potential water damage and enhancing the durability and safety of the concrete surface.

- Paver Resetting:
  Loose pavers are carefully removed, taking care to minimise damage to adjacent pavers and underlying surfaces. The substrate is then meticulously cleaned and prepared to ensure optimal bonding conditions. High-performance adhesive or mortar is applied to the underside of the pavers, and they are firmly pressed into place, aligning them with neighbouring pavers to maintain a uniform surface. Excess adhesive is carefully removed, and the pavers are allowed to set according to manufacturer specifications. This meticulous resetting process not only addresses immediate paver detachment but also helps mitigate future issues, ensuring the longevity and stability of the paved surface

3. **Damaged Garden Membrane:** To address the damaged garden membrane, a multi-step approach is proposed. This includes the removal of earth and plants, followed by the removal of the damaged membrane. Slight surface grinding will be performed to prepare the substrate for the new coating, with the installation of a new epoxy membrane to provide robust waterproofing and protection.

Work type to use:

- Earth/Pebble Removal:
  The process of soil or pebble removal from the landscaped areas involves a careful and precise excavation process. First, the topsoil and any vegetation are carefully removed to prevent damage to the surrounding walkway and underlying structures. The rest of the soil is then excavated, with special attention given to protecting the surrounding patio stones and any nearby installations or utilities, as the case may be. Once the required depth is reached, the exposed area is meticulously cleaned to remove any remaining debris, ensuring clear and unobstructed access to the waterproofing membrane.

- Epoxy Removal:
  Initially, the existing epoxy surface is assessed to determine the thickness and adhesion properties, guiding the selection of appropriate removal techniques. Mechanical grinding or shot blasting is then employed to systematically strip away the old epoxy layer. These methods effectively abrade the surface, removing the epoxy and any contaminants. Throughout the process, careful attention is paid to maintain an even removal depth and avoid damaging the underlying concrete. Once the epoxy is fully removed, the surface is thoroughly cleaned to eliminate any remaining dust or particles, providing an optimal substrate for the application of the new epoxy coating. This meticulous preparation process is critical for achieving maximum adhesion and durability of the new epoxy layer.

- Grinding (General):
  The grinding process for a larger area involves the use of a floor grinder, a machine designed for efficiency and precision in surface preparation. The procedure begins with selecting the appropriate grinding disc based on the concrete's hardness and the desired finish. The floor grinder is then manoeuvred systematically across the surface, ensuring consistent and even grinding. This method effectively removes surface imperfections and any contaminants, creating a smooth and level substrate. Throughout the process, the grinder's speed and pressure are carefully monitored and adjusted to maintain optimal performance and avoid over-grinding. Dust extraction systems are employed to minimise airborne particles and maintain a clean working environment. This methodical approach ensures that the entire area is adequately prepared for subsequent applications, such as coatings or sealants, enhancing the durability and adhesion of the final treatment

- Surface Coating - Epoxy:
  Once the surface is properly prepared, the epoxy resin and hardener components are mixed according to manufacturer specifications, taking care to achieve the desired consistency and pot life. The mixed epoxy is then applied evenly to the substrate using specialised tools such as rollers or squeegees, ensuring uniform coverage and thickness. During application, careful attention is paid to avoid trapping air bubbles or leaving uneven spots. Depending on the type of epoxy used, additional steps such as broadcasting decorative flakes or applying a topcoat may be incorporated to enhance aesthetics and performance. Finally, the newly coated surface is allowed to cure in accordance with the manufacturer’s recommended curing times, ensuring the development of optimal mechanical and chemical

properties. This methodical approach ensures the successful installation of a durable and high-performance epoxy coating, suitable for a wide range of industrial and commercial applications.

4. **Leaking Cold Joints (Conference Room and Exterior Wall):** Both leaking cold joints will undergo a specialised cold joint repair process to effectively seal and waterproof these vulnerable areas, ensuring long-term protection against water ingress and structural damage.

Work type to use:

- Cold Joint:
  Cold joint waterproofing is a critical process aimed at fortifying vulnerable points in concrete structures where two slabs meet, such as walls and floors, to prevent water ingress and ensure long-term structural integrity. The repair process begins with meticulous opening of the joint to eliminate any loose material and contaminants, ensuring a clean and stable surface for subsequent treatment. An industrial-strength adhesive is then applied to the prepared joint to facilitate strong bonding. Following this, a continuous patch is installed along the entire joint at a 45-degree angle, effectively sealing the joint and enhancing its resistance to water penetration. It is then coated with a waterproofing material. To further reinforce the waterproofing, geotextile sheets can be applied, extending 6 inches upwards on the wall and 6 inches onto the floor, followed by another coating with a waterproofing membrane. This additional layer provides added protection against water intrusion and enhances the durability of the waterproofing system. Overall, cold joint waterproofing is a crucial step in maintaining the integrity of concrete structures and safeguarding against moisture-related damage.

5. **Loose Light Fixtures:** Loose light fixtures (bollards) will be tightened using appropriate techniques to restore structural stability without causing damage to the substrate or overtightening, ensuring the safety and integrity of the terrace floor.

Work type to use:

- Post/Bollard Adjustment:
  Loose bollards are carefully tightened using specialised tools and techniques, taking into consideration factors such as load requirements, substrate integrity, and manufacturer specifications. During the adjustment process, precise torque values are applied to achieve optimal fastening while avoiding over-tightening, which could potentially damage the substrate or compromise the structural integrity of the anchor points.

6. **Cracked and Loose Pavers**: Cracked pavers will be replaced with new ones, while loose pavers will be reset to ensure a level and secure terrace floor surface, enhancing safety and aesthetics.

Work type to use:

- Paver Resetting:
  Loose pavers are carefully removed, taking care to minimise damage to adjacent pavers and underlying surfaces. The substrate is then meticulously cleaned and prepared to ensure optimal bonding conditions. High-performance adhesive or mortar is applied to the underside of the pavers, and they are firmly pressed into place, aligning them with neighbouring pavers to maintain a uniform surface. Excess adhesive is carefully removed, and the pavers are allowed to set according to manufacturer specifications. This meticulous resetting process not only addresses immediate paver detachment but also helps mitigate future issues, ensuring the longevity and stability of the paver surface.

- Paver Removal:
  Loose pavers are carefully removed, taking care to minimise damage to adjacent pavers and underlying surfaces. The substrate is then meticulously cleaned and prepared to ensure optimal bonding conditions. High-performance adhesive or mortar is applied to the underside of the pavers, and they are firmly pressed into place, aligning them with neighbouring pavers to maintain a uniform surface. Excess adhesive is carefully removed, and the pavers are allowed to set according to manufacturer specifications. This meticulous resetting process not only addresses immediate paver detachment but also helps mitigate future issues, ensuring the longevity and stability of the paved surface.

- New paver Installation:
  Loose paving stones are carefully removed, taking care to minimise damage to adjacent stones/pavers and underlying surfaces. The substrate is then meticulously cleaned and prepared to ensure optimal bonding conditions. High-performance adhesive or mortar is applied to the underside of the stone/slab , and they are firmly pressed into place, aligning and levelling them with neighbouring pavers to maintain a uniform surface. Excess adhesive is carefully removed, and the pavers are allowed to set according to manufacturer specifications. This meticulous resetting process not only addresses immediate paver detachment but also helps mitigate future issues, ensuring the longevity and stability of the paved surface.

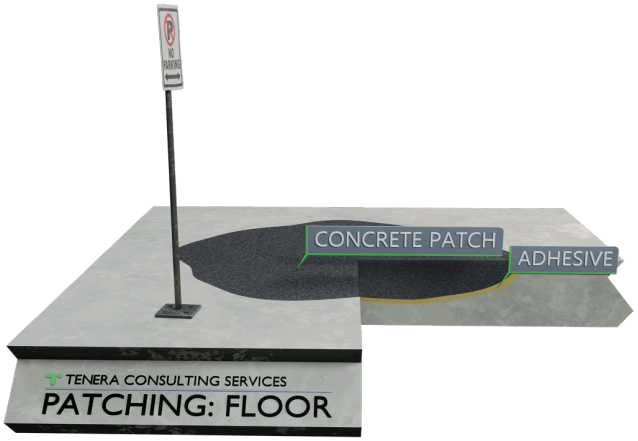
Conclusion

By implementing the proposed repair solutions for the underground parking garage and the rooftop terrace, both areas will undergo comprehensive restoration, addressing all identified issues and ensuring enhanced functionality, durability, and aesthetic appeal. This targeted approach aims to mitigate existing problems and prevent future issues, thereby optimising performance and longevity.

APPENDIX A

Application Diagrams

Patching - Floor



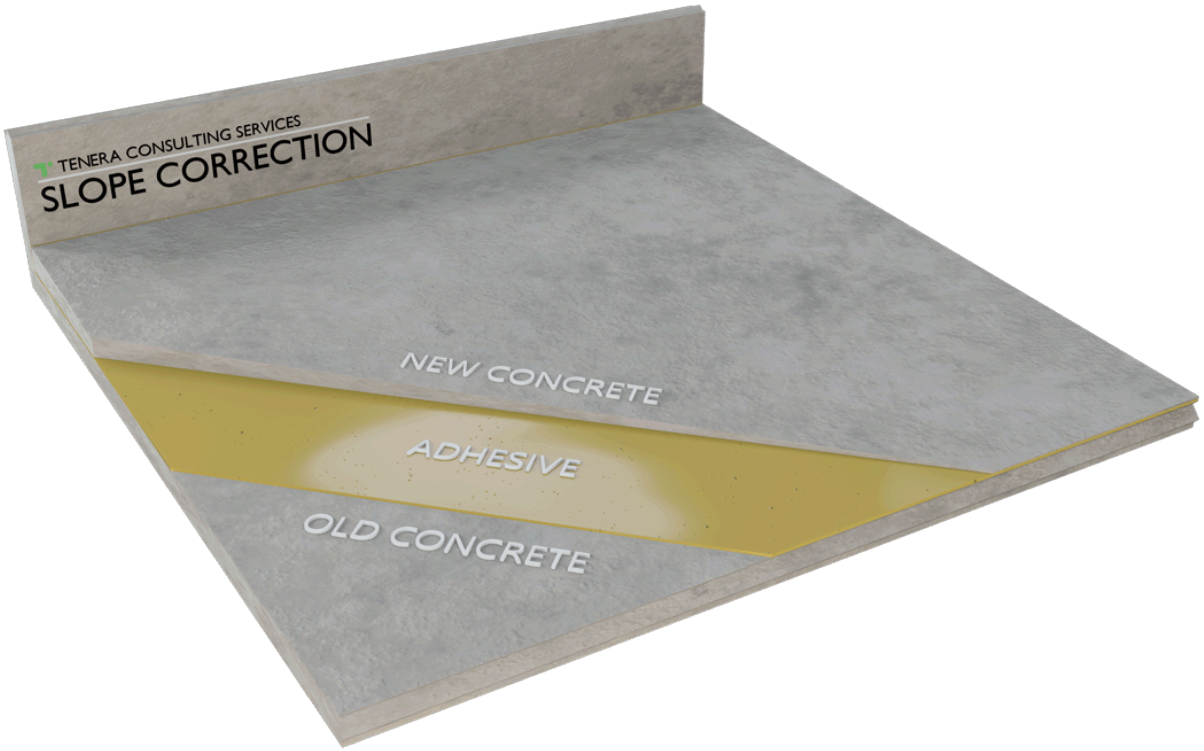
Patching with No Moisture

If there are no active leaks and the surface is dry, slight grinding is done to ensure proper patch installation. The prepared area is then coated with an industrial-strength adhesive, and the patch installed immediately afterwards (The product used provides monolithic adhesion which allows for patches as thin as 5 mm to be installed.). Some grinding is done, for a smoother surface finish.

Patching a Wet Surface

When there is active leakage, the water must be stopped and the surface dried. Polymer cement is used as a leak stop, followed by surface torching. The surface is then coated with a primer, followed by a waterproofing material, and an industrial-strength adhesive. Patching is done immediately afterward, and grinding is done, to smooth out the surface.

Surface Resloping

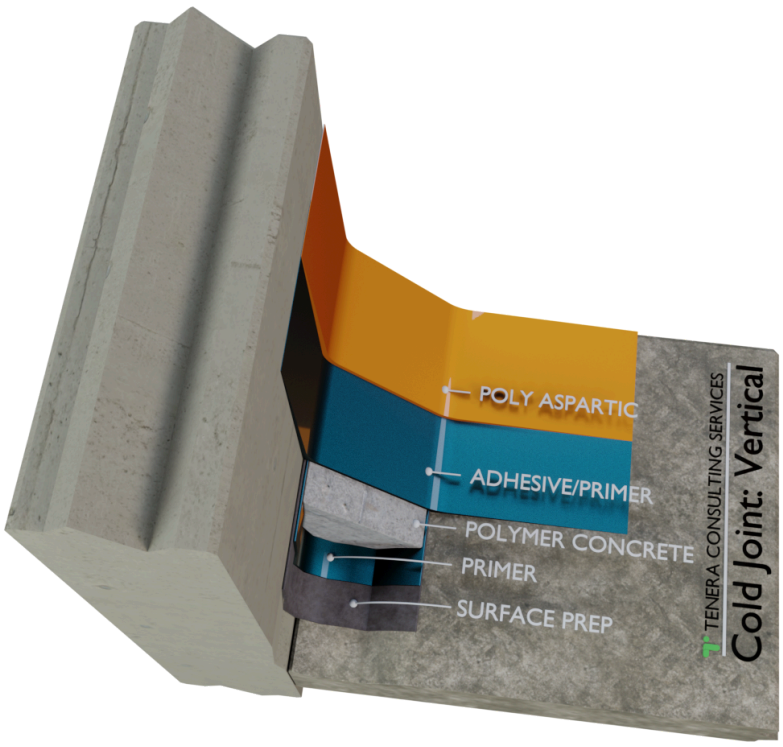


Slope correction, also known as resloping, is one of the repairs that can help preserve concrete structures. The need for slope correction can arise in various areas, such as balconies, elevator pits, and parking garage floors, where the existing slope may be insufficient or even inverted, leading to undesirable water flow patterns. For instance, improper slopes can cause water to accumulate towards the unit or garage walls, rather than draining away as intended.

Failing to address this issue promptly and effectively can have severe consequences, particularly for concrete structures. If surfaces remain damp due to inadequate drainage, this will lead to concrete degradation over time. As moisture seeps into the concrete, it weakens the material, compromising its durability and strength. Consequently, this deterioration can pose a significant risk of structural damage, potentially jeopardising the safety and longevity of the entire building or infrastructure.

To mitigate such risks, existing slopes must be assessed, and appropriate correction measures implemented. This entails taking correct measurements and calculating the required slope. By addressing slope correction properly, the service life of concrete surfaces can be extended, contributing to the overall safety and longevity of the building infrastructure.

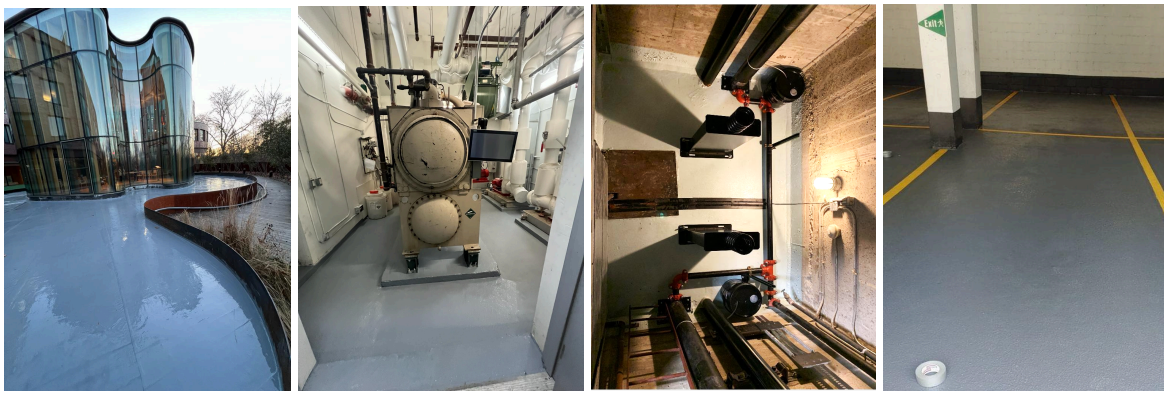
Cold Joint Waterproofing



Floor / wall corners (cold joints) are a weaker area of any concrete structure, so they are more likely to leak.

For lasting waterproofing results, the joints are first chipped out to the depth of 1”. If there is active leakage, polymer cement and torching are used, to stop water flow and allow for the repair. A waterproofing material is applied next, followed by an industrial-strength adhesive tested to MTO standards. A continuous patch, running along the entire joint, is then installed forming a 45° angle. It is then coated with a specialised primer, followed by another layer of a waterproofing material.

Coating - Waterproofing Membrane



Applying a waterproofing membrane in two layers, integrated with non-slip aggregates, offers a robust solution for enhancing surface durability and safety. The repair begins with surface preparation: grinding is done to eliminate any loose material and ensure proper adhesion of the membrane. The first membrane layer acts as a base, providing a resilient foundation for the subsequent application. Non-slip aggregates are then incorporated into the second layer to enhance traction and prevent slips and falls, followed by a second layer of the membrane.

This dual-layer approach not only reinforces the surface against wear and tear but also enhances safety by reducing the risk of accidents. Overall, the application of a waterproofing coating with non-slip aggregates, preceded by thorough surface grinding, results in a durable, high-traction surface suitable for various commercial, industrial, and residential settings.

Waterproofing membranes offer exceptional durability that provides a long-lasting protection against abrasions, impacts, and chemical exposure, allowing the floor surface to maintain its integrity and appearance even in high-traffic areas or harsh environments. Additionally, most membranes are highly resistant to UV radiation, preventing color fading and maintaining the aesthetic appeal of the floor over time. Their seamless application creates a smooth, easy-to-clean surface, reducing maintenance requirements and enhancing hygiene in commercial, industrial, and residential spaces.